Devils Postpile National Monument

U.S. Department of the Interior
National Park Service

Draft General Management Plan and Environmental Assessment

August 2014

United States Department of the Interior

NATIONAL PARK SERVICE
Devils Postpile National Monument
P. O. Box 3999
Mammoth Lakes, California 93546
760-924-5505

D-18 August 2014

Dear Friends of Devils Postpile National Monument,

It is with great pleasure that we submit to you the *Draft General Management Plan and Environmental Assessment* for Devils Postpile National Monument. When completed, this plan will guide our management of the monument as it enters its second century and provide the framework for managing natural, cultural, and recreational resources for the next 20 years.

Throughout this planning process, we've received ideas from our visitors, area residents, and diverse stakeholders through public meetings, our website, emails, and in letters. Your input, coupled with NPS resource and planning expertise and the collaborative participation of Inyo National Forest staff, has helped shape the recommendations in this plan, including the identification of the preferred alternative.

This *Draft General Management Plan* (GMP) offers three alternative approaches, including a preferred alternative, to public use and enjoyment of the monument, protection of its natural and cultural resources, management of facilities, and overall operations for this special unit of the national park system.

It is also important to note that while the GMP will result in a commitment to a specific vision for Devils Postpile National Monument, the NPS and USFS recognize the public and resource benefits of the monument are intertwined with the surrounding Reds Meadow Valley and Upper Middle Fork of the San Joaquin. Both agencies are working together on this plan and using this opportunity to develop some additional recommendations for the valley and watershed, so our shared efforts can provide high quality visitor experiences and resource protection as we look forward to the next 100 years.

We have timed the review of this draft plan during the peak summer season with the goal of engaging all of our visitors and people who care for Devils Postpile in creating an enduring vision for the preservation and enjoyment of the monument's scenic, resource, and recreational values, benefitting both present and future generations. Please take the time to review this draft document and provide us with your thoughts and comments.

We look forward to seeing you in the monument this season.

Deanna M. Dulen

Deanna Dulen
Superintendent

Devils Postpile National Monument Draft General Management Plan and Environmental Assessment

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Draft General Management Plan / Environmental Assessment

The National Park Service (NPS) planning team, with participation by staff from the Inyo National Forest, identified three alternatives for managing Devils Postpile National Monument for the next 15-20 years. These alternatives respond to National Park Service planning requirements, and the issues identified during public scoping. The alternatives establish desired future conditions for administration and management, cultural and natural resource protections, research, education and opportunities for visitor enjoyment. The alternatives also respond to comments received through public scoping and the ongoing involvement of public agencies, tribes, local communities, organizations, and individuals. Alternative C (Connecting People to Nature and Heritage) is the preferred alternative of the NPS to guide future management of Devils Postpile National Monument.

Alternative A (Continue Current Management) assumes that existing management, programming, facilities, staffing, and funding would generally continue at their current levels.

Alternative B (Watershed Emphasis) proposes a greater emphasis on managing and promoting visitor understanding of the monument in the context of a larger watershed. Toward this end, the current level of visitor services in the monument would be continued, but locating visitor services and facilities outside of the watershed would be emphasized, when possible.

Alternative C (Connecting People to Nature and Heritage), the Preferred Alternative, emphasizes key features with national significance for resource protection and connecting visitors with nature and heritage, including traditional park experiences in a wild setting. The monument would be managed as a gateway to a greater wilderness and additional emphasis would be placed on connections and partnerships with the Inyo National Forest and the Town of Mammoth Lakes.

The environmental consequences of the alternatives are examined in the Environmental Assessment. Results of public involvement, consultation, and coordination conducted throughout the planning process are included in Chapter 6: Consultation and Coordination.

How to Comment on this Document

This Draft General Management Plan / Environmental Assessment has been distributed to other agencies and interested organizations and individuals for their review and comment. The public comment period for this document will last for approximately 60 days. Please submit comments by September 30, 2014.

This document is available online at the NPS Planning and Public Comment System website at http://parkplanning.nps.gov/depo. An online public comment form is provided at this website.

Comments may also be made in person at one of the public workshops that will be conducted during the public review period. The specific dates and times for these workshops will be announced in local newspapers, in the General Management Plan newsletter, and online at the above site.

For further information or to send written letters or comment forms on this draft plan, contact or write:

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Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that the NPS practice is to make comments, including the names and addresses of respondents, available for public review. Individual respondents may request that their address be withheld from the planning record, which will be honored to the extent allowable by law. There also may be circumstances in which a respondent's identity would be withheld from the record, as allowable by law. To have your name and/or address withheld state this prominently at the beginning of the comment.

A Guide to This Document

This Draft General Management Plan / Environmental Assessment is organized in accordance with the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act,

the National Park Service's "Park Planning Program Standards," and Director's Order 12 and Handbook, "Conservation Planning, Environmental Analysis, and Decision Making."

Chapter 1: Introduction sets the framework for the entire document. It provides an overview of the monument, describes why the plan is being prepared and what needs it must address. This chapter also details the planning opportunities and issues that were raised during internal and public scoping meetings. The alternatives in Chapter 3 address these issues and concerns. Next is a statement of the scope of the environmental assessment—specifically what impact topics are or are not analyzed in detail. This chapter concludes with an overview of other related planning efforts.

Chapter 2: Foundation for Planning and Management provides guidance for the management alternatives that are being considered. This guidance is based on the national monument's establishing legislation or proclamation, its purpose, the significance of its resources, fundamental resources and values, special mandates, and administrative commitments. This chapter concludes with a list of servicewide laws and policies that are applicable to all of the alternatives presented in this plan.

Chapter 3: Alternatives begins with an overview of the individual components included in the Draft General Management Plan alternatives. Management zones that would be used to manage the national monument in the future and specific actions that are common to all the alternatives are described. Next is the description of the three alternatives, including the continuation of current management practices and trends (alternative A – no action). This section is followed by a discussion of visitor capacity indicators and standards, summary of the alternatives and the environmental consequences of implementing those alternatives, discussions of the environmentally preferred alternative, actions/alternatives considered but dismissed from detailed consideration, and implementation of the general management plan.

Chapter 4: The Affected Environment describes those areas and resources that would be affected by implementing the actions contained in the alternatives.

Chapter 5: Environmental Consequences analyzes the impacts of implementing the alternatives on topics described in the "Affected Environment" chapter. Methods that were used for assessing the impacts in terms of the intensity, type, and duration of impacts are outlined for each impact topic. The chapter begins with mitigation measures proposed to minimize or eliminate the impacts of some proposed actions in the alternatives and identification of the environmentally preferred alternative.

Chapter 6: Consultation and Coordination describes the history of public and agency coordination during the planning effort and any future compliance requirements. It also lists agencies and organizations that will be receiving copies of the document and a list of preparers.

Appendices (including an Extent Necessary Determination and a Wild and Scenic River suitability analysis), glossary, and a list of references are found at the end of the document.

Devils Postpile National Monument Ranger Station *NPS Photo*

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Introduction

Devils Postpile National Monument ("Devils Postpile NM" or "the monument") was established on July 6, 1911 by Presidential Proclamation 1166. Devils Postpile NM sits in Reds Meadow Valley, within the central Sierra Nevada of California, surrounded by the Inyo National Forest and attached to one of the largest contiguous wilderness complexes in the lower 48 states. The purpose of the monument 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 in the Sierra Nevada for scientific value, public interest, and inspiration.

Devils Postpile, 1927, *Pomona Library,*

Devils Postpile NM is comprised of approximately 800 acres of geologic formations, riparian and wetland areas, mixed conifer forests, with an elevational gradient ranging from 7200 feet at the southern monument boundary to nearly 8400 feet at the summit of Granite Dome. Approximately 85% (687 acres) of the monument is federally designated wilderness. The monument provides access to a greater 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 Areas. The closest communities to Devils Postpile NM are Mammoth Lakes to the east, Lee Vining and June Lake to the northeast, and Bishop to the southeast.

The peak season of visitation to the monument is mid-June through Labor Day. During September and early October, visitation can be high, with parking lots at capacity, when weather is pleasant and fall colors vibrant. The primary access point (and the only vehicular access) is through Mammoth Lakes, off of U.S. Route 395. 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. The road typically re-opens and visitor services resume in early to mid-June, though winters with exceptionally high snowfall have pushed opening day into late June.

The last comprehensive planning effort for Devils Postpile NM was a master plan developed in 1962 and revised in 1964. This planning effort was based on an assumption that the trans-Sierra highway would be built and sought to accommodate a dramatic increase in visitation coupled with easier vehicle access. Since then, the highway proposal was defeated, a shuttle system was instituted in coordination with the Inyo National Forest, and a large portion of the monument was designated as wilderness, rendering the previous plan obsolete. Devils Postpile NM has never undertaken a comprehensive planning process meeting the requirements of the Parks and Recreation Act of 1978. A general management plan, reflecting the contemporary and future issues and challenges facing Devils Postpile NM, is essential for providing a framework for management of the monument into the future.

This Draft General Management Plan/Environmental Assessment (GMP/EA) was developed in consultation with NPS staff and program managers, USFS staff

from the Inyo National Forest and Pacific Southwest Research Station, local communities, government agencies, California Indian tribes, stakeholder groups and individuals. The Inyo National Forest is a cooperating agency under the National Environmental Policy Act (NEPA) on the GMP and a Memorandum of Understanding is in place outlining collaboration between the two agencies on this planning effort.

The GMP articulates a vision and overall management framework for Devils Postpile NM 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 and the need for new facilities; and long-term operations and management of the monument.

Rainbow Falls, *NPS Photo*

The GMP will be a National Park Service decision document. Its management guidance will only govern future actions taken by the NPS. However, through this planning process additional recommendations were developed by the GMP team, with participation by USFS staff, for the surrounding watershed within the Inyo National Forest. The USFS could undertake any or all of the recommendations individually or by integration into planning on the Inyo National Forest. These recommendations were provided in an effort to identify opportunities for interagency efficiency, improve visitor services, and establish a vision for collaborative management of the watershed, consistent with the monument's management under the GMP. The USFS has not committed to and is not required to adopt any of the recommendations contained in these alternatives.

Issues

The general public, NPS staff, and representatives from county, state, and federal agencies, and various organizations identified issues and concerns about monument management during the scoping phase (early information gathering) for this general management plan. An issue is defined as an opportunity, conflict, or problem regarding the use or management of public lands. Issues and concerns raised during public scoping generally involved suggestions for the types and levels of services and activities offered at the monument (particularly interpretive and educational programs) and protecting the character of both the developed area and the wilderness. The general management plan alternatives provide strategies for addressing these issues within the context of the monument's purpose, significance, and special mandates.

NATURAL RESOURCES

The GMP will articulate management direction for natural resources protection, research and monitoring, largely based on existing law and policy, and address the balance between visitor use and enjoyment and the protection of natural resources. Desired conditions, management zoning, and indicators and standards for visitor capacity will be established. This guidance will include determination of appropriate visitor uses, protection of sensitive resources, and opportunities to coordinate and collaborate with other land managers and stakeholders to protect natural communities and features. The GMP will address the balance between visitor access and natural resource protection, particularly in regards to the relationship of the campground and parking area to the sensitive riparian resources along the river corridor. The GMP process also provides an opportunity to review and update the wild and scenic river eligibility study and conduct a suitability study of the Middle Fork of the San Joaquin River within Devils Postpile NM.

CULTURAL RESOURCES

The GMP will articulate management direction for cultural resources protection, research, collections management, and monitoring, largely based on law and policy, as well as address the balance between visitor use and enjoyment and resource protection. Desired conditions, management zoning, and indicators and standards for visitor capacity will be established. This guidance will include determination of

appropriate visitor uses, protection of sensitive sites, and opportunities to coordinate with the Inyo National Forest and tribal representatives to protect culturally significant sites within Reds Meadow Valley and to address community and tribal interests related to the monument.

WILDERNESS

The GMP will provide overall direction for wilderness management and, given that approximately 85% of the monument is designated wilderness, satisfy several aspects of wilderness stewardship planning. This will include incorporating the wilderness character framework as a new context for managing wilderness, determining the desired resource conditions and visitor experiences in wilderness, determining the appropriate balance of protecting the qualities of wilderness character with other public values, and defining the appropriate level of development at popular wilderness locations such as Rainbow Falls. The GMP will also include an analysis of the types and amounts of commercial services that support the realization of the purposes of wilderness while still preserving the qualities of wilderness character.

Devils Postpile Campground, *NPS Photo*

CLIMATE CHANGE

The GMP will provide general guidance to help the monument understand, anticipate and address the potential impacts. Global climate change will have direct and indirect impacts on natural resources, visitor use, facilities, administration and operations at Devils Postpile NM. The effects of global climate change will almost certainly include changes in local weather patterns, temperature and precipitation trends, wildfire frequency, distribution of plants and animals, increased vulnerability to invasive species, and increased insect and pathogen infestations. Pro-active planning and management can help the monument adapt to these changes and their effects on monument resources, operations, and visitors.

VISITOR USE AND FACILITIES

The GMP will determine what types of visitor experiences and activities, including interpretation and education, should be available in different areas of the monument, in keeping with the values and special designations of those areas and the surrounding lands. Experiences in the monument range from traditional day use activities, such as hiking, nature viewing, and picnicking to an immersion into the vast Sierran wilderness.

The GMP will address visitor contact facilities, including whether the current ranger station meets the needs of visitors and staff and what improvements can be made if it doesn't. At the same time, the GMP will examine opportunities outside of the monument for visitor services, including in the Town of Mammoth Lakes.

The GMP will also identify indicators and standards for visitor capacity to define the types and levels of visitor and other public use that can be accommodated while sustaining the desired resource and social conditions for each management zone. Monitoring strategies will be developed to test the effectiveness of management actions and provide a basis for informed adaptive management of public use.

ACCESS AND TRANSPORTATION

The GMP will consider alternatives for parking and access and determine the appropriate balance between visitor access and the protection of natural resources. The GMP will consider how the monument's trail system can be enhanced, how trail management should be coordinated with the Inyo National Forest, and the types of uses that should be accommodated, including consideration of accessibility.

ADMINISTRATIVE AND OPERATIONAL FACILITIES

The GMP will determine the appropriate levels of development in different parts of the monument, and explore which areas, if any, are appropriate for administration and operations activities. Removal of facili-

ties and infrastructure, in order to support effective operations, improve facility condition index and invest available funds wisely, will be examined. Long-term sustainability and cost-effective approaches to providing for office / administrative space, law enforcement operations, emergency service operations, interpretive operations, resource management, maintenance, meeting and training space, and housing will be considered. The GMP will also address which operational functions should continue to be located in the monument itself and whether there are opportunities to move functions to other locations and/or to collaborate with the Inyo National Forest.

Trailhead at the Ranger Station, *NPS Photo*

LAND USE AND REGIONAL ISSUES

The National Parks and Recreation Act of 1978, as amended, requires that general management plans consider the adequacy of existing boundaries. In the context of Devils Postpile National Monument, the GMP will explore boundary modifications, additional designations, and provide guidance for future cooperative agreements with the Inyo National Forest.

COORDINATION OF FACILITIES AND SERVICES IN THE VALLEY

The GMP will explore opportunities for the National Park Service and U.S. Forest Service to coordinate services and facilities in the valley, as well as in the Town of Mammoth Lakes, through options including the use of Service First authority. Service First is a partnership authority among four agencies: Bureau of Land Management, Forest Service, National Park Service and US Fish and Wildlife Service. Service First provides legal authority for these agencies to carry out shared or joint management activities to achieve mutually beneficial resource management goals. Service First authority has been used primarily for collocating offices, joint permitting, shared management and single points of contact for resource programs.

Devils Postpile NM and the Inyo National Forest have a shared responsibility and interest in management of public lands in this area and work as partners to provide visitor services and manage resources. Both agencies recognize it is in the best public interest to coordinate many aspects of the management of visitor services, shuttle bus operations, visitor information, resource protection strategies, and emergency response. The GMP will make recommendations for collaboration, with participation throughout the planning process from Inyo National Forest staff.

The Inyo NF is a cooperating agency under NEPA on the GMP and a Memorandum of Understanding is in place for the agencies to cooperate on the development of the plan.

Development of the GMP

The GMP is based on an analysis of existing and predicted natural and cultural resource conditions, visitor experiences, environmental impacts, and costs. It primarily provides a framework for administration and management and a vision to be realized through future actions. This document also includes an environmental assessment (EA), which considers at a general qualitative level the impacts that each of the alternatives could have on the monument environment. The EA sets the framework for future compliance with the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) for the monument. It also assists decision makers and the public in assessing the relative merits and effects of the alternatives.

Alternatives

Three alternatives for future management of Devils Postpile NM are presented in this draft GMP. Each of these alternatives is consistent with the monument's purpose, significance, and special mandates and presents a different way to manage resources and visitor use and improve facilities and infrastructure.

These three alternatives represent the range of ideas the public, NPS staff, and other agencies and stakeholders identified regarding natural and cultural resource conditions, visitor use and experiences, and overall management of Devils Postpile NM.

The three alternatives are characterized as follows:

- Alternative A (Continue Current Management)
- Alternative B (Watershed Emphasis)
- Alternative C (Connecting People to Nature and Heritage), the Preferred Alternative

Ranger talk at the Postpile, *NPS Photo*

Several other actions and alternatives were also considered but were eventually dismissed from further analysis. These actions and alternatives, along with the rationale for their dismissal, are described near the end of Chapter 3 Alternatives.

MANAGEMENT ZONES

Management zones are a component of the alternatives. They describe a range of desired conditions and management approaches to be achieved and maintained in specific areas of the monument. These zones form the basis of the plan's alternatives and are applied to different geographic areas in each action alternative (alternatives B and C) based on the overall concept for each alternative. The four management zones are frontcountry, sensitive resource management, natural, and portal. Each zone includes a zone concept and desired conditions for natural and cultural resources, visitor opportunities and use, facilities, access and transportation, and other management concerns. A map depicting the application of management zones for each alternative can be found in Chapter 3 Alternatives.

The GMP team, with participation by some USFS staff, zoned the entire watershed, including both National Park Service and U.S. Forest Service lands. This zoning approach was taken to help planners and land managers think about the watershed holistically, with a goal of providing integrated and complementary visitor experiences in the valley, as well as increasing operational efficiencies between the two agencies. Zoning extending beyond the monument boundaries should only be viewed as a recommendation for the USFS. This zoning would become effective only if it is adopted or otherwise incorporated, in full or in part, in future USFS plans. This GMP does not, by itself, establish zones on USFS lands.

RECOMMENDATIONS TO THE USFS

The alternative descriptions are focused on management of the monument. Alternatives B and C are followed by recommendations for management of the surrounding USFS lands. These recommendations were developed under a Memorandum of Understanding (MOU) with the Inyo NF which provided a framework for participation by Inyo NF staff in their development.

The recommendations were formulated to complement proposed actions in the monument, provide an integrated valley-wide visitor experience, and increase efficiencies between the two agencies. Under the MOU, the recommendations are not part of the GMP alternatives and would not be implemented unless the Inyo National Forest decides to adopt some or all of them in its own planning and decision-making processes.

ACTIONS COMMON TO ALL ALTERNATIVES

Actions common to all alternatives present management guidance, desired conditions, and actions would apply to all alternatives, including alternative A (No Action). This section is included before the detailed descriptions of the three alternatives and contains direction the monument would follow, regardless of which alternative is selected.

Many aspects of natural and cultural resources management, preservation of wilderness character, support for scientific research, and commitments to develop adaptation strategies in response to climate change are common to all alternatives, along with elements of the

visitor experience such as preserving the traditional range of recreational activities and collaborating with the Inyo NF on the shuttle operation.

Consistent with an extent necessary determination for commercial services in wilderness, commercial stock day use at Rainbow Falls may continue at levels currently permitted by the U.S. Forest Service from their trailhead (1440 day rides per season) in realization of the purpose of wilderness (See *Appendix D: Determination of Extent Necessary*). Also common to all alternatives is an NPS recommendation for Congressional legislation for wild and scenic river designation for the portion of the Middle Fork of the San Joaquin River within Devils Postpile NM (See *Appendix E: Wild and Scenic River*).

Restoration work *NPS Photo*

The common to all alternatives section also describes possible USFS measures suggested by the interagency GMP planning team which, if adopted by the USFS, could better integrate visitor services, operational efficiency, and resource management in Reds Meadow Valley.

ALTERNATIVE A (CONTINUE CURRENT MANAGEMENT)

Alternative A is the "no action" alternative and assumes that existing management, programming, facilities, staffing, and funding would generally continue at their current levels. A no action alternative is required by the National Environmental Policy Act and serves as a baseline for comparison in evaluating the changes and impacts of the other two alternatives. The emphasis of alternative A would be to protect the values of Devils Postpile National Monument without substantially increasing staff, programs, funding support, or facilities. Resource preservation and protection would continue to be a high priority for the management of the monument. Staff would continue to work with the Inyo National Forest on projects of mutual interest, on a case-by-case basis. Management of visitor use and facilities would generally continue under existing levels and types of services and regulations. Existing visitor facilities, such as buildings, structures, roads, parking areas, camping areas, and trails, would be maintained. Most administrative facilities would also be maintained with the exception of the monument's inadequate maintenance building which would be replaced.

Mammoth Lakes

The monument would continue to co-locate administrative offices with the USFS in their current location at the Mammoth Lakes Welcome Center and the Mammoth Ranger Station campus.

Devils Postpile NM Developed Area

The monument would maintain the existing ranger station in its current location. The building interior would continue to provide a small space for visitor contact, as well as a small office for some operational use. The ranger station would continue to receive upgrades as needed, particularly for accessibility and safety. The monument would maintain its overnight campground in its current configuration, with minimal improvements over time. The shuttle bus stop would also remain unchanged and in its current location.

The existing buildings, including operational space, employee housing, tent cabins, and storage facilities, would remain in the administrative area. An overnight staff presence would be maintained in the monument.

The maintenance building would be replaced in the monument with a new structure consistent with earlier building plans, but final design plans and a location within the monument would still need to be determined. The monument would strive to find a location that could adequately accommodate the new building and minimize impacts to the visitor experience. The monument would continue to try and address concerns around changing the character of the area by having a larger building in the small developed area and siting the maintenance building so it is not the first NPS facility visitors see upon entering the monument.

Rainbow Falls

The monument would maintain facilities currently at Rainbow Falls, including trails, hitching posts, viewing platforms, walls, and stairs to the base of the river in their current configurations. Visitor access to the river at the base of Rainbow Falls would be maintained.

Boundary Modification

No boundary modification would occur.

ALTERNATIVE B (WATERSHED EMPHASIS)

Alternative B proposes a greater emphasis on managing and promoting visitor understanding of the monument in the context of the Upper Middle Fork of the San Joaquin River watershed. Toward this end, the current level of visitor services in the monument would be continued, but locating visitor services and facilities outside of the watershed would be emphasized, when possible. Resource management and visitor programming would emphasize watershed values, natural processes, and adaptation of infrastructure/systems to a changing environment. Science and learning opportunities would be directed toward watershed issues and increasing visitor understanding of the broad importance of the watershed. Enhanced orientation to the watershed would be provided through improvements outside of the watershed. Minaret Vista is identified as an ideal location for these improvements. Alternative B generally envisions less development in the monument than currently exists.

Glacial polish on Postpile columns *NPS Photo*

Mammoth Lakes

The monument would continue to co-locate administrative offices in their current location at the USFS Mammoth District Ranger Offices adjacent to the Mammoth Lakes Welcome Center.

Devils Postpile NM Developed Area

The monument would maintain the existing ranger station in the developed area, with small improvements to accommodate the public and NPS staff, and would convert the campground to accommodate day use only. A comprehensive site design or development concept plan would be completed for the developed area, including the ranger station, parking areas, campground, shuttle stop, and administrative area.

The monument would retain the visitor contact/ranger station in the valley, in its existing location. The deck would be expanded, and a service window potentially added, to provide improved accessibility and additional outdoor space for interpretation and ranger contact. Administrative functions would be removed and the building would be rehabilitated for visitor services only.

The campground would be converted to day use, reducing overnight staffing needs, restoring previously impacted areas, and providing visitors with greater river access and additional day use opportunities near the monument's developed area.

The shuttle bus stop and parking area would be redesigned to improve parking and circulation for shuttle buses, cars and pedestrians and a modest shelter or an overhang on the bus stop would be added, providing space for additional visitor information and outdoor exhibits.

The monument operations area would provide staff housing, administrative space, and other essential operational functions with an overall goal of minimizing visual and audible impacts associated with park operations. Buildings near the edge of the meadow would be removed to protect the meadow within the riparian area and reduce visual impacts from the Devils Postpile trail. Other cabins would be converted from housing to operational functions, replacing the operational functions once located in the ranger station.

The monument would seek to work collaboratively with the USFS to adaptively reuse the Pumice Flat cabin as an interagency maintenance shop. Small equipment storage buildings and maintenance work areas would be developed around the Pumice Flat cabin to support

basic maintenance needs for both agencies in the valley. The monument would locate the remainder of the NPS maintenance and storage needs that require larger facility space and work areas to the town of Mammoth Lakes, preferably co-located with partners such as the USFS. Once the monument's maintenance operations and functions are relocated to Pumice Flat and other locations, the existing maintenance shop would be removed.

Rainbow Falls

The monument would strive to enhance the wilderness qualities of Rainbow Falls and promote a greater sense of discovery and introductory wilderness experience for visitors to the area. Several modifications to infrastructure and facilities in the area would improve the undeveloped quality of wilderness near Rainbow Falls. The monument would realign the current trail from the wilderness boundary to Rainbow Falls away from steep edges and reduce both the footprint and visual extents of the trail, ultimately creating a more undeveloped wilderness experience and enhancing feelings of solitude. A trail with smaller widths and more curves, winding down from the wilderness boundary, could reduce the amount of time that visitors are in view of others and promote a sense of arrival. The interpretive panels would be removed and relocated outside of designated wilderness.

Ranger Station in winter, *NPS Photo*

The monument would maintain the two viewing platforms, preserving both their size and character for visitors to enjoy the views of Rainbow Falls. The monument would also maintain safe visitor access to the river at the base of Rainbow Falls, but would seek to remove the rock and concrete stairs, if feasible.

Boundary Modification

No boundary modification would occur.

ALTERNATIVE C (CONNECTING PEOPLE TO NATURE AND HERITAGE), THE PREFERRED ALTERNATIVE,

Alternative C, the Preferred Alternative, emphasizes key features with national significance for resource protection and connecting visitors with nature and heritage, including traditional park experiences in a wild setting. The monument would be managed as a gateway to a greater wilderness and additional emphasis would be placed on connections and partnerships with the Inyo National Forest and the Town of Mammoth Lakes.

Mammoth Lakes

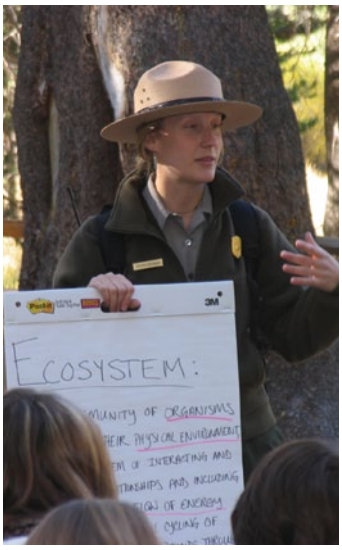
The monument would enhance its presence in the Town of Mammoth Lakes, preferably by expanding its current co-location arrangement with and leasing additional space from the Inyo National Forest on their Mammoth Lakes campus. Expanded NPS presence in the Town of Mammoth Lakes would support additional visitor services, enabling the monument to reach a wider range of visitors and members of the community, improving accessibility, and providing additional outdoor exhibits that could reach new audiences, including winter visitors to Mammoth Lakes. This area would also be a more appropriate location to include interpretive and educational exhibits that use new technology, such as television and computers, as opposed to the valley where the desire is to maintain a more traditional park experience in a rustic setting and the remote location makes it difficult to maintain reliable technological infrastructure, such as phone and internet access. Expanded co-location could also enhance the efficiency and effectiveness of the interagency collaboration that has characterized the relationship between Devils Postpile NM and the Inyo National Forest.

Devils Postpile NM Developed Area

The NPS would complete a comprehensive site design or development concept plan for the campground and day use area, including the visitor contact/ranger station, parking areas, and administrative area.

The monument would retain the visitor contact/ranger station in the valley and improve the surrounding areas to enhance visitor services and circulation. The ranger station deck would be expanded, and a service window potentially added, to provide improved accessibility and additional outdoor space for interpretation and ranger contacts. The shuttle bus stop and parking area would be redesigned to improve parking and circulation for shuttle buses, cars and pedestrians.

The monument would maintain an overnight campground in the valley while redesigning a portion of the campground and day use area to improve riverfront access for all visitors. The campsites in Loop B, immediately adjacent to the river, would be removed. Loop B would be redesigned to accommodate walk-in users only.



Ranger program, *NPS Photo*

The monument operations area would provide staff housing, administrative space, and other essential operational functions with an overall goal of minimizing visual and audible impacts associated with park operations. To the extent possible, staff housing would be provided in the Town of Mammoth Lakes; however, a minimum overnight staff presence would still be maintained in the operations area. Maintenance functions would be moved to a different location to reduce the impacts on visitor experience and resident staff. With a goal of increasing operational efficiency and collaboration between the agencies, the NPS would partner with the USFS to explore replacement of the monument's current deficient maintenance shop with a small interagency, multi-purpose facility outside of the monument, potentially in the vicinity of the Pumice Flat or other locations provided those areas are relatively level, outside of the floodplain, and preferably centrally located within the valley.

Once the new facility was constructed, the current maintenance shop in the monument would be removed. Structures visible from Devils Postpile trail that are not needed for essential NPS operations would also be removed to improve the visual quality of the area.

Rainbow Falls

The monument would strive to enhance the wilderness qualities at Rainbow Falls, promoting a greater sense of discovery and an introductory wilderness experience for visitors to the area. Several modifications to visitor infrastructure and facilities in the area would help improve the undeveloped character of wilderness. The monument would generally maintain the alignment of the main trail to Rainbow Falls to continue to allow for the current volume of visitors. However, the monument would explore redesigning the main trail from the wilderness boundary to the viewing platforms in a manner that is more consistent with wilderness character and promotes a sense of discovery and arrival to Rainbow Falls. The monument would maintain the two viewing platforms, preserving both their size and character, and also maintain safe visitor access to the river at the base of Rainbow Falls.

The interpretive panels at Rainbow Falls would be removed and relocated outside of designated wilderness. If possible, they would be relocated to the Boundary Creek trail junction. The stock trail would be realigned where necessary to separate pedestrian and stock use and reduce impacts to the visitor experience.

Boundary Modification

The NPS would seek a minor boundary adjustment to the monument that would include the main trail corridor connecting Devils Postpile and Rainbow Falls, for the purpose of simplifying and consolidating management of this high-use trail and incorporating the entire stretch of the river between the northern and southern boundaries of the monument. Additional areas of the Postpile geologic formation would also be included. The monument would continue to provide access on trails within this area as they are part of an extensive trail network that supports popular visitor opportunities and provides important access to a larger landscape and recreation experience beyond the monument. The monument would also strive to maintain the John Muir Trailhead parking lot which

provides an efficient access point to this popular area. (See *Appendix B: Proposed Adjustment to the Devils Postpile National Monument Boundary*).

Environmental Consequences

The potential effects of the three alternatives are analyzed for impacts to natural and cultural resources, wilderness character, visitor opportunities, the socioeconomic environment, and monument operations. This analysis is the basis for comparing the advantages and disadvantages of the alternatives. Impacts are described in terms of whether they are beneficial or adverse. If adverse, their intensity and duration are described. Cumulative impacts result from the incremental (i.e. additive) impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes such actions. Conclusions for each topic area are provided, comparing each action alternative to the no-action alternative.

SUMMARY OF IMPACTS

The following discussion summarizes the impacts of the alternatives considered, in accordance with the National Environmental Policy Act.

Impacts from Alternative A

Natural resources would continue to experience some adverse impacts in localized areas related to social trails, erosion, nonnative species, noise, and trampling due to monument operations, facilities, and visitor use. Cultural resources would continue to be vulnerable to surface disturbance, inadvertent damage, and vandalism. Natural and cultural resources would continue to benefit from ongoing assessment, restoration, treatments, and survey work. Visitor use, including interpretation and education, would continue to benefit from a wide variety of opportunities and programming, but would continue to be hampered by limited staff. Monument operations would continue to experience a lack of operational space.

Impacts from Alternative B

Many of the adverse and beneficial effects of alternative A would continue. Natural resources would benefit from a focus on watershed-scale planning and management, trail redesigns, and visitor capacity monitoring. Some adverse impacts would occur due to construction and day-use reconfiguration. Cultural resources could experience adverse impacts due to construction and reconfiguration, but would be mitigated by strict adherance to departmental policy. Visitor use, including interpretation and education, would continue to benefit from a wide variety of opportunities and programming, and would be enhanced through improved facilities and increased staff capacity. The removal of the monument campground would adversely impact some visitors. Monument operations would be improved through increased operational space.

Impacts from Alternative C

Most of the adverse and beneficial effects of alternative B would continue. Effects on natural and cultural resources would be very similar to alternative B. Construction of a joint maintenance facility could lead to some additional adverse impacts, but would be subject to further environmental compliance to ensure minimal impacts. Visitor use, including interpretation and education, would continue to benefit from a wide variety of opportunities and programming, and would be enhanced through improved facilities, increased exhibit space, and greater interagency collaboration. The monument campground would not be removed. Monument operations would be improved through more operational space in Mammoth Lakes.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The environmentally preferable alternative is defined as "the alternative that will promote national environmental policy as expressed in Section 101 of the National Environmental Policy Act." Section 101 states that it is the continuing responsibility of the federal government to . . .

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

- assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- preserve important historic, cultural, and natural aspects of our national heritage; and maintain, wherever possible, an environment which supports diversity, and a variety of individual choices;
- achieve a balance between population and resource use which would permit high standards of living and a wide sharing of life's amenities; and
- enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The Council of Environmental Quality states that the environmentally preferable alternative is "the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources (46 FR 18026 – 46 FR 18038)." According to the NPS NEPA Handbook (DO-12), through identification of the environmentally preferred alternative, the NPS decision-makers and the public are clearly faced with the relative merits of choices and must clearly state through the decision-making process the values and policies used in reaching final decisions.

The environmentally preferable alternative for Devils Postpile National Monument is alternative C: Connecting People to Nature and Heritage, the NPS preferred alternative. This alternative best satisfies the national environmental goals by providing the highest level of protection of natural and cultural resources while concurrently providing for a wide range of neutral and beneficial uses of the environment. This alternative maintains an environment that supports a diversity and variety of individual choices, and it integrates resource protection with an appropriate range of visitor uses and understanding.

Both of the action alternatives (alternative B: Watershed Emphasis and the preferred alternative) would provide a high level of protection of natural resources, although the preferred alternative provides a slightly higher level of protection for cultural resources. In addition, the preferred alternative provides a wider range of visitor opportunities than alternative B, thus better fulfilling criteria 3. The preferred alternative would provide the greatest educational and research opportunities to foster better understanding of the monument's resources, therefore better equipping the monument in fulfilling NEPA criteria 3, 4, and 5.

Alternative A, No Action, while accurately describing the current management direction and best efforts of the staff, fails to satisfy the NEPA requirements outlined above when compared to the action alternatives. A shortage of funding, staff, programs, facilities, and services limits the monument's effectiveness in achieving NEPA criteria 1, 4, and 6.

Implementation

Once the general management planning process is completed, the selected alternative would become the new management plan for Devils Postpile National Monument and would be implemented in phases over the next couple of decades. Implementation of the actions and developments proposed within this management plan is dependent upon funding available at the time of need. The approval of this general management plan does not guarantee that the funding and staffing needed to implement the plan would be forthcoming. Instead, the plan establishes a vision of the future that will guide future management of the monument. In addition to funding, the implementation of any preferred alternative could be affected by other factors. More detailed planning, environmental documentation, and studies could be required before most conditions proposed in the alternatives are achieved. Additionally, all of the alternatives were developed on the assumption that certain mitigating actions would be incorporated into the proposed actions in order to reduce the degree of adverse impacts.

Chapter One: Introduction

Previous page: Devils Postpile, © Rod Planck

Chapter One: Introduction

An introduction to the purpose, scope, and issues of the plan.

Background on Devils Postpile National Monument

Devils Postpile National Monument ("Devils Postpile NM" or "the monument") was established on July 6, 1911 by Presidential Proclamation 1166. The purpose of the monument 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 in the Sierra Nevada for scientific value, public interest, and inspiration. Devils Postpile NM is comprised of approximately 800 acres of geologic formations, riparian and wetland areas, mixed conifer forests, with an elevational gradient ranging from 7200 feet at the southern monument boundary to nearly 8400 feet at the summit of Granite Dome. Approximately 85% (687 acres) of the monument is federally designated wilderness.

Top of Devils Postpile, *NPS Photo*

LOCATION AND ACCESS

Devils Postpile NM sits in Reds Meadow Valley, within the central Sierra Nevada of California, surrounded by the Inyo National Forest and attached to one of the largest contiguous wilderness complexes in the lower 48 states. The monument provides access to both the 231,279 acre Ansel Adams Wilderness (of which it is a part) and the adjacent 651,992 acre John Muir Wilderness Areas. Located in California, the closest communities to Devils Postpile NM are Mammoth Lakes to the east, Lee Vining and June Lake to the northeast, and Bishop to the southeast.

The peak season of visitation to the monument is mid-June through Labor Day. During September and early October, visitation can be high, with parking lots at capacity, when weather is pleasant and fall colors vibrant. The primary access point (and the only vehicular access) is through Mammoth Lakes, off of U.S. Route 395. 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. The road typically re-opens and visitor services resume in early to mid-June, though winters with exceptionally high snowfall have pushed opening day into late June.

Private vehicle use is regulated during most of the summer season when mandatory shuttle service brings visitors in and out of the monument. From 2010 to 2012, average annual visitation to Devils Postpile NM was just over 100,000. The average length of stay for day use is 4 to 5 hours and for overnight use is 2.5 days. The monument is used as an access point for backcountry hikers heading for the Pacific Crest Trail and the John Muir Trail, as well as approximately 1,500 equestrians, most of which are commercial day trips to Rainbow Falls from the Reds Meadow Pack Station (Mutch et al., 2008). Access to the monument in the fall when the shuttle buses are not in operation is primarily via private vehicles. During busy fall weekends, parking demands often exceed current capacity, requiring significant management by monument staff. Because of this workload, monument staff experience the fall as a second "peak season". The number of visitors accessing the monument during the cold winter months is probably less than one hundred per year, though winter use has been increasing in recent years (Mutch et al., 2008). Legal winter access is by backcountry skiing or snowshoeing, though snowmobiles that are allowed on the adjacent Inyo National Forest lands occasionally trespass into the monument.

DESCRIPTION OF DEVILS POSTPILE NATIONAL MONUMENT

Devils Postpile National Monument is characterized in many ways by its namesake, the Devils Postpile

formation. Over time, the intriguing columns of cooled basaltic lava have captivated a wide variety of individuals, scientists, and groups. Early observers noted the symmetry of the columns and by the early twentieth century, scientists began regarding the Postpile formation as one of the best examples of jointing in the world. To this day, Devils Postpile NM remains a place of geologic study and inquiry.

Although the Postpile formation itself brings visitors to the area, many are captivated by the surrounding resources and landscape as well. The monument is flanked on the east by 11,053-foot Mammoth Mountain and on the west by the jagged peaks of the Ritter Range, reaching over 13,000 feet of elevation. The Upper Middle Fork San Joaquin (UMFSJ) River winds through the monument, supporting riparian habitat and providing tremendous opportunities to experience the natural beauty of the area.

Although the Postpile formation itself brings visitors to the area, many are captivated by the surrounding resources and landscape as well.

The dominant geomorphic process underway today is the hydrological force of the Upper Middle Fork of the San Joaquin River and its tributaries (Mutch et al., 2008). The river flows through the monument from north to south near the eastern boundary. In the northern portion of the monument, it meanders through meadows, and then begins to descend more rapidly in the southern portion through scattered pools, quickly flowing rapids, cascades, and waterfalls. The headwaters of the UMFSJ River are in the area of the Ritter Range and Thousand Island Lake, located 8.7 miles upstream, north and west of Devils Postpile. Three primary creeks drain into the river in and near the monument: King Creek, Boundary Creek, and Reds Creek. Reds Creek flows from Sotcher Lake and Reds Meadow, entering the UMFSJ River in a small waterfall. The river tumbles 101 feet over a sheer cliff of dacite rock, creating the scenic Rainbow Falls, the second named feature in the monument's enabling legislation.

The UMFSJ River is free-flowing from its headwaters through the monument and is supplied by relatively unpolluted surface and groundwater. This naturally functioning river sustains mineral springs, wetlands, waterfalls, aquatic communities, riparian areas, and associated habitats as well as terrestrial communities. The greater San Joaquin River and its tributaries provide an ecological link to areas upstream and downstream of the monument. The main river corridor provides a natural migration corridor for wildlife.

The monument also features portions of the nationally designated John Muir and Pacific Crest Trails, providing hiking and long-distance backpacking opportunities to thousands of people each year.

These features, along with the monument's geographic position, located just west of the hydrologic divide of the Great Basin and Pacific Ocean, and near the boundary of the Northern/Southern and Eastern/Western Sierra, support a diverse assemblage of flora and fauna. Three hundred and eighty native plant species, 128 bird species, 149 invertebrate taxa, and 33-37 mammal species (including 13 species of bats) are known to occur in the monument for at least part of the year. [Note: a range is provided for mammals since there is variability among sources (NPS 2013)]. While little is known about some animal families such as amphibians and reptiles, much more is known about others, including birds and macro-invertebrates.

The monument also protects several historic and prehistoric archeological and cultural sites. These consist of trade and travel routes, ancient living and activity areas, evidence of herding and other uses and remains of early federal land management activities. The monument encompasses part of the ancestral homelands of several American Indian tribes and groups from both the east and west sides of the Sierra Nevada.

In August 1992 the Rainbow Fire burned 82% of the monument. Much of the burn was of moderate to high intensity and dramatically impacted forest structure and composition. Conifer species are slowly recolonizing burned areas in the southern portion of the monument,

Hikers in Soda Springs Meadow, *NPS Photo*

MAP 1.1: REGIONAL CONTEXT

while the unburned portions of the monument still contain large stands of mature mixed conifer forest.

In November and December 2011, the most extensive wind event on record in California's Sierra Nevada caused extensive damage to trees in Devils Postpile NM and surrounding areas. The wind event occurred because of an extreme pressure gradient from north to south over Nevada and the Sierra Nevada that caused high intensity winds blowing in an atypical direction that lasted for over 12 hours. Numerous trees blown down by the winds were salvaged from the surrounding Inyo National Forest along the Reds Meadow Road. Salvage logging did not occur in the monument but the NPS used many of the downed trees to provide firewood for the campground and as bumper logs to define visitor use areas within the monument. The extensive damage is likely to have lasting impacts on forest composition, structure and function.

HISTORY OF DEVILS POSTPILE NATIONAL MONUMENT

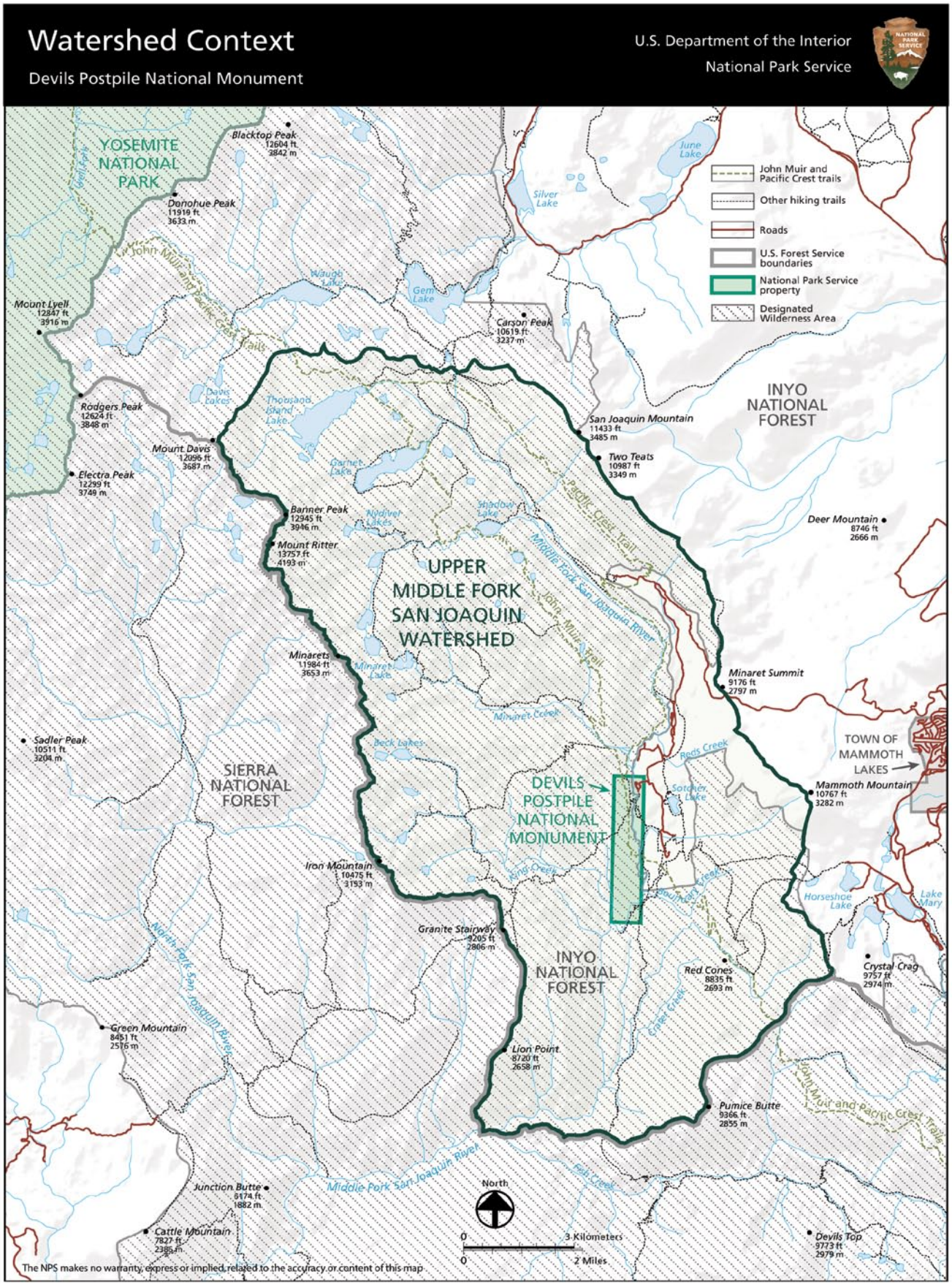
Archeological surveys of Devils Postpile and the surrounding area suggest that humans began crossing the Sierra crest west of present day Mammoth Lakes as far back as 7,500 years ago. Challenging access, heavy snow pack, high elevation, frequent volcanic activity, and territorial conflict may have led to the Postpile region seeing less human activity than other areas to the east and west. Obsidian found within the monument suggests that the valley was used seasonally by tribes on the east and west sides of the Sierra and was likely part of a trade route from the Casa Diablo geothermal area, where the obsidian originated.

The Sierra divide east of Devils Postpile is typically described as a boundary between the North Fork Mono tribe to the west and the Owens Valley Paiute and Northern Paiute to the east. There is some debate as to how long these groups have been in the Sierra. Tribal histories suggest that contemporary tribes are descendants of the original inhabitants of the area. Some archaeological interpretations suggest that Numic-speaking people have been widespread in the Great Basin for at least 10,000 years. A 1993 archaeological survey of the monument indicated that the region was most likely "utilized seasonally" in the summer and fall perhaps by the North Fork Mono and Northern Paiutes. The Owens Valley Paiutes may have also used the Reds Meadow Valley at times. Trade between the North Fork Mono groups and the Eastern Sierra Paiutes by way of Mammoth Pass and the Reds Meadow Valley did occur. It is also likely that some groups entered the Reds Meadow Valley to collect materials for basketry and to hunt deer and other species. Today, the area's early trade and American Indian occupation and use are represented by numerous archeological sites in the monument.

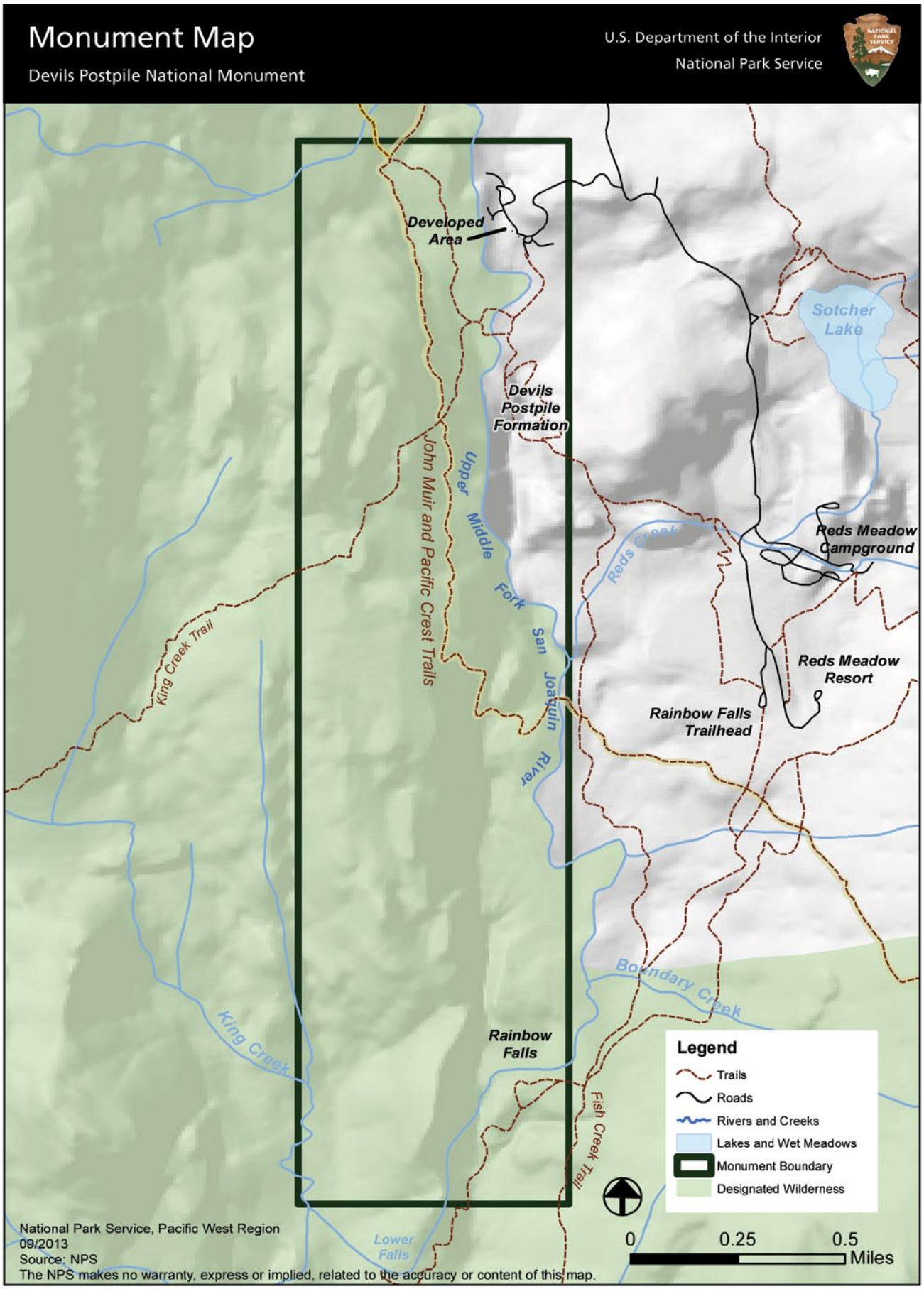
Euro-Americans began exploring the Sierra Nevada in the early 1800s, but likely did not get as far as the Postpile region until the mid-19th century. American exploration of the Sierra began in 1826 and continued through the 1850s. Although explorers such as John C. Fremont and Joseph Walker explored areas of the Sierra near the Middle Fork Valley, development of the Postpile region was slow, primarily due to geographic isolation. Mining eventually brought settlers to the area around Devils Postpile. After an 1852 discovery of gold-bearing quartz in the Sierra near Mono Lake, miners began to settle in the Mono Basin. In the summer of 1861, a mining camp was set up at Pumice Flat but, yielding no results, the miners left the area after the summer of 1862. Gold and silver-bearing quartz was reportedly discovered in the Mammoth Lakes basin in the 1870s and the Mammoth Lakes Mining Company was formed in 1879. Mines were also developed near the headwaters of the Middle Fork San Joaquin close to Lake Ediza and the Minarets. The collapsed cabin near the base of the Postpile is the monument's most visible remnant of the area's mining past. Discoveries of gold and silver in the area inspired road-building. John S. French built and operated a trans-sierra route which brought miners and supplies to the Mammoth Mines between 1879 and 1880. It roughly followed the Mammoth Pass trail and was called the French Trail. The 30 mile stretch from North Fork to Summit Meadow to Devils Postpile and up to Mammoth Pass was a rugged trail suitable for pack trains and livestock drivers rather than wheeled transport. Although the mines soon closed, the trail was used by U.S. Forest Service crews, sheepherders, and native people. The current foot and stock trail from Clover Meadows to Devils Postpile follows the general route of the French Trail.

In 1879, "Red" Sotcher, the valley's namesake, began grazing sheep in the meadows near Devils Postpile. Basque sheepherders also used the valley for sheep grazing. It was the sheepherders who were thought to have given the Postpile formation the name "the Devil's Woodpile". The sheepherders left evidence of their presence through arborglyphs, tree carvings, in and around the Postpile area. Increased interest in

MAP 1.2: WATERSHED CONTEXT

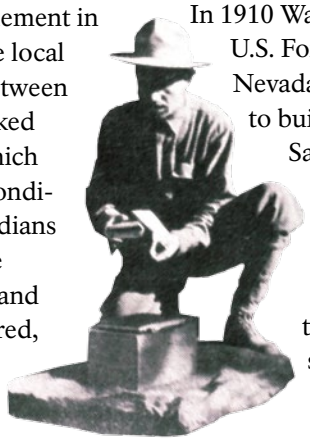


MAP 1.3: MONUMENT MAP



resource extraction in the area continued through the late 1800s and early 1900s, while the nascent American conservation movement started working with the federal government to protect some wild lands from development.

California Indians suffered disproportionately during the mid-1800s, and those in the Sierra were no exception. The forced removal of Indian people to make way for settlement and resources had far-reaching social and ecological consequences. In 1851, members of the Mariposa Battalion tracked a band of Indians to the headwaters of the North Fork San Joaquin River before retreating. The Indians likely continued east, following the Mammoth Pass trail toward Devils Postpile. By the early 1860s, increasing settlement in the Owens Valley had depleted much of the local Paiute resource base, triggering conflicts between Indians and the white settlers. Conflict peaked after the harsh winter of 1861 and 1862, which exacerbated the Indians' desperate living conditions and increased the tension between Indians and settlers. Soon after, federal troops were dispatched to the region to protect settlers and their land claims. During the war that ensured, Paiute bands frequently retreated into the high mountains - including the Devils Postpile area - given the difficulty of access and the rugged terrain. By 1864, most of the surviving local Paiute people had been temporarily removed to the military post at Fort Tejon. Those who survived continued to find ways to resist or adapt to their new existence alongside and within white American society.


Walter L. Huber

The first designation of the Devils Postpile area came in 1890 when it was included as part of Yosemite National Park, although given the distance from the core of Yosemite National Park and its headquarters, very few recognized the significance of what was protected in the Postpile region. The original park boundary extended to the Public Land Survey townships that marked the western border of the Mammoth mining districts. Many of the people then using this area, primarily sheepherders and miners, resented the new park boundaries and the restrictions on land use that came with them. The Postpile area was protected by the U.S. Cavalry from 1891 to 1905. Their primary purpose was to deter grazing in the newly formed national park. They also worked to resolve disputes with existing mining claims in the Minaret, Agnew Meadows, Iron Mountain, and Lake Ediza areas.

Due to pressure from timber interests on the western boundary of Yosemite, the Department of the Interior agreed to a boundary revision in 1905. "An Act to exclude from the Yosemite National Park, California, certain lands therein described and to attach and include the said lands in the Sierra Forest Reserve" which took effect on February 7, 1905, established the new eastern boundary of Yosemite along the Foerster Peak-Isberg Peak-Triple Divide Peak crest. This excluded Devils Postpile, Rainbow Falls, and the Upper Middle Fork San Joaquin watershed from the federal protection of Yosemite National Park, and transferred that land to the Sierra Forest Reserve, which would ultimately become the Sierra and Inyo National Forests.

In 1910 Walter L. Huber, the district engineer for the U.S. Forest Service's California and Southwestern Nevada district, received an application for a permit to build a dam on the Upper Middle Fork of the San Joaquin River at Devils Postpile. The intent was to blast the Postpile formation for the raw material to create a rock fill dam that would be employed to generate power for local mining operations. Huber regarded the proposal as a "wanton destruction of scenery," and brought the matter up with District Forester F. E. Olmsted. At Olmsted's instruction, Huber contacted the secretary of the Sierra Club, William Colby, who then enlisted the support of Joseph N. LeConte, a professor at the University of California and an expert on the Postpile region. Ultimately, the U.S. Forest Service decided that, due to the remote location, small capacity, and lack of a market for power, the dam at the Postpile would not be built. Beyond that, Olmsted called for the creation of a national monument. Using the authority of the Antiquities Act, President William H. Taft proclaimed Devils Postpile a national monument on July 6, 1911.

The early years of the monument saw few tourists and recreational users. The surrounding area experienced resurgence in mining activity following its exclusion from Yosemite in 1905. A rough mining road was built from Minaret Summit to Devils Postpile and Reds Meadow in 1928, but tourist visits remained infrequent until the 1930s. For the first 23 years of its existence, the monument was managed on-site by one or two U.S. Forest Rangers. In 1933, the National Park Reorganization Act transferred all national monuments to the National Park Service. Devils Postpile was placed under the administration of Yosemite National Park in early 1934, despite local concerns that Yosemite could not

adequately manage monument resources from their distant headquarters.

Devils Postpile National Monument has a varied administrative and managerial history due partly to the relatively small size of the monument, its isolation from other parks, and the fact that it is surrounded by national forest system lands. During World War II, an arrangement was made with the U.S. Forest Service that Yosemite would retain administrative responsibility but the Inyo National Forest would take over on-site management duties. However, by 1947, the National Park Service considered also transferring administrative oversight to the U.S. Forest Service.

Throughout the 1940s and 1950s, tourism and recreation in the surrounding community of Mammoth Lakes and throughout the Eastern Sierra began to grow, largely due to the completion of U.S. Highway 395, which brought visitors from the growing city of Los Angeles, and the development of Mammoth Mountain Ski Area. Many of these visitors were drawn to the national monument. This led the superintendent of Yosemite, Frank Kittredge, to recommend that the monument remain under NPS jurisdiction after an intensive review in 1952 that recognized the value of science, interpretation, and visitor enjoyment within the monument. Since then, all legal, administrative and operational duties have been the responsibility of the NPS. For the next twenty years, Yosemite's administrators attempted to provide funds and manpower to manage and interpret the resources of this small and relatively inaccessible park unit. On-site managers did their best to protect and interpret natural resources with minimal staffing and budgets (Johnson 2013).

Throughout the 1950s, although the occasional resource study or assessment was conducted, the focus of monument rangers and resources was on interpretation and providing for the recreational enjoyment of visitors. By 1956, annual visitation was near 40,000, which taxed the monument's small staff and the infrastructure of both the monument and the surrounding valley. To handle increasing visitation, both the NPS and the U.S. Forest Service continued to cooperate to meet the needs of valley visitors.

Throughout the 1950s, proposals for a trans-Sierra highway through the Reds Meadow Valley surfaced. This had a drastic impact on planning for the future of the monument. Plans for management of the monument were based on the assumption that the road would be built or that the road into the monument would be improved. A 1962 Master Plan suggested that the entrance to the monument be relocated and reconstructed. This Master Plan was revised in 1964 and stressed anticipated increases in visitation. This plan suggested that the Devils Postpile road would be connected to the main highway by a paved spur road and that the parking lot would be expanded. The plan also called for expansion across the river, a modern 3,000 square foot visitor center, a four-unit apartment for seasonal housing, and a maintenance facility. However, NPS presence at the monument and within the Mammoth region remained light even as visitation continued to grow (Johnson 2013).

From the time of its initial proposal in the 1950s, a grassroots group of community leaders and members, cabin owners, packers, business owners, and visitors to the area, petitioned against the construction of the proposed trans-Sierra highway. The coalition was concerned about the loss of wilderness character and the detrimental impacts on the local community that would be caused by a road bisecting a relatively undeveloped portion of the Sierra Nevada. The coalition succeeded in halting the highway project on the state level, and provided the foundation that prompted action from then-Governor Ronald Reagan and from former Sierra Packer and resource secretary to Reagan, Norman "Ike" Livermore to convince President Nixon to officially halt the road project by executive order in 1972. The NPS followed by putting plans for the development of further infrastructure in the monument on hold.

Through the 1970s, the monument further solidified its partnership with the Inyo National Forest, and moved under the jurisdiction of Sequoia National Park. Cooperation with the Inyo National Forest came in the form of major trail projects, including rerouting the John Muir Trail through the monument and improving both the Devils Postpile and Rainbow Falls trails. The collaboration on trail projects in the valley and an overall change to broader regional management both in the NPS and the USFS encouraged the two agencies to address the long-standing entrance road issue. Increasing visitation to both Mammoth Lakes and the monument had created stress on the existing infrastructure in the valley. A 1972 recreation plan suggested an expanded trail system and more camping opportunities to meet the needs of increasing visitation. The same report suggested that the road into the Reds Meadow Valley should be paved, but that private

automobiles should be restricted by requiring the use of public transportation. In 1979, after the road was paved, monument officials worked with staff from the Inyo National Forest and the Mammoth Mountain Ski Area to fund and operate a mandatory shuttle bus that transported visitors from the resort to and from the monument and the Reds Meadow Valley to alleviate automobile impacts to the area (Johnson 2013).

Throughout the years, the shuttle bus proved an effective method of reducing resource damage and handling the ever-increasing visitation to the Reds Meadow Valley. Despite financial challenges to keeping the system active, both agencies have continually recognized the shuttles as imperative for resource protection and visitor enjoyment in the Reds Meadow Valley. Today, the Devils Postpile-Reds Meadow Shuttle Bus is the longest running mandatory shuttle bus on federal land and serves as a model of interagency cooperation and partnership.

With the traffic and congestion issues addressed, managers turned to recreation in surrounding communities and its effect on the monument and the Reds Meadow Valley. With pressure to expand Mammoth Mountain Ski Area, Congress ordered the USFS to place areas in the Reds Meadow Valley up to the south and west boundaries of Devils Postpile back into its wilderness area inventory, after these areas had been previously removed. In 1984, President Reagan and Congress approved closing the wilderness gap in the valley and expanded the Minarets Wilderness to form the new Ansel Adams Wilderness. The new, larger wilderness included most of Devils Postpile National Monument. An Inventoried Roadless Area remains due east of the Postpile formation along Reds Creek to Government Pasture on national forest system lands.

Throughout the 1990s and early 2000s, the Town of Mammoth Lakes grew rapidly, driven largely by an economy based on recreation and real estate. This growth put continued emphasis on visitor management and, in turn, resource management in the monument. Being a small national park unit, cooperation and partnerships were imperative to ensure effective resource management and protection in the monument. Successful partnerships with the USDA-Pacific Southwest Research and Inyo National Forest, Sequoia Kings Canyon, and Yosemite National Parks, the USGS, academic researchers and universities, and other organizations and agencies furthered a great deal of research and a focus on monument resources in the broader context of the Sierra Nevada, continuing the monument's tradition of partnerships and collaboration.

The presidential proclamation that established Devils Postpile as a National Monument in 1911 described its value as offering important opportunities for scientific study and shared learning about past, present, and future natural conditions and connected physical processes. Accordingly, scientific interpretation has long been a major theme in the monument's management history. In the 1930s, the NPS emphasized the monument's significance as a place to interpret the geology of the Sierra Nevada using local geologic resources as examples. Today, the monument staff encourages participation of children, American Indians, students, scientists, gateway communities, and the general public in interpretation, education, science, and stewardship. The monument has developed strong interagency and institutional scientific partnerships that have resulted in progress toward creating useful adaptive strategies for responding to threats, and that have provided opportunities for teaching and engaging students, communities, and the public.

Overview of the National Park Planning Process

GENERAL MANAGEMENT PLANS AND THE NATIONAL PARK SYSTEM

The National Parks and Recreation Act of 1978 requires each unit of the National Park Service (NPS) to have a general management plan (GMP); and NPS Management Policies 2006 (§2.3.1) states "The National Park Service will maintain a general management plan for each unit of the national park system."

The purpose of a GMP is to ensure that a national park system unit (park unit) has a clearly defined direction for resource preservation and visitor use that will best achieve the NPS mandate to preserve resources unimpaired for the enjoyment of future generations.

The ultimate outcome of general management planning for park units is an agreement among the National Park Service, its partners, and the public on why each area is managed as part of the national park system, what resource conditions and visitor experience should exist, and how those conditions can best be achieved and maintained over time. General management plans are

intended to be long-term documents that establish and articulate a management philosophy and framework for decision making and problem solving in the parks.

The National Environmental Policy Act (NEPA) requires federal agencies to fully consider the environmental costs and benefits of their proposed actions before they make any decision to undertake those actions. NEPA and the Council on Environmental Quality (CEQ) regulations implementing NEPA put two important mechanisms in place to achieve this goal. One is the requirement that all agencies make a careful, complete, and analytical study of the impacts of any proposal that has the potential to affect the human environment, and alternatives to that proposal, well before any decisions are made. The other is the mandate that agencies be diligent in involving any interested or affected members of the public in the NEPA process.

> The purpose of a general management plan is to ensure that a National Park System unit has a clearly defined direction for resource preservation and visitor use that will best achieve the NPS mandate to preserve resources unimpaired for the enjoyment of future generations.

As plans that focus on desired conditions to be achieved and maintained over a relatively long period of time, GMPs are generally large in scope, implemented in phases over many years, and contain little or no detail about specific actions. As a result, the NEPA analysis for GMPs is typically a programmatic, or broad-scale analysis, rather than a site-specific analysis. As decision making moves from general management planning into program planning, strategic planning, and implementation planning, the need for information becomes increasingly focused and specific, requiring additional analysis at those levels.

Public involvement provides critical input into this plan. Throughout the planning process, the monument has encouraged participation from visitors, local community members, and other interested stakeholders and solicited their comments. Formal public comment periods were held during the scoping phase, the release of preliminary alternatives, and review of the general management plan. See Chapter Six: Consultation and Coordination for more details on this process.

Purpose and Need for the General Management Plan

PURPOSE OF THE PLAN

The approved general management plan will be the comprehensive document guiding management of Devils Postpile National Monument for the next 15 to 20 years. The purposes of this general management plan are as follows:

- confirm the purpose, significance, and special mandates of Devils Postpile National Monument
- clearly define resource conditions and visitor uses and experiences to be achieved in the monument
- provide a framework for managers to use when making decisions about how to best protect the monument's resources, how to provide quality visitor uses and experiences, how to manage visitor use, and what kinds of facilities, if any, to develop in the monument
- ensure that this foundation for decision making has been developed in consultation with interested stakeholders and adopted by the NPS leadership after an analysis of the benefits, impacts, and economic costs of alternative courses of action

Legislation establishing the National Park Service as an agency and governing its management provides the fundamental direction for the administration of Devils Postpile NM (and other units and programs of the national park system). This general management plan builds on these laws and the proclamation that established Devils Postpile NM to provide a vision for the monument's future.

This *Draft General Management Plan and Environmental Assessment* presents and analyzes three alternative future directions for the management and use of Devils Postpile NM. Alternative C is the National Park Service's preferred alternative (See *Chapter 3, Alternatives*). The potential environmental impacts of all alternatives are identified and assessed in Chapter 5, *Environmental Consequences*.

Actions directed by general management plans or in subsequent implementation plans are accomplished over time. Budget restrictions, requirements for additional data or regulatory compliance, and competing priorities may delay implementation of many actions. Major or especially costly actions could be implemented 10 or more years into the future.

The general management plan does not describe how particular programs or projects should be prioritized or implemented. Those decisions will be addressed in future, more detailed planning efforts. All future plans should be consistent with the approved general management plan.

NEED FOR THE PLAN

The last comprehensive planning effort for Devils Postpile NM was a master plan developed in 1962 and revised in 1964. This planning effort was based on an assumption that the trans-Sierra highway would be built and sought to accommodate a dramatic increase in visitation coupled with easier vehicle access. Since then, the highway proposal was defeated, a shuttle system was instituted in coordination with the Inyo National Forest, and a large portion of the monument was designated as wilderness, rendering the previous plan obsolete. Devils Postpile NM has never undertaken a comprehensive planning process meeting the requirements of the Parks and Recreation Act of 1978. A general management plan, reflecting the contemporary and future issues and challenges facing Devils Postpile NM, is essential for providing a framework for management of the monument into the future.

A general management plan, reflecting the contemporary and future issues and challenges facing Devils Postpile NM, is essential for providing a framework for management of the monument into the future.

SCOPE OF THE GENERAL MANAGEMENT PLAN

The following topics describe some of the preliminary needs and challenges the general management plan (GMP) addresses for the monument to preserve resources while providing for public use and enjoyment. The general public, NPS staff, and representatives from county, state, and federal agencies, and various organizations identified issues and concerns about monument management during the scoping phase (early information gathering) for this general management plan. An issue is defined as an opportunity, conflict, or problem regarding the use or management of public lands. Comments were solicited at public meetings, through planning newsletters, and at meetings with agencies and community stakeholders (See *Chapter 6, Consultation and Coordination* for more information about the scoping efforts).

Comments received during the initial scoping period for the GMP planning process demonstrated that the public is generally pleased with current management and resources at Devils Postpile National Monument. The public values the monument's diverse resources, viewsheds, solitude, visitor opportunities, and the rustic character of its facilities. Issues and concerns raised during public scoping generally involved suggestions for the types and levels of services and activities offered at the monument (particularly interpretive and educational programs) and protecting the character of both the developed area and the wilderness. The general management plan alternatives provide strategies for addressing these issues within the context of the monument's purpose, significance, and special mandates presented in Chapter 2, "Foundation for Planning and Management."

ISSUES

Natural Resources

The monument sits at the convergence of the California, Sierra Nevada and Great Basin biogeographic regions, creating a diverse assemblage of flora and fauna. Distinct landscape features that include the Postpile, Rainbow Falls, and other geologic features provide textbook quality evidence of volcanism, glaciation, and mountain building forces of plate tectonics. The monument also provides opportunities for scientific study and shared learning about past, present and future environmental conditions and connected biogeophysical processes.

The GMP will articulate management direction for natural resources protection, research and monitoring, largely based on existing law and policy, and address the balance between visitor use and enjoyment and the protection of natural resources. Desired conditions, management zoning, and indicators and standards for visitor capacity will be established. This guidance will include determination of appropriate visitor uses, protection of sensitive resources, and opportunities to coordinate and collaborate with other land managers and stakeholders to protect natural communities and

features. The GMP will address the balance between visitor access and natural resource protection, particularly in regards to the relationship of the campground and parking area to the sensitive riparian resources along the river corridor.

The Middle Fork of the San Joaquin River (MFSJR) was previously determined eligible for inclusion in the National WSR System in 1991. These findings were produced and published by the Sierra National Forest in Appendix E of their Forest Land and Resource Management Plan (1991). Because they were prepared by a neighboring entity and were not published in an Inyo National Forest or Devils Postpile National Monument document, the findings have not been widely known or understood by managers or the public alike. The GMP process provides an opportunity to review and update the wild and scenic river eligibility study and conduct a suitability study of the Middle Fork of the San Joaquin River within Devils Postpile NM.

The general management plan alternatives provide strategies for addressing issues within the context of the monument's purpose, significance, and special mandates.

Cultural Resources

The GMP will articulate management direction for cultural resources protection, research, collections management, and monitoring, largely based on law and policy, as well as address the balance between visitor use and enjoyment and resource protection. Desired conditions, management zoning, and indicators and standards for visitor capacity will be established. This guidance will include determination of appropriate visitor uses, protection of sensitive sites, and opportunities to coordinate with the Inyo National Forest and tribal representatives to protect culturally significant sites within Reds Meadow Valley and to address community and tribal interests related to the monument.

Pacific Crest Trail sign, *NPS Photo*

Wilderness

Most of the monument (approximately 85% or 687 acres) is designated wilderness. The monument also serves as an access point for greater wilderness experiences for many visitors. Visitors highly value the qualities of wilderness character in Devils Postpile NM and surrounding areas, including solitude and ecological diversity. Development and other activities can negatively impact wilderness, including viewshed obstruction, light pollution, noise and air pollution. The GMP will provide overall direction for wilderness management and, given the amount of the monument that is designated wilderness, satisfy several aspects of wilderness stewardship planning. This will include incorporating the wilderness character framework as a new context for managing wilderness, determining the desired resource conditions and visitor experiences in wilderness, determining the appropriate balance of protecting the qualities of wilderness character with other public values, and defining the appropriate level of development at popular wilderness locations such as Rainbow Falls. The GMP will also include an analysis of the types and amounts of commercial services that support the realization of the purposes of wilderness while still preserving the qualities of wilderness character.

Climate Change

Global climate change will have direct and indirect impacts on natural resources, visitor use, facilities, administration and operations at Devils Postpile NM. The effects of global climate change will almost certainly include changes in local weather patterns, temperature and precipitation trends, wildfire frequency, distribution of plants and animals, increased vulnerability to invasive species, and increased insect and pathogen infestations. Pro-active planning and management can help the monument adapt to these changes and their effects on monument resources, operations, and visitors. The GMP will provide general guidance to help the monument understand, anticipate and address the potential impacts.

Visitor Use and Facilities

Visitors are offered time-honored park experiences in a setting with unspoiled natural vistas that emphasizes the enjoyment of natural sights and sounds and promotes a sense of place. With most of Devils Postpile NM designated as wilderness and with internationally recognized trails (John Muir Trail, Pacific Crest Trail), the monument is an entryway to exploration, understanding, and appreciation of wilderness character and values. Experiences in the monument range from traditional day use activities to an immersion into the vast Sierran wilderness. The GMP will determine what types of visitor experiences, activities, and facilities should be available in different areas of the monument, in keeping with the values and special designations of those areas and the surrounding lands.

The GMP will address visitor contact facilities, including whether the current ranger station meets the needs of visitors and staff and what improvements can be made if it doesn't. At the same time, the GMP will examine opportunities outside of the monument for visitor services, including in the Town of Mammoth Lakes.

Trail work, *NPS Photo*

Appropriate visitor orientation, interpretive, and resource education opportunities within the monument, as well as opportunities outside of the monument, will be identified.

An appropriate long-term management approach for camping at Devils Postpile NM will be developed. The appropriate balance between protection of natural and scenic resources in the campground area and visitor use opportunities will be explored.

The GMP will also identify indicators and standards for visitor capacity to define the types and levels of visitor and other public use that can be accommodated while sustaining the desired resource and social conditions for each management zone. Monitoring strategies will be developed to test the effectiveness of management actions and provide a basis for informed adaptive management of public use.

Access and Transportation

The GMP will consider alternatives for parking and access and determine the appropriate balance between visitor access and the protection of natural resources. The GMP will consider how the monument's trail system can be enhanced, how trail management should be coordinated with the Inyo National Forest, and the types of uses that should be accommodated, including consideration of accessibility.

Administrative and Operational Facilities

Devils Postpile NM staff offices, operational space, and storage are currently located in inadequate facilities. A shortage of affordable and suitable housing hampers the monument's ability to build programs, recruit and retain staff. The GMP will determine the appropriate levels of development in different parts of the monument, and explore which areas, if any, are appropriate for administration and operations activities. Removal of facilities and infrastructure, in order to support effective operations, improve facility condition index and invest available funds wisely, will be examined. Long-term sustainability and cost-effective approaches to providing for office / administrative space, law enforcement operations, emergency service operations, interpretive operations, resource management, maintenance, meeting and training space, and housing will be considered. The GMP will also address which operational functions should continue to be located in the monument itself and whether there are opportunities to move functions to other locations and/or to collaborate with the Inyo National Forest.

Land Use and Regional Issues

The National Parks and Recreation Act of 1978, as amended, requires that general management plans consider the adequacy of existing boundaries. In the context of Devils Postpile National Monument, the GMP will explore boundary modifications, additional designations, and provide guidance for future cooperative agreements with the Inyo National Forest.

Coordination of Facilities and Services in the Valley

The GMP will explore opportunities for the National Park Service and U.S. Forest Service to coordinate

services and facilities in the valley, as well as in the Town of Mammoth Lakes, through options including the use of Service First authority. Service First is a partnership authority among four agencies: Bureau of Land Management, Forest Service, National Park Service and US Fish and Wildlife Service. Service First provides legal authority for these agencies to carry out shared or joint management activities to achieve mutually beneficial resource management goals. Service First authority has been used primarily for collocating offices, joint permitting, shared management and single points of contact for resource programs.

Devils Postpile NM and the Inyo National Forest have a shared responsibility and interest in management of public lands in this area and work as partners to provide visitor services and manage resources. Both agencies recognize it is in the best public interest to coordinate many aspects of the management of visitor services, shuttle bus operations, visitor information, resource protection strategies, and emergency response. The GMP will make recommendations for collaboration, with participation throughout the planning process from Inyo National Forest staff. The Inyo NF is a cooperating agency under NEPA on the GMP and a Memorandum of Understanding is in place for the agencies to cooperate on the development of the plan.

Bird banding demonstration, *NPS Photo*

ISSUES AND CONCERNS NOT ADDRESSED

Not all of the issues or concerns raised by the public will be addressed in this GMP. Some issues raised by the public were not considered because they are already prescribed by law, regulation, or policy; would be in violation of laws, regulations, or policies; or were at a level that was too detailed for a GMP and are more appropriately addressed in subsequent planning documents.

Impact Topics: Resources and Values at Stake in the Planning Process

The consequences of implementing each alternative evaluated in the general management plan are listed and compared using specific impact topics. These impact topics were identified based on federal laws and other legal requirements, the Council on Environmental Quality's guidelines for implementing the National Environmental Policy Act, NPS Management Policies (2006), subject-matter expertise and knowledge of limited or easily impacted resources, and issues and concerns expressed by other agencies or members of the public during scoping. Impact topics were developed to focus environmental analysis and to ensure that alternatives were evaluated against relevant topics. A detailed justification for dismissing any topics from further consideration is given below.

IMPACT TOPICS TO BE CONSIDERED

The following impact topics will be retained for analysis due to the potential of management alternatives to affect these resources and values, either beneficially or adversely. Current conditions for each of these topics are described in Chapter 4, Affected Environment:

- Natural Resources
- Cultural resources
- Wilderness Character
- Visitor Opportunities
- Socioeconomic Environment
- Operations

IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

The following impact topics were considered and determined not relevant to the development of this general management plan because either they would have no effect or a negligible effect on the topic or resource, or the resource does not occur in the monument. The topics dismissed from further analysis are as follows.

Energy Requirements and Conservation Potential

Alternatives in the general management plan, including the preferred alternative, could result in new facilities with inherent energy needs. In the proposed alternatives, new facilities would be designed with long-term sustainability in mind. The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development. The objectives of sustainability are to design facilities to minimize adverse effects on natural and cultural values, to reflect their environmental setting, and to require the least amount of nonrenewable fuels/energy.

The action alternatives could result in an increased energy need, but this need is expected to be negligible when seen in a regional context. Additionally, implementation of the monument's Climate Friendly Park Action Plan is common to all alternatives and will reduce the consumption of non-renewable energy. Thus, this topic is dismissed from further analysis.

Environmental Justice

The Environmental Protection Agency's Office of Environmental Justice defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. The goal of this "fair treatment" is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts.

On February 11, 1994, President William J. Clinton signed Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This order requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs/policies on minorities and low-income populations and communities. The Secretary of the Interior established Department of the Interior policy under this order in an August 17, 1994, memorandum. This memorandum directs all bureau and office heads to consider the impacts of their actions and inactions on minority and low-income populations and communities; to consider the equity of the distribution of benefits and risks of those decisions; and to ensure meaningful participation by minority and low-income populations in the department's wide range of activities where health and safety are involved.

In responding to this executive order two questions are asked and answered as the major part of the analysis:

- Does the potentially affected community include minority and/or low-income populations?
- Are the environmental impacts likely to fall disproportionately on minority and/or low-income members of the community and/or tribal resources?

The potentially affected community does contain some minority and low-income populations; however, environmental justice is dismissed as an impact topic for the following reasons:

- NPS staff and the planning team actively solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- Implementation of the proposed alternative would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect adverse human health effects on any minority or low-income population.
- The impacts associated with the preferred alternative would not result in any identified effects that would be specific to any minority, low-income, or tribal population communities, or tribal resources.

Based on the above information and the requirements of Executive Order 12898, environmental justice was ruled out as an impact topic to be further evaluated in this document.

Indian Trust Lands

The National Park Service does not manage or administer Indian trust assets. The overriding mandate for the National Park Service is to manage the park units in the National Park System consistent with park laws and regulations. No lands comprising Devils Postpile National Monument are held in trust by the Secretary of the Interior solely for the benefit of American Indians. Therefore, this topic was dismissed from further analysis.

Natural or Depletable Resources Requirements and Conservation Potential

Resources that will be permanently and continually consumed by implementation of the GMP include water, electricity, natural gas, and fossil fuels; however, the amount and rate of consumption of these resources would not result in significant environmental impacts or the unnecessary, inefficient, or wasteful use of resources. All alternatives reduce the use of fossil fuels through implementation of the common to all Climate Action Plan and regional sustainability initiatives.

Construction activities related to implementation of the alternatives would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels (including fuel oil), natural gas, and gasoline construction equipment. With respect to operational activities, compliance with all applicable building codes, as well as project mitigation measures, would ensure that all natural resources are conserved or recycled to the maximum extent feasible.

Consideration of these topics is required by 40 Code of Federal Regulations (CFR) 1502.16. The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development (NPS Management Policies 9.1.1.7). Through sustainable design concepts and other resource management principles, the alternatives analyzed in this document would attempt to conserve natural or depletable resources. Therefore, this topic has been dismissed from further analysis.

Prime or Unique Farmlands

In 1980 the Council on Environmental Quality directed federal agencies to assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resource Conservation Service as prime or unique. Prime farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland soils produce specialty crops such as specific fruits, vegetables, and nuts.

There are no prime or unique farmlands in Devils Postpile NM. Private agriculture does not exist within the monument, so this type of land use would not be affected by this plan. Therefore, there would be no impacts on prime or unique farmlands and the topic is being dismissed from further analysis in the plan.

Urban Quality and Design of the Built Environment

Consideration of this topic is required by the Code of Federal Regulations (CFR) 1502.16. The quality of urban areas is not a concern in this planning project. Throughout the monument, vernacular architecture and compatible design would be taken into consideration for new structures built under all of the action alternatives. Facilities would be designed in the style of rustic architecture that complements the natural setting. Under any alternative, the monument will strive to create integrated valley-wide design standards in collaboration with the USFS. Emphasis would be placed on designs, materials, and colors that blend in and do not detract from the natural and built environment. Therefore adverse impacts are anticipated to be negligible and no further consideration of this topic is necessary.

Conformity with Local Land Use Plans

The basic land use of the monument as a recreation and resource management area is in conformance with local land use plans. The creation of additional recreation and visitor service opportunities in the monument, as proposed in the alternatives, would be consistent with the existing land uses in the monument or local (non-NPS) land use plans. Therefore this topic is dismissed from further consideration.

Public Health and Safety

Actions and developments proposed in the alternatives would not result in any identifiable adverse impacts

to human health or safety. Therefore, this topic is dismissed from further consideration.

Ethnographic Resources

The NPS defines ethnographic resources as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence or other significance in the cultural system of a group traditionally associated with it" (DO 28, page 181). No ethnographic resources have been identified in the monument in consultation with traditionally associated tribes and groups that would be affected by the actions proposed in the GMP. Therefore, the impact topic of ethnographic resources is dismissed from further analysis.

Air Quality

Clean air, free from excessive human-caused pollution, is critical for health for both humans and ecosystems. In order to protect this value, the US Congress passed the Federal Clean Air Act in 1970 (expanded in 1977 and 1990) which identifies dangerous air pollutants and also establishes concentration thresholds for these pollutants. The federal Environmental Protection Agency (EPA) classifies several areas in the Sierra Nevada as protected air quality management areas, with standards for six air pollutants: Carbon Monoxide, Lead, Nitrogen Dioxide, Particulate Matter, Ozone, and Sulfur Dioxide.

Middle Fork of the San Joaquin River, *NPS Photo*

Although Devils Postpile NM was not designated as a Class I air quality management park, approximately 85% of the monument is within the Ansel Adams Wilderness; a Class I area. Thus, the majority of the monument is managed as a Class I area. Class I areas are afforded the highest degree of protection under the Clean Air Act. This designation allows very little additional deterioration of air quality.

Unfortunately, Devils Postpile NM receives some of the most polluted air in the nation from the agricultural Central Valley and the cities of coastal California. Prevailing winds from the Pacific Ocean blow eastward and push polluted air inland from the San Francisco Bay Area and Central Valley over the Sierra Nevada or up the San Joaquin River canyon to the monument and on towards Mammoth Lakes through the low pass directly east of the monument. This transported air deposits pollutants derived from fertilizers and combustion of fossil fuels, including ozone and nitrogen dioxide, on lands and waters within the watershed.

Air quality specialists collected air samples Devils Postpile throughout the summers of 2007 and 2008 (Bytnerowicz et al. 2010) and found that ozone, atmospheric ammonia (NH3), and nitric oxide (NO) pollution was higher than expected for the site. It is likely that upslope movement of polluted air from the Central Valley and the Bay Area creates late afternoon peaks in ozone. However, other potential sources include local emissions of volatile organic compounds and nitric oxide compounds from buses, other automobiles, campfires, and landscape-scale fires (Goldhammer et al., 2009). After the late afternoon peaks in pollutant concentrations, atmospheric concentrations decline rapidly due to down slope movement of clean air from the eastern Sierra Nevada (Cisneros et al. 2010). The observed high levels of ozone in the afternoon exceeded California and Federal standards at times and may produce toxic effects in at least some plant species within the monument, especially highly sensitive ones such as Jeffrey pine (Bytnerowicz & Grulke, 1992).

Some of the actions proposed in the alternatives involve the demolition, repair and replacement of existing facilities, site redsesign, and possible trail realignments. The anticipated effects of these activities could result in increased dust and particulates, however the extent of these impacts would be confined to the local area, lasting only for the short-term duration of the construction or maintenance activities, and would have a negligible to minor effect on air quality. Furthermore, additional proposals in the alternatives related to climate change and sustainability in terms of transportation, encouraging non-motorized circulation in the valley, and improvements to NPS operations would have a long-term benefit on air quality.

While there are ongoing effects to air quality originating from external sources, no actions proposed in the alternatives proposed in this GMP would have a long-term adverse impact air quality, and some proposals would

result in long-term benefits. Therefore, the impact topic of air quality is dismissed from further analysis.

Greenhouse Gas Emissions

Consistent with the NPS interim guidance for considering climate change in NEPA analysis, the planning team considered potential effects from proposals in the alternatives on greenhouse gas emissions and the monument's carbon footprint. The most significant contribution to greenhouse gas emissions in the monument and surrounding valley is from vehicle traffic. Vehicle traffic is largely controlled by the mandatory shuttle operation that runs during the peak season and limits the number of private vehicles that enter the valley and monument, thereby limiting greenhouse gas emissions. The GMP alternatives do not propose any changes to the shuttle operation or opportunities for allowing additional motorized vehicles into the valley or monument. Construction projects would be short-term and not result in any long-term adverse impacts from increasing greenhouse gas emissions. Furthermore, the GMP alternatives propose recommendations for improving the sustainability of NPS operations, including construction and maintenance activities, with the goal of further reducing greenhouse gas emissions and contributions to the monument's carbon footprint. Therefore, this impact topic is dismissed from further analysis.

Relationship of Other Planning Efforts to this General Management Plan

Several plans have influenced or would be influenced by the approved general management plan for Devils Postpile National Monument. These plans have been prepared by the National Park Service, the U.S. Forest Service, and state and local entities. Some of these plans are described briefly here, along with their relationship to this general management plan.

NATIONAL PARK SERVICE PLANS AND STUDIES

Natural Resource Management Statement (1982)

The Natural Resources Management Statement for Devils Postpile National Monument describes the natural resources of the monument and summarizes management objectives, accomplishments, and general needs. These types of management statements are no longer being prepared by the National Park Service. General information from this document was used in preparing this general management plan.

Long Range Interpretive Plan (2011)

The monument's interpretive staff, in coordination with regional staff, completed a long range interpretive plan in 2011. The planning process required by this general management plan contains many of the elements that were also included in the interpretive plan, and many of the proposed actions in the GMP relate to interpretation and education. The long range interpretive plan was developed in tandem with the beginning stages of the GMP planning process to ensure compatibility and consistency. If necessary, this plan would be modified to reflect any changes resulting from implementation of this general management plan.

Fire and Fuels Management Plan (2005)

The Fire and Fuels Management Plan for Devils Postpile National Monument outlines fire management objectives and ways that the monument can enhance firefighter and public safety while meeting resource management needs. This document is a specific implementation plan meant to be used in cooperation with the GMP. If necessary, this plan would be modified to reflect any changes resulting from implementation of this general management plan.

Climate Friendly Park Action Plan (2010)

The climate friendly park action plan identifies steps that the monument can undertake to reduce greenhouse gas (GHG) emissions and adapt to current and future impacts of climate change. The plan presents the monument's emission reduction goals, and associated reduction actions and adaptation strategies to achieve its goals. The climate action plan complements the general management plan by providing detailed actions related to the common-to-all GMP alternatives goal of carbon footprint reduction.

Devils Postpile National Monument Visitor Study (2007)

This report described the results of a visitor study at Devils Postpile NM collected in 2007. These responses provided a valuable demographic and behavioral profile of Devils Postpile NM visitors. The insights gained through this study were used in the development of alternatives for the general management plan.

Curatorial Facilities Strategy (2006)

The cultural resources program in the Pacific West Region prepared a document that provides direction for preserving, protecting, and making accessible all museum collections within the region. This document includes museum facility strategy recommendations for each park unit in the Pacific West Region, including Devils Postpile NM. The strategy recommends consolidating the mounument's collections at Sequoia and Kings Canyon National Parks until a future curatorial facility proposed by Manzanar National Historic Site at the Eastern California Museum is complete. The GMP alternatives explore some additional long-term recommendations for the monument's museum collections.

Housing Management Plan (2013)

The Housing Management Plan (HMP) serves as the housing framework and strategy to guide the park's housing program for the next five years, and was based on a Housing Needs Assessment (HNA) completed in 2012. The GMP alternatives for employee housing were also informed by the HNA and the HMP recommendations are largely consistent with the GMP recommendations. The GMP outlines a broader, long-term vision and strategies for housing the monument's employees that could inform future updates to the monument's HMP.

Devils Postpile National Monument Visitor Use Assessment (2011)

This assessment provided an inventory of visitor use levels at select places within the monument and examined patterns to inform managers of the relationships between visitor travel patterns and natural resources. A subsequent document, titled Devils Postpile National Monument Visitor Behavior Model and Travel Simulation (2012), expanded further on this work by modeling visitor use patterns from entry into the valley to selected features inside the monument and examining the relationship of current social behavior to visitor flow and experience. Data and analysis from these efforts were used in the development of the GMP alternatives.

Natural Resource Condition Assessment (in progress)

This report is an assessment of the natural resource conditions of Devils Postpile NM and an evaluation of the threats and stressors that act on these resources. This condition assessment was undertaken to provide National Park Service (NPS) managers, interpreters, and planners with a synthesis of current information on the natural resources in and around the monument. The assessment follows an iterative process between NPS staff and the authors to identify a set of indicators of stressors and resources of concern. The condition assessment identifies a number of emerging issues that may become of greater management concern in the future. Some GMP team members have also been participants in the development of the NRCA.

Sierra Nevada Network Biological Inventory Plan (2001)

The Biological Inventory Plan targets the completion of basic inventories of vascular plants and vertebrate animals for the parks of the Sierra Nevada Network. Sierra Nevada Network parks include Devils Postpile National Monument and Sequoia, Kings Canyon and Yosemite National Parks. The plan's purpose is to provide park managers in the network, NPS policymakers, and publics with scientifically sound information on the nature and status of selected biological resources in a readily accessible form.

Sierra Nevada Network Monitoring Plan (2008)

The purpose of the Sierra Nevada Network Inventory & Monitoring Program is to collect and provide relevant scientific and research information about the current status and long term trends in the composition, structure, and function of Sierra Nevada Network park ecosystems. In addition, the Inventory & Monitoring program helps the Network determine how well current management practices are maintaining those ecosystems.

Resource Stewardship Strategy (in progress)

The resource stewardship strategy will take an integrated approach to natural and cultural resource management. It will identify conservation objectives and potential activities for managing resources, as well as implementation strategies, consistent with the GMP. The resource stewardship strategy will include plans and strategies for wildlife and vegetation linkages, connectivity, and migration corridors that respond to climate change, among other factors.

U.S. FOREST SERVICE PLANS

Inyo National Forest Land and Resource Management Plan (1988)

The Land and Resource Management Plan (LRMP or Forest Plan) provides general direction for management activities on the Inyo National Forest. The Forest Plan guides where and under what conditions an activity or project on national forest lands can generally proceed. Specific project or activity proposals are analyzed separately, following National Environmental Policy Act procedures. The Land and Resources Management Plan has been amended multiple times since it was completed in 1988, and a revision is underway.

The Inyo National Forest is one of three National Forests in California revising its Forest Plan using the 2012 National Forest System Planning Rule. After completing an assessment of forest resource conditions and trends, including social and economic conditions; terrestrial and aquatic ecosystems; and recreation opportunities and access, the forest will develop a revised plan.

Staff members from the Inyo National Forest have been full team members on the GMP planning team, providing input throughout the process that ensures compatibility with forest planning.

Management Direction for the Ansel Adams, John Muir and Dinkey Lakes Wildernesses (2001)

This document amended the Land and Resource Management Plan (1988) with specific guidance for three federally designated wilderness areas, including the Ansel Adams and John Muir Wildernesses which surround Devils Postpile NM. Staff members from the Inyo National Forest have been full team members on the GMP planning team, providing input throughout the process that ensures compatibility with forest planning. Care has been taken to integrate GMP recommendations with the direction found in this document.

LOCAL AND REGIONAL PLANS

Mono County General Plan (2009)

The purpose of the Mono County General Plan is to establish policies to guide decisions on future growth, development, and conservation of natural resources in the unincorporated areas of the county. The plan reflects community-based planning and includes individual area plans for Mono County communities. Due to its distance from the county's unincorporated areas, the monument's GMP will not affect any of the provisions or land areas in the county's general plan.

Inyo County General Plan (2001)

The 2001 Inyo County General Plan Update is a comprehensive and long-range general plan for the county's physical development, providing the County with a consistent framework for land use decision-making. Due to its distance from the county's unincorporated areas, the monument's GMP will not affect any of the provisions or land areas in the county's general plan.

Madera County General Plan (1995)

The Madera County General Plan provides an overall framework for development and resource protection. Due to its location on federal land and distance from the county's developed areas, the monument's GMP will not affect any of the provisions or land areas in the county's general plan.

Town of Mammoth Lakes General Plan (2007)

This plan establishes standards, guidelines and priorities that define the town's vision for sustainable land use, recreation, and economic growth. Although not directly or explicitly tied to the general plan, many of the actions proposed in the GMP would support the goals articulated in the general plan, particularly in terms of tourism promotion, engagement of residents in conservation activities, and education.

Next Steps in the Planning Process

After the distribution of the General Management Plan and Environmental Assessment there will be a 60-day public review and comment period, after which the NPS planning team will evaluate comments from other agencies, organizations, businesses, California Indian tribes, and individuals regarding the draft plan. If no significant environmental impacts are identified and no major changes are made in the alternatives, then a Finding of No Significant Impact (FONSI) and final decision on the preferred alternative can be made and approved by the Pacific West Regional Director. Following a 30-day waiting period, the plan can then be implemented.

Implementation of the Plan

Implementation of the approved plan will depend on funding. The approval of this plan does not guarantee that the funding and staffing needed to implement the plan will be forthcoming. Full implementation of the actions in the approved General Management Plan could be many years in the future. The implementation of the approved plan could also be affected by other factors, such as changes in NPS staffing, visitor use patterns, and unanticipated environmental changes.

Once the General Management Plan has been approved, additional feasibility studies and more detailed planning, environmental documentation, and consultations may need to be completed, as appropriate, before certain preferred alternative actions can be carried out. For example:

- additional environmental documentation may need to be completed
- appropriate permits may need to be obtained before implementing actions
- appropriate federal and state agencies would need to be consulted concerning actions that could affect threatened and endangered species
- The State Historic Preservation Officer would need to be consulted, as appropriate, on actions that could affect historic properties eligible for listing, or listed in, the National Register of Historic Places.
- Consultation with American Indian tribes and groups would continue throughout the implementation process, and as part of any effort to identify, document and manage historic properties with religious and cultural significance to traditionally associated American Indian peoples.

Future program and implementation plans, describing specific actions that managers intend to undertake and accomplish in the monument, will be guided by the desired conditions and long-term goals set forth in this general management plan.

Flyfishing in the Middle Fork of the San Joaquin River, *NPS Photo*

Chapter Two: Foundation for Planning

Previous page: Rainbow Falls

Chapter Two: Foundation for Planning and Management

Introduction

This chapter contains two distinct components that provide a foundation for this general management plan: the foundation statement and the desired conditions derived from law and policy. The foundation statement documents a shared understanding of Devils Postpile National Monument's purpose, significance, resources and values, interpretive themes, and special mandates. These statements identify Devils Postpile National Monument's unique characteristics and what is most important about Devils Postpile National Monument. The desired conditions explained in this chapter provide the broadest level of direction for management of Devils Postpile National Monument and are based on laws and policies that guide the NPS. Together, these two elements provide basic guidance for decision-making and management for Devils Postpile National Monument.

Foundation Document

Every national park unit needs a formal statement of its core mission to provide basic guidance for all of the decisions to be made about the park—a "foundation for planning and management." The foundation for future planning and management is generally developed early in the general management planning process as part of the initiation of a GMP. It is a process of public meetings, internal and external scoping, literature, policy, and legislative review, and more. A foundation document includes discussion of the purpose, significance, interpretive themes, and fundamental resources and values of a park unit. It also presents the desired conditions for resources, facilities, and experiences within the park unit as they are set forth by various laws, regulations, and policies specifically related to that unit.

The foundation document for Devils Postpile National Monument was initiated during an interagency planning workshop held in February 2009 at Golden Gate National Recreation Area. It has been further refined throughout the GMP process, including consideration of public comments. The foundation document can be used in all aspects of management to ensure that the most important objectives are accomplished before turning to items that are also important but not directly critical to achieving the park purpose and maintaining its significance.

Devils Postpile National Monument preserves and protects the glacially exposed columns of the Devils Postpile, the scenic Rainbow Falls, and the wilderness landscape of the upper Middle Fork San Joaquin River in the Sierra Nevada for scientific value, public interest, and inspiration.

PARK PURPOSE

Park purpose is a statement of why Congress and/or the President established a unit of the National Park System. A purpose statement provides the most fundamental criteria against which the appropriateness of all planning recommendations, operational decisions, and actions are tested. The purpose of the park is grounded in a thorough analysis of the park's legislation (or executive order) and legislative history. A park purpose statement goes beyond a restatement of the law and details shared assumptions about what the law means in terms specific to a park unit. The purpose of Devils Postpile National Monument is based upon its establishment by Presidential proclamation and legislative history (See *Appendix A*).

Devils Postpile National Monument Purpose Statement:

> Devils Postpile National Monument preserves and protects the glacially exposed columns of the Devils Postpile, the scenic Rainbow Falls, and the wilderness landscape of the upper Middle Fork San Joaquin River in the Sierra Nevada for scientific value, public interest, and inspiration.

SIGNIFICANCE

Significance statements express why the park unit's resources and values are important enough to warrant

designation as a unit of the national park system. These statements describe why the park unit is important within a global, national, regional, and system-wide context and are directly linked to the purpose of the unit. A park unit's significance statements are substantiated by data or consensus and reflect the most current scientific or scholarly inquiry and cultural perceptions, which may have changed since the park's establishment. The following statements describe the significance of Devils Postpile National Monument:

- Devils Postpile is one of the world's finest examples of columnar jointing, displaying volcanic rock columns polished by glaciers and revealing a mosaic of polygons on its dome shaped top.
- Devils Postpile National Monument is nested in one of the largest contiguous designated wilderness in the lower 48 states that includes three national forests and three national parks in the Sierra Nevada.
- For a small area, Devils Postpile National 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.
- Devils Postpile National Monument provides a traditional national park experience in a rustic setting that promotes learning and intimate (time-honored) visitor experiences that include enjoying the sights and sounds of nature.
- The establishment of Devils Postpile National Monument provides compelling insight into the history and evolution of national parks and national forests, beginning in the early years of the public lands conservation and preservation movement.

INTERPRETIVE THEMES

Interpretive themes contained in this section are based upon the monument's purpose and significance. They provide the foundation on which the monument's educational and interpretive program is based. These interpretive themes connect monument resources to relevant ideas, meanings, concepts, contexts, beliefs, and values. They support the desired interpretive outcome of increasing visitor understanding and appreciation of the significance of the monument's resources.

- The Devils Postpile challenges the intellect and inspires the imagination in our efforts to understand how lava, ice, and other forces forged and sculpted this scenic and scientific wonder.
- Complex natural processes shape and support the diverse and dynamic Devils Postpile landscape, creating inspirational scenery and opportunities for significant scientific discovery and understanding.
- Devils Postpile provides a gateway for a myriad of wilderness experiences, protecting natural processes while providing opportunities for personal renewal, inspiration, artistic expression, connection to the landscape, and the prospect of hope for the future.
- The establishment of Devils Postpile National Monument provides compelling insight into the ongoing evolution of our relationship to the land, environmental citizenry, stewardship ethic, and the internationally shared heritage of public lands conservation.
- The rustic setting and traditional park experience at Devils Postpile brings us closer to the land by providing opportunities for solitude, exploration, experiencing simple pleasures, and developing a sense of place.
- Unusually rich ecological diversity, which can be experienced at Devils Postpile's smaller scale, provides opportunities for intimate understanding and appreciation of the monument's connection to the larger Sierra Nevada ecosystem and the world.
- Each visitor is part of a proud and enduring legacy of stewardship that catalyzed the creation of Devils Postpile National Monument and inspires us to protect and preserve the environment as a whole for future generations.
- Evidence of powerful physical change due to past ice ages within the monument, as well as ongoing scientific climate studies, make Devils Postpile NM an ideal location to teach visitors about the causes and effects of natural and anthropogenic climate change.

FUNDAMENTAL RESOURCES AND VALUES

Fundamental resources and values are the most important ideas or concepts to be communicated to the public about a park and merit primary consideration during planning and management because they are critical to achieving the monument's purpose and maintaining its significance. They may include systems, processes, features, visitor experiences, stories, scenes, sounds, smells or other resources and values. Fundamental resources and values provide a valuable focus throughout the planning process and the life of the plan. They are the reasons for data collection, planning issues, management prescriptions, impact assessments, and value analyses. Other important resources and values or secondary significance statements are those that may not be fundamental to the purpose and significance but are nevertheless determined to be particularly important in general management planning.

Fundamental and other important resources and values, which link directly to the significance statements follow.

Fundamental Resources and Values:

- *Distinct geologic features*. The Postpile, Rainbow Falls, and other geologic features that provide textbook quality evidence of volcanism, glaciation, and mountain building forces.

- *Upper Middle Fork San Joaquin River*. A free flowing river, mineral springs, wetlands, riparian areas and other water-dependent features and communities sustained by naturally functioning, unpolluted surface and ground water system.

- *Component of a larger ecosystem*. The monument is a functional part of three converging biogeographic regions affected by dynamic physical processes that influence a diverse and evolving biota.

- *Body of knowledge*. A body of knowledge and material evidence documenting the monument's natural and administrative history, cultural significance, and topographic importance in the Sierra Nevada ecoregion.

- *Opportunities for science and learning*. Opportunities for scientific study and shared learning about past, present and future environmental conditions and connected biogeophysical processes.

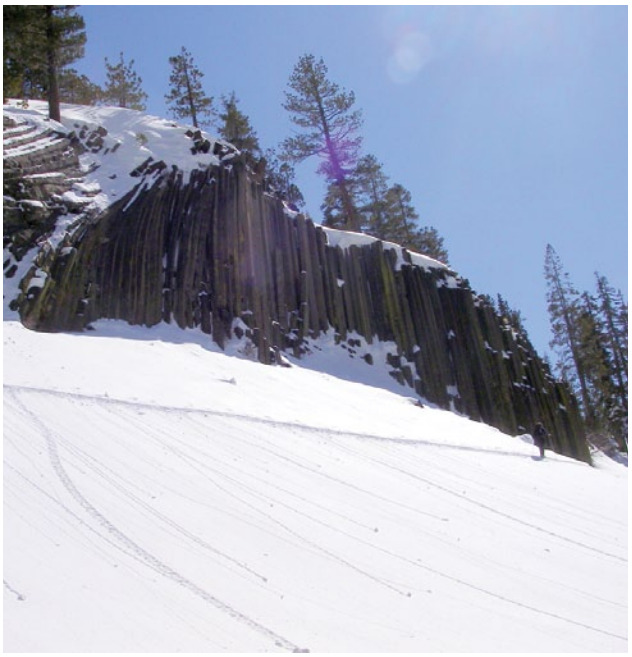
- *Natural soundscapes and visual quality*. Natural soundscapes, dark night skies, clean air, clear water, and unspoiled natural vistas.

- *Wilderness portal*. Approximately 85 percent of Devils Postpile National Monument is designated as wilderness. The monument contains the internationally recognized John Muir and Pacific Crest Trails. It is an entryway to exploration, understanding, and appreciation of the qualities of wilderness character. Experiences range from a glimpse to an immersion into the vast Sierra wilderness.

- *Traditional undeveloped park experience*. Visitors are offered time-honored park experiences in a setting that emphasizes the enjoyment of natural sights and sounds and promotes a sense of place.

Other Important Resources and Values

- *Historic sites and structures*. The monument contains historic structures and features such as the Devils Postpile Ranger Station, the Postpile cabin ruins, portions of the Mammoth Pass Trail, and archeological sites associated with Native American use of the area, sheepherding, and the U.S. Cavalry administration of Yosemite National Park.



Devils Postpile in winter, *NPS Photo*

SPECIAL MANDATES AND ADMINISTRATIVE COMMITMENTS

Special mandates are legal requirements specific to a national park unit that must be fulfilled, along with the park's purpose, even if they do not relate to that purpose. Special mandates provide direction for park planning and management. Mandates can include the designation of an area in the park as wilderness or may also commit park managers to specific actions and limit their ability to modify land use in a park unit, such as long term cooperative agreements, or easements. All easements and rights-of-way are managed under the terms of federal law and NPS regulations. Based on NPS Management Policies (2006), all easements must be formal, legal titles or they will be extinguished.

Administrative commitments are agreements that have been reached through formal, documented processes. Examples include a memorandum of agreement to abide by the policies of an interagency management commission, or to manage fishing in cooperation with state wildlife agencies. Although agreements also identify park commitments they are not legally binding and are revocable by the superintendent.

TABLE 2.1: SPECIAL MANDATES

SPECIAL MANDATES	
WILDERNESS DESIGNATIONS	
The Wilderness Act, Public Law 88-577, September 3, 1964 California Wilderness Act of 1984, Public Law 98-425, September 28, 1984 Omnibus Public Land Management Act of 2009, Public Law 111-11, March 30, 2009	• The John Muir Wilderness includes approximately 651,000 acres of designated wilderness in the Sierra Nevada. • The Ansel Adams Wilderness includes approximately 231,000 acres of designated wilderness in the Sierra Nevada. Originally established as the Minarets Wilderness in 1964, the California Wilderness Act of 1984 expanded this wilderness area and changed the name to Ansel Adams, honoring the famous photographer. • Approximately 687 acres of monument lands are located within designated wilderness. • The legal and policy requirements that apply to all wilderness areas and all wilderness areas within the NPS also apply to wilderness within Devils Postpile NM.
PACIFIC CREST AND JOHN MUIR TRAILS	
The National Trails System Act (P.L. 90-543, as amended through P.L. 111-11, March 30, 2009	• The Pacific Crest National Scenic Trail is a trail of approximately 2,350 miles, extending from the Mexican-California border northward generally along the mountain ranges of the west coast states to the Canadian-Washington border near Lake Ross. The trail is to be administered by the Secretary of Agriculture. • Portions of the Pacific Crest Trail overlap with the John Muir Trail. Although it has no formal designation, the John Muir Trail is one of the oldest trails in the Sierra Nevada. • The monument contains approximately two miles of the Pacific Crest and John Muir Trails. • The legal and policy requirements that apply to these trails also apply to the sections located within Devils Postpile NM.
DETERMINATION OF ELIGIBILITY FOR WILD AND SCENIC RIVER DESIGNATION	

The Wild and Scenic Rivers Act (P.L. 90-542; 16 U.S.C. 1271 et seq.)	• The Middle Fork of the San Joaquin River (MFSJR) was found eligible for wild and scenic river designation, under Section 5(d)(1) of the Act, in a 1991 eligibility study (Sierra National Forest, 1991). Due to its eligibility, the river must be protected as a potential addition to the national system of wild and scenic rivers, unless the river is determined to be "nonsuitable" in a suitability analysis.
	• Protective management of federal lands in the river area begins at the time the river segment is found eligible and includes these elements:
	  • Free-flowing values. The free-flowing characteristics of eligible river segments cannot be modified to allow stream impoundments, diversions, channelization, and/or rip-rapping to the extent authorized under law.
	  • River-related values. Each segment is managed to protect outstanding remarkable values (subject to valid existing rights) and, to the extent practicable, such values are enhanced. See Appendix for a list of outstanding remarkable values found in the MFSJR corridor.
	  • Water Quality. Water quality must be protected.
	  • Classification impacts. Management and development of the eligible river and its corridor cannot be modified, subject to valid existing rights, to the degree that its eligibility or classification would be affected.

TABLE 2.2: ADMINISTRATIVE COMMITMENTS

NAME	AGREEMENT TYPE	EFFECTIVE DATE AND DURATION	STAKEHOLDERS	PURPOSE
Mandatory Shuttle Bus from Mammoth Mountain Ski Area to Reds Meadow and Devils Postpile National Monument	N/A	Initiated in 1979 and ongoing	National Park Service, U.S. Forest Service, Eastern Sierra Transit Authority	The shuttle system - operated under the cooperative supervision of the U.S. Forest Service, National Park Service, and Eastern Sierra Transit Authority - reduces congestion on park and forest roads, protects sensitive resources from damage due to illegal parking, and reduces vehicle emissions.
Special Use Permit for Eastern Sierra Transit Authority	Special Use Permit	Effective 2012 – 2016	National Park Service, U.S. Forest Service, Eastern Sierra Transit Authority	Grants a waiver from the Superintendent's Compendium requirement limiting vehicle lengths to 37 feet on the monument's access road and allows 39.5 foot buses for shuttle bus operations, with conditions.
General Agreement of Understanding between Devils Postpile National Monument and the Inyo National Forest	Agreement	2004 (has sunset)	National Park Service, U.S. Forest Service	General agreement on the coordination of visitor services, shuttle bus operations, visitor information, resource protection strategies and emergency response.
Interagency Agreement River Gage and Monitoring Station and the Upper Middle Fork of the San Joaquin River Gauge at Devils Postpile National Monument	Agreement	Initiated in 2010 and ongoing with Sierra Nevada Inventory and Monitoring Network.	US Geological Survey	This project will implement a real-time streamflow station at Devils Postpile National Monument with the goal of for long term data collection.
Memorandum of Understanding between Madera County Sheriff's Office and Devils Postpile National Monument	Agreement	Effective for 5 years to June 10, 2018	National Park Service, Madera County Sheriff's Office	Agreement to cooperate in law enforcement, and that Madera County will maintain MOU's with Mono County and Town of Mammoth Lakes regarding law enforcement duties for areas of Madera County that are most reasonably accessed from the east side of the Sierra Nevada mountain range.

GUIDING PRINCIPLES

In addition to the body of laws, policies, and directives that must be followed when managing units of the national park system, guiding principles may be identified to help direct park management. The following principle is important in guiding the management of resources and values within the monument:

> The integrated management of the monument and surrounding national forest provides a quality visitor experience and enhanced resource protection.

DESIRED CONDITIONS FROM LAW AND POLICY

To understand the implications of the actions described in the GMP alternatives, it is important to describe the laws and policies that underlie the management actions. Many monument management directives are required based on law and/or policy and are therefore are not subject to alternative approaches. A GMP is not needed to decide, for instance, that it is appropriate to protect endangered species, control nonnative invasive species, protect archeological sites, conserve artifacts, or provide for universal access — laws and policies already require the NPS to fulfill these mandates. The NPS would continue to implement these requirements with or without a new general management plan.

The National Park System General Authorities Act affirms that while all national park units remain "distinct in character," they are "united through their interrelated purposes and resources into one National Park System as cumulative expressions of a single national heritage." The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further, the Redwood Act of 1978 states that NPS management of park units should not "derogat[e]… the purposes and values for which these various areas have been established." The NPS has established policies for all units under its stewardship that are explained in a guidance manual – NPS Management Policies 2006.

Table 2.3 describes the desired conditions that provide the broadest level of direction for management of Devils Postpile National Monument and are based on federal laws, executive orders, and NPS Management Policies. For each topic there are a series of desired conditions required by law and policy that Devils Postpile National Monument would continue to work toward under all of the alternatives presented in this GMP.

TABLE 2.3: SERVICEWIDE LAWS, POLICIES, AND DESIRED CONDITIONS

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS	
ARCHEOLOGICAL RESOURCES	
POLICY GUIDANCE/ SOURCES National Historic Preservation Act of 1966 (16 USC 470) Archaeological Resources Protection Act of 1979 (16 USC470aa-mm) The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation NPS Director's Order 28 NPS Management Policies 2006 36 CFR 800 "Protection of Historic Properties" 36CFR79 "Curation of Archeological Collections	**DESIRED CONDITIONS** • Archeological sites are identified and inventoried, their significance is evaluated and documented in consultation with tribal partners, and they are in good condition. • Significant archeological sites are nominated for listing in the National Register of Historic Places either individually or in districts. • Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance is unavoidable or that ground disturbing research or stabilization is desirable. **MANAGEMENT DIRECTION/STRATEGIES** Devils Postpile National Monument would take the following kinds of actions to meet legal and policy requirements related to archeological sites: • Continue the process of monument wide archeological survey and inventory until all archeological resources have been identified, documented and evaluated. • Continue consultations with tribal partners to share knowledge about archeological resources, and solicit tribal perspectives on their management and protection. • Conduct archeological fieldwork and research in accordance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, by qualified individuals and organizations. • Curate archeological collections in accordance with federal standards. • Record all archeological sites including new discoveries in the Archeological Resources Management Information System (ASMIS). • Monitor all archeological sites on a regular basis and their current conditions recorded in ASMIS. • Regularly update archeological baseline documents including but not limited to GIS base maps and the archeological overview and assessment. • Protect archeological site locations and other sensitive archeological information and keep confidential under the law. • Partner with tribes, colleges, universities, and other appropriate organizations to encourage preservation and appropriate research for the public benefit.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

AIR QUALITY

POLICY GUIDANCE/ SOURCES	
Clean Air Act, 1970 NPS Management Policies 2006 NPS Director's Order 77 "Natural Resources Management Guideline"	Although Devils Postpile NM was not designated as a Class I park, 85% of the monument is within the Ansel Adams Wilderness; a Class I area. Thus, the monument is managed as a Class I area. Class I areas are afforded the highest degree of protection under the Clean Air Act. This designation allows very little additional deterioration of air quality. **DESIRED CONDITIONS** • Air quality in the monument meets national ambient air quality standards (NAAQS) for specified pollutants. The monument's air quality is maintained or enhanced with no significant deterioration. • Nearly unimpaired views of the landscape both within and outside the monument are present. Scenic views are substantially unimpaired (as meant by the Clean Air Act). **MANAGEMENT DIRECTION/STRATEGIES** • Devils Postpile National Monument would take the following kinds of actions to meet legal and policy requirements related to air quality: • Continue to cooperate with the California Commission on Environmental Quality and the U.S. Environmental Protection Agency to monitor air quality and ensure that monument actions do not impair air quality. (Note: The NPS has very little direct control over air quality in the airshed encompassing the national monument.) • Inventory the air quality-related values (AQRVs) associated with the national monument. Monitor and document the condition of air quality and related values. • Evaluate air pollution impacts and identify causes. • Minimize air pollution emissions associated with national monument operations, and visitor use activities. • Conduct all prescribed and pile burning in compliance with Air Quality standards and procedures with regional Air Quality Control Boards. • Conduct air quality monitoring in conjunction with other government agencies and academic institutions. • Conduct national monument operations in compliance with federal, state, and local air quality regulations. • Ensure healthful indoor air quality at NPS facilities. • Participate in federal, regional, and local air pollution control plans and drafting of regulations and review permit applications for major new air pollution sources. • Develop educational programs to inform visitors and regional residents about the threats of air pollution. • Initiate or participate in research on air quality and effects of air pollution on plants, soils, and wetlands in the national monument. Determine changes in ecosystem function caused by atmospheric deposition and assess the resistance and resilience of native ecosystems in the face of these external perturbations.

Soda Springs Meadow, *NPS Photo*

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

CLIMATE CHANGE

POLICY GUIDANCE/ SOURCES	DESIRED CONDITIONS:
The Energy Independence and Security Act of 2007 Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management" Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance" Executive Order 13653, Preparing the United States for the Impacts of Climate Change President's Climate Change Action Plan 2013 DOI Secretarial Order 3226, "Evaluating Climate Change Impacts in Management Planning;" DOI Secretarial Order 3289,"Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources NPS Climate Change Response Strategy 2010 NPS Climate Action Plan 2012 NPS Green Parks Plan 2012 Pacific West Region Climate Change Response Strategy 2013 NPS Management Policies 2006, Section 4.7.2, Weather and Climate	• The NPS utilizes environmentally preferable materials, products, and services to design, construct, maintain, and operate high performance sustainable buildings. • The NPS works together with other federal, state, tribal and local governments, and private landowner partners to develop strategies at multiple scales, including landscape-level strategies, for understanding and responding to climate change impacts. • The NPS considers and analyzes potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, and/or when making major decisions affecting natural and cultural resources. • The NPS engages in partnerships to implement projects and activities that contribute to the conservation of species, natural communities, and lands and waters placed at risk by changing climate conditions. • The NPS continues to provide and foster state-of-the art science to better understand the impacts of climate change and to develop science-based adaptive management strategies for natural and cultural resource managers. • The NPS continues to minimize the monument's contributions to climate change, implement strategies to improve sustainability and energy efficiency, and decrease the monument's carbon footprint and consumption of resources. **POTENTIAL MANAGEMENT STRATEGIES:** • Engage in the Climate Friendly Parks program. • Use the best available scientific data and knowledge to inform decision-making in regard to climate change. • Collaborate with partners to develop, test, and distribute the best available information from climate change models. • Inventory and monitor key attributes of the natural resources, cultural resources, and visitor experiences likely to be impacted by climate change. • Develop and sustain a historical archive of the climate, weather, hydrologic and ecological conditions in the past, present, and future and integrate these disciplines to feed into modeling, adaptation strategies and mitigations. • Use best available science to evaluate and manage the monument's greenhouse gas storage and emissions. • Incorporate climate change considerations and responses in all levels of planning. • Develop, prioritize and implement adaptation strategies that promote ecosystem resilience and enhance restoration, conservation, and preservation of monument resources. • Develop, prioritize, and implement management strategies to preserve climate-sensitive cultural resources. • Enhance the sustainable maintenance, design, and construction of monument infrastructure. • Substantially reduce the monument's carbon footprint from 2008 levels by 2016 through aggressive commitment to environmentally preferable operations. • Integrate climate change mitigation into the monument's business practices. • Promote biological carbon sequestration as a function of healthy ecosystems. • Coordinate and distribute climate change information throughout the monument. • Increase climate change knowledge and understanding for visitors and staff within the monument. • Provide external communications about the implications of climate change and the NPS response. • Model and communicate sustainable practices that lead by example.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

ETHNOGRAPHIC RESOURCES (CULTURALLY SIGNIFICANT RESOURCES) AND SACRED SITES

POLICY GUIDANCE/ SOURCES

National Historic Preserva¬tion Act of 1966 (16 USC 470)

American Indian Religious Freedom Act

Archaeological Resources Protection Act

Native American Graves Protection and Repatria-tion Act

National Environmental Policy Act

Executive Order 13007 (Indian Sacred Sites)

NPS Management Policies 2006

Director's Order 28

Nationwide Programmatic Agreement for Section 106 of the National His-toric Preservation Act

The NPS defines ethnographic resources as any cultural and natural features of a park that are of traditional significance to traditionally associated peoples. These peoples are the contemporary park neighbors and ethnic or occupational communities that have been associated with a park for two or more generations (40 years), and whose interests in the park's resources began before the park's establishment.

DESIRED CONDITIONS

- The NPS acknowledges that American Indian tribes treat specific places containing certain natural and cultural resources as sacred places having established religious meaning, and as locales of private ceremonial activities. Consistent with the requirements of the policy guidance cited, the NPS will allow American Indians and other traditionally associated peoples access to, and use of, ethnographic resources.
- The NPS continues consultation and coordination with tribal partners to identify ethnographic resources and sacred sites in order that any known sites or resources are managed and protected, consistent with policy guidance.
- Monument staff, visitors, and partners understand the deep cultural and historical ties, and the cultural significance of the monument's lands and resources to American Indian tribes and groups.

MANAGEMENT DIRECTION/STRATEGIES

Devils Postpile National Monument would take the following kinds of actions to meet legal and policy requirements related to ethnographic resources and sacred sites:

- Consistent with NPS management policies, allow for continued access to and use of ethnographic resources as is often essential to the survival of family, community, or regional cultural systems, including patterns of belief and sociocultural and religious life.
- Collaborate with traditionally-associated American Indian tribes and groups in gathering, synthesizing, and sharing information on the historical and contemporary associations and culturally-significant resources of the monument.
- Exercise reasonable control over the times when and places where specific groups are provided exclusive access to particular areas of a park.
- Allow for consumptive use of park resources as provided for in regulations published at 36 CFR 2.1. These regulations allow superintendents to designate certain fruits, berries, nuts, or unoccupied seashells which may be gathered by hand for personal use or consumption if it will not adversely affect park wildlife or the reproductive potential of a plant species, or otherwise adversely affect park resources. The regulations do not authorize the taking, use, or possession of fish, wildlife, or plants for ceremonial or religious purposes, except where specifically authorized by Federal statute or treaty rights, or where hunting, trapping, or fishing are otherwise allowed. These regulations are currently under review, and NPS policy is evolving.
- Protect sacred resources to the extent practicable, consistent with the goals of the traditionally associated American Indian tribe or group.
- Withhold the location and character of sacred sites from public disclosure, if disclosure will cause effects, such as invasion of privacy, risk harm to the resource, or impede the use of a traditional religious site by practitioners.
- Allow members of American Indian tribes or groups to enter park units for traditional non- recreational activities without paying an entrance fee.
- Where appropriate, develop a record about such places in consultation with appropriate groups, and identify any treatments preferred by the groups. This information will alert superintendents and planners to the potential presence of sensitive areas, and will be kept confidential to the extent permitted by law.
- Collaborate with traditionally-associated American Indian tribes and groups to prepare mutually agreeable strategies for providing access to ordinarily gated or otherwise-inaccessible locales, and for enhancing the likelihood of privacy during religious ceremonies. .
- Make accommodations for access to, and the use of, sacred places when interest is expressed by other traditionally associated peoples, especially American Indian peoples and others who often have a long- standing connection and identity with a particular park or resource.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS	
ETHNOGRAPHIC RESOURCES AND SACRED SITES (CONTINUED)	
	MANAGEMENT DIRECTION/STRATEGIES (CONTINUED) • Negotiate agreements with appropriate groups for access and use of traditional cultural places consistent with constitutional and other legal constraints. • Various ethnic groups, local groups with recently developed ties to resources in neighboring parks, and visitors to family and national cemeteries and national memorials also might use park resources for traditional or individual religious ceremonies.
GEOLOGIC RESOURCES	

POLICY GUIDANCE/ SOURCES
 	
NPS Management Policies 2006
 	
NPS Director's Order 77 "Natural Resources Management Guideline"
	DESIRED CONDITIONS
	• The national monument's geologic resources are preserved and protected as integral components of the natural systems. Natural geological processes are unimpeded.
	
	MANAGEMENT DIRECTION/STRATEGIES
	Devils Postpile National Monument would take the following kinds of actions to meet legal and policy requirements related to geologic resources:
	• Assess the impacts of natural processes and human activity on geologic resources.
	• Mitigate human impacts on geologic processes (e.g. accelerated erosion).
	• Integrate geologic resource management into NPS operations and planning to maintain and restore the integrity of existing geologic resources.
	• Interpret geologic resources for visitors.
	  • Develop programs to educate visitors about geologic resources.
	  • Update geologic interpretations of localities that are the subject of interpretive venues.
	• Develop a plan to identify and prioritize geologic research, inventory, and monitoring.
	• Collect baseline information on surface geology.
	• Partner with the U.S. Geological Survey and others to identify, address, and monitor geologic hazards.
	• Update geologic map of the Devils Postpile National Monument in digital format that can be used in the geographic information system (GIS).
	• Update geologic history using modern theory and techniques.
	• Conduct a mapping of the Postpile formation for advancement of scientific understanding and provide interpretation to visitors and students of the results.
	• Complete the update of the 2009 NPS Geologic Resources publication.
	• Prepare a geologic inventory, including the identification of the significant geologic processes that shape ecosystems and the identification of the human influences on those geologic processes (i.e., "geoindicators"); identification of geologic hazards; inventory of type sections or type localities within the monument; inventory of geologic features that provide particularly excellent examples of rock types or geologic processes, and that may warrant special protection or interpretive efforts; and identification of interpretive themes or other opportunities for interpreting the significant geologic events or processes that are preserved, exposed, or occur in the monument.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

HISTORIC SITES, STRUCTURES, BUILDINGS, AND LANDSCAPES

POLICY GUIDANCE/ SOURCES	DESIRED CONDITIONS
National Historic Preservation Act Archeological and Historic Preservation Act The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation Secretary of the Interior's Standards for the Treatment of Historic Properties Programmatic Agreement among the National Park Service, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation (2008) NPS Management Policies 2006 NPS Director's Order 28	• Historic sites, structures, buildings, and landscapes are inventoried and their significance and integrity are evaluated under National Register of Historic Places criteria. The qualities that contribute to the listing or eligibility for listing of historic sites, structures, buildings, and landscapes on the National Register are protected in accordance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (unless it is determined through the Section 106 process (including a signed MOA) that disturbance or natural deterioration is unavoidable). • Visitors, staff and researchers understand the historic and cultural values of the monument's historic resources. **MANAGEMENT DIRECTION/STRATEGIES** Devils Postpile National Monument would take the following kinds of actions to meet legal and policy requirements related to historic sites, structures, buildings, and landscapes: • Upon completion of the Historic Resource Study and identification of any potentially significant historic sites, structures, buildings, and landscapes, complete National Register nominations for these, submit them for review and concurrence by the State Historic Preservation Officer, and the Keeper of the National Register. • Update and certify the list of classified structures (LCS). • Determine the appropriate level of preservation for any historic structure formally determined to be eligible for listing or listed on the National Register of Historic Places (subject to the Secretary of the Interior's Standards). • Implement and maintain the appropriate level of preservation for such properties. • Analyze the design elements (e.g., materials, colors, shape, massing, scale, architectural details, and site details) of historic sites, structures, buildings, and landscapes in the monument (e.g., intersections, curbing, signs, and roads and trails) to guide the rehabilitation and maintenance of sites and structures. • Prepare historic preservation plans to guide maintenance. • Document history through oral histories of individuals, groups, and others who have ties to the monument. • Before modifying any historic structures on the National Register of Historic Places, fulfill Section 106 responsibilities by utilizing the 2008 Programmatic Agreement or completing the full Section 106 consultation process as appropriate. • Incorporate the historical stories and information into new and ongoing interpretive programs, media, and exhibits.

Group hike, *NPS Photo*

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

LIGHTSCAPE MANAGEMENT/DARK NIGHT SKY

POLICY GUIDANCE/ SOURCES	DESIRED CONDITIONS
NPS Management Policies 2006	• Excellent opportunities to see the night sky are available. Artificial light sources, both within and outside the national monument, do not unacceptably adversely affect opportunities to see the night sky. **MANAGEMENT DIRECTION/STRATEGIES** Devils Postpile National Monument would take the following kinds of actions to meet legal and policy requirements related to lightscape management/dark night sky: • Cooperate with visitors, neighbors, and local government agencies to find ways to prevent or minimize the intrusion of artificial light into the night scene in Devils Postpile National Monument. • Limit artificial outdoor lighting in the monument to basic safety requirements and shield it when possible. • Evaluate impacts on the night sky caused by monument facilities. If light sources within the monument are affecting night skies, alternatives such as shielding lights, changing lamp types, or eliminating unnecessary light sources would be used. • Evaluate impacts of lightscape on nocturnal biota and minimize effects.

MUSEUM RESOURCES

POLICY GUIDANCE/ SOURCES	DESIRED CONDITIONS
National Historic Preserva¬tion Act Archeological and Historic Preservation Act Archeological Resources Pro-tection Act Native Ameri¬can Graves Protection and Repatria-tion Act Curation of Federally-Owned and Administered Archeological Collections (36 CFR 79) Management of Museum Properties Act NPS Management Policies 2006 Director's Order 28 Director's Order 24 NPS Museum Handbook Programmatic Agreement among the National Park Service, the National Con-ference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation (2008).	Devils Postpile National Monument would collect, protect, preserve, provide access to, and use objects, specimens, and archi¬val, and manuscript collections. These collections may contribute to advancing knowledge in the humanities and sciences in many disciplines, including but not limited to archeology, ethnography, history, biology, geol¬ogy, and pale-ontology to improve understanding by monument visitors. Visitors, staff, researchers, and partners recognize and understand the value of the monu-ment's museum collections, and have reasonable access for research and educational pur-poses. **MANAGEMENT DIRECTION/STRATEGIES** Devils Postpile National Monument would take the following kinds of actions to meet legal and policy require¬ments related to museum resources: • Continue to ensure adequate conditions for the security, climate control of collections and means for fire detection and suppression, integrated pest management, and research and interpretation access are maintained. • Survey the monument's archival materials in order to identify all important documentary collections, and develop a plan for their cataloging, curation, and access. • Digitize archival collections and documents that require routine or regular access. • Inventory and catalog all monument museum collections in accordance with NPS standards and guidelines. • Develop and implement a collection management program according to NPS standards to guide the protection, conservation, and use of museum objects. Ensure that the qualities that contribute to the significance of collections are protected and preserved in accordance with established NPS museum curation and storage standards. • Develop a long-term strategy for consolidating and managing collections on the eastern side of the Sierra Nevada, in order to provide reasonable access for monument staff, researchers, and other partners. • Where feasible, incorporate historic objects into the monument's interpretive programs or exhibits.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

ECOLOGICAL COMMUNITIES

POLICY GUIDANCE/ SOURCES

Endangered Species Act of 1973 National Invasive Species Act of 1996

Lacey Act

Federal Noxious Weed Act of 1974

Executive Order on Invasive Species, #13112

NPS Management Policies 2006

NPS Director's Order 77 "Natural Resources Management Guideline"

NPS Director's Order 18 "Wildland Fire Management"

California State Bill 192 - the Trout and Steelhead Conservation and Management Planning Act of 1979

Migratory Bird Treaty Act of 1918

NPS Climate Change Response Strategy 2010

PWR Climate Change Response Strategy 2013

DESIRED CONDITIONS

- Populations of native plant and animal species function in as natural a condition as possible except where special considerations are warranted (such as with species and/or communities of special management concern).
- Actions promote ecosystem level, park-specific strategies that enhance the restoration, conservation, and preservation of park resources and reduce non-climate stressors.
- Native species populations that have been severely reduced or extirpated from the monument are restored where feasible and sustainable.
- Potential threats to the monument's native plants and wildlife are identified early and proactively addressed through inventory and monitoring.
- Sources of air, water, and noise pollution and visitor uses adversely affecting plants and animals are limited to the greatest degree possible.
- Visitors and staff recognize and understand the value of the monument's native plants and wildlife and the role that surrounding ecologically functional landscapes play in habitat connectivity.
- Visitors understand how changing environmental conditions can and will lead to changes in processes and biota at the monument.
- Develop understanding of climate change impacts to species and communities.
- Help visitors and staff recognize and understand the purpose of adaptation strategies and mitigations to respond to climate change.
- Use the best available scientific data and knowledge to inform decision making.
- NPS staff uses the best available scientific information and technology to manage these ecological communities.
- Federally- and state-listed threatened and endangered species, as well as species of special management concern, and their habitats are protected and sustained.
- NPS staff prevents the introduction of nonnative species and provides for their control to minimize the economic, ecological, and human health impacts that these species cause.

MANAGEMENT DIRECTION/STRATEGIES

Devils Postpile National Monument would take the following kinds of actions to meet legal and policy requirements related to native wildlife and vegetation:

- Complete a baseline inventory of the plants and animals in the monument and regularly monitor the distribution and condition of selected species that are indicators of ecosystem condition and diversity.
- Establish a comprehensive monitoring program that improves understanding of species, communities, and ecosystem health.
- Identify impacted areas and develop methods to ecologically restore native biological communities.
- Improve understanding of effects of climate, disturbance events, insects, and pathogens on trends in forest condition.
- Improve understanding of distribution, condition, and trends of aspen stands in the monument.
- Identify, through research and collaboration, species that would be most at risk to local extinctions due to a warming climate and monitor their distribution and abundance in the monument.
- Analyze potential climate change impacts and adaptively apply the information to promote ecosystem resilience and enhance restoration, conservation, and preservation.
- Participate in regional ecosystem efforts to restore native species and ecosystem processes.
- Support research that contributes to management of native species.
- Minimize negative human impacts on native plants, animals, populations, communities and ecosystems and the processes that sustain them.
- Rely upon natural processes when possible to maintain native plant and animal species and to influence natural fluctuations in populations of these species.
- Manage populations of non-native plant and animal species, including eradication, when control is prudent and feasible.
- Use best available scientific information and technology to manage natural resources at the monument. Develop a historical archive of all existing data and determine linkages to help develop and ground-truth ecological prediction models, identify vulnerabilities, and develop adaptation strategies.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS	
ECOLOGICAL COMMUNITIES (CONTINUED)	
	MANAGEMENT DIRECTION/STRATEGIES (CONTINUED) • Work with other public and private land managers, including the state of California, the USFS, the USFWS, the BLM, and others to encourage the conservation of populations and habitats of species that share common areas or migrate into and out of the monument whenever possible. • Continue inventory and monitoring of the plants and animals in the monument. Collected data will be used as a baseline to regularly monitor the distribution and condition of selected species, including indicators of ecosystem condition and diversity, rare and protected species, and nonnative species. Management plans will be modified to be more effective, based on the results of monitoring. • Continue to provide interpretive and educational programs on the preservation of native species for visitors. • Communicate with monument neighbors regarding best management practices outside the monument to assist the monument in the preservation of native species and habitats. • Avoid, minimize, or otherwise mitigate any potential impacts on state or federally listed species. Should it be determined through informal consultation that an action might adversely affect a federally listed or proposed species; the NPS staff would initiate formal consultation with the USFWS under Section 7 of the Endangered Species Act. • Collaborate with sister agencies, partners and the public to develop, test, and appropriately apply climate change related models and tools to PWR activities, communication, and landscape-level and park-specific priorities. • Implement the fire management plan, and update when necessary, consistent with federal law and departmental management policies that also address the need for adequate funding and staffing to support the planned fire management program.
NATURAL SOUNDS	
POLICY GUIDANCE/ SOURCES NPS Management Policies 2006 NPS Director's Order 47,"Sound Preservation and Noise Management" Executive memorandum signed by President Clinton on April 22, 1996	An important component of NPS management is to preserve or restore the natural sounds associated with National Park System units. The sounds of nature are among the intrinsic elements that combine to form the environment of our national park system units. **DESIRED CONDITIONS** • The NPS preserves the natural ambient soundscapes, restores degraded soundscapes to the natural ambient condition wherever possible, and protects natural soundscapes from degradation due to human-caused noise. • Disruptions from recreational uses are managed to provide a high-quality visitor experience in an effort to preserve or restore the natural quiet and natural sounds. **MANAGEMENT DIRECTION/STRATEGIES** • Devils Postpile National Monument would take the following kinds of actions to comply with policy requirements related to soundscapes: • Develop and implement soundscape management policy that emphasizes preserving natural soundscapes. • Avoid and minimize any extrinsic sounds that would impact the peak of wildlife communications from pre-dawn to mid-morning. • Take actions to monitor and minimize or prevent unnatural sounds that adversely affect monument resources and values, including visitors' enjoyment. • Continue to require tour bus operators, monument visitors and staff vehicles to comply with regulations designed to reduce noise levels (e.g., turning off engines when buses are parked and a no-idling policy for administrative vehicles). • Minimize noise generated by NPS management activities by strictly regulating administrative functions such as the use of motorized equipment. Consider noise in the procurement and use of equipment within the monument. • Continue to work with Federal Aviation Agency and Town of Mammoth Lakes to address noise from commercial flights. • Encourage visitors to avoid creating unnecessary noise, such as through the use of generators and maintaining quiet hours in the campgrounds. • Minimize noise from recreational activities to protect natural soundscapes, particularly in the morning hours and in wilderness areas.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

PUBLIC HEALTH AND SAFETY

POLICY GUIDANCE/ SOURCES	DESIRED CONDITIONS
NPS Management Policies 2006 NPS Director's Order 51 and Reference Manual 51 "Emergency Medical Services" NPS Direc¬tor's Order 30 and Reference Manual 30 "Hazard and Solid Waste Management OSHA Regulations (29CFR) Executive Order 12873 "Federal Acquisition, Recycling, and Waste Prevention" Executive Order 12902 "Energy Efficiency and Water Conservation at Federal Facilities"	• Devils Postpile National Monument and its partners, contractors, and cooperators work cooperatively to provide a safe and healthful environment for visitors and employees while applying nationally accepted standards and while recognizing that there are limitations on the NPS's capability to eliminate all hazards. • Consistent with mandates and nonimpairment, the monument would reduce or remove known hazards by applying appropriate mitigation measures, such as closures, guarding, gating, education, speed limits, vehicle lengths, and other actions. **MANAGEMENT DIRECTION/STRATEGIES** Devils Postpile National Monument would take the following kinds of actions to meet legal and policy requirements related to public health and safety: • Maintain a documented safety program in the monument to address health and safety concerns and to identify appropriate levels of action and activities to reduce or eliminate safety hazards. • Ensure that all potable water systems and waste water systems in the monument continue to meet state and federal requirements. • Provide interpretive signs and materials as appropriate to notify visitors of potential safety concerns, hazards and procedures; to help provide for a safe visit to the monument; and to ensure visitors are aware of the possible risks of certain activities. • As staffing permits, provide a basic Search and Rescue program to conduct hasty searches of separated parties in the monument. Continue collaboration with partners that provide professional Search and Rescue, including county emergency response personnel and Yosemite National dispatch office, to assist lost persons and respond to emergency situations affecting human health.

Rainbow Falls Trail, *NPS Photo*

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS	
SUSTAINABLE FACILITY DESIGN	
POLICY GUIDANCE/ SOURCES Executive Order 12873 "Federal Acquisition, Recycling, and Waste Prevention" Executive Order 12902 "Energy Efficiency and Water Conservation at Federal Facilities" NPS Management Policies 2006 NPS Green Parks Plan 2012	**DESIRED CONDITIONS** • Administrative and visitor facilities are harmonious with monument resources, compatible with natural processes, aesthetically pleasing, functional, as accessible as possible to all segments of the population, energy efficient, and cost-effective. • Decisions regarding operations, facilities management, and development in the monument—from the initial concept through design and construction—reflect principles of resource preservation. • Monument developments and operations are sustainable to the maximum degree practicable. • New developments and existing facilities are located, built, and modified through sustainable design or practices. • Biodegradable, nontoxic, and durable materials are used in the monument whenever possible. • The reduction, reuse, and recycling of materials is promoted, while use of materials that are nondurable, environmentally detrimental, or that require transportation from great distances are avoided whenever possible. **MANAGEMENT DIRECTION/STRATEGIES** • Devils Postpile National Monument would take the following kinds of actions to meet policy requirements related to sustainable design: • Develop major facilities - especially those that can be shared with other agencies - outside of the monument boundary whenever possible. • Design facilities to ensure compatibility with the rustic character of the monument. • Remove or relocate structures and facilities that are no longer functional in their present locations or that have been determined to be inappropriately placed in important resource areas. • Design, construct, and operate all buildings and facilities so they are accessible and useable by persons with disabilities to the greatest extent practicable. • Use transportation plan updates to determine whether the road system should be maintained as is, reduced, expanded, reoriented, eliminated, or supplemented by other means of travel. • Provide NPS staff a comprehensive understanding of their relationship to environmental leadership and sustainability. • Support and encourage the service of suppliers and contractors that follow sustainable practices. • Monitor energy use and promote energy efficient practices and renewable energy sources would be promoted wherever possible. • Identify sustainable and non-sustainable practices where appropriate in interpretive programs. • Incorporate the principles of environmental leadership and sustainability in exhibits and other interpretive media as appropriate. • Perform value analysis and value engineering, including life cycle analysis, to examine the energy, environmental, and economic implications of proposed developments. • Measure and track environmental compliance and performance. • Document environmental compliance, identify best management practices, and educate employees at all levels about environmental management responsibilities through Environmental Management System audits.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

VISITOR EXPERIENCE

POLICY GUIDANCE/ SOURCES

NPS Organic Act

Americans with Disabilities Act, P.L. 101-336, 104 Stat. 327, 42 USC §12101

Architectural Barriers Act of 1968 (ABA)

NPS Management Policies 2006

NPS Director's Order 42, "Accessibility for Visitors with Disabilities"

NPS Director's Order 6, "Interpretation and Education"

NPS Reference Manual 9, "Law Enforcement"

The NPS Organic Act, NPS General Authorities Act, and NPS Management Policies 2006 (§1.4, 8.1) all address the importance of national park units being available to all Americans to enjoy and expe¬rience. Current laws, regulations, and policies leave considerable room for judgment about the best mix of types and levels of visitor use activities, programs, and facilities. For this reason, most decisions related to visitor experience are addressed in the alternatives; however, all visitor use of the national park system must be consistent with the following guidelines.

DESIRED CONDITIONS

- Monument resources are conserved "unimpaired" for the enjoyment of future generations.
- Visitors have opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the monument; opportunities continue to be provided for visitors to understand, appreciate, and enjoy Devils Postpile National Monument.
- Visitors have opportunities to understand and appreciate the significance of the monument and its resources, and to develop a personal stewardship ethic. Interpretive and educational programs build public understanding of, and support for, such decisions and initiatives, and for the NPS mission and for Devils Postpile National Monument.
- Excellent communication between resource managers/researchers and professional interpreters produce compelling and effective science communication to a wide audience.
- To the extent feasible, all programs, services, and facilities in the monument are accessible to and usable by all people, including those with disabilities.

MANAGEMENT DIRECTION/STRATEGIES

Devils Postpile National Monument would take the following kinds of actions to meet legal and policy requirements related to the provision of visitor services:

- Provide visitors with easy access to the information they need to have a safe and enjoyable experience through information and orientation programs.
- Provide both on and off-site interpretive programs that are designed to encourage visitors to form their own intellectual or emotional connections with the resource. Interpretive programs facilitate a connection between the interests of visitors and the meanings of the monument.
- Design curriculum-based educational programs that link monument themes to national standards and state curricula and involve educators in planning and development. These programs would include pre-visit and post visit materials, address different learning styles, include an evaluation mechanism, and provide learning experiences that are linked directly to clear objectives. Programs would develop a thorough understanding of a monument's resources in individual, regional, national, and global contexts and of the monument's place within the national park system; and
- Develop interpretive media that provide visitors with relevant monument information and facilitate more in depth understanding of—and personal connection with—monument stories and resources. This media will be continually maintained for both quality of content and condition based upon established standards.
- Integrate resource issues and initiatives of local and national importance into the interpretive and educational programs.
- Provide outreach services as an active part of a balanced visitor services program.
- Ensure that, to the extent possible, modifications for access benefit the greatest number of visitors, staff, and the public, and are integrated with, or in proximity to, the primary path of travel for building entrances and from parking areas.
- Provide access to wilderness areas in a way that balances the intent of access and wilderness laws provides the highest level of protection to wilderness resources.
- Allow to the highest extent possible, for people with disabilities to participate in the same programs and activities available to everyone else.
- Give higher priority to methods of providing accessibility that offer programs and activities in the most integrated setting appropriate.
- Provide special, separate, or alternative facilities, programs, or services only when existing ones cannot reasonably be made accessible.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

WATER RESOURCES

POLICY GUIDANCE/ SOURCES	DESIRED CONDITIONS
NPS Management Policies 2006 NPS Reference Manual 77, "Natural Resource Management" The Clean Water Act Rivers and Harbors Act Executive Order 11514, "Protection and Enhancement of Environmental Quality" Executive Order 12088, "Federal Compliance with Pollution Control Standards" Executive Order 11990, Wetlands Protection Executive Order 11988, Floodplain Management	**DESIRED CONDITIONS** • NPS Management policies call for the NPS to perpetuate surface and groundwater as integral components of monument aquatic and terrestrial ecosystems. • Surface water and groundwater are protected, and water quality meets or exceeds all applicable water quality standards. • NPS and NPS-permitted programs and facilities are maintained and operated to avoid pollution of surface water and groundwater. • Water resources in Devils Postpile National Monument meet or exceed all federal and state water quality standards for temperature, bacteria, specific conductance, dissolved oxygen, turbidity, toxic substances, pH, and nutrients. • Pollution prevention and protection of water quality to meet the needs of aquatic organisms are priorities. • Almost all water resources meet state criteria for "outstanding resource waters." **POTENTIAL MANAGEMENT STRATEGIES** • For waters in the monument, or affecting monument resources, work with appropriate agencies and partners to determine minimum flow needs and to attain the highest possible water quality standards available under the Clean Water Act. • Develop and implement an environmental management plan, which includes pollution prevention and environmental best management practices. • Promote water conservation by the National Park Service, partners, visitors, and monument neighbors. • Apply best management practices to all pollution-generating activities and facilities in the monument. Take positive steps to reduce such activities. • Minimize the use of pesticides, fertilizers, and other chemicals, and manage them in keeping with NPS policy and federal regulations. • Continue monitoring water flows and water quality in selected areas. • In selected monument waters, conduct water quality monitoring and research to target detection of change from atmospheric input. • Manage stormwater runoff appropriately. • Develop strategies to mitigate the potential for a hazardous material spill that may impact wetlands and San Joaquin River. • Promote greater public understanding of water resource issues at Devils Postpile National Monument, and encourage public support for and participation in protecting watersheds.

Fishing in the Middle Fork of the San Joaquin River, *NPS Photo*

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

WETLANDS

POLICY GUIDANCE/ SOURCES	DESIRED CONDITIONS
NPS Management Policies, 2006 Clean Water Act Rivers and Harbors Act Executive Order 11514, "Protection and Enhancement of Environmental Quality" Executive Order 11990, "Protection of Wetlands" Executive Order 11988, Floodplain Management NPS Director's Order 77, "Natural Resource Management Guidelines" NPS Director's Order 77-1, "Wetland Protection"	• Natural and beneficial conditions of wetlands are preserved and enhanced. • The NPS implements a "no net loss of wetlands" policy and strives to achieve a longer-term goal of net gain of wetlands across the National Park System through the ecological restoration of previously degraded wetlands. • To the extent possible, the NPS avoids long- and short-term adverse impacts associated with the destruction or modification of wetlands and avoids direct or indirect support of new construction in wetlands wherever there is a practicable alternative. • The NPS compensates for unavoidable adverse impacts on wetlands by restoring wetlands that have been previously degraded. • "Keystone" species that sustain and depend upon wetland habitats occur in natural distribution and sustainable numbers. • Monument visitors have the opportunity to learn about and understand services and functions provided by wetlands. • Wetlands near developed areas remain unaffected by recreational activities or maintenance of monument facilities or management. • Wetlands adversely affected by prior human activity are restored where feasible. **POTENTIAL MANAGEMENT STRATEGIES:** • Inventory, monitor and define distinct functions of wetlands within Devils Postpile National Monument • Ecologically restore, preserve and/or protect any degraded or damaged wetland in the monument to promote function and minimize impact. • Locate any new facilities, or relocate existing facilities, to avoid or restore wetlands if feasible. If avoiding wetlands is not feasible, undertake other actions to comply with Executive Order 11990, "Protection of Wetlands;" the Clean Water Act; and Director's Order 77-1, "Wetland Protection." • Prepare a statement of findings if proposed actions would result in adverse impacts on wetlands, including an analysis of alternatives, delineation of the wetland, a wetland restoration plan, mitigation, and a functional analysis of the impact site and restoration sites. • Ensure that NPS actions or recreational uses do not adversely impact wetlands, both directly and indirectly. • Ecologically restore, preserve and/or protect any degraded or damaged wetland in the monument to promote function and minimize impact. • Conduct systematic surveys of watersheds within the monument to complete wetland inventories and include this information in the planning, management, and protection of wetlands. • Encourage the use of wetlands for educational and scientific purposes that do not disrupt natural wetland functions. • Participate in collaborative planning efforts with adjacent land managers and tribal governments to protect and restore wetlands within and outside the boundaries through cooperative conservation strategies.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

WILDERNESS

POLICY GUIDANCE/ SOURCES	DESIRED CONDITIONS
Wilderness Act of 1964, Public Law 92-493 Wilder¬ness Designation for Devils Postpile National Monument (1964, P.L. 88-577; 1984, P.L. 98-425; and 2009, P.L. 111-11) NPS Management Policies 2006 NPS Director's Order 41, "Wilderness Preservation and Management"	The National Park Service will manage wilderness areas for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness. Visitors to the monument will continue to find opportunities for solitude and primitive, unconfined recreation, and signs of people and modern development in wilderness areas will remain substantially unnoticeable. **MANAGEMENT DIRECTION/STRATEGIES** Devils Postpile National Monument would take the following kinds of actions to meet legal and policy requirements related to wilderness: • Encourage uses that are in keeping with the definitions and purpose of wilderness, and do not degrade wilderness resources and character. Impose appropriate restrictions on any authorized activity as necessary to preserve wilderness character and resources, or to ensure public safety. • Maintain a wilderness stewardship plan or equivalent planning document to guide the preservation, management and use of these resources. • Consider impacts to the character, aesthetics, and traditions of wilderness before considering the costs and efficiency of the equipment if the use of aircraft or other motorized equipment or mechanical transportation is proposed. • Ensure that all management decisions affecting wilderness are consistent with the minimum tool requirement concept: a proposed management action must be appropriate or necessary for administration of the area as wilderness and not pose a significant impact to wilderness resources and character, and the management method (tools) used must cause the least amount of impact to the wilderness resources and character. • Authorize administrative use of motorized equipment or mechanical transport only if the superintendent determines it is the minimum requirement needed to achieve the purposes of the area as wilderness, or it is needed in an emergency situation involving the health or safety of persons actually within the area. • Take into account the qualities of wilderness character and influence of the wilderness; the preservation of wilderness conditions in evaluation of environmental impacts. • Ensure that cultural resources are protected as part of the unique character of the monument's wilderness, and that any actions taken to protect and manage these resources also protects overall wilderness character and complies with the minimum requirements of the Wilderness Act. • Encourage and permit scientific activities in wilderness when these are consistent with NPS responsibilities to preserve and manage wilderness. • Use wilderness education/interpretive programs to inform visitors about wilderness ethics and how to minimize their impacts on wilderness, leave-no-trace practices will be emphasized. • Ensure that all fire management activities in wilderness conform to the basic purposes of wilderness.

SERVICEWIDE LAWS, POLICIES AND DESIRED CONDITIONS

RIVERS AND FLOODPLAINS

POLICY GUIDANCE/ SOURCES

The Wild and Scenic Rivers Act, 1968

Executive Order 11988, "Floodplain Management"

NPS Director's Order 46A

NPS Director's Order 77-2 and accompanying procedural manual.

NPS Management Policies 2006

DESIRED CONDITIONS:

- Manage the Middle Fork of the San Joaquin River (determined eligible as a Wild and Scenic River) so that no management actions could adversely affect the values that qualify the river for inclusion in the National Wild and Scenic Rivers System.
- Conduct Wild and Scenic Rivers Act eligibility and suitability studies and manage candidate rivers protectively. See Appendix E.
- All fluvial systems in the monument are free-flowing and protected from local anthropogenic degradation.
- Natural floodplain conditions are preserved, protected or restored.
- Long-term and short-term environmental effects associated with the occupancy and modification of floodplains is avoided when practicable.
- When it is not practicable to locate or relocate development or inappropriate human activities to a site outside the floodplain, the National Park Service prepares and approves a statement of findings in accordance with NPS Director's Order 77-2.
- Uses nonstructural measures as much as practicable to reduce hazards to human life and property while minimizing impacts on the natural resources of floodplains
- Ensures that structures and facilities are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR 60)
- The most current engineering methods and techniques that minimize adverse effects on natural river processes are used to protect roads and facilities located in floodplains.
- Visitors understand the dynamic nature of Devils Postpile National Monument's river systems, and the variability and cycles of river flow, and flooding.

POTENTIAL MANAGEMENT STRATEGIES:

- Identify 100-year and 500-year floodplains and any administrative, maintenance, operational, or visitor facilities located within them.
- Inventory flood-prone areas near facilities and roads, and develop a program to protect these using the most current techniques that minimize adverse effects on aquatic and riparian habitats and fluvial processes.
- Work with area partners, including tribes, federal, state, and county agencies, and others, to develop restoration plans for at risk river systems and to protect water quality and free flowing conditions
- Continue monitoring streamflow, water quality and riverbank condition to help determine baseline conditions and direct management.
- Use current technologies, over time, to restore or improve floodplain and riparian functions altered in the past by bank-hardening techniques or other manipulations or impacts.
- In wilderness, natural river processes will be allowed, insofar as possible, to shape and control wilderness ecosystems, and management intervention should only be undertaken to the extent necessary to correct past mistakes, the impacts of human use, and influences originating outside of wilderness boundaries, using the minimum requirement concept.
- If facilities are damaged or destroyed by a hazardous or catastrophic natural event, thoroughly evaluate options for relocation or replacement by new construction at a different location. If a decision is made to relocate or replace a severely damaged or destroyed facility, it will be placed, if practicable, in an area believed to be free from natural hazards.
- Prepare evacuation plans for facilities in flood hazard areas.
- Develop a comprehensive river and corridor management plan.
- Protect shoreline areas that provide breeding, dens/nesting, feeding, and rearing habitats for native species, and support rare aquatic plant species. During drought or other conditions warranting greater resource protection, this may involve occasional seasonal closures of specific areas.
- Provide information to visitors regarding river processes and natural flooding regimes.
- When emergency situations occur, consult with traditionally associated tribes to evaluate the potential impact of the proposal and consider tribal views in the decision-making process. Protocols for consultation would be developed when needed.
- Manage significant historic properties to protect cultural and scientific values and to educate the public about the river's cultural history.

Chapter Three: Alternatives

Previous page: Leopard lily © Rod Planck

Chapter Three: Alternatives

Alternatives for the management of Devils Postpile National Monument

Introduction

Development of these alternatives for management of Devils Postpile National Monument was based on information about the monument's resources, visitor use, and visitor preferences gathered from National Park Service information, the public, government agencies, and stakeholder groups.
Each of these alternatives would meet the purpose and need for action of Devils Postpile NM. The concepts and subsequent actions for each alternative comply with NPS park planning requirements and were evaluated to ensure consistency with current laws, regulations, and policies.

This chapter contains several parts:

- description of the five management zones for the action alternatives
- description of alternatives A, B, and C, including:
- alternative concept
- desired conditions
- boundary modifications
- estimated costs
- visitor capacity prescriptions
- mitigation measures
- other actions and alternatives considered
- environmentally preferred alternative
- table detailing all components of the alternatives
- summary of impacts chart that is based on the analysis in Chapter 6, "Environmental Consequences"

The three proposed alternatives embody the range of what the public and NPS staff want to see accomplished regarding natural resource conditions, cultural resource conditions, visitor use and experience conditions, and management at Devils Postpile National Monument.

Rainbow Falls, *NPS photo*

In many cases, decisions or other discussions contained in this draft GMP/EA refer directly to maps and figures; many decisions themselves are "map based." The reader must rely on the text, maps, and figures taken together to fully understand the range of alternatives described in this draft GMP/EA. Three alternatives are described in this draft GMP. Each alternative has a different overarching concept, application of management zones on the landscape, series of actions, and associated costs. The three alternatives are characterized as follows:

Alternative A (Continue Current Management) assumes that existing management, programming, facilities, staffing, and funding would generally continue at their current levels.

Alternative B (Watershed Emphasis) proposes a greater emphasis on managing and promoting visitor understanding of the monument in the context of a larger watershed. Toward this end, the current level of visitor services in the monument would be continued, but locating visitor services and facilities outside of the watershed would be emphasized, when possible.

Alternative C (Connecting People to Nature and Heritage), the Preferred Alternative, emphasizes key features with national significance for resource protection and connecting visitors with nature and heritage, including traditional park experiences in a wild setting. The monument would be managed as a gateway to a greater wilderness and additional emphasis would be placed on connections and partnerships with the Inyo National Forest and the Town of Mammoth Lakes.

Management Zones

Management zones define specific desired conditions and management approaches to be achieved and maintained within Devils Postpile National Monument. Each zone includes a description of the types of activities and facilities that are appropriate in that management zone. For Devils Postpile, four management zones have been developed:

- Frontcountry Zone
- Sensitive Resource Management Zone
- Natural Zone
- Portal Zone

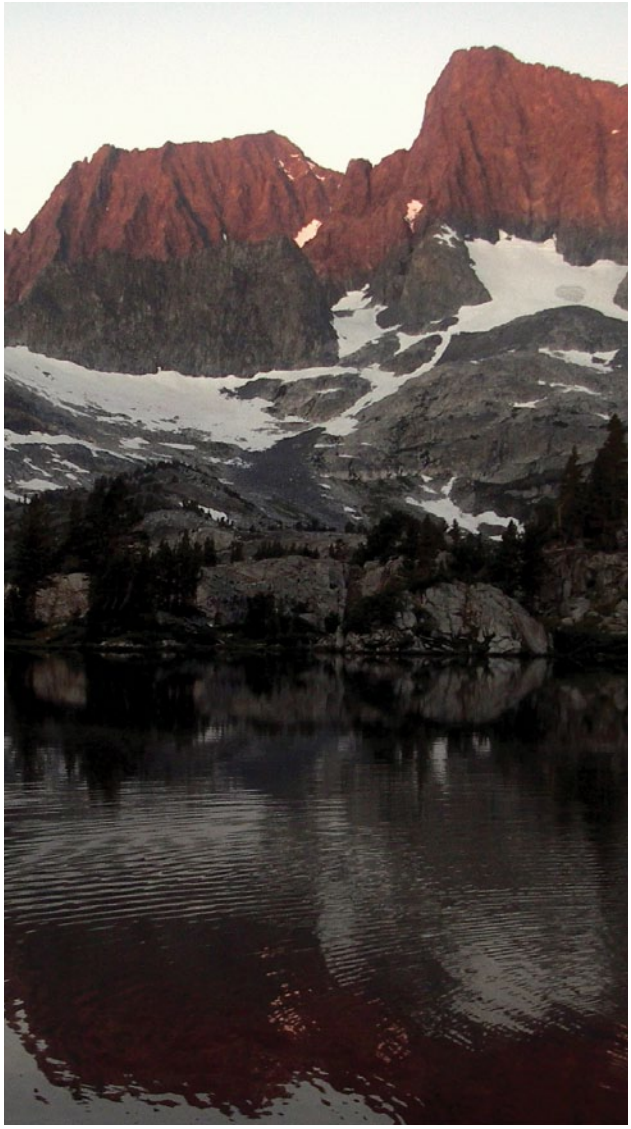
These zones form the basis of the plan's alternatives and are applied to different areas of the monument in each action alternative (alternatives B and C). For alternatives B and C, management zone boundaries were assigned according to the overall concept of each alternative. Therefore, the alternatives represent different ways to apply the management zones. For example, an alternative whose overall concept includes emphasizing visitor services will have more of the Frontcountry Zone applied to the monument than an alternative whose primary focus is wilderness preservation.

The management zones and prescriptions for the monument and the broader watershed are presented in Table 3.1. A zone concept, desired conditions for natural and cultural resources, visitor opportunities and use, facilities, access and transportation, among other management concerns, are described for each management zone. The zones are included in the maps of each alternative.

In addition to the management zones, park managers would continue to use the "Superintendent's Compendium" to effect limitations or closures as necessary to protect resources and wilderness values. The "Superintendent's Compendium" is a list of designations, closures, requirements, and other restrictions imposed under the discretionary authority of the superintendent as provided in Title 36 of the Code of Federal Regulations.

RECOMMENDED MANAGEMENT ZONING ON THE INYO NATIONAL FOREST

The GMP team, with participation by some USFS staff, zoned the entire watershed, including both National Park Service and U.S. Forest Service lands. This zoning approach was taken to help planners and land managers think about the watershed holistically, with a goal of providing integrated and complementary visitor experiences in the valley, as well as increasing operational efficiencies between the two agencies. Zoning extending beyond the monument boundaries should only be viewed as a recommendation for the USFS. This zoning would become effective only if it is adopted or otherwise incorporated, in full or in part, in future USFS plans. This GMP does not, by itself, establish zones on USFS lands.



Garnet Lake (Inyo National Forest), *NPS Photo*

TABLE 3.1: MANAGEMENT ZONES

MANAGEMENT ZONES			
FRONTCOUNTRY	**SENSITIVE RESOURCE MANAGEMENT**	**NATURAL**	**PORTAL**
ZONE CONCEPTS			
The zone is managed for diverse visitor opportunities (education, interpretation, and traditional outdoor recreation) and park operations, consistent with the fundamental resources and values and the scenic quality of the area. Natural and cultural resources receive protection, but natural resources could be modified or cultural resources adaptively reused to accommodate visitor or management needs.	The zone is managed for natural and cultural resources that are particularly sensitive to a variety of impacts and are provided the highest level of protection, while being monitored and possibly studied for scientific purposes. Visitors have opportunities to learn about these resources, but access to these areas is highly managed and could include closures. Designated wilderness within this zone is managed primarily to preserve and enhance its untrammeled, natural, and undeveloped qualities.	The zone is managed to preserve natural, wild characteristics and maintaining resource integrity while accommodating low to moderate levels of visitor use that provide a sense of remoteness and challenge. Designated wilderness within this zone is managed to preserve wilderness qualities including untrammeled, natural, and undeveloped qualities, as well as solitude or primitive and unconfined recreation.	The zone is managed to provide a transition between areas with higher development and more primitive and pristine wilderness areas. This zone can accommodate periodic high visitor use with limited improvements, as necessary, while still providing a high degree of resource protection. Designated wilderness within this zone is managed primarily for its natural qualities, as well as primitive and unconfined recreation.
OVERALL NATURAL RESOURCE CONDITIONS			
Natural resources receive protection and the natural and rustic character of the area is predominant. Natural resources and processes could be modified to accommodate visitor and administrative needs such as facilities and infrastructure, as well as safety concerns. Research will continue to be directed in these areas to support management and understanding of monument resources, including hydrological, climatological, ecological, and visitor use research.	Protection of significant/designated natural resources and processes is paramount. Research and resource protection activities are permitted, consistent with long term maintenance of natural processes and protection of natural resources or features. Natural resource objectives (e.g. research) would be pursued in collaboration and in concert with cultural resource objectives.	Continuation of physical and ecological processes and ecosystem services in the watershed are paramount. Qualities and features of this zone provide connectivity and integration with a larger wilderness and ecosystem. Any natural resource management actions should be consistent with maintaining wilderness qualities. Research is facilitated and resource protection activities are permitted, consistent with and to ensure long-term maintenance of wilderness qualities.	Continuation of physical and ecological processes and ecosystem services in the watershed are paramount. May be minor modifications to natural resources to facilitate visitor introductions to the wild character of the area. Any natural resource management actions and research activities should be consistent with maintaining the wild character (and wilderness qualities in designated wilderness).

MANAGEMENT ZONES			
FRONTCOUNTRY	SENSITIVE RESOURCE MANAGEMENT	NATURAL	PORTAL
SOUNDSCAPES			
Natural sounds are generally audible, but sounds from visitors and park activities can be heard. New activities and facilities are sited, designed, and managed to minimize impacts on the acoustical environment. Disruptions from recreational uses, transportation, operations and maintenance activities are managed to provide high-quality visitor experience and protect biological resources that rely on sound.	Natural sounds are generally audible, but sounds from visitors and park activities can be heard. New facilities are sited and designed to minimize impacts on the acoustical environment. Disruptions from recreational uses, transportation, operations and maintenance activities are minimized to provide high-quality visitor experience and protect biological resources that rely on sound.	Natural sounds dominate; however, sounds from visitor and park operations may be heard in areas closer to development. New facilities that are compatible with wilderness are sited and designed to minimize impacts on the acoustical environment. Disruptions from recreational uses, transportation, operations and maintenance activities are limited to the greatest extent possible to provide high-quality visitor experience, preserve wilderness character, and protect biological resources that rely on sound.	Natural sounds are generally audible, but sounds from visitors and park activities can be heard. New facilities are sited and designed to minimize impacts on the acoustical environment. Disruptions from recreational uses, transportation, operations and maintenance activities are limited to the greatest extent possible to provide high-quality visitor experience, preserve wilderness character, and protect biological resources that rely on sound.
NATURAL LIGHTSCAPES			
A natural lightscape can be experienced at certain locations. Permanent artificial lighting is minimized to the extent feasible and practical. Permanent lighting is retrofitted to restore views of night sky and minimize impacts to nocturnal wildlife.	The natural lightscape is unobscured in most locations. Permanent artificial lighting is minimized to the extent feasible and practical. Permanent lighting is retrofitted to restore views of night sky and minimize impacts to nocturnal wildlife.	The natural lightscape is unobscured, with the exception of personal lighting. No permanent lighting is present though distant lighting may be visible from certain locations. Personal lighting is limited or modified to protect sensitive wildlife (flashlights, campfires etc.).	The natural lightscape is unobscured, with the exception of personal lighting. No permanent lighting is present though distant lighting may be visible from certain locations. Personal lighting is limited or modified to protect sensitive wildlife (flashlights, campfires etc.).

MANAGEMENT ZONES			
FRONTCOUNTRY	**SENSITIVE RESOURCE MANAGEMENT**	**NATURAL**	**PORTAL**
OVERALL CULTURAL RESOURCE CONDITION			
Cultural resources receive protection and the natural and rustic character of the area is predominant. Cultural resources would provide distinct visitor opportunities and experiences throughout the area. The cultural elements would support interpretation and visitor use. Cultural resources could be adaptively used to accommodate visitor and administrative needs. Traditional American Indian cultural use is facilitated in accordance with agency regulations. The condition, significance and integrity of cultural resources are understood and knowledge adequate for management - given the higher levels of visitor use; research may be directed in these areas to support management and understanding of conditions.	Protection of significant/designated cultural resources is paramount. Cultural resource objectives (e.g. research, stabilization) would be pursued in collaboration and in concert with natural resource objectives. Traditional American Indian cultural use is facilitated in accordance with agency regulations. Cultural resources, including traditional American Indian uses, are understood and knowledge is adequate for management. Research and resource protection activities are permitted, consistent with long term preservation of cultural resources and values	Cultural resources are managed as part of wilderness character, based on their condition, significance, and safety considerations to complement the goals of promoting ecosystem processes. Cultural resources, including traditional American Indian uses, are understood and knowledge is adequate for management Traditional American Indian cultural use is facilitated consistent with wilderness regulations and in accordance with agency regulations.	Cultural resources are managed as part of wilderness character, based on their condition, significance, and safety considerations to complement the goals of promoting ecosystem processes. Cultural resources may provide opportunities for interpretation. Cultural resources, including traditional American Indian uses, are understood and knowledge is adequate for management. Traditional American Indian cultural use is facilitated consistent with wilderness regulations and in accordance with agency regulations.
OVERALL CONDITION OF THE QUALITIES OF WILDERNESS CHARACTER			
N/A	Designated wilderness within this zone is managed primarily to preserve and enhance its untrammeled, natural, undeveloped, and other qualities.	Designated wilderness within this zone is managed to preserve wilderness qualities including untrammeled, natural, and undeveloped qualities, as well as solitude or primitive and unconfined recreation. The minimum requirements analysis would guide all management actions in designated wilderness. Cultural sites are part of the wild character of this zone, and are protected consistent with wilderness values.	Designated wilderness within this zone is managed primarily for its wilderness qualities, as well as primitive and unconfined recreation.

MANAGEMENT ZONES			
FRONTCOUNTRY	**SENSITIVE RESOURCE MANAGEMENT**	**NATURAL**	**PORTAL**
OVERALL VISITOR EXPERIENCE			
The visitor experience is focused on connections to traditional park experiences, a diversity of activities, and physical access. Visitors are provided with orientation, education, interpretation and amenities consistent with the traditional rustic character of the area.	The visitor experience is focused on understanding, experiencing, and protecting the sensitive resources within this zone. Access is ordinarily encouraged, but subordinate to research and resource protection priorities.	The visitor experience is focused on immersion in primitive and wild environments, a high degree of opportunities for solitude, natural sounds, smells, and views, and self-reliance.	The visitor experience is focused on introduction to wilderness experiences and locations. Visitors have some opportunities for solitude, discovery, and connections with nature in an undeveloped environment with some interpretation.
INTERPRETATION AND EDUCATION			
Focus on traditional non-personal and personal services. Interpretive services conform to the rustic and traditional character of the valley. Technology appropriate to the rustic corridor could be explored.	Visitors would gain an understanding of the special resources of this area and the potential threats to these resources. Visitors are provided with off-site or nearby interpretation. Guided tours could be appropriate if research and resource protection activities are not disrupted.	Visitors are provided with off-site or nearby interpretation. No interpretive facilities are found in this zone. Guided activities could be appropriate if wilderness values are not degraded.	Visitors are provided with off-site or nearby interpretation. Limited on-site interpretation signage if necessary for resource protection. Guided activities could be appropriate if wilderness values are not degraded.
RECREATIONAL ACTIVITIES			
Access opportunities are a primary purpose of this zone. Visitors of all physical abilities can enjoy this zone. Opportunities for visitors to engage in interpretive programs and guided walks and hikes.	Visitor opportunities emphasize research, stewardship, and resource protection activities, as well as nature study and guided interpretive opportunities that enhance research or stewardship.	Activities are primitive and unconfined, and consistent with the Wilderness Act.	Activities are primitive and consistent with the Wilderness Act.
USE LEVELS, DENSITY, ENCOUNTERS			
Visitors can expect a high degree of social interactions with other visitors and with a broad range of user types.	Visitor use would be highly managed to ensure that activities and their intensities are compatible with research needs and resource integrity. Use density and encounter levels may be high, but concentrated and highly managed.	Lower visitor use levels. Encounters with others are infrequent. Potential for high degree of solitude. High degree of self-reliance, less interaction with staff and amenities.	Visitation levels are moderate to high. Interaction with other visitors is generally moderate, but could be high during peak use. This zone serves as a thoroughfare for visitors accessing wilderness experiences.

MANAGEMENT ZONES			
FRONTCOUNTRY	**SENSITIVE RESOURCE MANAGEMENT**	**NATURAL**	**PORTAL**
ACCESS AND TRANSPORTATION			
Transportation and access is a primary component of the visitor experience in this zone. The shuttle bus is the primary means of access for day use visitors during the summer season to prevent crowding and congestion. Parking outside of the watershed is managed and required during the summer season to facilitate use of the shuttle bus. Parking is available in select areas that would avoid sensitive resources, maintain scenery, and allow for safe public access. Use of parking areas varies by season. Large buses and vehicles are allowed access only in areas where roads can accommodate safe travel and with prior authorization.	Non-motorized access is the primary means of accessing this zone. Motorized access would be limited to administrative use for resource protection or emergency services.	Non-mechanized access is the primary means of accessing wilderness areas. Motorized access would not occur with the exception of emergency services and resource protection subject to existing laws, regulations, and policies.	(Same as Natural Zone)
TYPES AND CHARACTER OF FACILITIES			
Facilities would include road and trail corridors, day use facilities, and campgrounds that support visitor use. Facilities would be rustic in appearance and compatible with historic character and a natural setting. Development levels would be minimal to moderate. Aimed at access, public safety, and resource protection. Support services and administrative facilities, including limited, small scale telecommunications facilities, would be allowed in this zone. Such facilities	This zone would have minimal facilities to support research, resource protection, and visitor access where appropriate (e.g. trails, picnic tables, restroom), Interpretative-waysides. This zone would have non-paved roads with an emphasis on temporary road construction techniques that would be compatible with sensitive resources. Limited, small scale telecommunications facilities may be allowed outside of designated wilderness in this zone if not disrup-	Facilities/structures would be very minimal for research, resource protection, and low-level visitor use. Such structures include minimal signage for way-finding and boundary delineation compatible with wilderness policies and regulations. Roads are not found in this zone. Telecommunications facilities and transmission lines are not allowed in this zone.	Facilities/structures would be minimal for low-moderate visitor use and would address safety, protection, and information. Limited, small scale telecommunications facilities and may be allowed outside of designated wilderness in this zone if designed and sited to minimize visual impacts.

MANAGEMENT ZONES			
FRONTCOUNTRY	SENSITIVE RESOURCE MANAGEMENT	NATURAL	PORTAL
TYPES AND CHARACTER OF FACILITIES (CONTINUED)			
would be sited sensitively to protect open space, resources, and to harmonize with the natural environment. Roads would be designed and maintained to protect the scenic character. Roads would be maintained for safety and visibility (e.g. slower speeds).	tive to resource protection activities and if designed and sited to minimize visual impacts.		
TRAILS			
This zone would include soft and hard-surface trails designed to accommodate low to moderate use. Safe pedestrian connections from parking areas and shuttle stops to trails and trailheads would be provided. Trails would emphasize loop opportunities.	Trails are soft-surface and low impact, designed to accommodate appropriate visitor use and with minimal trail features such as constructed stone steps, drainage features, etc. Generally, trailheads would not be located in this zone.	Trails would be soft-surface trails, varying in width and would accommodate low use.	Trails would be soft-surface designed to accommodate low to moderate use.
AMOUNT AND CHARACTER OF SIGNAGE			
This zone would feature a wide variety of signage, wayfinding, interpretation, and orientation to accommodate visitor use. Design standards would guide signage to ensure consistency and appropriate scale for the natural and rustic setting (common to all zones).	Wayfinding and limited signage to interpret research and resources.	Signage would include minimal wayfinding and public safety information. Examples include trail markers, basic directional signs, bear warning signs, junctions, and boundary delineation. All signage would be compatible with wilderness character and values.	Signage would include wayfinding where appropriate. Examples include trail markers, basic directional signs, safety information, mileage, and minimal interpretation. All signage would be compatible with wilderness character and values

Range of Alternatives

This section presents the three alternatives that are being considered for Devils Postpile National Monument. Each alternative is structured around a concept or vision for the future. For each alternative, there are desired conditions for resources and visitor use as a whole and for specific areas within the monument.

Each alternative is also supported by management zones with boundaries that vary by alternative. It is important to note that the management zones provide broad desired conditions for areas within Devils Postpile NM and the alternatives provide additional guidance both at a monument-wide scale as well as site specific prescriptions.

The complete list of monument-wide desired conditions and specific actions that would be taken under each alternative is presented in the alternatives summary Table 3.9 toward the end of this chapter.

The reader must rely on the text, maps, and figures taken together to fully understand the range of alternatives described in this draft GMP/EA.

The Common to All section below describes management guidance, desired conditions, and actions that would apply to all alternatives, including alternative A. Following are descriptions of each of the alternatives: A (no action), B, and C.

Recommendations to the USFS

The alternative descriptions are focused on management of the monument. Alternatives B and C are followed by recommendations for management of the surrounding USFS lands. These recommendations were developed under a Memorandum of Understanding (MOU) with the Inyo NF which provided a framework for participation by Inyo NF staff in their development.

The recommendations were formulated to complement proposed actions in the monument, provide an integrated valley-wide visitor experience, and increase efficiencies between the two agencies. Under the MOU, the recommendations are not part of the GMP alternatives and would not be implemented unless the Inyo National Forest decides to adopt some or all of them in its own planning and decision-making processes.

Minaret Vista (Inyo National Forest), *NPS Photo*

Actions Common to All Alternatives

The following management guidance, desired conditions, and actions would apply to all alternatives, including alternative A (No Action). The table describes what the monument would do under this plan, regardless of which alternative is selected. Also included are *Recommendations to the USFS*, which are possible measures suggested by the interagency GMP planning team which, if adopted by the USFS, could better integrate visitor services, operational efficiency, and resource management in Reds Meadow Valley. They are not planned actions, but merely suggestions.

TABLE 3.2: NPS ACTIONS COMMON TO ALL ALTERNATIVES

NPS ACTIONS COMMON TO ALL ALTERNATIVES	
NATURAL RESOURCES	• Increase intra- and interagency coordination for resource management and restoration activities. • Complete a resource stewardship strategy for the monument to guide subsequent resource management priorities. • Establish a comprehensive monitoring program for geologic resources, emphasizing the Postpile itself. • Develop a baseline inventory of the Postpile formation. Identify premier areas of glacial polish and ensure protection from visitor impacts while allowing other areas of glacial polish to be accessible to visitors. • Establish a comprehensive monitoring program for hydrological resource monitoring that improves the understanding of conditions and trends. • Establish a comprehensive monitoring program for ecological resources that improves the understanding of distribution, condition, and trends of species, communities, and processes. • Identify species that would be most at risk to local extinctions due to a warming climate and monitor their distribution and abundance in the monument. • Monitor and mitigate, where possible, the pressures of climate change and other stressors on native vegetation and wildlife. • Develop adaptation strategies to respond to climate change. • Ecologically restore, enhance and protect meadows, riparian areas wetlands and sensitive habitats to the greatest extent possible. • Ecologically restore, enhance and protect native biota communities by prevention, early detection and removal of invasive species • Protect sensitive resources through direct and indirect visitor management • Inventory and evaluate facilities that could discharge into water sources, mitigate threats to water resources and hydrologic processes, and remove or upgrade facilities that do not meet water quality standards. • Inventory and evaluate facilities that affect habitat and native biota and mitigate, remove or upgrade to minimize impacts. • Collaborate with the U.S. Forest Service, the U.S. Geological Survey, and other stakeholders to develop and implement best management practices to minimize impacts to water quality in the watershed. • Actively pursue inventory, research, monitoring, and study of hydrologic influences in the watershed, in partnership with the Inyo National Forest, in order to improve understanding of the influences that affect the monument's resources and to enhance management and protection of those resources. **RECOMMENDATIONS TO THE USFS** • Increase intra- and interagency coordination for resource management and restoration activities. • Participate with the monument in developing a resource stewardship strategy to guide resource management priorities in the monument.

NPS ACTIONS COMMON TO ALL ALTERNATIVES	
SOUNDSCAPES, VISUAL AND SCENIC RESOURCES	• Develop and implement soundscape management policy that includes an emphasis on preserving natural soundscapes. • Take actions to monitor and minimize or prevent unnatural sounds that adversely affect monument resources and values, including visitors' enjoyment. • Activities that can be managed will also focus on efforts to eliminate or minimize the intrinsic and extrinsic sounds during the early-mid morning hours when wildlife communications are often at their peak. • Continue to work to maintain high quality viewsheds. • Reduce intrusion of existing buildings and infrastructure on views through screening and other techniques that could include less reflective materials, paint colors that blend with the natural landscape, and minimized lighting. • Sensitively design and site new facilities or infrastructure in order to limit impacts on visual and scenic resources. • Maintain and enhance traditional, natural design characteristics of facilities, exhibits, signs, and infrastructure. • Maintain natural darkness within the monument relatively free from light pollution **RECOMMENDATIONS TO THE USFS** • Continue to work to maintain high quality viewsheds. • Reduce intrusion of existing buildings and infrastructure on views through screening and other techniques that could include less reflective materials, paint colors that blend with the natural landscape, and minimized lighting. • Continue to sensitively design and site new facilities or infrastructure in order to limit impacts on visual and scenic resources.
CULTURAL RESOURCES	• Increase interagency coordination for cultural resource preservation strategies and treatment. • Continue to work to improve communication and collaboration with interested American Indian tribes. • Continue to facilitate traditional and contemporary American Indian uses consistent with agency policies and federal regulations. • Research and inventory ethno-historic tribal uses of traditional plant, animal, water, and mineral resources to improve understanding of traditional uses. • Actively pursue consultation, special studies, and historical research to determine National Register eligibility of monument cultural resources, such as the Postpile Cabin ruins, the Ranger Station, Mammoth Pass Trail, and potential cultural landscapes. • Integrate more cultural resource information into ongoing interpretation and education programs. • Maintain active tribal consultation program for identification, evaluation, and management of natural and cultural resources with cultural and religious significance to traditionally associated American Indian tribes and groups. **RECOMMENDATIONS TO THE USFS** • Pursue consultation and special studies to determine National Register eligibility of Reds Meadow Guard Station, CCC Bath House, Reds Meadow Pack Station, and Minaret Mine. • Increase interagency coordination for cultural resource preservation strategies and treatment. • Continue to work to improve communication and collaboration with interested tribes. • Coordinate with the monument to research and inventory ethno-historic tribal uses of traditional plant, animal and mineral resources to improve understanding of traditional uses. • Continue to facilitate traditional and contemporary American Indian uses consistent with agency policies and federal regulations.

NPS ACTIONS COMMON TO ALL ALTERNATIVES	
WILDERNESS	• Continue to preserve the qualities of wilderness character in areas of designated wilderness. • Continue to manage key locations in the monument and valley as a launching point to a greater wilderness, highlighting, protecting, and maintaining significant wilderness trails including the John Muir Trail and Pacific Crest Trail. • Continue the current policy of no overnight camping in designated wilderness within the monument. • Use indirect visitor use strategies when possible in designated wilderness, but direct management strategies and other techniques, such as limiting group size or rerouting trails, would be implemented when needed. • Encourage scientific research, but in designated wilderness manage consistent with preservation of wilderness character, minimum requirements analysis and agency policy. • Ensure that research installations in wilderness are not highly visible or detract from wilderness character. • Promote collaboration and a joint planning effort for any future wilderness planning with the Inyo National Forest. **RECOMMENDATIONS TO THE USFS** • Continue to manage key locations in the monument and valley as a launching point to a greater wilderness, highlighting, protecting, and maintaining significant wilderness trails including the John Muir Trail and Pacific Crest Trail. • Involve Devils Postpile National Monument as a partner in future wilderness planning.
WILD AND SCENIC RIVER	• Based on the findings of the Wild and Scenic River eligibility and suitability analysis (See *Appendix E*), recommend that Congress designate the portions of the Middle Fork of the San Joaquin River within Devils Postpile NM as a wild and scenic river under the Wild and Scenic Rivers Act. • Continue to ensure that no management actions within the monument would adversely affect the values that qualify the river for inclusion in the National Wild and Scenic Rivers System (See *Appendix E*). **RECOMMENDATIONS TO THE USFS** • Involve Devils Postpile National Monument as a partner in future wild and scenic river studies or planning.

Family enjoying the day use area, *NPS Photo*

NPS ACTIONS COMMON TO ALL ALTERNATIVES	
CLIMATE CHANGE AND SUSTAINABILITY	• Continue to reduce carbon emissions, conserve water resources, and increase energy and fuel efficiency whenever and wherever possible. • Continue to implement the actions identified in the Devils Postpile National Monument Climate Friendly Action Plan. • Emphasize and prioritize sustainable or green facility design for any new construction, retrofitting, and upgrading of facilities to the greatest extent possible. • Consider influences from a changing climate in the decision process when replacing facilities due to damage or loss. • Integrate the principles, goals, and objectives of the NPS and PWR Climate Change Response Strategy and Action Plans into management and operations. Ensure that actions promote ecosystem and landscape resilience within and beyond park boundaries throughout the watershed. • Monitor, mitigate, and develop adaptation strategies where possible to address the pressures of climate change and other stressors on native vegetation and wildlife • Participate in regional ecosystem efforts to restore native species and ecosystem processes, and/or develop adaptation strategies for responding to climate change where appropriate. • Work with other public and private land managers, including the state of California, the U.S. Forest Service, the U.S. Fish and Wildlife Service, the Bureau of Land Management, and others to develop cross-jurisdictional plans for conservation of populations and habitats of species that share common areas or migrate into and out of the monument whenever possible. • Continue to participate in NPS, interagency, and regional efforts to understand the effects of climate change on natural and cultural resources, natural processes, recreation demands, operations and facilities and develop adaptation strategies for the monument and watershed to address anticipated changes to resources and infrastructure. **RECOMMENDATIONS TO THE USFS** • Continue to reduce carbon emissions and increase energy and fuel efficiency whenever and wherever possible. • Continue to emphasize and prioritize sustainable or green facility design for any new construction, retrofitting, and upgrading of facilities to the greatest extent possible. • Continue to integrate the USFS National Roadmap and Performance Scorecard into management and operations. • Participate in regional ecosystem efforts to restore native species and ecosystem processes, and/or develop adaptation strategies for responding to climate change where appropriate. • Work with the monument to develop cross-jurisdictional plans for conservation of populations and habitats of species that share common areas or migrate into and out of the monument whenever possible.

NPS ACTIONS COMMON TO ALL ALTERNATIVES	
RESEARCH AND RELATED FACILITIES	• Continue to support and encourage scientific research and study consistent with NPS policies and use the best available science in decision-making. • Participate fully in partnerships that increase scientific understanding of climate change and effects. • Seek research opportunities with agency and academic partners to improve understanding of effects of climate, disturbance events, insects, and pathogens on trends in forest condition. • Collaborate with sister agencies, partners and the public to develop, test, and appropriately apply climate change related models and tools to PWR activities, communication, and landscape-level and park-specific priorities. • Continue to obtain information and data that would help managers accomplish park management objectives provided for in law and planning documents and provide information that can be used in public education. • Work with the USFS and other federal agencies to create a short- and long-term research plan and strategy/agenda to identify research needs for the monument and the greater watershed, helping streamline the process for prioritizing and granting permits for research. • Work with the USFS to facilitate research by working with partners in the community to provide housing and facilities in Mammoth Lakes for visiting researchers. • Consider interagency review measures and processes for permitted research and science activities when research activities cross agency boundaries. • Ensure research activities follow permit and review procedures, with required documentation for evaluating permit requests, timely review of requests, and curation of resultant specimens and reports in the monument's museum collections. • Ensure that park staff, researchers and park partners have access to monument archival resources to support ongoing research • Research related facilities and instrumentation will be located and designed to minimize their impact on resources and their visual intrusion on the traditional national park visitor experience. **RECOMMENDATIONS TO THE USFS** • Work with the monument and other federal agencies to create a short- and long-term research plan and strategy/agenda to identify research needs for the monument and the greater watershed, helping streamline the process for prioritizing and granting permits for research. • Work with the monument to facilitate research by working with partners in the community to provide housing and facilities in Mammoth Lakes for visiting researchers. • Consider interagency review measures for permitted research and science activities when research activities cross agency boundaries. • Continue to support research opportunities with agency and academic partners to improve understanding of effects of climate, disturbance events, insects, and pathogens on trends in forest condition. • Ensure research activities follow permit and review procedures, with required documentation for evaluating permit requests and timely review of requests.
VISITOR EXPERIENCE – RECREATION	• Continue to provide a range of traditional visitor experiences, including hiking, camping, picnicking, fishing, wildlife viewing, and equestrian use. • Continue to use the superintendent's compendium, which can be updated annually, to document other management decisions related to recreational activities as appropriate, such as group size limits, winter access, campfires, and boating and floatation devices. Compendium restrictions and changes would be accompanied by required public notice. • Continue to work on an interagency basis to ensure impacts from ongoing winter use are minimized and mitigated and that such use conforms to the respective agency regulations and policies. • Implement a monitoring program of indicators and standards developed to manage visitor capacity and a quality experience. **RECOMMENDATIONS TO THE USFS** • Continue to provide a range of traditional visitor experiences, including hunting, hiking, camping, picnicking, fishing, wildlife viewing, and equestrian use. • Continue to work on an interagency basis to ensure impacts from ongoing winter use are minimized and mitigated and conform use to different agency regulations and policies.

NPS ACTIONS COMMON TO ALL ALTERNATIVES	
VISITOR EXPERIENCE – INTERPRETATION, EDUCATION, AND INFORMATION	• Improve public education and signage about boundary awareness and visitor safety to reduce conflicts. • Synchronize long range interpretive planning between the NPS and USFS in order to create an integrated visitor experience and interpretive messaging that recognizes agency differences while providing clarity to visitors. • Continue to partner with the USFS, Mammoth Mountain, the Town of Mammoth Lakes, and other organizations, agencies, and tribes on trail connections, signage, and interpretation. • Collaborate with the USFS to develop integrated or consistent valley-wide design standards for signage that would use the style of rustic architecture and complement the natural setting, while preserving agency identity. • Collaborate with the USFS to create a more distinct and inviting sense of arrival to the valley by improving signs along Hwy 203 and creating a more distinct entrance sign in the vicinity of Minaret Vista. **RECOMMENDATIONS TO THE USFS** • Synchronize long range interpretive planning between the NPS and USFS in order to create integrated visitor experience and interpretive messaging that recognizes agency differences while providing clarity to visitors. • Continue to partner with the monument, Mammoth Mountain, the Town of Mammoth Lakes, and other organizations, agencies, and tribes on trail connections, signage, and interpretation. • Collaborate with the monument to develop consistent or integrated valley-wide design standards for signage that would use the style of rustic architecture and complement the natural setting, while preserving agency identity. • Collaborate with the monument to create a more distinct and inviting sense of arrival to the valley by improving signs along Hwy 203 and creating a more distinct entrance sign in the vicinity of Minaret Vista.
FACILITIES	• Ensure that facilities are sustainable, modest in scale, and sensitively sited to protect resources. • Design facilities in the style of rustic architecture that complements the natural setting. • Develop design standards guidelines to maintain and enhance traditional, natural design characteristics of facilities, exhibits, signs, and infrastructure. The monument would strive to create consistent valley-wide design standards in collaboration with the USFS. • Explore new employee housing opportunities in Mammoth Lakes, including evaluating options for leasing or providing potential future government housing. • Work with the USFS to evaluate and improve shared utilities, such as water and sewer systems. Evaluate strategies to reduce loading on the existing sewage infrastructure. • Ensure that installation of new infrastructure for communications and scientific research is compatible with wilderness character and the monument's rustic character. **RECOMMENDATIONS TO THE USFS** • Collaborate with the monument to create consistent valley-wide design standards. Design facilities in a style of rustic architecture that complements the natural setting. • Explore new employee housing opportunities in Mammoth Lakes in collaboration with the monument, including evaluating options for leasing or providing potential future government housing. • The NPS and USFS would work together to evaluate and improve shared utilities, such as water and sewer systems.

NPS ACTIONS COMMON TO ALL ALTERNATIVES	
TRANSPORTATION	• Ensure that roads continue to provide safe visitor access and emphasize opportunities for protecting and viewing scenery and wildlife and promoting tranquil visitor experiences. • Collaborate with the Inyo National Forest to identify long-term improvements in shuttle operations for visitors. • Work on an interagency basis to increase safety zones around areas of high concentrations of visitors to improve safety and minimize visitor conflicts. Areas would include Rainbow Falls trail, Devils Postpile trail, bus stops, crossing zones, and other locations as necessary. • Collaborate with partners to develop a plan to address overcrowding of parking areas during busy fall weekends. • Invest in maintenance of current NPS road. • Collaborate with the USFS on exploring and supporting funding opportunities for maintenance of the Reds Meadow Valley road. **RECOMMENDATIONS TO THE USFS** • Continue to maintain the current shuttle system operation as the primary visitor access during the peak season. • Collaborate with the monument to identify long-term improvements in shuttle operations for visitors. • Collaborate with partners to develop a plan to address overcrowding of parking areas during busy fall weekends. • The Minaret Vista Contact Station would remain the only vehicular entrance to the valley. • Roads would continue to provide safe visitor access and emphasize opportunities for protecting and viewing scenery and wildlife, promote a tranquil experience, and generally speeds would be slower than typical roads in this class. • Collaborate with the NPS on exploring funding opportunities for maintenance of the Reds Meadow Valley road.
INTERAGENCY COORDINATION AND COLLABORATION AND PARTNERSHIPS	• Use Service First authority to formalize and potentially expand the partnership with the Inyo National Forest and institutionalize strong interagency collaboration and coordination in cross-boundary resource and recreation management at a landscape scale. • Partner with entities in Mammoth Lakes (including the USFS) for additional housing needs for seasonal and temporary employees. • Partner with traditionally associated American Indian tribes and groups to further educational opportunities for tribal youth, expand ecological and historic preservation activities, interpret monument history and ongoing cultural connections, and develop opportunities for traditional and religious non-recreational access and cultural use. **RECOMMENDATIONS TO THE USFS** • Use Service First authority to formalize and potentially expand the partnership with Devils Postpile NM and institutionalize strong interagency collaboration and coordination in cross-boundary resource and recreation management at a landscape scale.
CONCESSIONS AND COMMERCIAL SERVICES	• No concessions would operate in the monument. • Allow commercial services in wilderness only to the extent necessary to achieve the purposes of wilderness. • Consider some commercial uses in non-wilderness, subject to consistency with park purposes and environmental compliance. **RECOMMENDATIONS TO THE USFS** • No recommendations

Formulation of the Alternatives

A comprehensive interdisciplinary planning team composed of NPS staff from Devils Postpile National Monument, Yosemite National Park, and the Pacific West Regional Office, along with USFS staff from the Inyo National Forest and Pacific Southwest Research Station, developed management alternatives for the monument using concerns and ideas generated by the public, USFS, and NPS staff.

The first opportunity for public comment, or scoping, was in a series of public workshops at the beginning of the general management planning process in July and September of 2009. The National Park Service invited comments from the public, government agencies, non-profit organizations, federally-recognized tribes, and federally non-recognized traditionally associated American Indian groups regarding concerns, issues, and ideas for the future management of Devils Postpile National Monument. Comments were recorded at the public meetings. In addition, written comments were received separately from seventeen individuals or organizations. The scoping comments assisted the planning team in identifying the range of issues to address in the GMP and preliminary ideas for the development of alternatives. Once the preliminary alternatives were identified by the planning team, the NPS distributed another newsletter in the summer of 2011 and again invited comments. Twenty-nine individuals or organizations provided comments in writing. Additional comments were recorded at a public meeting in Mammoth Lakes. These ideas assisted the NPS in refining the alternatives and selecting a preferred alternative.

Identification of the Preferred Alternative

The preferred alternative is the alternative the NPS believes would best fulfill its mission and responsibilities. The preferred alternative was identified following an initial assessment of the impacts of the alternatives. The public's ideas, preferences, and reasoning greatly assisted the NPS in its selection of the preferred alternative. When identifying the preferred alternative, the NPS compared the relative advantages and costs of each alternative in a workshop attended by the GMP team. Alternative C was identified as the preferred alternative because of the alternatives considered, it: 1) preserves resources and promotes the long-term stewardship of the monument, 2) provides a range of quality visitor experiences and access to recreational opportunities, 3) preserves the rustic character and wilderness values of the area, and 4) provides for cost-effective, efficient, and sustainable facilities and operations.

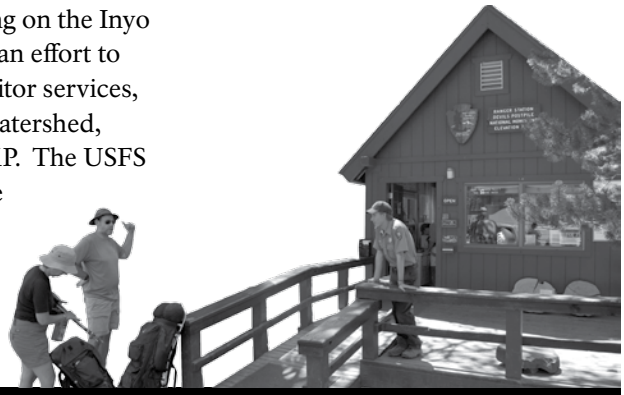
Implementation of the General Management Plan

Once the general management planning process is completed, the selected alternative would become the new management plan for Devils Postpile National Monument and would be implemented in phases over the next couple of decades. Implementation of the actions and developments proposed within this management plan is dependent upon funding available at the time of need. The approval of this general management plan does not guarantee that the funding and staffing needed to implement the plan would be forthcoming. Instead, the plan establishes a vision of the future that will guide future management of the monument. In addition to funding, the implementation of any preferred alternative could be affected by other factors. More detailed planning, environmental documentation, and studies could be required before most conditions proposed in the alternatives are achieved. Additionally, all of the alternatives were developed on the assumption that certain mitigating actions would be incorporated into the proposed actions in order to reduce the degree of adverse impacts.

Implementation of the Recommendations to the Inyo National Forest

The GMP will be a National Park Service decision document. Its management guidance will only govern future actions taken by the NPS. Additional recommendations were developed by the GMP team, with participation by USFS staff, for the surrounding watershed within the Inyo National Forest. The USFS could undertake any or all of the

recommendations individually or by integration into planning on the Inyo National Forest. These recommendations were provided in an effort to identify opportunities for interagency efficiency, improve visitor services, and establish a vision for collaborative management of the watershed, consistent with the monument's management under the GMP. The USFS has not committed to and is not required to adopt any of the recommendations contained in these alternatives.



Alternative A: The No Action Alternative

Alternative A is the "no action" alternative and assumes that existing management, programming, facilities, staffing, and funding would generally continue at their current levels. A no action alternative is required by the National Environmental Policy Act and serves as a baseline for comparison in evaluating the changes and impacts of the other two alternatives. The emphasis of alternative A would be to protect the values of Devils Postpile National Monument without substantially increasing staff, programs, funding support, or facilities. Resource preservation and protection would continue to be a high priority for the management of the monument. Staff would continue to work with the Inyo National Forest on projects of mutual interest, on a case-by-case basis. Management of visitor use and facilities would generally continue under existing levels and types of services and regulations. Existing visitor facilities, such as buildings, structures, roads, parking areas, camping areas, and trails, would be maintained. Most administrative facilities would also be maintained with the exception of the monument's inadequate maintenance building which would be replaced.

MANAGEMENT ZONES

For alternative A, no management zones are identified. Devils Postpile has not been zoned in a comprehensive planning exercise before and is not currently operating under a general management plan. Much of the monument, however, is designated wilderness, which provides its own set of desired conditions through the Wilderness Act's mandate to preserve wilderness qualities.

VISITOR CAPACITY

The monument would continue to manage visitation on a case-by-case basis, with facility capacity (including parking) and shuttle capacity largely setting the monument's daily visitor capacity. The monument would continue to conduct occasional visitor capacity and visitation studies to better manage visitors.

SITE SPECIFIC MANAGEMENT

Mammoth Lakes

The monument would continue to co-locate administrative offices with the USFS in their current location at the Mammoth Lakes Welcome Center and the Mammoth Ranger Station campus.

Devils Postpile NM Developed Area

Ranger Station

Under alternative A, the monument would maintain the existing ranger station in its current location. The building interior would continue to provide a small space for visitor contact, as well as a small office for some operational use. The building would remain vulnerable to flood events. The shuttle bus stop would remain unchanged and in its current location. The ranger station would continue to receive upgrades as needed, particularly for accessibility and safety.

Campground, Parking, and Day Use Area

The monument would maintain its overnight campground in its current configuration, with minimal improvements over time. The campground would continue to provide drive-up camping opportunities for tent campers and campers with recreational vehicles.

Parking would continue to be provided near the ranger station for approximately 65 vehicles, depending on whether parking is actively managed by staff. Current

parking lacks clear delineation and flow.

Opportunities for day use visitors near the riverfront would continue to be provided. Two river access points are provided for fishing and other activities. Several tables provide picnicking opportunities near the ranger station.

Operations Area

The existing buildings, including operational space, employee housing, tent cabins, and storage facilities, would remain in the administrative area. An overnight staff presence would be maintained in the monument. A Housing Management Plan has been completed identifying two required occupants. The maintenance building would be replaced in the monument with a new structure consistent with earlier building plans, but final design plans and a location within the monument would still need to be determined. The monument would strive to find a location that could adequately accommodate the new building and minimize impacts to the visitor experience. The monument would continue to try and address concerns around changing the character of the area by having a larger building in the small developed area and siting the maintenance building so it is not the first NPS facility visitors see upon entering the monument.

In the no-action alternative, there would be no major change in the management of the monument.

Junior rangers, *NPS Photo*

Devils Postpile Viewing Area

The monument would continue to provide visitors with quality viewing opportunities of the Postpile and maintain the general size of the viewing areas at the base and the top of the Postpile. Signage, trails, and waysides would remain relatively unchanged.

The monument would also continue to maintain access to the top of the Postpile to provide direct visitor contact with the dome, the shapes of the columns, and examples of glacial polish. The trail at the top of the Postpile would be maintained in its current alignment. The informal picnic area near the base of the Postpile would also be maintained.

Rainbow Falls

Facilities currently at Rainbow Falls, including trails, hitching posts, viewing platforms, walls, and stairs, would remain in their current configurations. The monument would maintain the two viewing platforms, preserving both their size and character for visitors to enjoy the views of Rainbow Falls. Visitor access to the river at the base of Rainbow Falls would be maintained.


Middle Fork San Joaquin River, *NPS Photo*

ADDITIONAL PROGRAM MANAGEMENT GUIDANCE

Natural Resources

Natural resources would continue to be protected to a high degree (See *Common to All NPS Alternatives* for more details on natural resource management). The monument would continue to connect visitors to the natural surroundings while still protecting sensitive areas. Current natural resource research, monitoring, education efforts and partnerships would continue. Engagement of visitors in some resource management activities and programs would continue, including occasional demonstrations of resource management techniques. Sensitive resources would continue to be protected through both direct and indirect visitor use management practices. A direct management action might involve a regulation, such as limiting group size in certain sensitive areas and wilderness. An indirect management practice could include an educational program designed to inform visitors about uses that could impact sensitive resources.

Cultural Resources

The documentation and protection of cultural resources would continue. The monument would continue to depend on cultural resource and museum staff in the regional office and other parks to assist with cultural resource management and compliance. Some museum collections would continue to be stored within the monument, while the remaining collections would be stored at Yosemite and Sequoia-Kings Canyon national parks. The monument would continue to follow guidance provided by the Curatorial Facilities Strategy (May 2006) that calls for consolidating collections at Sequoia-Kings Canyon National Park. The current level of cultural resources education, interpretation, and research would continue. Interpretation of cultural resources would likely remain limited because cultural resources staff would not be available to support the programming. National Register nominations for eligibility and designation would proceed for areas identified in the Historic Resource Study of 2013.

Climate Change and Sustainability

The monument would continue to participate in NPS, interagency, and regional efforts to understand the effects of climate change on resources, assets, and visitor opportunities and develop adaptation strategies for the monument to address anticipated changes to resources and infrastructure. The monument would also continue to implement the goals of its Climate Action Plan to help mitigate its contributions to climate change.

Wilderness

The monument would continue to preserve wilderness character in designated wilderness, including protecting and enhancing the natural, untrammeled, undeveloped and unique qualities of wilderness, as well as providing outstanding opportunities for solitude and primitive, unconfined recreation.

Visitor Experience

Visitors would continue to enjoy the range of recreational experiences that has traditionally been available within the monument within a setting of natural soundscapes and protected viewsheds. Traditional, low-impact recreation such as camping, day-hiking, backpacking, fishing, birdwatching and wildlife viewing, private stock use, permitted commercial stock use, and sightseeing would continue to be available.

Interpretation, Education, and Information

Interpretation, education, and information would continue to be guided by the monument's Long Range Interpretive Plan.

Transportation and Facilities

Level and Character of Development

No new facilities would be constructed in the monument, aside from replacement facilities due to damage or loss, or small, sensitively designed improvements.

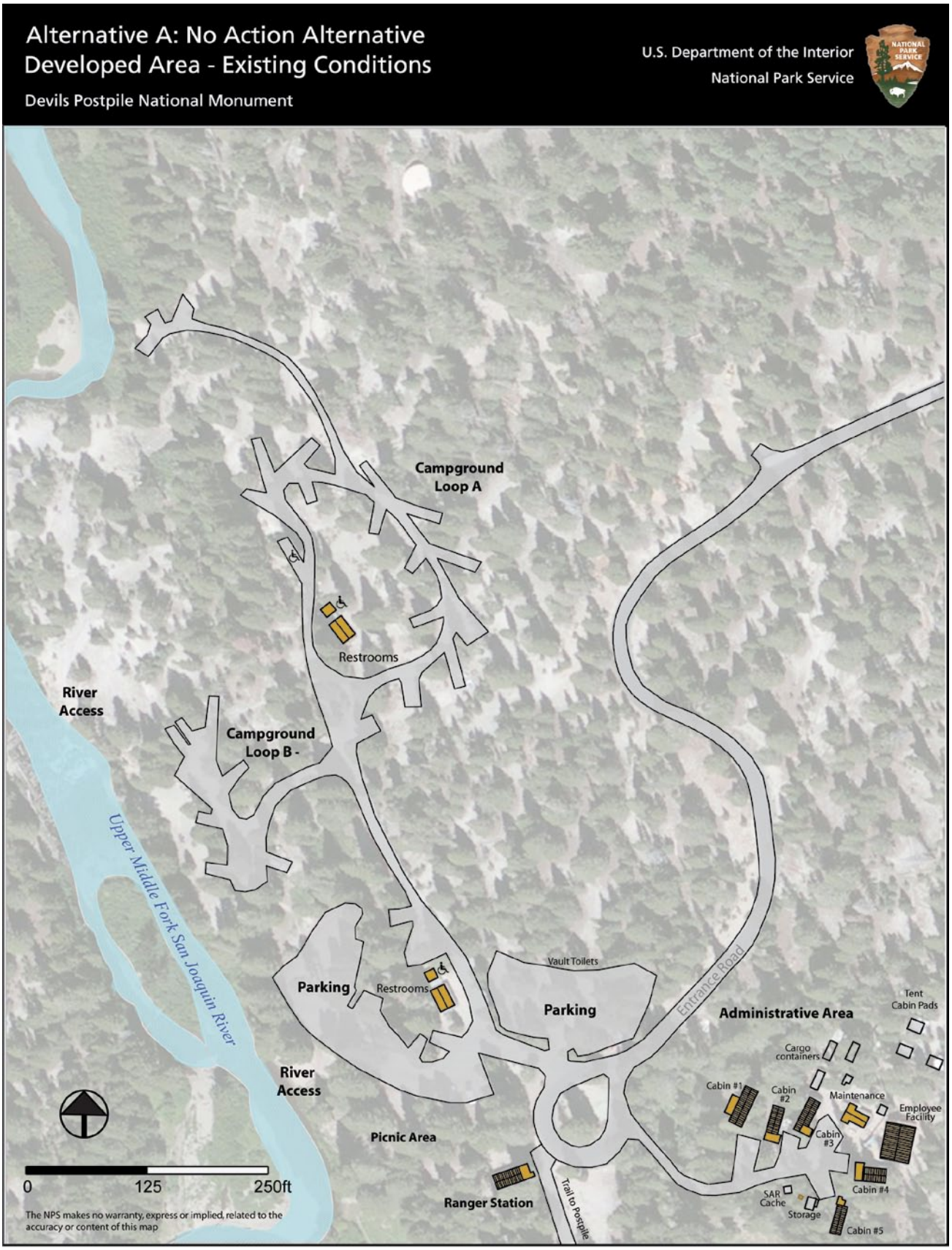
Transportation and Access

See Common to All Alternatives for descriptions of the ongoing and continuing efforts to maintain the shuttle system, and find solutions for the maintenance of current roads.

Concessions Operations and Commercial Services

No concessions operations would be added to the monument. The monument would continue to allow commercial groups with appropriate uses access to the monument under permit. Commercial services in designated wilderness would be limited to the extent

MAP 3.1: ALTERNATIVE A: DEVELOPED AREA - EXISITING CONDITIONS



necessary to realize the recreational purposes of wilderness (See *Appendix D: Determination of Extent Necessary*). Consistent with this extent necessary determination, commercial stock day use at Rainbow Falls may continue at levels currently permitted by the U.S. Forest Service from their trailhead (1440 day rides per season) in realization of the purpose of wilderness.

Outreach and Partnership Programs

The monument would continue to partner, when possible, with the USFS, tribes, organizations, and local communities to improve resource management and visitor experiences.

Boundary Modifications

No boundary modification would occur. The monument would continue to collaborate with the USFS on boundary issues as needed.

ESTIMATED COSTS

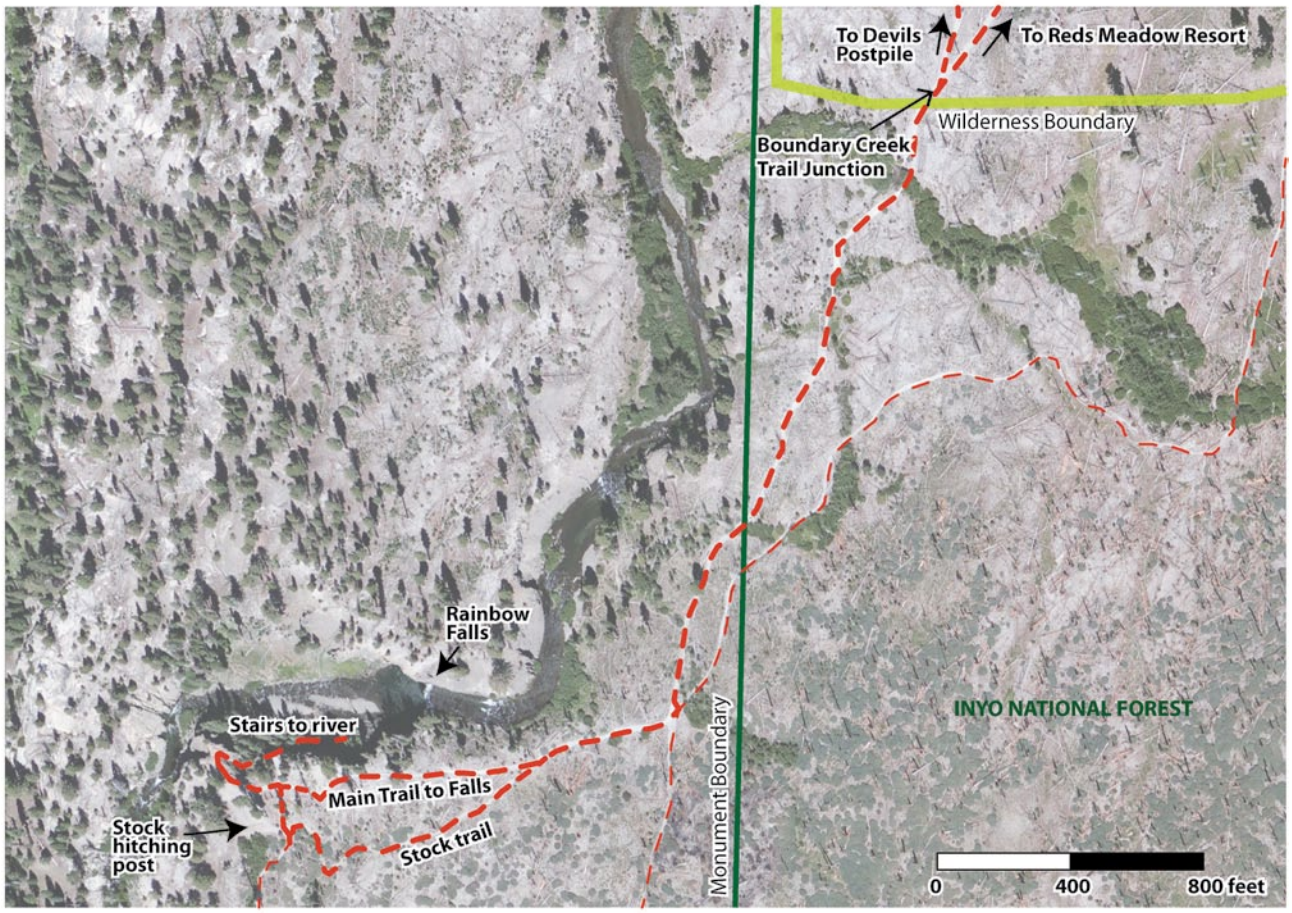
Cost estimates for alternative A are identified on the next pages in Tables 3.3 and 3.4. The costs shown here are not for budgeting purposes; rather, they are only intended to show a relative comparison of costs among the alternatives.

Implementation of the approved plan will depend on future funding. The approval of this plan does not guarantee that the funding and staffing needed to implement the plan would be forthcoming. Full implementation of the actions in the approved general management plan would likely take many years.

One time Capital Costs

The estimated costs for alternative A reflect the continuation of current management, including continuation of the current level of facilities. One-time costs for alternative A include projects that are currently approved and have been funded, and projects that are considered "common to all alternatives," such as the development of a Resource Stewardship Strategy. One-time costs for the maintenance facility replacement are included in Alternative A because the

MAP 3.2: ALTERNATIVE A: RAINBOW FALLS - EXISITING CONDITIONS



project had previously been approved for funding, but was ultimately put on hold so that other options and locations could be explored in the GMP process. Projects that involve deferred maintenance on facilities like the Ranger Station and continued campground improvements are also included.

Projects are identified in three phases, although alternative A is limited to Phase I projects only. Phase I projects would be pursued first and they include the most critical facility and resource protection needs. Phase II and Phase III projects would address a range of facility repair and rehabilitation needs, enhancements to wilderness character, and improvements to the visitor experience. The total estimated one-time capital cost for Phase I projects in 2012 dollars is approximately $1,311,000 and the total deferred maintenance would be $599,000.

Staffing

Alternative A assumes that current authorized staffing levels (2012) would remain, for a total of 8.25 full time equivalent staff. One full time equivalent (FE) is one person working 40 hours per week for one year, of the equivalent number of hours worked by different individuals. FTE may be base funded or project funded.

TABLE 3.4: ALTERNATIVE A (NO ACTION) STAFFING

Park Management Division	Alternative A (No Action) Base/ Project (FY12)
Administrative and Management	2 FTE/ 0 FTE
Resource Management	.75 FTE/ .5FTE
Interpretation and Education	1.5 FTE/ 1 FTE
Facilities and Maintenance	1 FTE /.5 FTE
Visitor Protection	1 FTE/ 0 FTE
Total Positions	6.25 FTE Base
	2 FTE Project
TOTAL FTE	8.25
Total Staffing Costs	$511,000

Annual Operating Costs

The monuments annual operating budget for fiscal year 2012 (FY2012) was $599,000. Additional operations and maintenance costs related to capital investments would be $25,000. The total annual operating costs for Alternative A would be approximately $624,000.

TABLE 3.3: DEVILS POSTPILE GMP ALTERNATIVE A (NO ACTION) IMPROVEMENT COSTS

Project Description	**Category** Note: Costs are net construction in 2012 dollars				**Deferred Maintenance Offset**
	Facility Repair/ Rehabilitation	New Construction	Resource Management	Planning	
Phase I Projects					
Remodel Devils Postpile Ranger Station	$220,000				$4,000
Replace/Relocate maintenance facility within monument boundaries		$927,000			$493,000
Campsite and day use area improvements	$94,000				$102,000
Complete a Resource Stewardship Strategy and Research Agenda			$50,000		
Develop a baseline inventory of the Postpile geologic formation			$20,000		
Subtotal Phase I	$314,000	$927,000	$70,000		$599,000
Total Phase I	$1,311,000				$599,000
Total One-Time Improvement Costs	**$1,311,000**				
Total Deferred Maintenance Offset	**$599,000**				

Alternative B: Watershed Emphasis

DESCRIPTION OF ALTERNATIVE

This alternative proposes a greater emphasis on managing and promoting visitor understanding of the monument's place in the Upper Middle Fork of the San Joaquin River watershed. Resource management and visitor programming would emphasize watershed values, natural processes, and adaptation of infrastructure/systems to a changing environment. Science and learning opportunities would be directed toward watershed issues and increasing visitor understanding of the broad importance of the watershed. Enhanced orientation to the watershed would be provided through improvements outside of the watershed. Minaret Vista is identified as an ideal location for these improvements. Alternative B generally envisions less development in the monument than currently exists.

Devils Postpile, *NPS Photo*

SITE SPECIFIC MANAGEMENT GUIDANCE

Mammoth Lakes

The monument would continue to co-locate administrative offices in their current location at the USFS Mammoth District Ranger Offices adjacent to the Mammoth Lakes Welcome Center.

Devils Postpile NM Developed Area

Under alternative B, the monument developed area would maintain the existing ranger station, with small improvements to accommodate the public and NPS staff, and would convert the campground to accommodate day use only. A comprehensive site design or development concept plan would be completed for the developed area, including the ranger station, parking areas, campground, shuttle stop, and administrative area.

Ranger Station, Parking, and Day Use Area

The ranger station and surrounding areas would be redesigned to optimize day use visitor experiences along the river and improve the parking lots to reduce visual impacts and restore riparian areas. The redesign could include pedestrian trails and river access points, along with improved picnic opportunities. Better delineated parking, with appropriate setbacks from riparian areas, would be designed with optimal traffic flow, restoration opportunities, and aesthetics in mind.

The monument would retain the visitor contact/ranger station in the valley, in its existing location. The ranger station has been identified as a potentially significant historic structure. The deck would be expanded, and a service window potentially added, to provide improved Americans with Disabilities Act (ADA) accessibility and additional outdoor space for interpretation and ranger contact. Administrative functions would be removed and the building would be rehabilitated for visitor services only, allowing a redesign of the interior to improve functionality and accessibility. The building could be elevated to mitigate flood hazards, if its rustic character can be maintained. The NPS is currently undertaking a determination of eligibility for listing in the National Register of Historic Places. If the building is determined to be historically significant, these proposed changes would be designed to avoid or minimize the potential for adverse effects.

The shuttle bus stop and parking area would be redesigned to improve parking and circulation for shuttle buses, cars and pedestrians. The new site design would also consider better separating the entrance to the visitor contact/ranger station and the bus loading and unloading area, adding a modest shelter or an overhang on the bus stop, and providing space for additional visitor information and outdoor exhibits.

Campground, Parking, and Day Use Area

The campground would be converted to day use, reducing overnight staffing needs, restoring previously impacted areas, and opening up more opportunities for day use near the monument's developed area. Visitors would have greater access to the river. The campground

area is unique in the monument for its proximity to parking and its non-wilderness status. Converting this area to day use would increase the monument's ability to provide accessible visitor experiences, interpretive waysides, and short loop trails, in a location convenient to the shuttle and parking. Restoration of this heavily impacted area would reduce the overall development footprint of the monument. The monument would work cooperatively with the USFS to provide replacement campsites elsewhere in the valley, if possible.

Operations Area

The monument operations area would provide staff housing, administrative space, and other essential operational functions with an overall goal of minimizing visual and audible impacts associated with park operations. Buildings near the edge of the meadow, such as Cabin 5 ("the Shed"), the current search and rescue cache, and fee collection office, would be removed to protect the meadow within the riparian area and reduce visual impacts from the Devils Postpile trail. Other cabins would be converted from housing to operational functions, including Cabin 1 ("the Superintendent's cabin") and Cabin 3 ("the Chateau"). Operational functions would be removed from the ranger station and relocated to these buildings.

Ranger program, *NPS Photo*

A Housing Management Plan has been completed identifying two required occupants. Due to removal of overnight services, no more than three staff occupants would reside in the monument. The tent cabins would be removed. Any additional administrative functions would be located in the Town of Mammoth Lakes. If needed, the monument would lease additional operational office space in the Town of Mammoth Lakes, on the USFS compound if possible. No enhanced visitor services are envisioned in the Town of Mammoth Lakes under this alternative.

The monument would seek to work collaboratively with the USFS to adaptively reuse the Pumice Flat cabin as an interagency maintenance shop. Small equipment storage buildings and maintenance work areas would be developed around the Pumice Flat cabin to support basic maintenance needs for both agencies in the valley. This location is centrally located within the valley and on level terrain outside the floodplain (See *Pumice Flat* below under *USFS Recommendations*). The monument would locate the remainder of the NPS maintenance and storage needs that require larger facility space and work areas to the town of Mammoth Lakes, preferably co-located with partners such as the USFS. The split maintenance operation would provide basic, daily needs in the valley by adaptively reusing an existing developed area but minimize any new construction down in the valley. However, the distance and road condition between the valley and Mammoth Lakes would be of concern in terms of operational efficiency. Both locations would be situated away from primary visitor locations and would not likely intrude on aspects of the overall visitor experience, although the Pumice Flat cabin is across the street from a group campground and could have effects on those visitors. Partnering with the USFS would provide efficiency by not duplicating the maintenance facility needs of both agencies with visitor and land management responsibility in the valley, and is consistent with NPS goals to collaborate with partners on issues that have solutions beyond park boundaries.

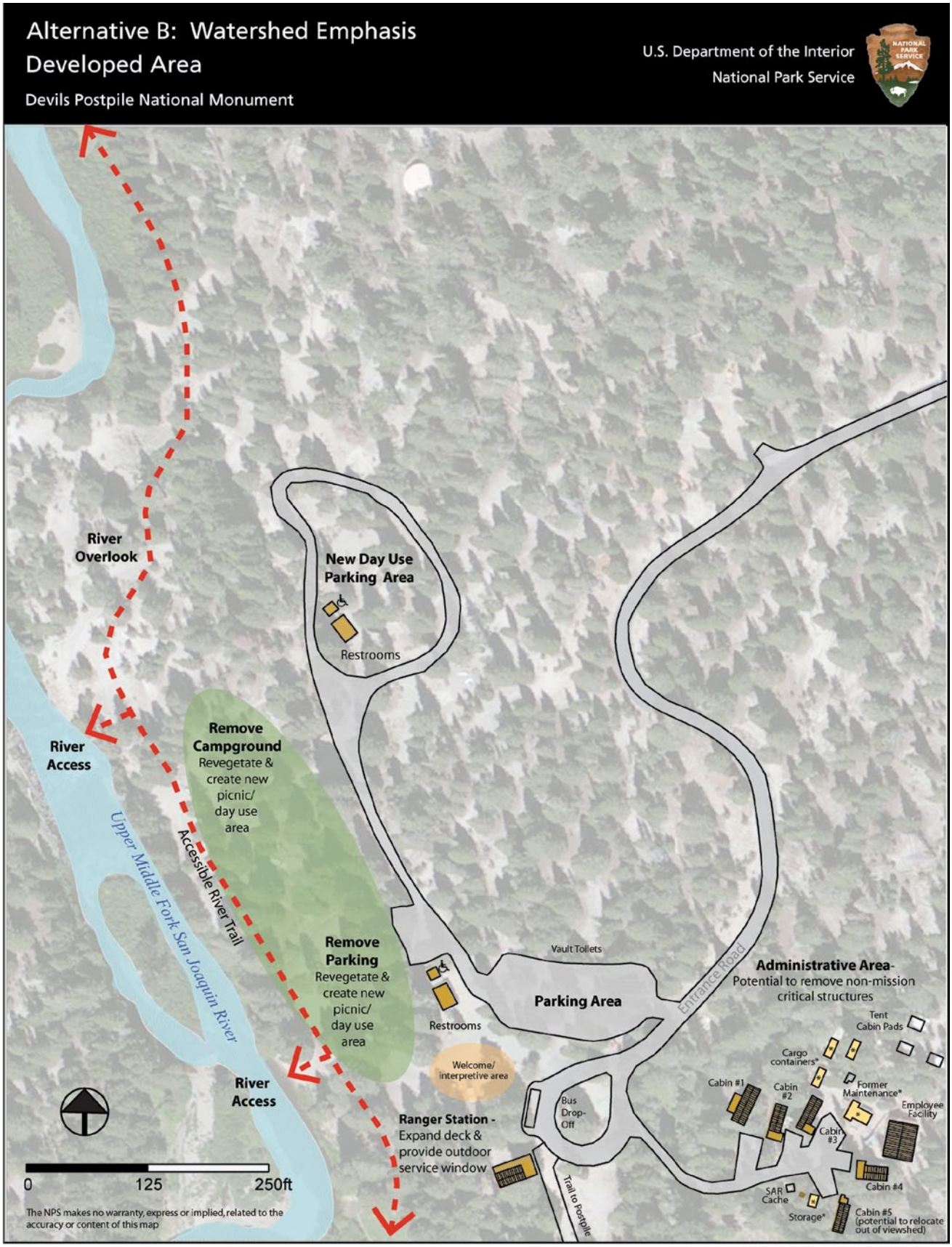
Once the monument's maintenance operations and functions are relocated to Pumice Flat and other locations, the existing maintenance shop would be removed.

If a mutually agreeable arrangement with the USFS cannot be negotiated at Pumice Flat and the relocation of maintenance operations to the town of Mammoth Lakes was found to be infeasible, the monument would implement Alternative A and pursue replacement of the maintenance facility within the monument boundary.

Devils Postpile NM Viewing Areas

The monument would continue to provide visitors with quality viewing opportunities of the Postpile and maintain the general size of the viewing areas at the base and the top of the Postpile. Opportunities for direct contact with the dome and glacial polish would still occur at the top, but the monument would truncate or shorten the trail to concentrate use in a smaller area to minimize impacts on glacial polish. The use of

MAP 3.3: ALTERNATIVE B: DEVELOPED AREA CONCEPT



waysides and signage would be minimized to emphasize the naturalness and rustic character of the area.

Because viewing the Postpile is, for many visitors, a primary motivation for visiting the monument, a study would be conducted to evaluate feasibility of making the entire trail from the ranger station to Devils Postpile more accessible to a wider variety of users.

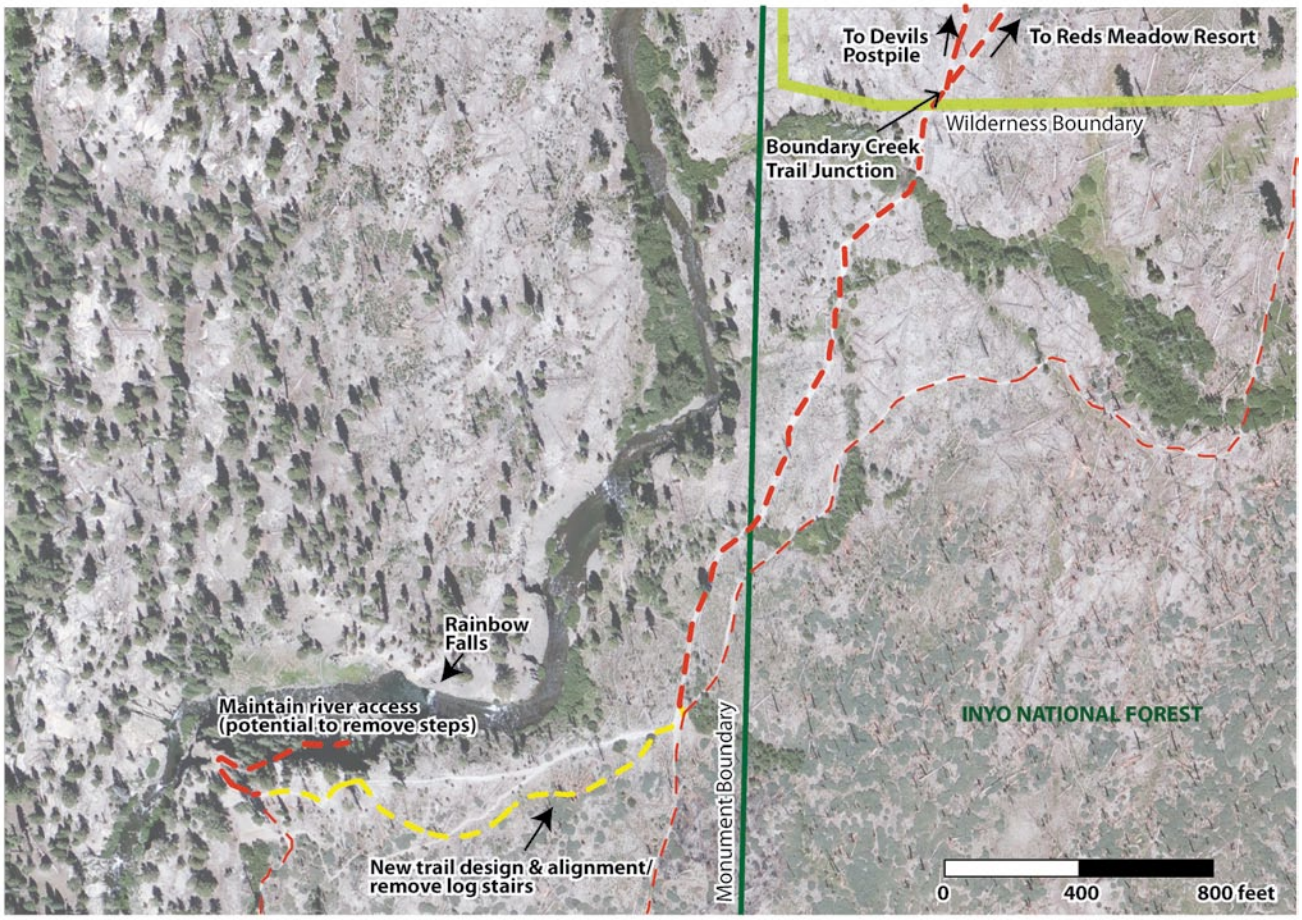
Rainbow Falls

Under alternative B, the monument would strive to enhance the wilderness qualities of Rainbow Falls and promote a greater sense of discovery and introductory wilderness experience for visitors to the area.

Several modifications to infrastructure and facilities in the area would improve the undeveloped quality of wilderness near Rainbow Falls. The monument would realign the current trail from the wilderness boundary to Rainbow Falls away from steep edges and reduce both the footprint and visual extents of the trail, ultimately creating a more undeveloped wilderness experience and enhancing feelings of solitude. A trail with smaller widths and more curves, winding down from the wilderness boundary, could reduce the amount of time that visitors are in view of others and promote a sense of arrival. The trail could be widened in select areas to allow large groups to rest or pass. Also, the interpretive panels would be removed and relocated outside of designated wilderness. Visitors entering the Ansel Adams Wilderness on their way to the falls would have an opportunity to learn about wilderness values prior to entry, helping them and others to enjoy a higher quality wilderness experience.

The monument would maintain the two viewing platforms, preserving both their size and character for visitors to enjoy the views of Rainbow Falls. The monument would also maintain safe visitor access to the river at the base of Rainbow Falls, but would seek to remove the rock and concrete stairs, if feasible. A minimum requirement analysis would be done to determine the type of access would be most compatible with wilderness character.

MAP 3.4 ALTERNATIVE B: RAINBOW FALLS AREA CONCEPT



ADDITIONAL PROGRAM MANAGEMENT GUIDANCE

Natural Resources

The monument would implement a watershed approach to natural resource management, expanding and prioritizing interagency collaboration and coordination in more areas of watershed management.

Natural resources would continue to be protected to a high degree, with an emphasis on unimpeded natural processes and enhancement of the untrammeled quality of wilderness. Sensitive and wilderness resources would be protected primarily by passive or indirect visitor use management strategies when possible. Such techniques could include relocating facilities and infrastructure or rerouting trails to avoid sensitive resources.

Cultural Resources

The documentation and protection of cultural resources would continue. As new information about cultural resources is identified through further documentation, such information would be integrated into the interpretation and education programs related to the history of the watershed.

The monument would consider additional intra-agency co-location opportunities for museum collection storage, preferably on the eastern side of the Sierra at Manzanar National Historic Site or Death Valley National Park. Some small collections storage for non-sensitive items would be located in the NPS administrative offices in the Town of Mammoth Lakes.

Climate Change and Sustainability

As with the other alternatives, the monument would continue to participate in NPS, interagency, and regional efforts to understand the effects of climate change on resources, assets, and visitor opportunities and develop adaptation strategies for the monument and watershed to address anticipated changes to resources and infrastructure. The monument would also continue to implement its Climate Action Plan.

Wilderness

The monument would continue to preserve wilderness character in designated wilderness. Enhancing the natural, undeveloped, and untrammeled qualities of wilderness would be the priority. Specific changes described above under Rainbow Falls are intended to enhance these wilderness qualities. In addition, the monument would remove existing facilities when possible. The monument would not build new trails or trailheads in wilderness, except for the purpose of resource protection (i.e. rerouting). Signs would be limited; primarily small mileage markers or orientation signs at trail junctions. Solitude and opportunities for primitive and unconfined recreation would also be preserved throughout the monument.

Visitor Experience

Visitors would continue to enjoy most of the recreational experiences that have traditionally been available within the monument. Traditional, low-impact recreation such as day-hiking, backpacking, fishing, picnicking, private stock use, and sightseeing would continue to be available and emphasized. Because camping would no longer be available in the monument, those desiring to camp would need to use one of the nearby USFS campgrounds.

Interpretation, Education, and Information

Interpretation, education, and information would continue to be guided by the monument's long range interpretive plan. Science-based learning opportunities for youth and cooperation with partners and researchers would continue to be prioritized. Programs and media would emphasize themes related to the watershed, its role locally and regionally, as well as the relationship of Devils Postpile NM and its resources to the watershed. The monument would seek partnership opportunities to provide interpretation and education outside of the watershed, preferably at Minaret Vista and Mammoth Lakes, to introduce people to watershed concepts. In the monument, opportunities for self-directed learning and discovery would be emphasized over facilitated experiences.

Transportation and Facilities

Level and Character of Development

No new facilities would be constructed in the monument, aside from replacement facilities due to damage or loss, or small, sensitively designed improvements. The monument would adopt design guidelines that help to provide an integrated visitor experience across boundaries, preserve wilderness character, and protect the traditional, rustic, and natural setting.

Transportation and Access

The monument would improve delineation of parking in the day use area, particularly around sensitive riparian areas to halt the gradual growth of parking areas through encroachment. As described above, a comprehensive site design or development concept plan (DCP) would be completed for the day use area. See Common to All Alternatives for descriptions of the ongoing and continuing efforts to maintain the shuttle system, invest in maintenance of current NPS roads, and collaborate with the USFS on exploring and supporting funding opportunities for maintenance of the Reds Meadow Valley road.

Facilities, including Employee Housing

Some facilities within the monument would be removed, with a net loss in the number of structures (See *Devils Postpile NM Developed Area*). The monument would continue to co-locate facilities with the USFS to enhance operational efficiency of agencies managing the watershed.

The monument would strive to partner with others in Mammoth Lakes (i.e., Mammoth Mountain, USFS) to meet short-term housing needs above the monument's minimum required occupancy, with a goal of leasing housing for most seasonal and temporary employees in Mammoth Lakes.

Concessions Operations and Commercial Services

No concessions operations would be added to the monument. The monument would continue to allow commercial groups with appropriate uses access to the monument under permit. Commercial services in designated wilderness would be limited to the extent necessary to realize the recreational purposes of wilderness (See *Appendix D: Determination of Extent Necessary*). Consistent with this extent necessary determination, commercial stock day use at Rainbow Falls may continue at levels currently permitted by the U.S. Forest Service from their trailhead (1440 day rides per season) in realization of the purpose of wilderness.

Outreach and Partnership Programs

The monument would expand its efforts to form and participate in partnerships that relate to landscape-scale watershed management. In particular, the monument would continue to partner with the Inyo National Forest, seeking ways to streamline and coordinate resource and visitor management in the watershed. Many of the recommendations listed below are opportunities for Service First collaboration in areas of mutual interest.

MANAGEMENT ZONES APPLIED TO ALTERNATIVE B

The management zones for alternative B would be applied to monument lands to identify an area's predominant use and desired future conditions. Specific boundaries of the management zones are provided in the map for alternative B. The management zones are explained in further detail in Table 3.1. The following description identifies the locations and details for the application of management zones in alternative B. Zoning applications outside of the monument boundary on U.S. Forest Service lands are recommendations only.

Front Country Zone

- A 400 foot corridor centered on Reds Meadow Road.
- A 400 foot corridor on access roads in developed areas within Reds Meadow Valley including:
    - The Devils Postpile NM entry road, campground, visitor contact/ranger station and adjacent day use area, and administrative/housing area
    - Minaret Vista
    - U.S. Forest Service campgrounds
    - Pumice Flat
    - West shore of Sotcher Lake
    - Reds Meadow Resort

Sensitive Resource Management Zone

- A 200 foot corridor (100 foot buffer) centered on the Upper Middle Fork of the San Joaquin River from Upper Soda Springs Campground to Lower Rainbow Falls, excluding Devils Postpile Campground and parking area.
- Wetland/meadow areas in Reds Meadow Valley. Areas include Soda Springs, Agnew Meadows, and the wet meadow areas west of Pumice Flat and south of Minaret Falls Campground.
- The east side of Sotcher Lake from the access trail on the east to where the creek drains into the lake from the north and exits the lake on the south.

Portal Zone

- Only one small area of the watershed is zoned portal/transition zone in alternative B. This zone includes the areas around Devils Postpile and much of the trail that connects the Postpile to

Rainbow Falls. The portal/transition zone area is bounded by the frontcountry zone corridor around the Devils Postpile NM entry road on the north and the John Muir Trail to the south. From west to east, this area stretches from the sensitive resource management zone corridor around the Upper Middle Fork of the San Joaquin River east to the frontcountry zone corridor around the Minaret-Summit Road and Reds Meadow Resort.
- Areas defined by the U.S. Forest Service as Wildland Urban Interface Zones outside of designated wilderness areas and sensitive resource management zoned areas.

Natural Zone

Under alternative B, the predominant zone applied to the monument is the natural zone. The natural zone would include the following areas:

- All designated wilderness areas, with the exception of those areas included in the sensitive resource management zone, to provide visitors ample opportunities to experience solitude, natural sounds, and a sense of remoteness.
- Remote areas beyond the wilderness boundary extending to the frontcountry, portal, and sensitive resource management zones.

RECOMMENDATIONS FOR THE INYO NATIONAL FOREST

These recommendations were developed by the NPS in collaboration with the Inyo NF. They are only recommendations and could be modified, rejected, or adopted in future Inyo NF planning.

Minaret Vista

Under this alternative, Minaret Vista would become a primary destination and the focus of visitor engagement. An exhibit area, potentially with shelter, would be constructed to provide visitors with an opportunity to learn about and experience the watershed. Periodically and seasonally staffed with NPS and/or USFS interpreters, the exhibit area could provide some respite from harsh weather conditions and a central place for ranger contact and visitor orientation. Redesigned as a primary destination, the vista would serve both visitors to the valley and those who don't have the time or inclination to enter the valley. Visitors to the vista would learn about the valley's natural and cultural resources, the monument, the forest, and the watershed as a whole from an accessible location that allows them to witness the size and grandeur of the entire watershed.

Toward these ends, the NPS and USFS would collaborate on an improved site plan for Minaret Vista to better serve as a destination for visitors. A new site design would strive to relocate the parking area and restrooms away from the viewing platform to provide better separation between the viewing and interpretive areas and the supporting infrastructure. A new accessible, interpretive trail that meets Americans with Disability Act standards, if feasible, could also be added, providing an enhanced visitor experience for people at the vista. Also, a trail connection to the Pacific Crest Trail (PCT) would serve those seeking a route between the PCT and the Town of Mammoth Lakes.

The new site design would evaluate adding shuttle stop at Minaret Vista. Currently not included as a stop on the mandatory shuttle, Minaret Vista could be included as shuttle stop #1, allowing visitors on the shuttle an opportunity to experience the viewpoint without having to seek alternative modes of transportation to the site. The placement of the shuttle stop would consider the efficiency of the overall shuttle route, and could be located closer to the road with a trail that links to the viewing area.

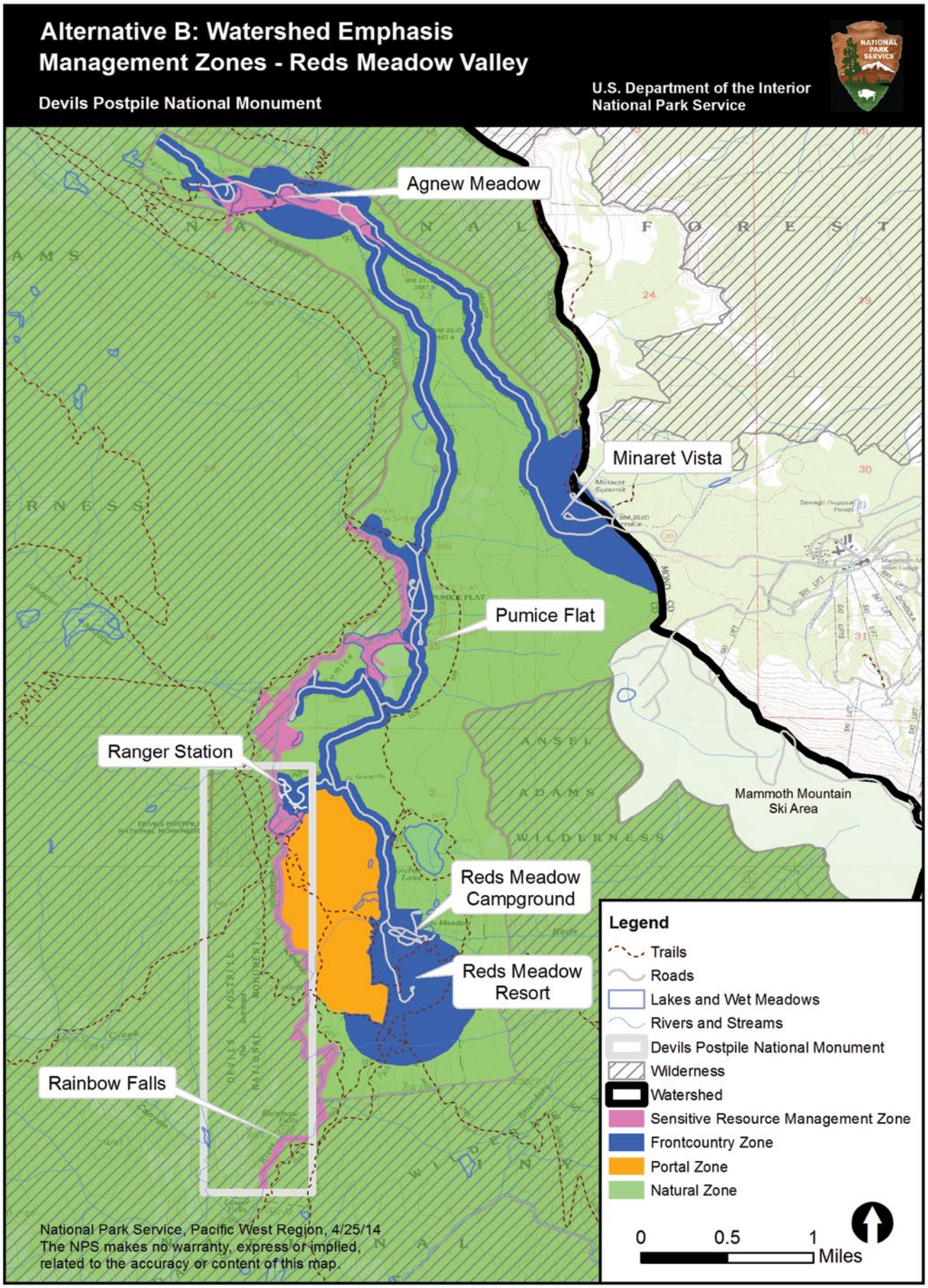
A new entrance sign could also be located on Minaret Summit Road, near the turnoff to Minaret Vista. The sign, designed to evoke a sense of arrival to this particular landscape similar to many national park system entrance signs, could introduce visitors to both Reds Meadow Valley and Devils Postpile NM and provide visitors with a photo opportunity.

Pumice Flat

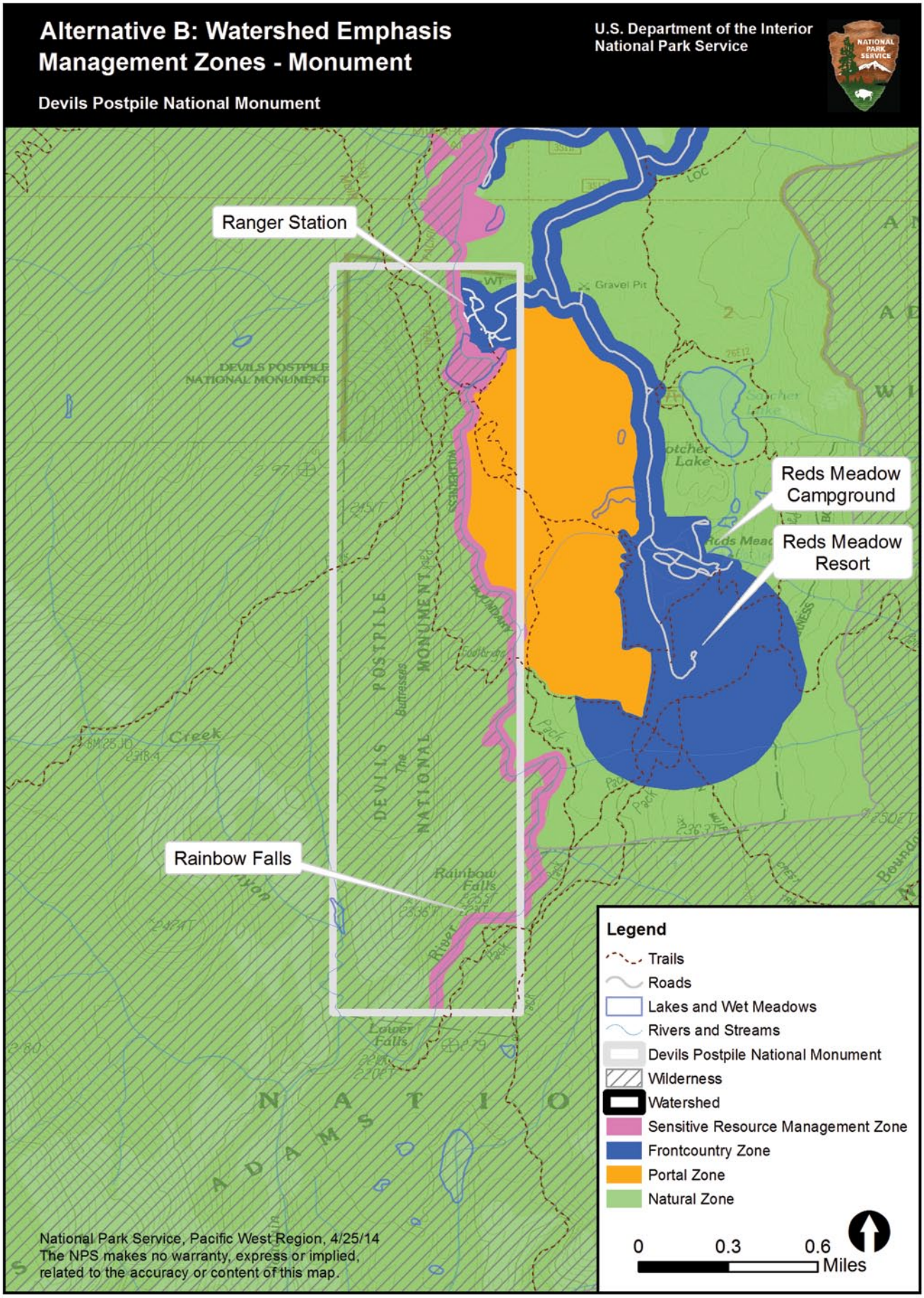
Pumice Flat would continue to provide individual and group camping opportunities for visitors to Reds Meadow Valley. Given its central location and relatively level terrain outside of the floodplain, the USFS would partner with the NPS to explore opportunities to provide joint maintenance needs at this site while retaining existing recreational opportunities such as the group campground.

Under this alternative the USFS and NPS would explore adaptive reuse of the Pumice Flat cabin area for shared maintenance needs. Small maintenance work areas, with equipment storage, would also be developed around the cabin for minimal maintenance needs. This

MAP 3.5: ALTERNATIVE B - ZONING - VALLEY



MAP 3.6: ALTERNATIVE B - ZONING - MONUMENT



facility would primarily serve the maintenance needs in the valley of both agencies and would replace the current maintenance facility in the monument.

Boundary Creek

The existing interpretive panels and trail configuration would remain.

Agnew Meadows

The range of services and activities at Agnew Meadows and its function as a primary launch point into wilderness and onto the Pacific Crest Trail would be continued. A redesign of the campground to improve parking, pull roads and parking away from meadows, better orient day users and provide walk-in camping, could be developed. The shuttle stop could be improved to provide water, as well as information that would orient both day users and overnight visitors to the valley and the surrounding wilderness. Information would be provided at the shuttle stop to introduce wilderness concepts.

Reds Meadow Guard Station and Bathhouse

The Reds Meadow guard station and bathhouse would continue to be managed as cultural resources by the U.S. Forest Service. Additional signs or interpretive panels around the guard station would be avoided. The guard station could be part of a self-guided interpretive experience, facilitated through a brochure or other media (such as a podcast) that tells the history of the site.

Sotcher Lake

Continue to improve parking, day use, and trail connections at Sotcher Lake but protect the riparian resources along the east side of the lake. The USFS could consider tools such as the installation of boardwalks to maintain access to the east of the lake while enhancing protection of sensitive wildlife species.

BOUNDARY MODIFICATIONS

No boundary modification would occur. The monument would seek to expand cooperative management of similar resource areas through agreements with the USFS, notably for areas that include the geologic and other resources associated with Devils Postpile and Rainbow Falls, to promote complementary visitor management and resource protection in these areas.

ESTIMATED COSTS

Cost estimates for alternative B are identified on the next pages in Tables 3.5 and 3.6. The costs shown here are not for budgeting purposes; rather, they are only intended to show a relative comparison of costs among the alternatives.

Implementation of the approved plan will depend on future funding. The approval of this plan does not guarantee that the funding and staffing needed to implement the plan would be forthcoming. Full implementation of the actions in the approved general management plan would likely take many years.

One time Capital Costs

Alternative B would consist of improvements to facilities and structures described previously in the alternative. There would be projects related to facility improvements, enhanced resource protection, and improvements to the visitor experience. Highlights include the replacement of the maintenance facility by adaptively reusing the Pumice Cabin and finding alternative space in the town of Mammoth Lakes, adaptive reuse of existing operations and housing facilities, improvements to the existing ranger station, conversion of the campground to a day-use area, enhancements to wilderness character with projects at Rainbow Falls, and opportunities to improve the visitor experience in partnership with the Inyo NF at Minaret Vista. Projects that are considered "common to all alternatives," such as the development of a Resource Stewardship Strategy, are also included.

Projects are identified in three phases. Phase I projects would be pursued first and they include the most critical facility and resource protection needs. Phase II and Phase III projects address a range of facility repair and rehabilitation needs, enhancements to wilderness character, and improvements to the visitor experience. The total estimated one-time costs for Phase I projects is $2,799,000. The total estimated one-time cost for Phase II projects is $2,735,500. The total estimated one-time cost for Phase III projects is $1,505,000. The estimated one-time cost for Alternative B is $7,039,500 and the total deferred maintenance offset would be $869,000.

Staffing

Implementation of Alternative B would require additional staffing for increased monitoring and resource protection, new interpretive and educational

TABLE 3.5: DEVILS POSTPILE GMP ALTERNATIVE B IMPROVEMENT COSTS

Project Description	Category Note: Costs are net construction in 2012 dollars				Deferred Maintenance Offset
	Facility Repair/ Rehabilitation	New Construction	Resource Management	Planning	
Phase I Projects					
Remodel Devils Postpile Ranger Station *	$301,000				$4,000
Replace/Relocate valley maintenance facility (joint USFS)		$1,702,000			$493,000
Remove campground and convert to day use	$726,000				$102,000
Complete a Resource Stewardship Strategy and Research Agenda			$50,000		
Develop a baseline inventory of the Postpile geologic formation			$20,000		
Subtotal Phase I	$1,027,000	$1,702,000	$70,000		$599,000
Total Phase I	$2,799,000				$599,000
Phase II Projects					
Rainbow Falls infrastructure removal			$182,000		$24,000
Adaptive reuse of operations and housing facilities	$2,518,500	$1,702,000			$238,000
Study improved accessibility alternatives for Postpile Trail				$35,000	
Subtotal Phase II	$2,518,500		$182,000	$35,000	$262,000
Total Phase II	$2,735,500				$262,000
Phase III Projects					
Redesign Minaret Vista with additional visitor contact options (joint USFS)	$1,477,000				
Update and protect Devils Postpile viewing areas			$28,000		$8,000
Subtotal Phase III	$1,477,000		$28,000		$8,000
Total Phase III	$1,505,000				$8,000
Total One-Time Improvement Costs	**$7,039,500**				
Total Deferred Maintenance Offset	**$869,000**				

programming and outreach, additional maintenance needs, and administrative support. In many instances, additional FTE are the result of extending less than full time positions longer into the season, or full time, in order to fulfill reporting requirements, proposal development and project management, and hiring and training seasonal workers.

Implementation of alternative B requires an additional 4.25 FTE for a total of 12.75 FTE.

TABLE 3.6: ALTERNATIVE B STAFFING

Park Management Division	Alternative A (No Action) Base/ Project (FY12)
Administrative and Management	2.5 FTE/ 0 FTE
Resource Management	2.25 FTE/ 1 FTE
Interpretation and Education	2.5 FTE/ 1 FTE
Facilities and Maintenance	1.5 FTE /.5 FTE
Visitor Protection	1.5 FTE/ 0 FTE
Total Positions	10.25 FTE Base
	2.5 FTE Project
TOTAL FTE	12.75
Total Staffing Costs	$821,000

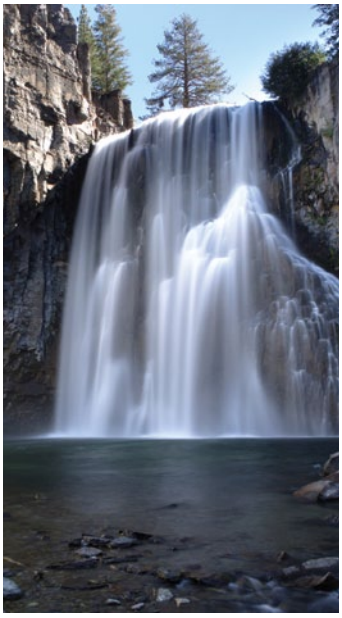
Annual Operating Costs

This alternative would be implemented with an additional 4.25 FTE. The additional staffing would add approximately $387,500 for salaries and operational support. Additional operations and maintenance costs related to capital investments would be $35,000. The total annual operating cost for alternative B would be approximately $1,046,500.

Alternative C: (NPS Preferred Alternative) Connecting People to Nature and Heritage

DESCRIPTION OF ALTERNATIVE

Alternative C is the NPS preferred alternative. This alternative emphasizes protecting resources with national significance and connecting visitors with nature and heritage, including traditional park experiences in a wild setting. The monument and the corridor from Minaret Vista down through Reds Meadow Valley would be managed as a gateway to a greater wilderness. Emphasis would be placed on coordination and partnerships with the Inyo National Forest and the Town of Mammoth Lakes.



Rainbow Falls

SITE SPECIFIC MANAGEMENT GUIDANCE

Mammoth Lakes

The monument would increase its presence in the Town of Mammoth Lakes, preferably by expanding its current co-location arrangement with the Inyo National Forest on their Mammoth Lakes campus (i.e. Mammoth Welcome Center, Ranger Station, and/or Tourism building), for public contact and operational space, enhancing its current presence and relationship with Inyo National Forest staff and the operation at the Mammoth Welcome Center.

The monument would pursue leasing additional space from the U.S. Forest Service on the Inyo National Forest campus to reach a wider range of visitors and members of the local community, including school groups, by extending its operation into the shoulder seasons and winter months, when the monument is closed to vehicular traffic. The challenging road access to the monument often means the official "operating season" is from mid-June to mid-October. Providing visitor services in town could extend that season year round and reach new audiences, given Mammoth Lakes' high winter visitation. Outdoor exhibits would also be included to provide interpretation about the monument when NPS staff are not available and would not require year-round staffing.

The additional space on the Inyo National Forest campus would also be a more appropriate location to include interpretive and educational exhibits that use new technology, such as television and computers, as opposed to the valley where the desire is to maintain a more traditional park experience in a rustic setting and the remote location makes it difficult to maintain reliable technological infrastructure, such as phone and internet access. The Town of Mammoth Lakes would also provide a more appropriate location for the use of technology in NPS interpretive and educational programs. Adequate infrastructure to support a more high-tech experience already exists and would be easier to maintain year round.

Expanding an NPS visitor presence in Mammoth Lakes would also provide an alternative way for local people and visitors to learn about and connect with resources in the monument, bringing the monument closer to the population, and ideally encouraging more local visits to the monument itself. The monument has been looking for ways to engage more K-12 students in the monument and conservation. Opening to vehicle traffic in mid-late-June and closing often in early October makes field trips to the monument very challenging for many school groups. Expanding the monument's presence in the Town of Mammoth Lakes would provide a location for all groups, including K-12 students, to learn about monument resources, participate in activities, and have a location in which to interact with NPS rangers and volunteers.

A location in town would not only enable monument staff to reach a broader audience that is currently not served by existing programming, it would also provide opportunities for increased educational partnerships. This facility would provide a location to present educational programs and/or trainings for local educators in partnership with the Inyo National Forest.

The Inyo National Forest campus is a preferred location for an expanded NPS presence as it would create a single stop for visitors seeking information about opportunities in town, on the forest, as well as in the monument. Expanded co-location with the Inyo could also enhance the efficiency and effectiveness of the interagency collaboration that has characterized the relationship between Devils Postpile NM and the Inyo National Forest. Should leasing additional space from the Inyo National Forest and adaptively reusing existing space not be feasible options, the NPS could also consider: 1) purchasing a new building in the Town of Mammoth Lakes; 2) collaboration with the Inyo National Forest to upgrade existing facilities to provide new visitor contact opportunities; or 3) explore other leasing opportunities in the Town of Mammoth Lakes.

Devils Postpile NM Developed Area

Ranger Station

The monument would retain the visitor contact/ranger station in the valley and improve the surrounding areas to enhance visitor services and circulation. The ranger station deck would be expanded, and a service window potentially added, to provide improved accessibility and additional outdoor space for interpretation and ranger contacts. The interior of the ranger station would continue to provide a mix of visitor services and a small amount of staff office and operations space. The building could be elevated to mitigate flood hazards, if its rustic character can be maintained. The NPS is currently undertaking a determination of eligibility for listing in the National Register of Historic Places. If the building is determined to be historically significant, these proposed changes would be designed to avoid or minimize the potential for adverse effects.

The shuttle bus stop and parking area would be redesigned to improve parking and circulation for shuttle buses, cars and pedestrians. The new site design would also consider better separating the entrance to the visitor contact/ranger station and the bus loading and unloading area, adding a modest shelter or an overhang on the bus stop, and providing space for additional visitor information and outdoor exhibits.

Campground, Parking, and Day Use Area

The monument would continue to provide both camping and day use opportunities in the developed area of the monument. The NPS would complete a comprehensive site design or development concept plan for the campground and day use area, including the visitor contact/ranger station, parking areas, and administrative area.

The monument would maintain an overnight campground in the valley while redesigning a portion of the campground and day use area to improve riverfront access for all visitors. The campsites in Loop B, immediately adjacent to the river, would be removed. Loop B would be redesigned to accommodate walk-in users only.

If feasible, additional walk-in campsites could be sited to maintain current campground capacity. Separation between car camping, day use, and walk-in camping would be achieved through additional site planning.

The monument would continue to make improvements to the camping experience in Loop A through adjustments to site design, better site delineation, and continued vegetation restoration where feasible.

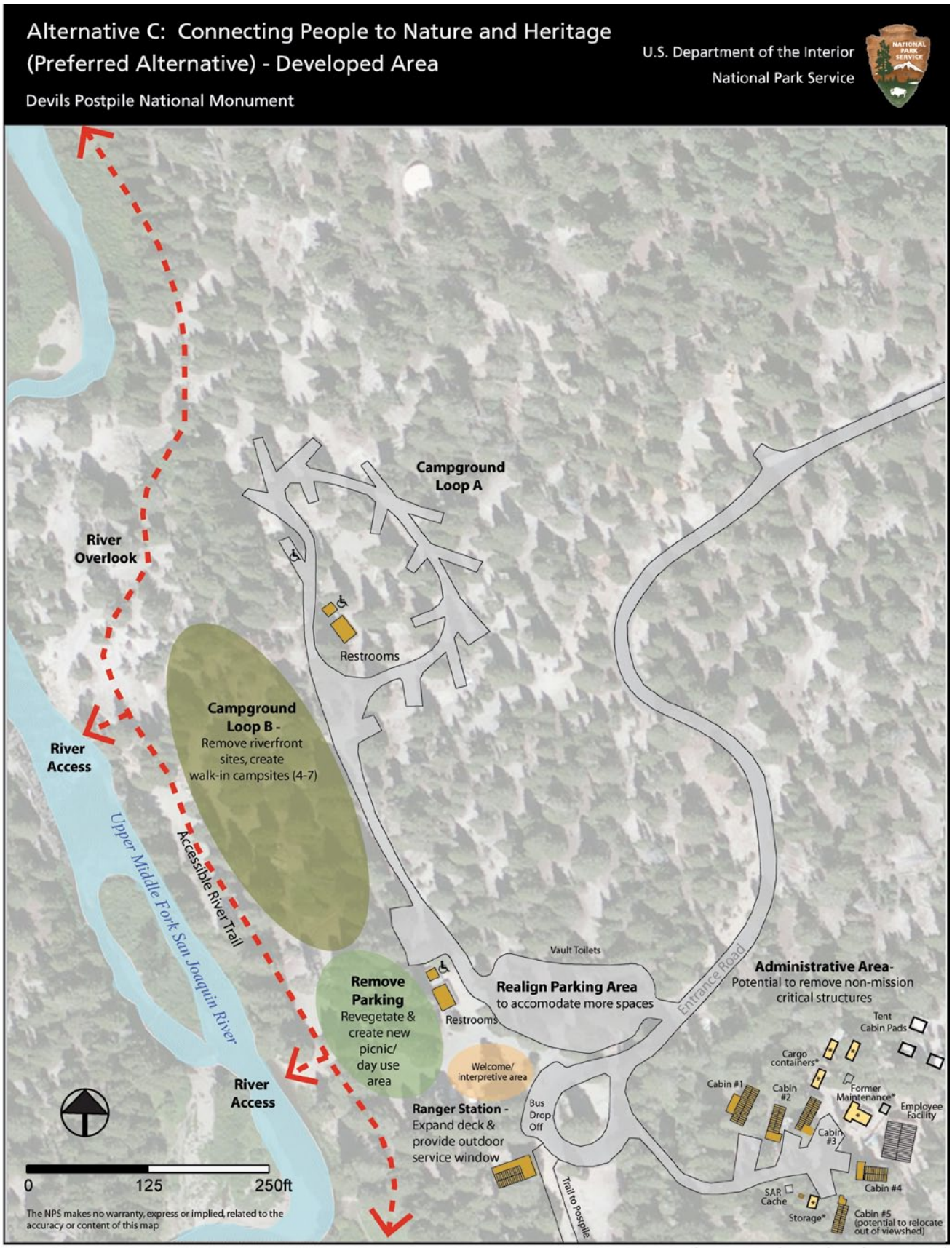
Day use opportunities along the riverfront would be improved. The campground redesign would provide clear delineation of specific river access points to better protect riparian areas and manage visitor access to and use of the riverfront. The monument would also relocate and redesign the day use parking lot to reduce visual impacts, enhance day use recreation near the river at defined locations, and restore riparian vegetation. The design would strive to retain existing parking capacity within the developed area to the extent feasible.

Operations Area

The monument operations area would provide staff housing, administrative space, and other essential operational functions with an overall goal of minimizing visual and audible impacts associated with park operations. To the extent possible, staff housing would be provided in the Town of Mammoth Lakes. However, a minimum overnight staff presence would still be maintained in the operations area, commensurate with the programs and services being offered. A Housing Management Plan has been completed identifying two required occupants. The existing tent cabins, currently used by seasonal staff, could be used to house volunteers or visiting researchers.

Maintenance functions would be moved to a different location to reduce the impacts on visitor experience and resident staff. With a goal of increasing operational efficiency and collaboration between the agencies,

MAP 3.7: ALTERNATIVE C: DEVELOPED AREA CONCEPT



the NPS would partner with the USFS to explore replacement of the monument's current deficient maintenance shop with a small interagency, multi-purpose facility outside of the monument in the vicinity of the Pumice Flat Campground (See *Pumice Flat* below). This facility would primarily serve the maintenance needs in the valley of both agencies and would replace the current small and inadequate maintenance facility in the monument. Some multi-purpose and maintenance staff office space could also be included. This facility would provide a single location to support maintenance operation needs which would be more efficient than having staff spread across multiple locations in the valley and in Mammoth Lakes. Similar to Alternative B, partnering with the USFS would also provide efficiency by not duplicating the maintenance facility needs of both agencies with visitor and land management responsibility in the valley, and is consistent with NPS goals to collaborate with partners on issues that have solutions beyond park boundaries.

Finding a site within the monument where the new maintenance facility would be visually shielded from visitors and staff and would be out of the floodplain would be difficult. The size of the maintenance facility necessary to support monument operations would likely be twice the size the largest building in the monument and could seem incompatible with the rest of the scale and character of development within the monument. Other locations outside the monument but within the valley would be more suitable for such a facility, providing better access and egress for larger vehicles such as fire engines, as well as better visual screening to protect the visitor experience and scenic quality of the area.

Given its central location and relatively level terrain outside of the floodplain, Pumice Flat could provide space for the joint maintenance needs of the NPS and USFS, while retaining existing recreational opportunities such as the group camping site. The facility would be sited to provide adequate separation from the existing amphitheater. The NPS and USFS could also explore other locations for the joint maintenance facility provided those areas are relatively level, outside of the floodplain, and preferably centrally located within the valley. Priority would also be given to previously disturbed or impacted sites.

Similar to Alternative B, if a mutually agreeable arrangement with the USFS cannot be negotiated at Pumice Flat or another suitable location, the monument would implement Alternative A and pursue replacement of the maintenance facility within the monument boundary.

Once the new facility was constructed, the current maintenance facility in the monument would be removed from the operations area. Structures visible from Devils Postpile trail that are not needed for essential NPS operations would also be removed to improve the visual quality of the area.

As in Alternative B, cabins 1 (Superintendent's) and 5 (The Shed) would be converted to operational functions. Most administrative functions would be in Mammoth Lakes. Only those functions that can't be performed in Mammoth Lakes would occur in the monument.

Devils Postpile NM Viewing Areas

The monument would continue to provide visitors with quality viewing opportunities of the Postpile and maintain the general size of the viewing areas at the base and the top of the Postpile. The monument would seek to enhance the experience at the base of the Postpile through several small site improvements. Some individual waysides would be separated from the main viewing areas to reduce congestion and improve the visual quality of the area.

The monument would also provide enhanced opportunities for learning and self-discovery by a providing self-guided interpretive experience along the trail to the Postpile. Expanded interpretive messages that could be told at the site include geology, scenery, and NPS and USFS collaboration in preservation of the area. As in alternative B, the Postpile trail would be evaluated for opportunities to improve accessibility from the ranger station to the Postpile.

The monument would also maintain an area at the top of the Postpile to provide direct visitor contact with the dome, the shapes of the columns and glacial polish, while still protecting important geological resources. The trail at the top of the Postpile would be maintained in its current general alignment, with its southern connection to the Rainbow Falls trail. The monument would implement a suite of resource protection and active visitor use management measures to preserve other areas of glacial polish, such as signage and trail borders to keep people on designated trails. The monument would develop a baseline inventory and increase active protection of glacial polish of the

top of the Postpile and on other glacial features in the monument to understand resource conditions and inform future management actions.

The monument would redesign the picnic area near the base of the Postpile to reduce inadvertent resource impacts, stabilize the landscape and archeological site surrounding the historic cabin ruins, and provide additional interpretation of the history of the area, including the historic cabin ruins, but with minimal infrastructure or wayside additions.

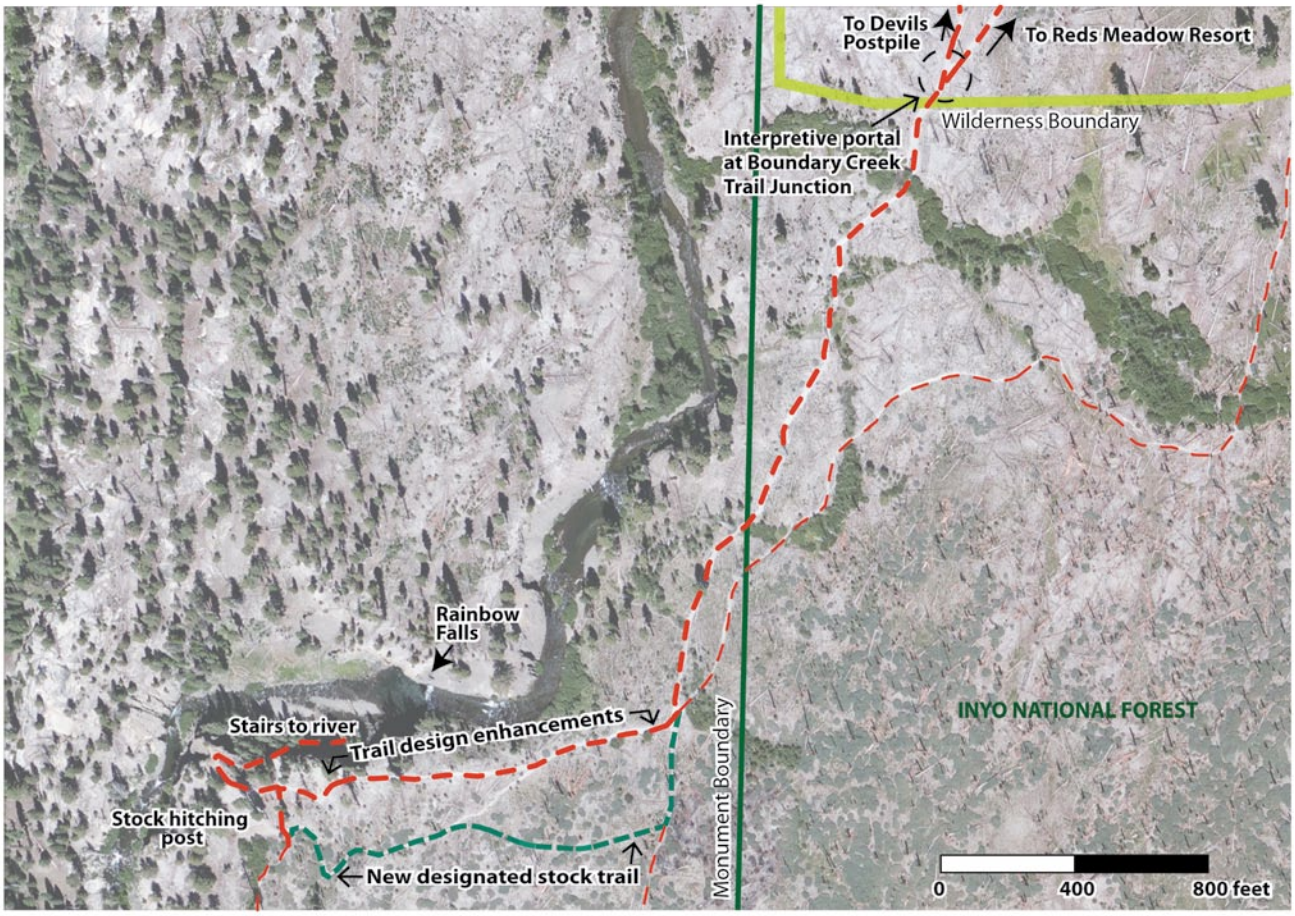
Rainbow Falls

Under the preferred alternative, the monument would strive to enhance the wilderness qualities at Rainbow Falls, promoting a greater sense of discovery and an introductory wilderness experience for visitors to the area.

Several modifications to visitor infrastructure and facilities in the area would help improve the undeveloped character of wilderness. The monument would generally maintain the alignment of the main trail to Rainbow Falls to continue to allow for the current volume of visitors. The monument would also explore redesigning the main Rainbow Falls trail from the wilderness boundary to the viewing platforms in a manner that is more consistent with wilderness character. For example, the logs that line the trail could be replaced with smaller diameter logs or stones that harmonize with the surroundings. The stock trail would be realigned where necessary to separate pedestrian and stock use to reduce impacts to visitor experience. The interpretive panels at Rainbow Falls would be removed and relocated outside of designated wilderness. If possible, they would be relocated to the Boundary Creek trail junction (See *Boundary Creek* below).

The monument would maintain the two viewing platforms, preserving both their size and character for visitors to enjoy the views of Rainbow Falls. The monument would also maintain safe visitor access to the river at the base of Rainbow Falls. A minimum tool requirement analysis would be completed to determine

MAP 3.8: ALTERNATIVE C - RAINBOW FALLS AREA CONCEPT



the type of access most compatible with the area's wilderness character. Options include maintaining the rock and concrete stairs or removing the staircase and replacing it with a switchback trail.

ADDITIONAL PROGRAM MANAGEMENT GUIDANCE

Natural Resources

Natural resources would continue to be protected to a high degree. The monument would provide visitors with a greater connection to the natural surroundings while still protecting sensitive areas. Engaging visitors in resource management activities would be a priority, including demonstrations of resource management techniques such as inventory and monitoring. Sensitive resources would continue to be protected through both direct and indirect visitor use management practices. A direct management action might involve a regulation, such as limiting group size in certain sensitive areas. An indirect management practice could include an educational program designed to inform visitors about uses that could impact sensitive resources.

Cultural Resources

The documentation and protection of cultural resources would continue. Interpretation of cultural resources would be enhanced and focused on the broader human history of the valley as a travel corridor, telling the stories of prehistoric, historic, and current uses of area. Demonstrations of cultural resource projects, such as archeological investigations, would be used to engage park partners and visitors. Additional visitor contact space in Mammoth Lakes could provide new opportunities to display museum collections.

As in alternative B, the monument would consider additional and intra-agency co-location opportunities for museum collection storage, preferably on the eastern side of the Sierra at Manzanar National Historic Site or Death Valley National Park. Public access to museum collections would be provided through rotating interpretive displays at the new interpretive location in Mammoth Lakes, as well as via online and virtual options.

Climate Change and Sustainability

As with the other alternatives, the monument would continue to participate in NPS, interagency, and regional efforts to understand the effects of climate change on resources, assets, and visitor opportunities and develop adaptation strategies for the monument and watershed to address anticipated changes to resources and infrastructure. The monument would continue to implement its Climate Action Plan.

The monument would also increase opportunities for visitors to engage in hands-on and distance learning opportunities pertaining to climate change research being conducted in the monument.

Wilderness

The monument would continue to preserve wilderness character in designated wilderness. Providing an outstanding introductory wilderness experience for visitors would be the priority. Enhancing opportunities for primitive and unconfined recreation, as well as minimizing development within or visible from wilderness would contribute toward this goal. Specific changes described above under Rainbow Falls would be designed to enhance these wilderness qualities. The monument would refrain from building new trails in wilderness, except for the purpose of resource protection (e.g. rerouting). Signs would be limited; primarily small mileage marker or orientation signs at trail junctions. Naturalness, solitude and the untrammeled quality of designated wilderness would also be preserved.

Visitor Experience

Visitors would continue to enjoy the range of recreational experiences that have traditionally been available within the monument, with an increased emphasis on self-discovery and opportunities to connect with nature. Traditional, low-impact recreation such as camping, day-hiking, backpacking, fishing, private stock use, bird watching, wildlife viewing, bird watching, and sightseeing would continue to be available.

The monument would partner with the USFS and others to create an interagency multi-modal trail plan, exploring opportunities for increased connectivity to locations within and outside of the watershed. The plan would examine the potential for new or enhanced trails, accessibility, trailheads, and parking, as well as new opportunities for a variety of trail users, including hikers, stock users, and bicyclists.

The monument would partner with the USFS, to the extent possible, to provide a higher level of personal ranger contact in campgrounds throughout the valley,

improve visitor experience in campgrounds, and remove sites from sensitive areas where possible.

Interpretation, Education, and Information

Interpretation, education, and information would continue to be guided by the Long Range Interpretive Plan. The monument would emphasize information and orientation strategies that facilitate visitor connections to resources within and outside of the monument, especially wilderness. As a gateway or introductory wilderness experience for many visitors, the monument would continue to use techniques, programs, and media conducive to preserving wilderness character and a traditional, rustic built environment within the monument. As described above under Mammoth Lakes, enhancement of the NPS presence in the Town of Mammoth Lakes would allow the monument to explore more high-tech techniques, programs, and media outside of the valley. The visitor contact station, along with potential use of the USFS cabin at Pumice Flat (See *Pumice Flat* below), would expand the monument's ability to deliver educational programming in multiple locations and in different seasons. This presence in town would enable the monument to reach audiences with diverse backgrounds and needs, including those who do not actually visit the monument.

Transportation and Facilities

Level and Character of Development

No major new facilities would be constructed in the monument, aside from replacement facilities due to damage or loss, or small, sensitively designed improvements. New facilities could include new trails and picnic areas, primarily within the existing footprint of the developed area. The monument would adopt design guidelines that help to provide a consistent visitor experience across boundaries, preserve wilderness character, and protect the traditional and rustic style of infrastructure that harmonizes with the natural setting.

Transportation and Access

The monument would improve delineation of parking in the day use area and campground, particularly around sensitive riparian areas to halt the gradual growth of parking areas through encroachment. As described above, a comprehensive site design or development concept plan (DCP) would be completed for the campground and day use area. See Common to All Alternatives for descriptions of the ongoing and continuing efforts to maintain the shuttle system, invest in maintenance of NPS current roads, and collaborate with the USFS on exploring funding opportunities for maintenance of the Reds Meadow Valley road.

Facilities, including Employee Housing

Some facilities within the monument would be removed, with a net loss in the number of assets (See *Devils Postpile NM Developed Area* above). The monument would continue to co-locate facilities with the USFS to enhance operational efficiency of agencies managing the watershed. As described above, under Mammoth Lakes, the monument would seek to enhance its presence at the Inyo National Forest campus. This additional space would serve administrative office space needs as well as visitors.

The monument would strive to partner with others in Mammoth Lakes (e.g. Mammoth Mountain, USFS) to meet short-term housing needs above the monument's minimum required occupancy, with a goal of increasing housing availability for most seasonal and temporary employees in Mammoth Lakes. The USFS and NPS could partner to explore opportunities for an interagency dorm if adequate housing for seasonal and temporary employees is not available in the Town of Mammoth Lakes.

Concessions Operations and Commercial Services

No concessions operations would be added to the monument. The monument would continue to allow appropriate commercial uses, under permit. Commercial services in designated wilderness would be limited to the extent necessary to realize the recreational purposes of wilderness (See *Appendix D: Determination of Extent Necessary*). Consistent with this extent necessary determination, commercial stock day use at Rainbow Falls may continue at levels currently permitted by the U.S. Forest Service from their trailhead (1440 day rides per season) in realization of the purpose of wilderness.

Outreach and Partnership Programs

The monument would expand its efforts to form and participate in partnerships that help introduce people to the monument and the valley, particularly those that connect visitors with nature and wilderness. Civic organizations, trail-related organizations (such as MLTPA, PCT, JMT), American Indian tribes,

Mammoth Mountain, and the Town of Mammoth Lakes are examples of potential partnerships.

The monument would seek to expand its use of the Service First authority to form lasting, creative, and meaningful agreements with the USFS for collaborative management of the monument, valley, and watershed to increase operational efficiency and provide consistent, high-quality experiences for visitors to the watershed. Many of the recommendations listed in the Recommendations for the Inyo National Forest section below are opportunities for Service First collaboration in areas of mutual interest.

MANAGEMENT ZONES APPLIED TO ALTERNATIVE C

The management zones for alternative C would be applied to monument lands to identify an area's predominant use and desired future conditions. Specific boundaries of the management zones are provided in the map for alternative C. The management zones are explained in further detail in Table 3.1. The following description identifies the locations and details for the application of management zones in alternative C. Zoning applications outside of the monument boundary on U.S. Forest Service lands are recommendations only.

Front Country Zone

- A 400 foot corridor centered along Reds Meadow Road.
- A 400 foot corridor around roads in developed areas in Reds Meadow Valley including:
    - The Devils Postpile NM entry road, campground, ranger station and adjacent day use area, and the NPS operations area
    - Minaret Vista
    - U.S. Forest Service campgrounds
    - Pumice Flat
    - West shore of Sotcher Lake
    - Reds Meadow Resort
- In some developed areas where roads and parking lots are directly adjacent to wetland/meadows, these areas are included in the sensitive resource management zone. This includes areas in Agnew Meadows and Minaret Falls campgrounds.
- Portions of Wildland Urban Interface Zones, on U.S. Forest Service lands, when those portions occur outside of designated wilderness areas or sensitive resource management zones.

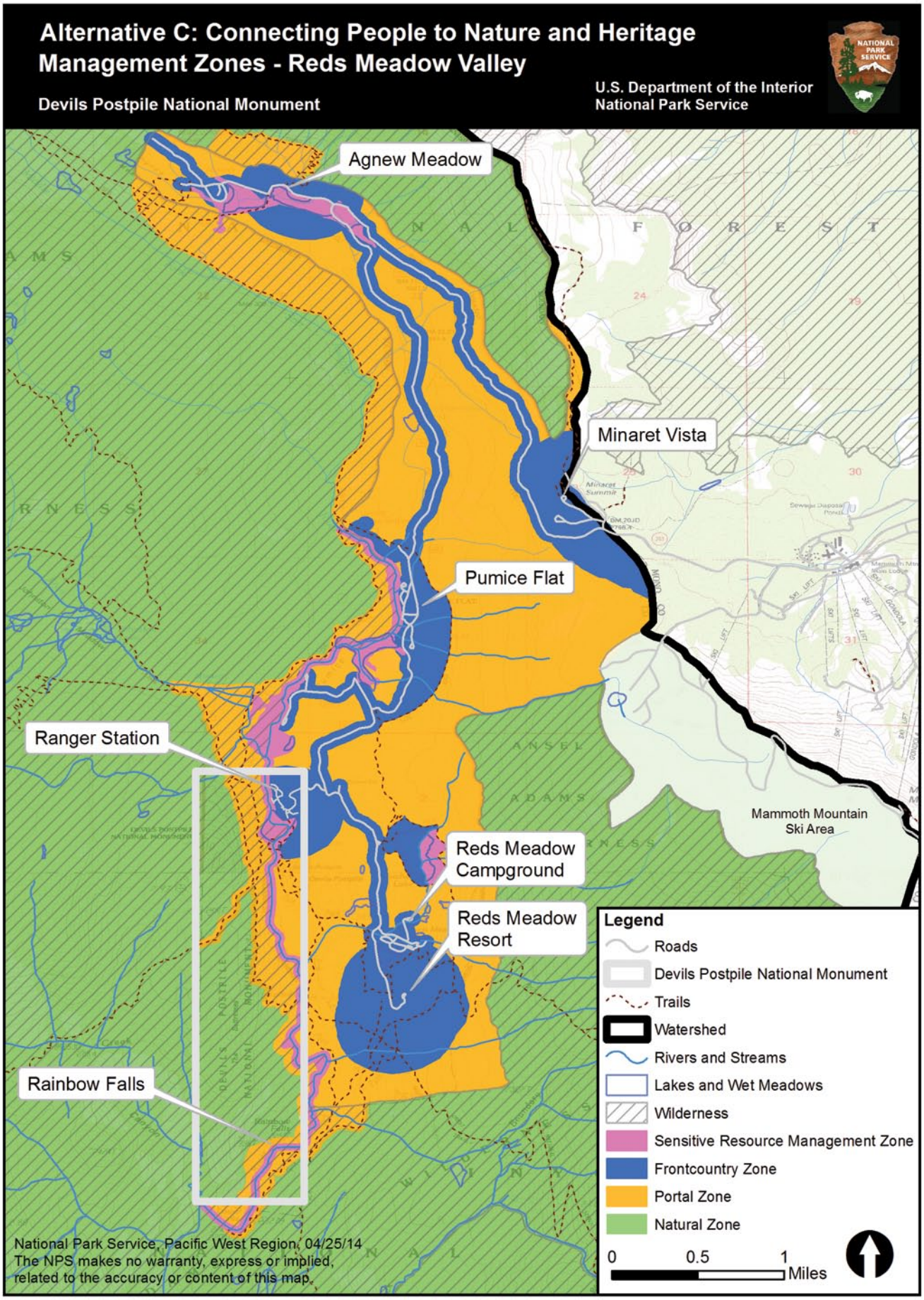
Sensitive Resource Management Zone

- A 200 foot corridor centered on the Upper Middle Fork of the San Joaquin River from Upper Soda Springs Campground to Lower Rainbow Falls.
- Wetland/meadow areas in Reds Meadow Valley. Areas include Soda Springs, Agnew Meadows, and the wet meadow areas west of Pumice Flat and south of Minaret Falls Campground.
- The east side of Sotcher Lake, from the access trail on the east to where the creek/drainage enters and exits the lake is included in this zone.

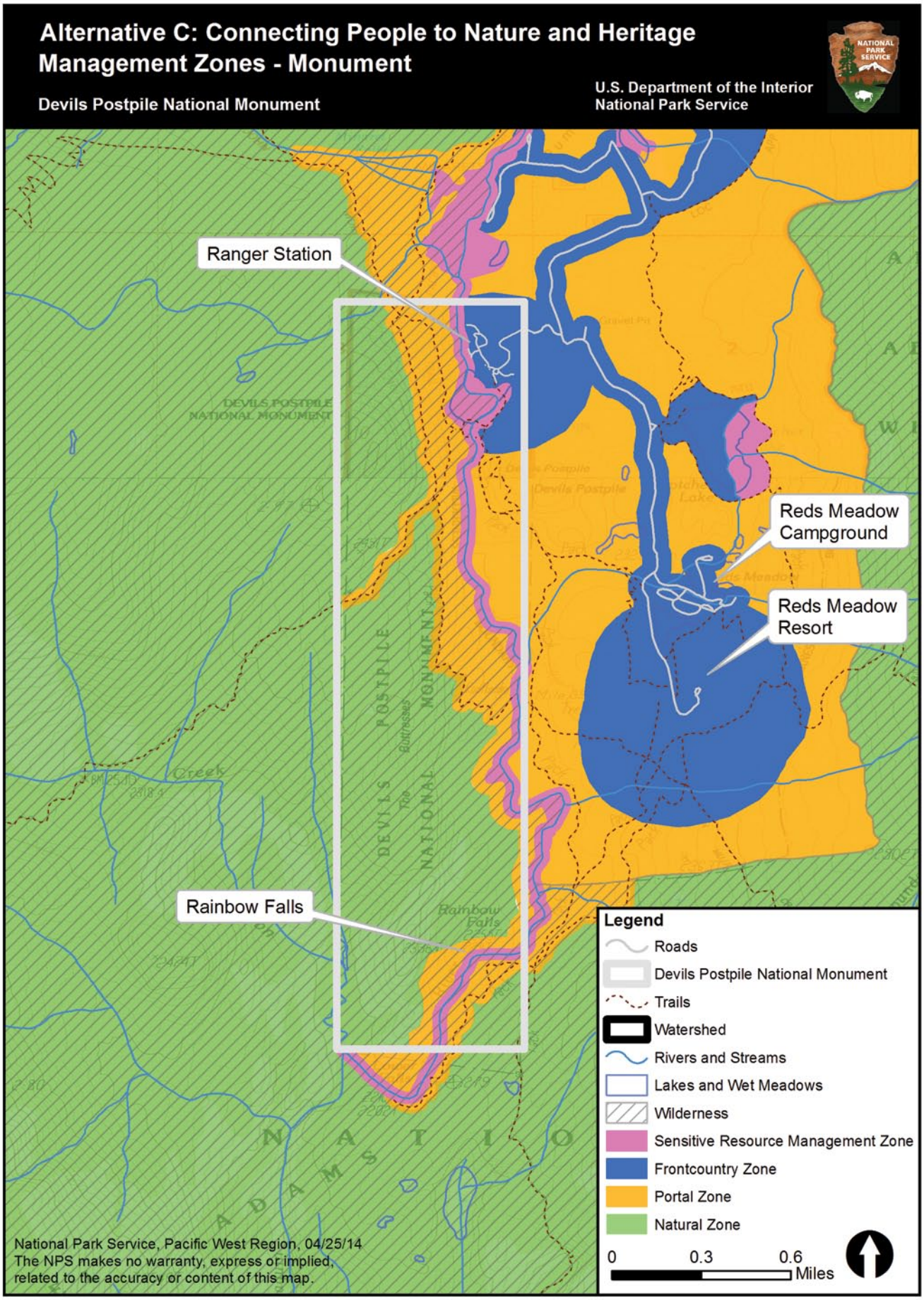
Portal Zone

- All non-wilderness areas with the exception of frontcountry and sensitive resource management zoned areas. This includes the Postpile viewing area.
- In designated wilderness:
    - A 100 foot corridor centered on the Pacific Crest Trail from the Agnew Meadows pack station to the monument where it merges with the John Muir Trail. Wilderness areas west of this corridor extending to the frontcountry and sensitive resource management zoned areas.
    - A 100 foot corridor around the John Muir Trail from Minaret Falls, through the monument, to the frontcountry zone at Reds Meadow Resort. The 100 foot corridor continues east of the frontcountry zone to where the trail enters wilderness again.
    - The area bounded by Minaret Falls, the John Muir Trail, the Pacific Crest Trail, and the monument's northern boundary.
    - A 100 foot corridor centered on the trails to Rainbow Falls and Lower Rainbow Falls, including the Rainbow Falls viewing areas and stock trail. Also includes areas between the stock trail and main trail to Rainbow Falls.
    - A 100 foot corridor centered on Kings Creek trail within the monument.
- Areas within the monument extending east of the Pacific Crest/John Muir Trails to the sensitive resource management zone along the Middle Fork of the San Joaquin River.
- South of the Pacific Crest/John Muir Trails within the monument, a 100 foot buffer extending west of the sensitive resource management zone along the Upper Middle Fork of the San Joaquin River from John Muir Trail to Lower Rainbow Falls.

MAP 3.9: ALTERNATIVE C - ZONING - VALLEY



MAP 3.10: ALTERNATIVE C - ZONING - MONUMENT



Rainbow Falls main trail and stock-use trail outside of the frontcountry zone.

Natural Zone

- All other designated wilderness areas not zoned portal/transition.

RECOMMENDATIONS TO THE INYO NATIONAL FOREST

These recommendations were developed by the interagency team comprised of staff from the NPS and Inyo NF. They are only recommendations and could be modified, rejected, or adopted in future Inyo NF planning.

Minaret Vista

Minaret Vista would continue to be one of the most outstanding and accessible views in the Sierras, where visitors can drive to a location that gives a sense of the watershed and the Sierra landscape as well as views into the Ansel Adams and John Muir Wildernesses, Devils Postpile NM, and Yosemite NP. The NPS and USFS would collaborate on an improved site plan for Minaret Vista to better integrate the viewpoint with the rest of the experience in Reds Meadow Valley.

Minaret Vista would continue to be a primarily self-guided experience. No new visitor contact facilities would be proposed at this location. A new site design would strive to relocate the parking area and restrooms away from the viewing platform to provide better separation between the viewing and interpretive areas and the supporting infrastructure. A new interpretive trail that improves accessibility could also be added, providing an enhanced visitor experience for people at the Vista.

The new site design would evaluate adding a shuttle stop at Minaret Vista. Currently not included as a stop on the mandatory shuttle route, Minaret Vista could be included as shuttle stop #1, allowing visitors on the shuttle an opportunity to experience the viewpoint without having to seek alternative modes of transportation to the site. The placement of the shuttle stop would consider the efficiency of the overall shuttle route, and could be located closer to the road with a trail that links to the viewing area.

A new entrance sign could be located on Minaret Summit Road, on the approach to Minaret Vista. The sign, designed to evoke a sense of arrival to this particular landscape similar to other national park system entrance signs, could introduce visitors to both Reds Meadow Valley and Devils Postpile NM and provide visitors with a photo opportunity.

Pumice Flat

Pumice Flat would continue to provide individual and group camping opportunities for visitors to Reds Meadow Valley. Given its central location and relatively level terrain outside of the floodplain, the USFS and NPS could partner to explore opportunities for joint maintenance needs at Pumice Flat while retaining existing recreational opportunities such as the group camping site.

With a goal of increasing operational efficiency and collaboration between the agencies, the USFS would partner with the NPS to explore replacement the monument's current deficient facility with a small interagency, multi-purpose maintenance facility in the vicinity of the Pumice Flat Campground. This facility would primarily serve the maintenance needs in the valley of both agencies and would replace the current small and inadequate maintenance facility in the monument. Some multi-purpose and maintenance staff office space could also be included. The facility would be sited to provide adequate separation from the existing amphitheater. The NPS and USFS could also explore other locations for the joint maintenance facility provided that areas which are relatively level, outside of the floodplain, and centrally located that are available within the valley.

The existing group camp sites could be relocated to other campgrounds in the valley. Alternatively, new group camp sites could be created at Pumice Flat, preferably on the other side of the road in closer proximity to the river.

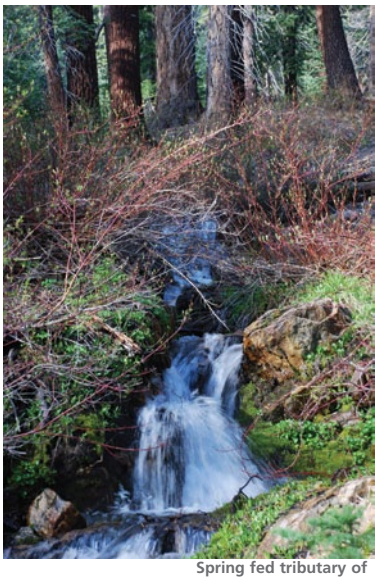
The USFS could also partner with the NPS to repurpose the Pumice Flat cabin, as well as the site immediately surrounding the cabin, to support group activities for schools, students, researchers, volunteers, tribes, and other special use groups. The cabin would be adaptively reused, with interior improvements designed to accommodate classroom learning, and other group uses. The area surrounding the cabin could be made available to those groups for day and/or overnight use.

Boundary Creek Junction

The NPS interpretive panels currently at Rainbow Falls would be relocated out of designated wilderness to the trail junction near Boundary Creek, just before visitors enter wilderness. These interpretive panels would be located near existing interpretive information. The interpretive area at the junction would remain small in scale and would not detract from the existing low-development character of the trail.

Agnew Meadows

The range of services and activities at Agnew Meadows and its function as a primary launch point into wilderness and onto the Pacific Crest Trail would be continued. The campground could be redesigned to improve parking, pull roads and parking away from meadows, better orient day users and provide walk-in camping. The shuttle stop could be improved to provide water, as well as information that orients both day users and overnight visitors and introduces wilderness concepts.



Spring fed tributary of San Joaquin River (USFS), *NPS Photo*

Reds Meadow Guard Station and Bathhouse

The Reds Meadow guard station and bathhouse would continue to be managed as cultural resources. These structures are among the valley's most important cultural resources and could be highlighted as places to visit. Inviting additional day users to the area, however, could impact the existing campground nearby. The USFS could partner with the monument to build an interpretive trail, on which the guard station and bathhouse would be located, with a focus on the history of human use and occupation in the valley. The trail could be designed to maintain separation between day-use and overnight visitors to the area.

Additional signs or interpretive panels around the guard station would be avoided to maintain the historic character of the area which is very similar today to when the guard station was originally occupied. The guard station could be part of a self-guided interpretive experience that tells the history of the site.

A historical interpretive trail could bring and connect more people to these cultural resources while providing minimal disruption to the adjacent campground. A formal group area for programming or special uses could also be provided in the vicinity of the guard station, in conjunction with the campground, to provide new visitor opportunities but maintain the historic quality of the area.

Sotcher Lake

Continue to improve parking, day use, and trail connections at Sotcher Lake and protect the wetland resources along the east of the lake. The USFS could consider tools, such as the installation of boardwalks, to maintain access to the east of the lake while enhancing protection of sensitive wildlife species.

BOUNDARY MODIFICATIONS

The NPS would seek a minor boundary adjustment to the monument that would include the main trail corridor connecting Devils Postpile and Rainbow Falls, for the purpose of simplifying and consolidating management of this high-use trail, incorporating the entire stretch of the river between the northern and southern boundaries of the monument, and including additional areas of the Postpile geologic formation. The monument would continue to provide access on trails within this area as they are part of an extensive trail network that supports popular visitor opportunities and provides important access to a larger landscape and recreation experience beyond the monument. The monument would also strive to maintain the John Muir Trailhead parking lot which provides an efficient access point to this popular area. No additional facilities are included in the boundary adjustment. See Appendix B for a more detailed analysis and recommendation.

Considering the watershed's nationally significant resources, its scenic grandeur, and its history of protection, the monument recommends that a complementary USFS National Monument be established to include the entirety of the Upper Middle Fork of the San Joaquin River watershed. Under such a designation, the USFS would continue to manage the new monument under USFS laws, regulations, and policies, without impacts to currently permitted activities or existing designations. Working

in collaboration, Devils Postpile National Monument and the new USFS national monument could provide visitors an integrated experience, highlight nationally significant resources throughout the watershed, and increase the public visibility of the watershed.

ESTIMATED COSTS

Cost estimates for alternative C are identified on the next pages in Tables 3.7 and 3.8. The costs shown here are not for budgeting purposes; rather, they are only intended to show a relative comparison of costs among the alternatives.

Implementation of the approved plan will depend on future funding. The approval of this plan does not guarantee that the funding and staffing needed to implement the plan would be forthcoming. Full implementation of the actions in the approved general management plan would likely take many years.

TABLE 3.7: DEVILS POSTPILE GMP ALTERNATIVE C IMPROVEMENT COSTS

Project Description	Category Note: Costs are net construction in 2012 dollars				Deferred Maintenance Offset
	Facility Repair/ Rehabilitation	New Construction	Resource Management	Planning	
Phase I Projects					
Remodel Devils Postpile Ranger Station *	$311,000				$4,000
Replace/Relocate maintenance facility in the valley (joint USFS)		$2,592,000			$493,000
Redesign campground/day use area	$379,000				$102,000
Complete a Resource Stewardship Strategy and Research Agenda			$50,000		
Develop a baseline inventory of the Postpile geologic formation			$20,000		
Subtotal Phase I	$690,000	$2,592,000	$70,000		$599,000
Total Phase I	$3,352,000				$599,000
Phase II Projects					
Redesign Rainbow Falls to improve Wilderness character			$498,000		$24,000
Adaptive reuse of operations and housing facilities	$1,311,000				$238,000
Site improvements for visitor contact in Mammoth Lakes at Inyo NF facilities		$311,000			
Develop an interagency multi-modal trail plan				$150,000	
Study improved accessibility alternatives for Postpile Trail				$35,000	
Subtotal Phase II	$1,311,000	$311,000	$498,000	$185,000	$262,000
Total Phase II	$2,305,000				$262,000
Phase III Projects					
Redesign Minaret Vista (joint USFS)	$1,316,000				
Update and protect Devils Postpile viewing areas			$34,500		$8,000
Subtotal Phase III	$1,316,000		$34,500		$8,000
Total Phase III	$1,350,500				$8,000
Total One-Time Improvement Costs	**$7,007,500**				
Total Deferred Maintenance Offset	**$869,000**				

One time Capital Costs

Alternative C would consist of improvements to facilities and structures described previously in the alternative. Similar to previous alternatives, there would be projects related to facility improvements, enhanced resource protection, and improvements to the visitor experience although there are differences in the way these projects would be implemented. Highlights include the replacement of the maintenance facility within the valley, adaptive reuse of existing operations and housing facilities, improvements to the existing ranger station and campground, enhancements to wilderness character with projects at Rainbow Falls, and opportunities to improve the visitor experience in partnership with the Inyo NF at Minaret Vista. Projects that are considered "common to all alternatives," such as the development of a Resource Stewardship Strategy, are also included.

Projects are identified in three phases. Phase I projects would be pursued first and they include the most critical facility and resource protection needs. Phase II and Phase III projects address a range of facility repair and rehabilitation needs, enhancements to wilderness character, and improvements to the visitor experience. The total estimated one-time costs for Phase I projects is $3,352,000. The total estimated one-time costs for Phase II projects is $2,305,000. The total estimated one-time costs for Phase III projects is $1,350,500. The estimated one-time costs for Alternative C is $7,007,500 and the total deferred maintenance offset would be $869,000.

Staffing

Implementation of Alternative C would require additional staffing for increased monitoring and resource protection, new interpretive and educational programming and outreach, additional maintenance needs, and administrative support. In many instances, additional FTE are the result of extending less than full time positions longer into the season, or full time, in order to fulfill reporting requirements, proposal development and project management, and hiring and training seasonal workers.

Implementation of alternative C requires an additional 4.5 FTE for a total of 13 FTE.

TABLE 3.8: ALTERNATIVE C (NPS PREFERRED ALTERNATIVE) STAFFING

Park Management Division	Alternative A (No Action) Base/ Project (FY12)
Administrative and Management	2.5 FTE/ 0 FTE
Resource Management	2.25 FTE/ 1 FTE
Interpretation and Education	2.5 FTE/ 1 FTE
Facilities and Maintenance	1.75 FTE /.5 FTE
Visitor Protection	1.5 FTE/ 0 FTE
Total Positions	10.5 FTE Base
	2.5 FTE Project
TOTAL FTE	13
Total Staffing Costs	$843,000

Annual Operating Costs

This alternative would be implemented with an additional 4.5 FTE. The additional staffing would add approximately $404,000 for salaries and operational support. Additional operations and maintenance costs related to capital investments would be $50,000. The monument would also require approximately $95,000 annual for leasing additional space from the Inyo National Forest in the town of Mammoth Lakes. The total annual operating cost for alternative C would be approximately $1,173,000.

TABLE 3.9: SUMMARY OF ALTERNATIVES

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
CONCEPT		
This alternative proposes continuation of current management and serves as a baseline for comparison.	This alternative proposes greater emphasis on managing and promoting visitor understanding of the monument in the context of a larger watershed. Visitor experiences outside of the monument would be emphasized to a greater degree. Development in the monument and valley would be minimal.	This alternative emphasizes key features with national significance for resource protection and connecting visitors with nature and heritage, including traditional park experiences in a natural setting. The monument and the corridor from Minaret Vista down through Reds Meadow Valley are managed as a gateway to a greater wilderness and additional emphasis will be placed on connections and partnerships with the Inyo National Forest and the Town of Mammoth Lakes.
MAMMOTH LAKES		
The monument would continue to co-locate administrative offices in their current location, on the Inyo National Forest Mammoth Lakes campus.	The monument would continue to co-locate administrative offices in their current location, on the Inyo National Forest Mammoth Lakes campus.	Enhances NPS presence in the Town of Mammoth Lakes, with expanded space for visitor services, exhibits, and improved accessibility. The NPS operational presence in the Town of Mammoth Lakes would be enhanced to provide additional space for visitor orientation, interpretation, education, exhibits, and improved accessibility. Existing space would be leased, preferably near the Mammoth Lakes Welcome Center on the Inyo National Forest campus.
DEVILS POSTPILE NM DEVELOPED AREA – RANGER STATION, PARKING, AND DAY USE AREA		
Maintains the existing visitor contact/ranger station in its current location. Existing building would remain approximately 580 sq. ft. and would continue to serve as both a visitor contact station and ranger station with basic operational office space. Retains the shuttle bus stop and parking area in its current configuration. Improvements for safety and accessibility would be implemented within the existing structure.	Retains the existing visitor contact/ranger station, while rehabilitating it for improved accessibility. Maintains the existing ranger station but removes operational functions and rehabilitates the building for visitor use only, improving functionality and ADA access. The building would be raised to mitigate flood hazards, if its rustic character can be maintained. Expands the exterior deck space around the ranger station to improve visitor circulation. The shuttle bus stop and parking area would be redesigned to improve parking and circulation for shuttle buses, cars and pedestrians, reduce visual impacts, and restore riparian areas.	Retains the existing visitor contact/ranger station and provides additional exterior deck space. Retain the existing ranger station in the valley and expand the deck to provide improved ADA accessibility and additional outdoor space for interpretation. Retain the current basic operational office space. The building would be raised to mitigate flood hazards, if its rustic character can be maintained. Expands the exterior deck space around the ranger station, with an information window, to improve visitor circulation. The shuttle bus stop and parking area would be redesigned to improve parking and circulation for shuttle buses, cars and pedestrians, reduce visual impacts, and restore riparian areas.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
DEVILS POSTPILE NM DEVELOPED AREA – CAMPGROUND		
Maintains the existing monument campground and supporting infrastructure in place. Modest improvements to improve circulation, restore impacted areas, and protect riparian habitat and riverbanks could occur over time.	Removes the monument campground and converts it to a day use area. Convert the Devils Postpile NM campground to day use and cooperate with the USFS to provide replacement campsites elsewhere in the valley.	Removes some campsites that are limiting general public access along the riverfront, converts additional campsites to walk-in sites, and strives to maintain camping capacity in the monument. Continue to make improvements to the camping experience in Loop A through adjustments to site design, better site delineation, and continued vegetation restoration where feasible. The sites in Loop B immediately adjacent to the river would be removed and Loop B would be redesigned for walk-in users only. Riparian areas are restored and day use opportunities along the river are improved. Additional walk-in campsites would be installed, if possible, to maintain current campground capacity. Separation between car camping, day use, and walk-in camping would be a primary design factor. Provide clear delineation of specific river access points in the campground and day use area to better protect riparian areas and manage visitor access to and use of the riverfront.
DEVILS POSTPILE NM DEVELOPED AREA – OPERATIONS AREA		
See *Operations Facilities and Housing* below		

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
DEVILS POSTPILE NM DEVELOPED AREA - MAINTENANCE FACILITY		
Construct a new facility within the monument to serve NPS maintenance needs. Once a new facility was constructed, the existing maintenance shop would be removed.	The monument would seek to work collaboratively with the USFS to adaptively reuse the Pumice Flat cabin as an interagency maintenance shop. The monument would locate the remainder of the NPS maintenance and storage needs to the town of Mammoth Lakes, preferably co-located with partners such as the USFS. Once the monument's maintenance operations and functions are relocated to Pumice Flat and other locations, the existing maintenance shop would be removed. If a mutually agreeable arrangement with the USFS cannot be negotiated, the monument would implement Alternative A and pursue replacement of the maintenance shop with a new maintenance facility within the monument boundary.	Work collaboratively with the USFS to develop a new interagency, multi-purpose maintenance facility on forest lands in the valley, preferably on an already disturbed location such as the Pumice Flat Group Campground area. The monument would relocate the majority of its maintenance operation and storage needs to the new interagency facility. The facility would also include offices for maintenance staff and a multi-purpose space. If a location such as the campground was selected, the NPS and USFS would work to find an alternative campground location, preferably with proximity to the river, in order to maintain overall camping capacity within the valley. Once the monument's maintenance operations and functions are relocated to the new interagency facility, the existing maintenance facility would be removed. If a mutually agreeable arrangement with the USFS cannot be negotiated, the monument would implement Alternative A and pursue replacement of the maintenance shop with a new maintenance facility within the monument boundary.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	The USFS would partner with the monument to adaptively reuse the Pumice Flat cabin for shared maintenance needs. Small equipment storage buildings and maintenance work areas would be developed around the Pumice Flat cabin for minimal maintenance needs.	The USFS would partner with the NPS to construct a small interagency, multi-purpose maintenance facility in the valley, preferably in the vicinity of the Pumice Flat Group Campground, to serve the support needs for operations and maintenance in the valley of both the NPS and USFS. The facility could also include maintenance staff office space and a multi-purpose space. Existing group camping sites could be relocated to other campgrounds in the valley, or by creating a new group camp at Pumice Flat, preferably on the west side of the road and in better proximity to river access. The site design should strive to locate the maintenance facility on a site that provides adequate separation from the existing amphitheater to avoid visitor use conflicts

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
PUMICE FLAT CABIN		
No change	See Devils Postpile NM Developed Area – Maintenance Facility above	If approved by the USFS, the monument would partner to adaptively reuse Pumice Flat cabin and the site around the existing cabin to support group activities (school groups, students, researchers, volunteer groups, tribal groups or other special use groups).
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	See *Devils Postpile NM Developed Area – Maintenance Facility* above	The USFS would partner with the monument to adaptively reuse Pumice Flat cabin and the site around the existing cabin to support group activities (school groups, students, researchers, volunteer groups, tribal groups or other special use groups).
OPERATIONAL FACILITIES		
In Mammoth Lakes, the monument would continue to co-locate offices with the USFS. The monument would continue to use a portion of the ranger station, Cabin 1, and Cabin 5 for office space	Lease administrative office space (no enhanced visitor services) in Mammoth Lakes, co-located with the USFS, if possible. In the monument, remove operational buildings from the edge of the meadow, such as Cabin 5, the SAR cache, and the temporary fee collection facility. Formally convert Cabin 1 and 5 to operational functions. Remove operational functions from the ranger station and relocate to other buildings.	Lease administrative office space (with enhanced visitor services) in Mammoth Lakes, co-located with the USFS, if possible. Some maintenance office space would be provided at the Pumice Flat maintenance facility, if approved by the USFS, reducing some needs in the monument. Formally convert Cabin 1 and 5 to operational functions.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	Partner with the monument to provide additional office space in Mammoth Lakes on the Inyo National Forest campus.	Partner with the monument to provide additional office space in Mammoth Lakes on the Inyo National Forest campus.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
HOUSING		
Current employee housing would remain primarily in the monument. Some seasonal employees would continue to seek housing each summer in Mammoth Lakes.	Maintain a minimum core presence in Devils Postpile NM, within existing facilities, for resource protection, emergency facility needs, and visitor safety. Tent cabins could be used for visiting researchers or volunteers. Remove excess housing from the Devils Postpile NM administrative area. Strive to partner with entities in Mammoth Lakes for additional short-term housing needs (i.e. Mammoth Mountain Ski Area, USFS) for seasonal and temporary employees.	Maintain an overnight staff presence in the monument that is consistent with minimum staffing requirements commensurate with the programs and services being offered. Tent cabins could be used for visiting researchers or volunteers. Locate an administrative campground in the valley, either in the monument or in the vicinity of the replacement Pumice Flat maintenance facility, if built, to provide space for temporary work crews and separation from visitors Strive to partner with entities in Mammoth Lakes for additional short-term housing needs (i.e. Mammoth Mountain Ski Area, USFS) for seasonal and temporary employees.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	No change	Partner with the monument to provide camping for temporary work crews in the vicinity of the replacement Pumice Flat maintenance facility, if built, to provide space for temporary work crews and separation from visitors. The USFS and NPS could partner to explore opportunities for an interagency dorm if adequate housing for seasonal and temporary employees is not available in the Town of Mammoth Lakes.
MINARET VISTA (USFS)		
Continue to partner with the USFS to improve interpretive information and the visitor experience as opportunities arise.	Same as A, plus: Partner with the USFS to accomplish the recommended improvements, if approved (see below).	Same as A, plus: Partner with the USFS to accomplish the recommended improvements, if approved (see below).

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management **(Alternative A)**	**Watershed Emphasis** **(Alternative B)**	**Connecting People to Nature and Heritage** **(Preferred Alternative)**
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	Redesign Minaret Vista to become a primary destination and focus of visitor activities Build a small visitor contact station that can be seasonally staffed with some interior exhibit space and improved exterior information. Relocate and redesign parking and restrooms to separate facilities from the viewing area and improve the viewing experience. Improve transit compatibility. Provide a bus stop, turn-around, and ability to accommodate possible transit transfers into the valley and to the Town of Mammoth Lakes. Create new trails, including a connection to the Pacific Crest Trail and a short, accessible, interpretive loop trail. Improve signage on the road and create a clear portal and sense of entry at Minaret Vista to the experience beyond in the valley.	Modest enhancements to Minaret Vista help connect this special destination to the overall visitor experience and introduce people to the wild setting in the valley and beyond. Improve exterior exhibits for self-guided interpretation and as a potential staging area for interpretive programs. No regularly staffed kiosk or contact station would be constructed. Exhibits could interpret watershed themes among other stories. Relocate and redesign parking and restrooms to separate facilities from the viewing area and improve the viewing experience. Improve transit compatibility and provide a bus stop at the vista. Create new trails, including a connection to the Pacific Crest Trail and a short, accessible, interpretive loop trail. Improve signage on the road and create a clear portal and sense of entry at Minaret Vista to the experience beyond in the valley.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
DEVILS POSTPILE		
Maintain the current viewing platforms and information available at the bottom of the Postpile. Continue to provide a picnic area near the Postpile and improve the site design to address access, erosion and cultural site protection. Maintain the current viewing opportunities at the top of the Postpile that provide for direct visitor contact with the dome, the shapes of the Postpile formations and glacial polish.	Continue to provide visitors with a viewing opportunity of the Postpile and information on the significance of the feature but minimize the amount of waysides and signage. Continue to provide a picnic area near the Postpile and improve the site design to address access, erosion and cultural site protection. Maintain an area at the top of the Postpile to provide direct visitor contact with the dome, the shapes of the columns, and glacial polish. Truncate or shorten the trail at the top of the Postpile to provide added resource protection for the glacial polish.	Continue to provide visitors with quality viewing opportunities of the Postpile and maintain the general size of the viewing area at the base of the Postpile. Enhance the experience at the base of the Postpile through several small site improvements. Redesign the picnic area to reduce inadvertent resource impacts and provide additional interpretation of the history of the area, including the cabin remnants, but with minimal infrastructure or wayside additions. Maintain an area at the top of the Postpile to provide direct visitor contact with the dome, the shapes of the columns, and glacial polish. Maintain the trail at the top of the Postpile in its current alignment and implement a suite of resource protection and active visitor use management measures to preserve other areas of glacial polish, such as signage and trail borders to keep people on designated trails. Develop a baseline inventory and increase active protection of glacial polish of the top of the Postpile and on other glacial features in the monument to understand resource conditions and inform future management actions.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management **(Alternative A)**	**Watershed Emphasis** **(Alternative B)**	**Connecting People to Nature and Heritage** **(Preferred Alternative)**
RAINBOW FALLS AND WILDERNESS		
Maintains trail in current alignment and retains the structures and associated infrastructure at Rainbow Falls Retain the log stairs on the trail and the rock stairs to the base of the falls Retain interpretive panels Retain trail alignments Maintain viewing platform sizes and character Retain hitching post in its current location	**Redesigns trail to promote wilderness qualities and a sense of discovery.** Remove log stairs and realign the trail away from the cliff edge and reduce visual extents, creating more of a wilderness quality trail and sense of discovery to and at Rainbow Falls. Remove interpretive panels from wilderness. Maintain viewing platform sizes and character. Consider removing the cement stairs to the base of the falls. Remove stock hitching post from current location and relocate a tie up for private stock use at a smaller scale away from the immediate proximity of the viewing area and potentially outside of wilderness.	**Redesigns facilities at Rainbow Falls to promote wilderness qualities and a sense of discovery.** Maintain current trail alignment to minimize crowding; soften the trail design and edges and remove the log stairs to create more of a wilderness trail design and promote a greater sense of discovery and arrival to Rainbow Falls. Remove interpretive panels from wilderness. Partner with the USFS to replace panels outside of wilderness at the Boundary Creek trail junction. Maintain viewing platform sizes and character. Maintain safe visitor access to the river at the base of the falls. Enhance the separate trail for stock to better separate stock and pedestrian use.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	No change	Partner with the monument to: 1) construct a small interpretation and orientation portal at the Boundary Creek trail junction before visitors enter wilderness, and 2) explore trail realignment to separate pedestrian and stock use.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management **(Alternative A)**	**Watershed Emphasis** **(Alternative B)**	**Connecting People to Nature and Heritage** **(Preferred Alternative)**
BOUNDARY AND ADDITIONAL DESIGNATIONS		
Maintain the existing monument boundary Continue to collaborate with the USFS on issues as needed	Maintain the existing monument boundary. Expand cooperative management of similar resource areas through local USFS designations or agreements, notably for areas that include the geologic and other resources associated with Devils Postpile and Rainbow Falls, to promote complementary visitor management and resource protection in these areas.	Seek a boundary adjustment to the monument that includes the river, the main trail corridor connecting Devils Postpile and Rainbow Falls, and additional portions of the Postpile formation, for the purpose of resource protection and consistent recreation management along the connecting trail. Expand cooperative management of similar resource areas through local USFS designations or agreements to promote enhanced resource protection of features associated with Devils Postpile and Rainbow Falls that are outside the monument's boundary. Recommend a complementary USFS National Monument be established to include the UMFSJ Watershed. This designation would be in recognition of the nationally significant resources, visitor experiences, and scenic grandeur of the Minarets and the UMFSJ watershed. The NPS would continue the management of Devils Postpile NM consistent with the NPS mission of science, visitor enjoyment, and preservation. The USFS would continue to manage its lands under USFS laws, regulations and policies. The new designation would not affect other designations or permitted activities.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	Expand cooperative management of similar resource areas through local USFS designations or agreements, notably for areas that include the geologic and other resources associated with Devils Postpile and Rainbow Falls, to promote complementary visitor management and resource protection in these areas.	Same as B, plus: Collaborate with the NPS to agree upon a boundary adjustment that puts more of the Devils Postpile formation, Rainbow Falls trail, and the river into the monument's jurisdiction while not adversely affecting USFS operations.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management **(Alternative A)**	**Watershed Emphasis** **(Alternative B)**	**Connecting People to Nature and Heritage** **(Preferred Alternative)**
AGNEW MEADOWS (USFS)		
RECOMMENDATION TO THE INYO NATIONAL FOREST		
Continue the range of services and activities at Agnew Meadows including camping, hiking, stock use, and day use. Agnew Meadows would continue to serve as a primary launch point into wilderness and connection with the Pacific Crest Trail.	Continue the range of services and activities at Agnew Meadows and its function as a primary launch point into wilderness and connection with the Pacific Crest Trail. Explore opportunities to improve the interface between parking and the meadow and sensitive riparian areas. Improve the shuttle stop to provide improved information and orientation for entry into the wilderness and Pacific Crest Trail.	Continue the range of services and activities at Agnew Meadows and the function as a primary launch point into wilderness and connection with the Pacific Crest Trail. Consider a redesign of the campground area to improve parking and trailhead connectivity and access as well as minimize resource impacts. Improve the shuttle stop to provide improved information and orientation for entry into the wilderness and Pacific Crest Trail.
REDS CABIN GUARD STATION AND BATHHOUSE (USFS)		
RECOMMENDATION TO THE INYO NATIONAL FOREST		
Continue existing documentation and preservation activities for Reds Meadow Guard Station and Bathhouse.	Continue existing documentation and preservation activities for Reds Meadow Guard Station and Bathhouse. Avoid additional signs or interpretive panels around the cabin but include the feature as part of a self-guided interpretive trail that tells the history of the site.	Same as alternative B, plus: The Reds Meadow Guard Station and Bathhouse would connect to an interpretive trail that tells a series of stories about the history of human use and occupation of the valley. Consider formalizing a gathering area for programming or special uses in the vicinity of the guard station. Consider trail alignments that provide access to the site while limiting conflicts and crowding between day use visitors and overnight campers.
SOTCHER LAKE (USFS)		
RECOMMENDATION TO THE INYO NATIONAL FOREST		
Maintain existing facilities at Sotcher Lake such as parking, picnic area, and trails.	Continue to improve parking, day use, and trail connections at Sotcher Lake. Consider tools such as the installation of boardwalks to maintain access to the lake but enhance protection of wetland species.	Same as alternative B

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
NATURAL RESOURCES		
Continue current resource management activities.	Implement a watershed approach to resource management, expanding and prioritizing interagency collaboration and coordination in more areas of watershed management. Natural resources would continue to be protected to a high degree with an emphasis on unimpeded natural processes in the watershed. Protect natural resources through visitor use management strategies that may be more passive or indirect, such as siting facilities and infrastructure to avoid sensitive resources, rerouting trails, etc.	Natural resources would continue to be protected to a high degree. Provide visitors with more direct access to resources in order to connect with the natural surroundings while still protecting sensitive areas. Protect sensitive resources through direct and indirect visitor use management strategies, including fencing, to minimize impacts. Emphasize demonstrations of resource management techniques, such as inventory and monitoring, social trail rehabilitation, and invasive plant removal, to engage visitors with natural resource management activities.
CULTURAL RESOURCES		
Continue to document and protect cultural resources and prepare appropriate National Register nominations.	Continue to document and protect cultural resources and focus interpretation of cultural resources on National Register listed and eligible properties in the watershed.	Continue to document and protect cultural resources and focus interpretation of cultural resources on the broader human history of the valley as a travel corridor. Emphasize demonstrations of cultural resource projects, such as archeological investigations, to engage visitors with cultural resource management activities.
MUSEUM COLLECTIONS		
Museum collections would continue to be stored within the monument, at Sequoia/Kings Canyon and Yosemite National Parks, or other NPS locations. Continue to follow direction provided by the Curatorial Facilities Strategy (May 2006) that calls for consolidating collections at Sequoia/Kings Canyon National Park until the Manzanar National Historic Site proposal to construct a curatorial facility at the Eastern California Museum is complete.	Consider additional and intra-agency co-location opportunities, preferably on the eastern side of the Sierra at Manzanar National Historic Site or Death Valley National Park – note: Manzanar is a future facility while Death Valley has already been expanded. Maintain some small collections storage for non-sensitive items in the Town of Mammoth Lakes in conjunction with NPS administrative space. Provide some access to museum collections via virtual options.	Same as alternative B, plus: Provide some exhibit space for rotating museum collections as part of interpretive displays in Mammoth Lakes.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management **(Alternative A)**	**Watershed Emphasis** **(Alternative B)**	**Connecting People to Nature and Heritage** **(Preferred Alternative)**
CLIMATE CHANGE		
Continue to participate in NPS, interagency, and regional efforts to understand the effects of climate change on natural and cultural resources, natural processes, recreation demands, operations and facilities and develop adaptation strategies for the monument and watershed to address anticipated changes to resources and infrastructure. Continue to interpret knowledge related to climate change to the public.	Same as A.	Same as A, plus: Increase opportunities for visitors to engage in hands-on and distance learning opportunities pertaining to research being conducted in the monument.
WILDERNESS		
Continue to manage wilderness for the qualities of wilderness character.	Minimize imprint of humans and maximize the natural qualities of wilderness. No new facilities in wilderness and maximize removal of existing facilities that are non-conforming. No new trails in wilderness. No or very limited new signs, primarily small orientation signs at trail junctions.	Provide an outstanding introductory wilderness experience for visitors. Enhance opportunities and access for wilderness recreation while still minimizing development. Limited new trails could occur in wilderness within the monument, primarily for the purpose of resource protection. No or very limited new signs, primarily small mileage marker or orientation signs at trail junctions.
WILD AND SCENIC RIVER		
Continue to ensure that no management actions would adversely affect the values that qualify the river for inclusion in the National Wild and Scenic Rivers System. Recommend that Congress designate the portions of the Middle Fork of the San Joaquin River within Devils Postpile NM as a wild and scenic river under the Wild and Scenic Rivers Act (See *Appendix E)*.	Same as A.	Same as A.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
VISITOR EXPERIENCE		
Visitor experiences would continue to include a range of recreational experiences that are compatible with the traditional park experience.	Visitor experiences would continue to include a range of recreational experiences that are compatible with protecting the watershed. Emphasis would be placed on traditional, low-impact recreation such as camping, day-hiking, backpacking, birdwatching, wildlife viewing, fishing, and sightseeing. Interpretation and education programs and media emphasize themes related to the watershed scale and the role of Devils Postpile NM within the watershed. Interpretive and educational messages at Minaret Vista focus on the watershed while messages at Devils Postpile NM focus on the role of the monument within the watershed	Visitor experiences would continue to include a range of traditional recreational experiences that have traditionally been available within the monument, with an increased emphasis on self-discovery and opportunities to connect with nature. Emphasis would be placed on traditional, low-impact recreation such as camping, day-hiking, backpacking, birdwatching, wildlife viewing, fishing, and sightseeing while also exploring opportunities for increased trail connections. Interpretation and education programs and media emphasize themes related to corridors and connectivity as well as the role of the area as a gateway to a broader wilderness. More hands-on engagement for visitors in a wider variety of program areas.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	Partner with the NPS to provide increased interpretation and education at Minaret Vista.	Same as NPS actions, but on a valley scale.
VISITOR INFORMATION AND INTERPRETATION		
The monument would continue to implement the Long Range Interpretive Plan, including helping monument visitors to understand and appreciate the connection between monument resources and the region.	Same as A, plus: Most facilitated learning would occur outside of the valley, at locations such as Minaret Vista and Mammoth Lakes. Opportunities for self-directed learning and discovery would be provided in the valley.	Same as A, plus: A greater emphasis on information and orientation to facilitate visitor connections to a wide variety of opportunities and resources, including wilderness.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	See *Devils Postpile NM Developed Area – Maintenance Facility* above	The USFS would partner with the monument to adaptively reuse Pumice Flat cabin and the site around the existing cabin to support group activities (school groups, students, researchers, volunteer groups, tribal groups or other special use groups).

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management **(Alternative A)**	**Watershed Emphasis** **(Alternative B)**	**Connecting People to Nature and Heritage** **(Preferred Alternative)**
CURRICULUM-BASED EDUCATION		
The monument would continue to implement the Long Range Interpretive Plan, including providing science-based learning opportunities for youth and working with partners and researchers to gather and share information.	Same as A, plus: Educational programming would occur outside of the valley, at locations such as Minaret Vista and Mammoth Lakes, and would be focused on the role of the watershed locally and regionally.	Same as A, plus: Access for audiences with diverse backgrounds, needs, and interests would be enhanced through delivery of educational programming in multiple locations, including Mammoth Lakes and the monument.
CONCESSIONS OPERATIONS AND COMMERCIAL SERVICES		
No concessions operations would be added to the monument. The monument would continue to allow appropriate commercial uses, under permit. Commercial services in designated wilderness would be limited to the extent necessary to realize the recreational purposes of wilderness (See *Appendix D: Determination of Extent Necessary*). Consistent with this determination, commercial stock day use at Rainbow Falls may continue at levels currently permitted by the U.S. Forest Service from their trailhead (1440 day rides per season).	Same as A.	Same as A.
OUTREACH AND PARTNERSHIP PROGRAMS		
Continue current outreach and partnership initiatives. Continue to rely on Sequoia National History Association for bookstore at the Devils Postpile ranger station.	Same as A, plus: Expand partnerships in areas related to landscape-scale watershed management.	Same as A, plus: Expand work with partnerships that help introduce people to the monument and valley and provide them with opportunities to connect with nature and wilderness. Examples include the Mammoth Lakes Trails and Public Access Foundation (MLTPA), Scholarly Pursuits, California Schools, and the Town of Mammoth Lakes.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
HIKING AND HIKING TRAILS		
Maintain the current number of trails, existing trail alignments, and trail uses.	Conduct a study to evaluate the range of alternatives and feasibility of making the entire trail from the ranger station to Devils Postpile more accessible to a wider variety of users. Consolidation of trails or realignment of trails could occur based on resource protection needs and focused on avoiding sensitive riparian areas and reducing turbidity.	Partner with the USFS to create an interagency multi-modal trail plan. Conduct a study to evaluate the range of alternatives and feasibility of making the entire trail from the ranger station to Devils Postpile more accessible to a wider variety of users. Trails would be designed to blend in with natural surroundings and existing trails could be realigned and revegetated to harmonize better with surrounding nature. Existing trails may also be realigned to better protect resources.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	Limited new trails could occur in the watershed.	Partner with the monument to create an interagency multi-modal trail plan to evaluate long-term trail connections and opportunities in the valley, including the possibility of a valley loop trail linking sites throughout the valley. New trails and improved trail connections between destinations, campgrounds, and supporting infrastructure, as well as to the town of Mammoth Lakes would be emphasized.
BICYCLING		
Bicycling would continue to be allowed in existing locations primarily along the road corridor.	Same as A.	Same as A, plus: Develop an interagency multi-modal trail plan to evaluate long-term trail connections and opportunities in the valley, including a potential dedicated trail and other improvements for bicycles and wheelchairs.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
CAMPING AND CAMPGROUNDS		
Existing campgrounds would remain in their current configurations.	Remove the Devils Postpile NM campground and convert the site to a day use area with restoration of riparian vegetation.	The monument would maintain an overnight campground in the valley while redesigning a portion of the campground to improve riverfront access for all visitors. Loop B would be redesigned to accommodate walk-in camping. Monument would partner with the USFS to improve camping opportunities in the valley, provide quality visitor experiences, and remove sites from sensitive areas where possible, notably riparian areas. Monument would partner with the USFS to separate types of overnight camping to reduce recreation conflicts and improve visitor experiences, either within individual campgrounds or across campgrounds in the valley. Monument would partner with the USFS to provide a higher level of personal ranger contact in campgrounds throughout the valley.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	The USFS would strive to maintain existing camping capacity in the valley by providing increased camping opportunities at other locations in the valley. Campgrounds would be reassessed to protect riparian and wetland habitat and riverbanks. This could include removal or realignment of campsites, notably sites out of sensitive riparian and wetland habitat. Any additional replacement overnight camping would be located away from sensitive riparian and wetland habitat. Additional camping would be low impact with minimal intrusion on resources and scenery.	Expand partnership with the NPS to improve camping opportunities throughout the valley, provide integrated visitor experiences, separate types of camping, increase the level of personal ranger contact in campgrounds, and remove sites from sensitive areas where possible, notably riparian areas.

SUMMARY OF ALTERNATIVES		
No Action / Continue Current Management (Alternative A)	**Watershed Emphasis (Alternative B)**	**Connecting People to Nature and Heritage (Preferred Alternative)**
LEVEL AND CHARACTER OF DEVELOPMENT		
Existing facilities and trails would remain and continue to be maintained, including minor improvements to visitor facilities.	Development in the monument would be minimized. Any future facilities would be small in scale, sustainable, sited to protect sensitive resources, and sensitively designed (screening, rustic style, etc.) to enhance the feeling of being in the wild/ in nature. Future facilities would be focused outside of the valley at locations such as Minaret Vista and Mammoth Lakes.	Development in the monument would be minimized. Any future facilities would be small in scale, sustainable, sited to protect sensitive resources, and sensitively designed (screening, rustic style, etc.) to enhance the feeling of being in the wild/ in nature.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	New facilities would be focused outside of the valley at locations such as Minaret Vista and Mammoth Lakes. Any future facilities would be small in scale, sustainable, sited to protect sensitive resources, and sensitively designed (screening, rustic style, etc.) to enhance the feeling of being in the wild/ in nature	No major new facilities would be constructed in the valley. Any future facilities would be small in scale, sustainable, sited to protect sensitive resources, and sensitively designed (screening, rustic style, etc.) to enhance the feeling of being in the wild/ in nature
ROADS AND PARKING		
Continue to invest in maintaining current monument entrance road. Improve delineation of parking	Same as A, plus: Improve delineation of parking in the monument to protect resources, particularly around sensitive riparian areas.	Same as alternative B, plus: Develop an interagency multi-modal trail plan which considers parking needs including shoulder seasons when the shuttle does not run. Improve delineation of parking in the monument to protect resources, particularly around sensitive riparian areas.
RECOMMENDATION TO THE INYO NATIONAL FOREST		
No change	Roads and parking areas could be realigned to better protect and restore watershed resources. Improve delineation of parking in the valley to protect resources, particularly around sensitive riparian areas.	Partner with the monument to create an interagency multi-modal trail plan which includes parking needs Roads and parking areas could be realigned to better protect and restore watershed resources. Improve delineation of parking in the valley to protect resources, particularly around sensitive riparian areas.

TABLE 3.9A: SUMMARY OF COSTS FOR IMPLEMENTING ALTERNATIVES

	No Action / Continue Current Management (Alternative A)	Watershed Emphasis (Alternative B)	Connecting People to Nature and Heritage (Preferred Alternative)
Annual Operational Costs			
Total Annual Operational Costs	$624,000	$1,046,500	$1,173,000
Total Staffing (FTE)	8.25	12.75	13
One-time Costs			
Phase 1 Costs	$1,311,000	$2,799,000	$3,352,000
Phase 2 Costs	-	$2,735,500	$2,305,000
Phase 3 Costs	-	$1,505,000	1,350,500
Total One-time Costs	**$1,311,000**	**$7,039,500**	**$7,007,500**
Deferred Maintenance Offset	**$599,000**	**$869,000**	**$869,000**

TABLE 3.10: SUMMARY OF IMPACTS

The following discussion summarizes impacts of all alternatives considered, in accordance with the National Environmental Policy Act. The full analysis of impacts is included in Chapter 5, "Environmental Consequences."

SUMMARY OF IMPACTS		
Alternative A (No Action)	**Alternative B**	**Alternative C (Preferred)**
GEOLOGIC RESOURCES		
Minor and unknown adverse impacts due to social trails and continuing visitor use in localized areas. Beneficial effects from continuing protection and education.	Same as alternative A, except: Reconfiguration of day use area and minor construction would have negligible impacts due to location. Additional beneficial effects from truncating trail at the top of Devils Postpile, reducing foot traffic on glacial polish.	Same as alternative B.
SOIL RESOURCES		
Minor adverse impacts due to social trails and continuing visitor use in localized areas.	Same as A, except: Minor to moderate short-term adverse impacts, with overall long-term beneficial impacts, due to reconfiguration of day use area, construction activities at Pumice Flat cabin, and minor construction. Beneficial effects through visitor capacity standard monitoring.	Same as alternative B, except: Minor short-term, negligible long-term impacts from construction of a joint maintenance facility. Additional environmental analysis required.

SUMMARY OF IMPACTS

Alternative A (No Action)	Alternative B	Alternative C (Preferred)
BIOLOGICAL RESOURCES		
Minor to moderate adverse impacts due to continuing visitor use, including social trails, trampling, and stock use. Small populations of nonnative species would continue to be present in the monument and would potentially spread to new developed areas, a minor to moderate impact. Beneficial impacts from ongoing treatment and eradication of nonnative species and habitat improvement.	Same as alternative A, except: Greater beneficial effects from an focus on interagency management, watershed scale planning, trail redesign, and restoration activities. Some minor adverse impacts due to Pumice Flat cabin adaptive reuse and day use reconfiguration.	Same as alternative B, except: No beneficial effect from campground removal and minor adverse effect from joint maintenance facility (additional environmental analysis will be required).
HYDROLOGIC SYSTEMS AND PROCESSES		
Negligible to minor adverse impacts from ongoing erosion related to facilities, operations, and visitor use.	Short term adverse impacts due to removal and construction activities associated with the campground, parking, and ranger station areas would be minor and localized. Long-term beneficial impacts due to watershed management approach, removal of buildings next to the meadow, trail redesign,	Same as alternative B, except: No beneficial effect from campground removal and minor adverse effect from joint maintenance facility (additional environmental analysis will be required).
SOUNDSCAPES		
In developed areas, soundscapes experience minor to moderate, adverse impacts depending on increases or decreases in visitor use levels, shuttle frequency, and maintenance activities when machinery is used. Much of the wilderness in the monument is susceptible to unintentional operational and visitor use noise impacts because of its proximity to developed areas.	Minor to moderate short-term adverse impacts due to short-term reconfiguration and construction activities. Long-term beneficial impacts due to removal of some maintenance functions from the monument.	Same as alternative B, except: No beneficial effect from campground removal and moderate adverse effect from joint maintenance facility (additional environmental analysis will be required).
ARCHEOLOGY		
Resources adjacent to or easily accessible from trails or day-use areas would continue to be vulnerable to surface disturbance, inadvertent damage, and vandalism. Continuing site condition assessments and archeological surveys would be beneficial No adverse effect under Section 106 of the NHPA.	Same as alternative A, except: Improvements to the ranger station facilities, conversion of the campground to day use, and construction related to the redesign of the parking and shuttle stop areas that could affect previously unidentified archeological resources. No adverse effect under Section 106 of the NHPA.	Same as alternative B, with some increase in beneficial impacts, plus: Potential minor adverse effects from construction of a joint maintenance facility No adverse effect under Section 106 of the NHPA.

SUMMARY OF IMPACTS		
Alternative A (No Action)	**Alternative B**	**Alternative C (Preferred)**
HISTORIC SITES, STRUCTURES, BUILDINGS, LANDSCAPES		
Negligible to minor adverse impacts. Cumulative impacts would be localized and minor. No adverse effect under Section 106 of the NHPA.	Same as alternative A. Would include improvements to the ranger station facilities, conversion of the campground to day use, and construction related to the redesign of the parking and shuttle stop areas that could affect the integrity of the ranger station, if the ranger station is determined to be eligible for listing in the National Register. However, these changes would be designed and constructed to meet the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings, avoiding adverse impacts.	Same as alternative B, with the additional potential for adverse effects to historic properties of religious and cultural significance to Indian Tribes if any such resources exist on lands proposed for inclusion in the monument as part of a boundary adjustment.
MUSEUM COLLECTIONS		
Minor adverse impact, which would likely be mitigated.	Same as alternative A, with increased beneficial impacts when collections are moved to a shared facility outside of the monument.	Same as alternative B.
WILDERNESS CHARACTER		
Negligible to moderate adverse impacts.	Same as alternative A, with some additional beneficial impacts	Same as alternative B.
SCENIC RESOURCES		
Existing minor impacts from equipment and storage containers visible from the entry road and developed area and from operational structures visible from Soda Springs Meadow and the ranger station would continue.	Short-term moderate adverse impacts due to reconfiguration and construction. Multiple long-term beneficial impacts due to campground removal, zoning, day use reconfiguration, relocation of maintenance functions, minimizing signage and waysides.	Same as alternative B, except: No benefical impacts from campground removal.
ACCESS AND ORIENTATION		
Minor to moderate adverse impacts and beneficial impacts due to ongoing maintenance, improvement, and use patterns.	Same as alternative A with some short-term minor impacts due to construction and day use reconfiguration. Also, minor to moderate potential impacts due to visitor capacity standards and management actions. Increased beneficial impacts due to trail realignments and improvements, accessibility study, boundary adjustment.	Same as alternative B with increased beneficial impacts due to interagency multi-modal trail planning, and provision of orientation services in Mammoth Lakes.

SUMMARY OF IMPACTS

Alternative A (No Action)	Alternative B	Alternative C (Preferred)
VISITOR USE OPPORTUNITIES		
Hiking, sightseeing, fishing, private equestrian use, bird watching, wildlife viewing, and camping in the developed campground are common activities and would continue to be available in alternative A. Support for the continuation of these traditional activities was strongly voiced in the public comments received during the preparation of the GMP. Visitor use opportunities are greatly enhanced by the continuation of these activities.	Same as A, except: Beneficial effects from enhancement of ranger station, proposed boundary adjustment, wild and scenic river findings. Moderate adverse impact from removal of the campground (partially alleviated by other nearby camping opportunities).	Same as alternative B, but without removal of the campground and a greater emphasis on improving visitor opportunities through partnerships.
INTERPRETATION AND EDUCAITON		
Continuing beneficial effects due to programming, but minor to moderate adverse impacts due to limitations on staffing and exhibit space.	Proposed improvements would greatly improve exhibit space and interpretive opportunities in the monument while also providing more opportunity for informal ranger contact. Several seasonal interpretive positions would be added, allowing the monument to seek to maintain current levels of visitor understanding while enhancing its outreach and education programs. Alternative B would result in limited, but overall beneficial impacts on the provision of interpretation and education.	Same as alternative B. In addition, an expanded NPS presence in Mammoth Lakes would provide additional space and increased capacity for visitor services, exhibits, education, orientation, and accessibility. The monument's ability to reach non-visitors would greatly increase through an in-town presence.
SOCIOECONOMICS		
Road access, recreational opportunities, and facilities would remain relatively unchanged, and would therefore provide a continuation of economic opportunities, tax revenues, and jobs.	The expansion of partnership efforts proposed in this alternative could help to bring sustained visitation to the area, resulting in a beneficial impact to the local and regional economies. Increased spending related to staffing would result in beneficial impacts to the local economy.	Same as B, plus: The development of an interagency maintenance facility in the valley and increased office space in Mammoth Lakes would contribute to the local economy.
MONUMENT OPERATIONS		
Moderate adverse impacts due to lack of operational and administrative space, campground management.	Beneficial effects due to staffing increases, increased operational space, and removal of the campground	Similar to alternative B, except that the campground would not be removed and greater beneficial impacts due to increased working space in Mammoth Lakes.

Section 106 Summary

Section 106 of the National Historic Preservation Act (16 USC 470 e seq.) requires (1) that federal agencies consider the effect of their projects on historic properties (including archeological resources) eligible for the National Register of Historic Places, and (2) that agencies give the Advisory Council on Historic Preservation and the state historic preservation office an opportunity to comment on projects.

As required by section 110 of the National Historic Preservation Act, federal land management agencies survey cultural resources on lands under their jurisdiction and evaluate these resources by applying criteria for the National Register of Historic Places. A number of surveys, inventories, and studies have been completed or are ongoing, and further resource evaluation and documentation will continue in Devils Postpile NM.

At this time, there is not enough information to identify an undertaking-determined area of potential effect or make a determination of effect consistent with section 106 of the National Historic Preservation Act of 1966 (as amended, 16 U.S.C. 470-470w-6) for the actions related to historic properties. Undertakings that have the potential to affect resources eligible for or listed in the National Register of Historic Places, such as any ground disturbing construction activities or modifications to the ranger station, will fulfill all procedural requirements specified in 36 CFR 800 (as amended in August, 2004). As more information is available, NPS staff will continue to consult with the SHPO and traditionally associated American Indian tribes and groups.

In the interim, no historic properties would be inalterably changed without consultation with the State Historic Preservation Office, traditionally-associated Amercan Indian tribes and groups, and the Advisory Council on Historic Preservation, as appropriate. Archeological sites would be protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. When such disturbance is unavoidable, appropriate treatment would follow in consultation with the California State Historic Preservation Office and American Indian tribes with traditional associations in the monument.

Visitor Capacity

General management plans are required to identify and implement user capacities for all areas of a national park unit. The National Park Service defines visitor capacity as the type and level of visitor use that can be accommodated while sustaining desired park resource conditions and achieving desired visitor experiences consistent with the purpose of a national park unit. The overall strategy of implementing a visitor capacity program is a tiered approach of monitoring indicators and managing to standards and conditions. At the general management plan level of decision making, desired resource conditions are maintained and desired visitor experiences are achieved through the use of management zone prescriptions. Visitor capacity includes managing all components of visitor use (levels, types, behavior, timing, and distribution). Visitor capacity is discussed for each management zone, including an identification of indicators that may be monitored and a range of actions that may be taken when indicators are not showing progress towards meeting desired conditions.

With any use on public lands comes some level of impact that must be accepted. Therefore, it is the responsibility of the National Park Service to decide what level of impact is acceptable and what actions are needed to keep impacts within acceptable limits. Instead of just tracking and controlling user numbers, the NPS park superintendent and staff manage the levels, types, behaviors, and patterns of visitor use and other public uses as needed to protect the condition of the resources and quality of the visitor experience. The monitoring component of this visitor capacity process helps test the effectiveness of management actions and provides a basis for informed adaptive management of public use.

The visitor capacity process for national park units typically involves the following steps:

- identify desired conditions for resources and visitors
- identify indicators (measures to monitor for determining whether desired conditions are being met)
- identify standards (condition limits) for the indicators
- monitor indicators
- take management actions to ensure that standards are met
- evaluate and make adjustments based on new information and lessons learned

General management plans provide a broad approach to addressing visitor capacity, identifying desired conditions for resources and visitors and focusing more specific monitoring and management on areas where action is most likely needed to achieve conditions. Implementation-level plans, such as a future wilderness management plan, would provide more specific direction for addressing visitor capacity.

The last steps of visitor capacity decision making, which continue indefinitely, are monitoring the indicators and standards and taking management actions to minimize impacts when needed. NPS staff would monitor indicators to determine if standards were being exceeded using techniques that could include non-systematic monitoring of visible impacts to trails or resources as part of regular and volunteer patrols, establishing systematic trail and resource assessments, reviewing special permit requests, and reviewing general information collected with respect to visitor trends, parking problems, vandalism, accidents, and visitor complaints.

Visitor capacity decision making is a continuous process; decisions are adjusted based on monitoring the indicators and standards. Management actions are taken to minimize impacts when needed. The indicators and standards included in this management plan would generally not change in the future. However, as monitoring of Devils Postpile NM's conditions continues, managers may decide to modify, add, or delete indicators if better techniques/approaches are found to measure important changes in resource and social conditions. The results of Devils Postpile NM's monitoring efforts, related visitor use management actions, and any changes to indicators and standards will be communicated with a clear rationale that the public can track.

INDICATORS AND STANDARDS

Devils Postpile NM has engaged in a variety of visitor use and impact studies since 2009 (Pettebone et al. 2010; Vezeau et al. 2011; Murdock et al. 2012). The intent of these investigations was to determine the most relevant indicators, standards and monitoring protocols to guide management actions for addressing monument issues. Monitoring protocols are based on Yosemite National Park's Visitor Use and Impacts Monitoring Program (http://www.nps.gov/yose/naturescience/

visitor-use-monitoring.htm) and have provided a significant body of knowledge including visitor use estimates, travel patterns, experience quality evaluations, and the resource impacts created by such activities. Table 3.11 outlines the formal indicators and associated standards to be monitored that will ensure desired conditions for resource and visitor experience quality. This monitoring program identifies indicators that provide the following benefit for management:

- target resource and experiential conditions most susceptible to use impacts (recreation and administrative)
- focus on conditions that are within management control and feasible potential actions
- identify/operationalize a quantifiable way to document conditions that can be replicated.

PRIORITY INDICATORS AND STANDARDS

Table 3.11 describes the user capacity indicators, standards, monitoring and management strategies for Devils Postpile National Monument. This information was developed after careful consideration of key aspects of desired resource conditions and visitor experiences, public scoping information, relevant research studies, staff management experience and other monument data sources. The planning team considered many potential issues and related indicators that would identify impacts of concern, but those described below were considered the most salient given the importance and vulnerability of the resource or visitor experience affected by visitor use.

the related long-term effect on macro-invertebrates. In addition to lint and litter, human waste, glass and other debris also pose a safety and health threat to visitors.

The standards selected for each user capacity indicator listed in Table 3.11 were based on professional management judgment informed by the general management plan's desired conditions, the monument's baseline conditions for each indicator, relevant monument-specific and national research studies, and NPS guidelines and standards.

The monitoring and management strategies included in table 3.11 provide a general description of the range of considerations for future monitoring and visitor management related to each indicator. The implementation of any specific management actions that affect visitor use will comply with the National Environmental Policy Act, the National Historic Preservation Act, and other laws, regulations and policies as needed.

TABLE 3.11: INDICATORS AND STANDARDS

Zone	Indicator	Standard	Monitoring	Potential Management Actions
Indicator 1: Natural resources – Informal trails proliferation				
Sensitive Resource Management Zone: Soda Springs and Meadow	Length and condition class of informal trail area	No increase in length of informal trails from 2010 baseline. No trails will be allowed which are classified to contain some barren ground (index score 2 or 3).	Monitoring will occur every three years. Change will be compared to the baseline conditions.	Visitor education, signage, engineered protection, selective closures, limited access, ecological restoration to remove informal trails.
Sensitive Resource Management Zone: Upper Postpile Area	Length of informal trail area	Reduction in length of informal trails by 25% from baseline. Condition classes not applicable, given the pumice substrates in this area.	Monitoring will occur, at a minimum, every six years. Change will be compared to the baseline conditions.	Visitor education, signage, engineered protection, selective closures, limited access, ecological restoration to remove informal trails.
Sensitive Resource Management Zone: Lower Postpile Area	Length of informal trail area	Reduction in length of informal trails by 5% from baseline. Condition classes not applicable, given the pumice substrates in this area.	Monitoring will occur, at a minimum, every six years. Change will be compared to the baseline conditions.	Visitor education, signage, engineered protection, selective closures, limited access, ecological restoration to remove informal trails.
Sensitive Resource Management Zone: Non-meadow Riparian	Length and condition class of informal trail area	No net increase in the length of informal trails until current baseline has been established. No trails will be allowed which are classified to contain some barren ground (index score 2 or 3).	Monitoring will occur every three to six years. Change will be compared to the baseline conditions.	Visitor education, signage, engineered protection, selective closures, limited access, ecological restoration to remove informal trails.
Indicator 2: Natural resources – Riverbank Condition				
Sensitive Resources Management Zone	California Rapid Assessment Method (CRAM) Condition Classification *	10% of conditions across assessment areas should fall within good condition (class B) as called out in the California Rapid Assessment Method (CRAM). No assessment areas should fall within condition class D (poor).	Purposeful sampling will be deployed to target high use areas, based off existing protocol, repeated every 3-6 years with repeat photography. Ten sampling sites are estimated.	Visitor education, signage, engineered protection, selective closures, limited access, ecological restoration.

Zone	Indicator	Standard	Monitoring	Potential Management Actions
Indicator 3: Natural resources – Wilderness Trail Condition				
Portal Zone:	Trail depth and width	Average wilderness trail conditions will not exceed 183cm (~6ft) wide and 46cm (~1.5ft) depth per trail mile on the east side of the river. Average wilderness trail conditions will not exceed 90cm (~3ft) wide and 30cm (~1ft) depth per trail mile on the west side of the river.	Upfront action is needed to conform to standard, but long-term monitoring should take a 6-9 year cycle.	Visitor education, signage, engineered protection, limited access, selective closures, ecological restoration.
Natural Zone:	Trail depth and width	Average wilderness trail conditions will not exceed 90cm (~3ft) wide and 30cm (~1ft) depth per trail mile.	Upfront action is needed to conform to standard, but long-term monitoring should take a 6-9 year cycle, reporting fits into maintenance and Facility Management Software System.	Visitor education, signage, engineered protection, limited access, selective closures, improved trail delineation or narrowing.
Indicator 4: Cultural resources – Archeological Site Integrity				
All zones: National Register sites with high data potential	Archaeological Site Management Information System (ASMIS) Condition and Threat Classifications **	Sites with high data potential, based on National Register criteria, show no signs of irreparable damage due to visitor activity.	Archeological Site Management Information System (ASMIS) platform of documentation and comparison from baseline, 7-10 year recommended monitoring schedule.	Visitor education, signage, engineered protection, selective closures
All zones: National Register eligible sites	Archaeological Site Management Information System (ASMIS) Condition and Threat Classifications **	At least 35% percent of all other known sites are in stable condition using ASMIS.	Archeological Site Management Information System (ASMIS) platform of documentation and comparison from baseline, 7-10 year recommended monitoring schedule.	Visitor education, signage, engineered protection, selective closures
Indicator 5: Visitor Experience - Trail encounters with other people				
Natural Zone	Encounters per hour (by a trail user)	Wilderness visitors will not experience more than 10 encounters per hour on all wilderness trails west of the river in the monument (inclusive of the John Muir Trail/ Pacific Crest Trail).	Monitor every 3 years for 10-15 days stratified across morning/ afternoon, direction, and season.	Visitor education, signage, engineered protection, limited access, selective closures

Zone	Indicator	Standard	Monitoring	Potential Management Actions
Indicator 6: Visitor Experience - Visitor use levels at Rainbow Falls				
Portal Zone: Main Viewing Platform	Number of people at any one time	Visitation will not exceed 44 people at one time at Rainbow Falls first viewing platform 90% of hours between 8am and 6pm.	Monitoring will occur every 1-3 years; seasonal sampling should range from 10-15 days across the season and stratified across weekend and weekdays.	Visitor education, signage, engineered protection, limited access, selective closures
Indicator 7: Visitor experience – Visitor use levels at Devils Postpile				
Sensitive Resource Management Zone	Number of people at any one time	Visitation will not exceed 26 people at one time at Devils Postpile central viewing platform 90% of hours between 8am and 6pm.	Monitoring will occur every 1-3 years; seasonal sampling should range from 10-15 days across the season and stratified across weekend and weekdays.	Visitor education, signage, engineered protection, limited access, selective closures
Indicator 8: Visitor experience – Wait time at shuttle stops				
Frontcountry Zone	Time between shuttle intervals	Visitors will not wait for buses at shuttle stops including Adventure Center, 6, 9, and 10 more than 30 minutes, 90% of the time.	Monitoring will occur every 1-3 years; seasonal sampling should range from 10-15 days across the season and stratified across weekend and weekdays.	Visitor education, signage, engineered protection, limited access, selective closures

* Methods outlined in detail and applied to a variety of settings at http://www.cramwetlands.org/
** Methods outlined in detail and applied to other National Park Service units at http://www.nps.gov/mwac/aim_pages/asmis1.htm

MONITORING EFFORTS

The monument staff will continue general monitoring of visitor use levels and patterns. In addition, the monument staff will begin monitoring these user capacity indicators. The rigor of monitoring (e.g., frequency of monitoring cycles, amount of geographic area monitored) of the indicators may vary considerably depending on how close existing conditions are to the standards. If the existing conditions are far from exceeding the standard, the rigor of monitoring may be less than if the existing conditions are close to or trending towards the standards.

In addition, the initial phases of monitoring for the indicators/standards defined above will help the monument's staff identify if any revisions are needed. The initial testing of the indicators and standards will determine if the indicators are accurately measuring the conditions of concern and that the standards truly represent the minimally acceptable condition of the indicator. Monument staff may decide to modify the indicators or standards and revise the monitoring program if better ways are found to measure changes caused by visitor use. Most of these types of changes should be made within the first several years of initiating monitoring. After this initial testing period of monitoring indicators and standards, adjustments should not occur unless there is a compelling reason. Finally, if use levels and patterns change appreciably, the monument staff may need to initiate additional monitoring of new indicators to ensure that desired conditions are protected. This iterative learning and refining process is the strength of the NPS user capacity management program, in that it can be adapted and improved as knowledge grows.

Youth group, *NPS Photo*

Environmentally Preferable Alternative

The environmentally preferable alternative is defined as "the alternative that will promote national environmental policy as expressed in Section 101 of the National Environmental Policy Act." Section 101 states that it is the continuing responsibility of the federal government to . . .

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

2. assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;

3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

4. preserve important historic, cultural, and natural aspects of our national heritage; and maintain, wherever possible, an environment which supports diversity, and a variety of individual choices;

5. achieve a balance between population and resource use which would permit high standards of living and a wide sharing of life's amenities; and

6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The Council of Environmental Quality states that the environmentally preferable alternative is "the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources (46 FR 18026 – 46 FR 18038)." According to the NPS NEPA Handbook (DO-12), through identification of the environmentally preferred alternative, the NPS decision-makers and the public are clearly faced with the relative merits of choices and must clearly state through the decision-making process the values and policies used in reaching final decisions.

The environmentally preferable alternative for Devils Postpile National Monument is alternative C: Connecting People to Nature and Heritage, the NPS preferred alternative. This alternative best satisfies the national environmental goals by providing the highest level of protection of natural and cultural resources while concurrently providing for a wide range of neutral and beneficial uses of the environment. This alternative maintains an environment that supports a diversity and variety of individual choices, and it integrates resource protection with an appropriate range of visitor uses and understanding.

Both of the action alternatives (alternative B: Watershed Emphasis and the preferred alternative) would provide a high level of protection of natural resources, although the preferred alternative provides a slightly higher level of protection for cultural resources. In addition, the preferred alternative provides a wider range of visitor opportunities than alternative B, thus better fulfilling criteria 3. The preferred alternative would provide the greatest educational and research opportunities to foster better understanding of the monument's resources, therefore better equipping the monument in fulfilling NEPA criteria 3, 4, and 5.

Alternative A, No Action, while accurately describing the current management direction and best efforts of the staff, fails to satisfy the NEPA requirements outlined above when compared to the action alternatives. A shortage of funding, staff, programs, facilities, and services limits the monument's effectiveness in achieving NEPA criteria 1, 4, and 6.

Actions Considered But Eliminated from Detailed Consideration

The Council on Environmental Quality guidelines for implementing the National Environmental Policy Act (NEPA) requires federal agencies to analyze all "reasonable" alternatives that substantially meet the purpose and need for the proposed action. Under NEPA, an alternative may be eliminated from detailed study for the following reasons [40 CFR 1504.14 (a)]:

- technical or economic infeasibility; the inability to meet project objectives or resolve need for the project

- duplication of other less environmentally damaging alternatives
- conflicts with an up-to-date valid plan, statement of purpose and significance, or other policy; therefore would require a major change in that plan or policy to implement
- environmental impacts too great

The following section describes the alternatives and actions that were considered but eliminated from detailed consideration in the DGMP/EA.

ALTERNATIVE D: FOCUS ON SPECIAL DESTINATIONS

In summer of 2011, the planning team developed four preliminary alternatives for public review. These four alternatives were as follows:

- Alternative A: No Action
- Alternative B: Watershed Emphasis
- Alternative C: Connecting People to Wild Nature
- Alternative D: Focus on Special Destinations

Alternative D: Focus on Special Destinations emphasized key resources and attractions with national significance within the Upper Middle Fork of the San Joaquin River watershed. Improvements to visitor services would be centered on experiences at key destinations, primarily Minaret Vista, Devils Postpile, Rainbow Falls, and Reds Meadow. Active management would be focused on resources with national significance, with more indirect or passive management applied elsewhere.

Discussions and the value analysis process used to identify the preferred alternative resulted in the combination of alternative actions primarily from alternatives C and D to create the preferred alternative. These actions best met the goals for the general management plan. Since many of the components from preliminary alternative D were included in the preferred alternative, alternative D was essentially considered a duplication of other less environmentally damaging alternatives and ultimately dropped from consideration in the DGMP/EA. Specific actions included in preliminary alternative D that were dismissed from further consideration in the DGMP/EA are described below.

AREAS CONSIDERED FOR BOUNDARY MODIFICATION BUT DISMISSED FROM CONSIDERATION

Early in the alternatives development process the planning team explored boundary adjustments as is required by the National Parks and Recreation Act of 1978. Two other boundary adjustment proposals were considered for increased operational efficiency and resource protection. One boundary adjustment option that would have included the full extent of the geologic formations associated with Devils Postpile and Rainbow Falls was considered (approximately 700 acres). This proposed boundary adjustment would include basalt of Devils Postpile and rhyodacite of Rainbow Falls formations covering areas from Minaret Falls Campground to Lower Rainbow Falls. This option was dismissed for several reasons related to duplication and impacts to monument operations. A boundary tied to the geologic formations would not be easily apparent on the ground and could create administrative challenges for enforcement purposes. It was also determined that it was not necessary to include the entire extent of the formations to adequately protect significant resource and enhance public enjoyment, as a large portion lies within the Ansel Adams Wilderness.

Likewise, some public comments suggested that the entire Upper Middle Fork San Joaquin River watershed be included in a proposed NPS boundary adjustment. This option was dismissed primarily because much of the watershed is wilderness and would thus be regulated similarly by either agency and therefore it was not needed to resolve a need or objective identified in the plan.

NEW RANGER STATION/VISITOR CENTER IN THE MONUMENT

Alternative D (considered but dismissed) proposed removal of the existing ranger station and development of a new visitor facility within the monument. Conceptually, the new visitor facility was to be located outside of the floodplain (the extent of which was unknown at the time) within the already impacted, developed area of the monument. The facility, approximately 800-1,000 square feet, would have included administrative space and areas for exhibits. A subsequent analysis of the floodplain within the monument, conducted in 2010/2011, indicated that this would be technically infeasible as most of the developed area of the monument is likely within either the 100 or 500 year floodplain for the Upper Middle Fork of the San Joaquin River. The preferred alternative recom-

mends leasing space in the Town of Mammoth Lakes to provide new opportunities for visitor services and exhibits and on-site modifications to the existing ranger station to better protect the structure from flooding.

DISCONTINUE COMMERCIAL DAY USE IN WILDERNESS AND ASSOCIATED ACTIONS

In the preliminary alternatives, discontinuation of commercial day use was considered under alternatives B and D. Following public review of the preliminary alternatives, the planning team completed an extent necessary determination for commercial day use in wilderness for the monument as directed by law. The finding of that determination was that commercial services in designated wilderness would continue, limited to the extent necessary to realize the recreational purposes of wilderness.

For preliminary alternatives B and D, the stock tie-up area adjacent to the Rainbow Falls viewing platforms used for commercial day use trips were proposed for removal or relocation in response to discontinuation of commercial day use in wilderness. In alternative D, a staging area with a vault toilet, interpretive information, and a stock-tie up area outside of wilderness at Boundary Creek Junction was proposed. These actions were considered to have impacts (on visitor use and scenic resources) too great to justify further consideration. With the extent necessary determination allowing continued commercial day use activities in wilderness to realize the recreational purposes of wilderness, these actions were determined no longer necessary to meet project objectives and were thus removed from further consideration in the GMP/EA.

EMPLOYEE HOUSING AT PUMICE FLAT

Preliminary alternative C included an action to consider locating employee housing at Pumice Flat on the Inyo National Forest in conjunction with relocating the monument's maintenance facility to a USFS location. This action was dismissed from further consideration in favor of further exploration of new employee housing opportunities in Mammoth Lakes, including evaluating options for leasing or providing potential future government housing. Additional construction in the valley was considered more environmentally damaging and technically and economically challenging than other alternatives. Locating housing in Mammoth Lakes was determined to be more operationally efficient and less environmentally damaging than constructing new housing in Reds Meadow Valley. There are high maintenance efforts and costs associated with maintenance and opening housing for seasonal staff each year due to the unpredictability associated with season opening for the valley.

Implementation of the General Management Plan

Once the general management planning process is completed, the selected alternative would become the new management plan for the monument and would be implemented in phases. The monument's strategic plan, business plan, and annual work plans would help develop priorities that would determine how best to implement the general management plan.

Implementation of the actions and developments proposed within the management plan is dependent upon funding available at the time of need. The approval of this general management plan does not guarantee that the funding and staffing needed to implement the plan would be forthcoming.

In addition to funding, implementation of the preferred alternative also could be affected by other factors. More detailed planning and environmental documentation may be completed, as appropriate, before some of the actions would be carried out.

Implementation Plans, Studies, and Design Work

The following list includes some of the implementation plans, studies, and design work that would be needed to implement the preferred alternative, in addition to future planning needs identified during the GMP process but not necessarily linked to implementation.

PLANS AND DESIGNS

- Resource Stewardship Strategy (underway 2014)
- Wilderness Character Narrative, and any additional wilderness stewardship planning requirements that are not satisfied by the GMP or Resource Stewardship Strategy
- Developed area (campground, parking and day use area, ranger station, operational facilities) site plan(s)

- Maintenance facility site plan
- Interagency multi-modal trail plan
- Rainbow Falls trails/site plan
- Postpile trails/site plan
- Short- and long-term research plan(s)
- Service First agreement(s) with the Inyo National Forest

STUDIES AND DATA NEEDS:

- Determination of National Register eligibility of monument cultural resources, including structures and archeological sites
- Baseline inventory of the Postpile formation
- Accessibility study for the Postpile Trail
- Design standards guidelines to maintain and enhance traditional, natural design characteristics of facilities, exhibits, signs, and infrastructure.

A deer crosses Soda Spring Meadow with the Devils Postpile in the background, *NPS Photo*

Chapter Four: Affected Environment

Previous page: Middle Fork San Joaquin River, © Rod Planck

Chapter Four: Affected Environment

This chapter describes the existing environment of Devils Postpile National Monument and the surrounding region. It is focused on monument resources, uses, facilities, and socioeconomic characteristics that have the potential to be affected by the General Management Plan alternatives.

Natural Resources

Geologic and Soil Resources

GEOLOGY OF THE SIERRA NEVADA AND UMFSJ WATERSHED

The majority of the Sierra Nevada is composed of granitic rocks with isolated remnants of the pre-Sierran metamorphosed rocks. These features are well represented in the watershed of the Upper Middle Fork of the San Joaquin River. However, the Sierra Nevada in the vicinity of Devils Postpile National Monument also contains a rich assemblage of relatively young volcanic rocks, including the Devils Postpile itself. The geology of this area is closely linked to the dynamic volcanic geology of Long Valley, directly to the east of the range.

Devils Postpile, *NPS Photo*

Metamorphosed volcanic rocks – rocks that solidified after eruption and were subsequently buried so deeply that their mineralogy and texture were transformed by great heat and pressure – make up about 37% of the exposed bedrock in the watershed, and are the dominant bedrock type in the northern half of the watershed (Huber & Rinehart 1965 and Bailey 1989). About 38% of the exposed bedrock in the watershed is intrusive igneous rock, found primarily in the southern half of the watershed. This bedrock formed from magma that cooled and crystallized within the Earth's crust, and is typical of the Sierra Nevada including rocks such as granite, diorite and gabbro.

About 16% of the watershed's bedrock is recently formed extrusive volcanic rock, formed from magma that cooled on or near the surface, including andesite, dacite, and basalt. These rocks are primarily found along the eastern and southern bounds of the watershed, and include the rocks of the Devils Postpile and Rainbow Falls. About 8% of the watershed is occupied by unconsolidated alluvium, colluvium, talus, and till, all deposited by surficial processes. A small portion (<1%) of the watershed contains glaciated remnants of Bishop Tuff, a welded pyroclastic rock that consolidated hot ash flows that erupted during the collapse of the Long Valley Caldera 760,000 years ago, pouring over the divide and originally filling much of the Middle Fork.

Within the watershed, the metamorphosed rocks in the Upper Middle Fork of the San Joaquin River, including the Ritter Range, are metavolcanic rocks of Mesozoic age. These lavas and tuffs formed a landscape of volcanic fields and shallow lakes during the early to middle Mesozoic. When accelerated subduction caused massive deep-crustal melting in Cretaceous time (95–85 million years ago), the buoyant molten granite magma lifted, tilted, intruded, metamorphosed (heated and recrystallized), and disrupted the volcanic terrain. Since then, the volcanic strata have remained as near-vertical layers that dip steeply west. They are like a great pack of cards, younger to the west, ranging from Triassic near Minaret Summit through Jurassic along Shadow Creek to Cretaceous (~100 Ma) in the Minarets (Hildreth and Fierstein 2014).

The monument and surrounding landscape also evidence many chronologies of geologic events, in "contact zones". Several contacts show young lava flows that often overlie older ones. The line of "contact" between them is an important clue when constructing the history of the land. Because pumice blankets the landscape, it is younger than all the lavas and granites below. Similarly, the basalt of Devils Postpile lies over the andesite of Mammoth Pass, which

in turn is above the dacite of Rainbow Falls. Such relationships allow volcanologists to put eruptions in chronological order without the science of calibrating the age and frequency using radio-isotopic techniques.

GEOLOGY OF DEVILS POSTPILE NATIONAL MONUMENT

Devils Postpile National Monument (Devils Postpile NM) sits in the heart of the Sierra Nevada - the "snowy mountain range"- of California. The Devils Postpile and surrounding landscape gained early recognition as an excellent example of the volcanic and glacial processes that shaped the Sierra Nevada. In the early 1900s, observers including University of California Professor Joseph N. LeConte and U.S. Forest Service engineer Walter Huber recognized the significance of Devils Postpile as a "wonderful natural curiosity" (LeConte 1911), warranting future scientific study that ultimately led to the establishment of the monument in 1911. Since then, the geologic histories of Devils Postpile and the Sierra Nevada increased and were investigated in ever-increasing depth and detail. With each revision, improvements in science lead to better knowledge and new questions that probe deeper into understanding this mountain range and its features.

Although the geology of the monument is integrally linked to that of the Sierra Nevada, it exhibits locally-distinct features, which are evidence of the monument's unusual geologic history within the range. These distinct geologic features include the Devils Postpile, Rainbow Falls, granitic domes, and other evidence of volcanism. A 2009 comprehensive inventory of the geologic resources of the monument detailed these resources and threats to their integrity (Graham 2009). This inventory will soon be updated with the most recent geologic research (Hildreth and Fierstein 2014). The overall condition of these features is very good, though both natural and human threats exist. Exposed geologic features were formed at various times in the past and include the relatively recent Postpile column formation that erupted and solidified about 82,000 years ago.

The Devils Postpile

The Devils Postpile geologic feature is a small part of a single lava flow which cooled in a way that promoted column formation. Columns would have started forming at the flow surface and extended progressively inward as the interior cooled and solidified over about two decades. The formation as we see it today was exposed by the scouring action of glaciers plucking into the hardened flow to reveal the buried columns, unveiling a polished mosaic of polygons on the surface and majestic columns as the glacier melted away. Glaciers are also responsible for the brilliant polish and dome shape that makes the Devils Postpile so unique among the world's other outcroppings of columnar rock.

Analyses and interpretation of the data to determine the age of the Postpile have evolved over time. The most recent studies, which used more precise Argon isotope techniques, found that the Postpile formed about 82,000 years ago (Mahood 2010). . This date places the Postpile flow within an interglacial period between the Tahoe and Tioga glaciations as suggested by many, including Huber and Eckhardt (2001).

Most columnar rock formations around the world occur in basaltic or andesitic rock, though the process of columnar jointing can occur in other mediums besides lava such as mud, saltpans, and frost. Understanding of the actual type of lava that formed the Devils Postpile has changed in recent years. Traditionally the rock which forms the Devils Postpile has been referred to as basalt (Clow and Collum 1986, Dalrymple 1964, Le Conte 1912). Recently, classification has been refined and the formal petrologic name is basaltic trachyandesite. Today, for general references the geologic units of the monument are referred to as basalt, dacite, and andesite

The exposed columns of the Postpile formation are the most spectacular and symmetrical attributes of a larger sheet of basaltic lava that is evidence of combined volcanic and glacial processes. This glacially eroded sheet of silicon rich lava (53.9-54.4% SiO2) is preserved discontinuously along the floor of the Middle Fork San Joaquin River canyon in two major remnants and several smaller sections. The eroded scoria cone and dikes opposite the modern day Upper Soda Springs Campground represent the eroded vent of an older crystal-poor lava flow that erupted about 121,000 years ago. This flow directly underlies the crystal-rich Postpile basalt, and both flows can be observed along the trail above the river's west bank. Despite wide search, the vent for the Postpile basalt has not been found. (Hildreth and Fierstein 2014).

The most prominent feature of the lava flow is the Postpile formation. It reveals the interior of the lava flow, with columns rising above a remarkable field of

fallen postglacial talus columns. The Postpile totals 196 feet in depth above the contact zone of lava and granite at the river. The highpoint of the lava flow is 1700 feet east, just outside the monument boundary for a total estimated depth of the flow at 360 feet.

Individual columns rise at the Postpile rise to 60 feet in height and are typically two to three and half feet thick. The column shapes are variously vertical, curved, inclined, or subhorizontal (Huber and Rinehart 1965b). The lava is widely striated and plucked, eroded into knolls, ridges, and sidewall benches; surviving exposures are nearly all massive and have only sparse scattered vesicles (Huber and Rinehart 1965b). Elsewhere in the unit sets of stouter or less regular columns are widespread (Hildreth and Fierstein, USGS, draft 2013). Experiments have shown that faster cooling results in smaller diameter columns and slower cooling results in larger diameter columns (Toramaru and Matsumoto 2004, Grossenbacher and McDuffie 1995).

The planar tops of the Postpile formation are truncated by glacial action. Visitors are allowed to walk on top of the formation and examine the shapes of the columns by walking across the colonnade. A survey of 200 columns indicated that the geometry of the Postpile is dominated by hexagons (55%) and pentagons (37%) (Huber and Eckhardt 2001). A separate survey of 400 columns showed similar results: 44.5% hexagons, 37.5% pentagons (Beard 1959). The percentage of 6-sided columns at Devils Postpile is comparable to other well-studied outcropping of columnar rock, such as Devils Tower, Wyoming and Giant's Causeway, Ireland (Huber and Eckhardt 2001).

One aspect of the Devils Postpile that sets it apart from the other columnar formations is the presence of glacial polish and glacial striations. Such features exhibit the power of glaciers to erode rock and thus the exact mechanism by which the columns of the Postpile were revealed. Another dramatic factor is the erosion of the San Joaquin River downstream from the Postpile, that helped to cut the gorge showcasing dramatic basalt columns plunging into the river on the east bank contrasted with the granite wall on the west bank.

Rainbow Falls

Rainbow Falls was not created by glaciers as were most waterfalls in the Sierra Nevada. The creation of the waterfall has been attributed to a change in the course of the Middle Fork of the San Joaquin River.

At Rainbow Falls, the Middle Fork of the San Joaquin River falls 101 feet over a sheer cliff of dacite. The dacite of Rainbow Falls formed when lava erupted just downstream from the Devils Postpile (Clow and Collum 1986, Huber and Eckhardt 2001) and has been dated about 98,000 years old by both Stanford and USGS. . The outcropping at Rainbow Falls reveals two lithologically distinct layers of the same lava flow: massive dacite above versus platy dacite below. The conspicuous change in lithology partway down the cliff is apparently due to an abrupt transition in cooling behavior of the lava within the single lava flow (W. Hildreth, USGS, pers. comm. 2010).). The difference in cooling and resulting differences in the dacite's resistance to erosion play a major role in the sheerness of the waterfall today.

At Rainbow Falls, two unequally hard, horizontal rock layers in its cliff erode at different rates. As the water cascading over the falls hits the lower rock, it wears the less-resistant rock away faster than the more-resistant rock above. This creates an alcove beneath the stronger rock above. As the stronger rock loses its support, it eventually caves in and breaks into boulders and rock debris seen at the bottom of the falls. Due to this process of undercutting, Rainbow Falls has moved upstream approximately 500 ft. while retaining its original height.

It is generally agreed that Rainbow Falls was created by an event that changed the course of the Middle Fork San Joaquin River for a one mile section. It was an eruption of dacite that blocked the drainage by filling the old channel which travelled along the granite-dacite contact zone. A shallow temporary overflow channel formed but was soon abandoned when the river cut a big bend into the surface of the dacite upstream from the falls forming a new channel that remains the course of the river today. The river cut back to the granite-dacite contact zone only a few hundred meters below the present-day falls, and headward erosion has slowly caused Rainbow Falls to recede upstream to the present location (W. Hildreth, USGS, pers. comm. 2013)

The Buttresses

West of Devils Postpile and north of King Creek are the oldest volcanic rocks in the monument at 3.75 million years old. They are seen from several vantage points including the top of the Postpile as a stair step of dark basaltic ledges, each formed by a separate flow, some with columns, known as the Buttresses. These exposed columns rival those of Devils Postpile and

are locally flush on granite at King Creek: strikingly black-on-white. The Buttresses lavas are about 45 times older than those of Devils Postpile. Other remnants indicate that 1,500 vertical feet of the lava flows have been removed by erosion, mainly from glaciers. This formation, found along the western boundary of the monument, is made of basalt with abundant crystals of pyroxene and olivine, unlike the feldspar-crystals prominent mixed with olivine in the Postpile flow.

The river channel filled in by the Buttresses basalt has not cut into the underlying granite since the lava filled it approximately 3.75 million years ago. River erosion and glaciers have widened the canyon and stripped away most of the basalt, but they did not deepen the channel any further (W. Hildreth, USGS, pers. comm. 2013). The contact of the old lava that extends down to the present-day river level indicates that the Middle Fork San Joaquin River has remained at its current elevation for at least 3.75 million years, despite numerous glacial advances during the last 2.5 million years.

The volcanic rocks of Devils Postpile National Monument reflect several separate eruptive events; the basalt of the Devils Postpile is merely the most recent of these. Rocks that formed from earlier events in order of increasing age include the andesite of Mammoth Pass, the dacite of Rainbow Falls, and the basalt of the Buttresses.

GEOLOGIC SCIENCE

Scientific interest in the rich geology of the monument and the surrounding area has advanced understanding and appreciation of the earth forces at work in shaping the dramatic landscapes of the Middle Fork of the San Joaquin River Valley. Field geologists continue research and observations in the area looking for clues and evidence of landscape evolution. Geologic maps published by the U.S. Geological Survey (USGS) are like progress reports documenting these improvements and human efforts. In the 1950s, the first geologic map of the Devils Postpile region mapped the region's mineral resources, granites, and ancient geologic history. Later, interest in geothermal resources and seismic unrest led to detailed mapping of the Long Valley caldera. Recently, interest in the seismic unrest and past eruptions near Mammoth Mountain and the numerous surrounding basaltic lavas such as Devils Postpile, will result in a new map to be published soon. Over time, research provided more specific information resulting in more detailed geologic maps, and improved understanding of the region's geologic history. Geologic maps share this story with scientists and visitors.

SOILS AND SURFACE MATERIALS IN DEVILS POSTPILE NM

Soils are the matrix of minerals and organic materials found in the upper several feet of the Earth's surface, excluding areas that are flooded or where rocky substrate dominates. A soil is a living ecosystem in itself that forms a critical component of the overall terrestrial ecosystem. Soils store water through the dry seasons, provide a medium for terrestrial plant rooting, provide habitat for uncounted micro- and macroscopic soil organisms, and recycle the organic material discarded from organisms into forms useful for other organisms.

Soil formation in the high-Sierra regions depends upon many important factors. Parent materials, slope, exposure, hydrology, organic matter content, and surface vegetation are only a few of such factors. The parent material of the Sierra Nevada is largely granitic, which is highly resistant to physical and chemical weathering in this climate. Overall, soil formation is relatively slow in the range, but soil-covered granite that stays moist much of the time weathers into sandy-gravelly "grus". The micas swell and drive the quartz & feldspar grains apart, promoting rapid decay and coarse sandy soils. Plenty of those in woodsy parts of the Middle Fork (though usually obscured here by the young pumice.

At the lower elevations biotic weathering of soils predominates due to warmer winter temperatures and corresponding higher year-round growth, decay, and activity of biological "soil engineers." At higher elevations, cold temperatures retard biological activity, but abiotic processes, including freeze/thaw and glacial plucking, contribute to ongoing soil formation. Therefore soils tend to be well developed in the middle elevations of the range, in general, at about 5,000 to 6,500 feet in elevation, and less well developed at lower and higher elevations (Dahlgreen et al. 1997).

The Upper Middle Fork of the San Joaquin watershed lies between about 5,400 and 13,000 feet in elevation. The watershed includes soils formed from three types of parent material, Cretaceous granitic bedrock from the Sierra Nevada pluton, Mesozoic metavolcanic rocks intruded by granites, and widespread pumice fall deposits that erupted at Deadman and Glass Creeks 664 years ago (1350 CE) east of the Sierra crest.

It is difficult to locate an area within the approximately 800 acres of Devils Postpile NM that is not covered by pumice The pumice within the monument indicates post-glacial volcanic activity from the chain of craters to the NE from the Inyo Craters to Mono Craters. The pumice at the monument plays an important role in the area's phytogeography and vegetation development. Most of the pumice found in the monument is less than 0.4 inches in diameter suggesting that it traveled some distance before falling. The Inyo Craters eruptions in 1350 CE are considered the source of the monument's pumice (Millar C.I., et al, 2006.).

Three vents were active, all fed by a common rhyolite dike. The combined thickness of these layers can extend up to 3 feet deep. In most areas of the monument it is less than a half foot (20 cm) in depth. In flatter areas (meadow areas and "tables") the pumice accumulation averages near 0.5-1.5 feet deep. Little soil formation probably occurred before the present pumice cover appeared, probably due to the facts that: 1) glaciated volcanic rock-surfaces are very slow to decompose, 2) slopes did not allow particle accumulation, 3) montane and sub-alpine climates do not foster rapid development of pioneer plant communities, and 4) snowpack and rainfall contribute to rapid soil erosion.

Although pumice predominates in many areas, a mixed conifer forest has established itself although the density varies throughout the monument and valley, and in places can be sparse. Pines and firs contribute limited organic matter, and soil formation is limited. However, Jeffrey Pines in particular can survive and thrive in pumice soils.

It is common, on steeper slopes, to see bare rock and few plants. Thundershowers often occur within the monument and create surface disturbances of pumice "washouts". These occurrences may strip an area until a later event carries "new" pumice in. The instability of such surface materials inhibits soil formation, further limiting plant establishment and cover. Therefore, little understory vegetation occurs within these unstable areas of the monument.

Pumice also creates numerous management problems within the monument. Soils that are slow in developing also limit plant establishment and cover making these areas more vulnerable to erosion. Human disturbances such as informal trails and heavy use leave long lasting ecological and visual impacts. For example, once an informal trail is visually evident, other visitors utilize it leading to rapid erosion and plant damage.

Soils in the meadows of the monument near the river are more developed due to high inputs of organic matter from wetland plant species and frequent fluvial deposits from flood events. Parent material in other meadows is primarily from simple mechanical weathering including the "grus" production in granite.

Based on a general Natural Resource Conservation Service mapping effort in 1995 (NRCS 1995), most soils in the monument are classified as vitrandic xerochrepts, typic cryorthents and rocky and xeric, or dry.

Biological Resources

Vegetation Communities

Devils Postpile NM is situated in the Sierra Nevada floristic province that encompasses nearly 25,000 square miles of foothill and higher elevation habitats. Contributing to the diversity of vegetation of the monument is the location of the monument adjacent to the lowest passes on the Sierra Divide. In this part of the mountain range at Mammoth Pass and San Joaquin Ridge, several species have migrated from the Great Basin floristic province to the Middle Fork of the San Joaquin River watershed. Within California, these provinces are situated within the larger California Floristic Province that extends west from the Sierra Nevada crest. The overlap of species and floristic provinces at the monument in this region provides insights into the migrations of species over time, and the importance of the low passes within the major cordillera as important migratory corridors.

The origin of vegetation in the range is highly complex given the geologic uplift and subsidence history, the diversity of historic climates, and the influence of many periods of dramatic climate change (Millar 1996, 2012). Factors that have the greatest influence on the distribution and vigor of plant communities include climate and hydrology, natural disturbance regimes, including fire, presence and health of symbiotic species such as microorganisms and pollinators, presence and vigor of insects and plant pathogens, air pollution, and

migration and invasion of novel species. Anthropogenic climate change is increasingly altering these factors, and will drive changes in vegetation distribution in the Sierra Nevada for the foreseeable future (NRCA 2013).

Climate is an overwhelming control on the distribution of plant species, and local climate varies greatly with elevation, topography and micro-climates. Therefore, vegetation communities in the Sierra Nevada are generally tied to distinct elevational zones: the foothill zone, the lower and upper montane zones, the subalpine zone, and the alpine zone, although variations exist due to micro-climates, aspect and hydrologic conditions. Vegetation of the monument comprises upper montane and subalpine forests while basalt and andesite upland slopes typically support open woodlands due to high rates of water percolation and a low water table. Riparian zones support populations of shrubs and trees.

A vegetation mapping and classification project in the Yosemite area mapped vegetation based on 1997 imagery, and included Devils Postpile NM (Aerial Information Systems 2007). 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*). Jeffrey pine (*P. jeffreyi*) is moderately widespread in patches at lower elevations, while on higher north-facing slopes scattered mountain hemlock (*Tsuga mertensiana*) and western white pine (*P. monticola*) occur. Western juniper (*Juniperus occidentalis*) are present but uncommon, restricted to warm dry sites protected from fire. Broadleaved trees including mountain alder (*Alnus incana*), black cottonwood (*Populus trichocarpa ssp balsamifera*), and quaking aspen (*Populus tremuloides*) comprise approximately 3% of the monument while shrub dominated ecosystems dominated by whitethorn ceanothus (*Ceanothus cordulatus*), huckleberry oak (*Quercus vaccinifolia*), and manzanita (*Arctostaphylos spp*) cover 17.5% of the monument.

Field surveys followed vegetation mapping done in 1997 and improved the coarse resolution of aerial surveys to a finer resolution. For example, based on the 1997 mapping, wetlands cover approximately 5% of the total monument land area. A more detailed wetlands survey in 2006 determined that wetlands covered 7.5% of the monument (Denn and Shorrock, 2009). Dominant wetland species include willows, horsetail (*Equisetum spp*.), sedges (*Carex spp*.), and rushes (*Juncus spp*.).

The extent and proportion of each vegetation type as well as rock dominated areas are presented in Table 4.1 (NPS 2013a). In general, the native plant communities within the monument are intact and functioning, although local impacts from visitor use, pack stock, and invasive species can be seen. It is important to note that plant communities can change dramatically in a short amount of time. For example, the structure and composition of the coniferous forests in Devils Postpile have been strongly influenced by two major disturbance events in the past 20+ years: the August 1992 Rainbow Fire (Caprio and Webster 2006, Caprio et al. 2006) and the extreme wind event and forest blowdown of November 30-December 1, 2011 (Hilimire et al. 2013).

TABLE 4.1: MAJOR VEGETATION AND LAND COVER TYPES OF DEVILS POSTPILE NATIONAL MONUMENT.

Type	Acres	Percent of total
Conifer forests & woodlands	554.4	69.3
Shrubs	140	17.5
Wetlands (including water bodies)	40	5.0
Broadleaf forests & woodlands	23.2	2.9
Grass/herbaceous	4.8	0.6
Rock outcrops/domes	37.6	4.7
Total	800	100
Data from Yosemite's 1997 vegetation map (Keeler-Wolf et al. 2012).		

Devils Postpile contains native plant communities as components of wetlands and forests. Because of Devils Postpile's unique location near a low Sierra Nevada pass, species of both the east and west slopes of the Sierra are present. A 2001 vascular plant survey of Devils Postpile NM increased the monument's number of vouchered plant specimens by 125% (from 165 to 380 taxa) (Arnett and Haultain 2005).

Three plant species that are in the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants of California (2001, 6th edition online): Bolander's woodreed (*Cinna bolanderi*), short-leaved hulsea (*Hulsea brevifolia*), and cut-leaved monkeyflower (*Mimulus laciniatus*) were found

during this survey. All three species are considered threatened in other parts of their ranges, but not within or around the monument (Arnett and Haultain 2005, NRCA 2013).To date, no species found within the monument are currently listed as threatened or endangered at the state or federal level. At the time of the survey, Bolander's woodreed was considered rare and endangered in a portion of its range in California but potential for extinction was low. Short-leaved hulsea is also endangered over a portion of its range and is even more limited in its distribution. Cut-leaved monkeyflower is rare but not endangered within California. Of the 86 sites surveyed for plants in 2001, one site contained Bolander's woodreed, and two sites each contained short-leaved hulsea and cut-leaved monkeyflower, all within designated wilderness

Due to funding and staffing limitations, as well as inconsistent survey and documentation of plant communities in the monument, knowledge of past distribution and condition is limited. Although a baseline condition of vegetation is lacking, recent assessments indicate that the current condition of most of the native plant community appears to be good (NPS 2013a). However, the condition of the monument's coniferous forests varies widely. Of the 84% of the monument that burned in the 1992 Rainbow Fire, more than 51% of this area burned with moderate to high severity fire (fire that killed from 50 to over 90% of overstory trees) (Caprio, unpublished data). In these areas, regeneration rates are limited by the lack of a seed source which is determined by the distance to living trees; this is particularly true in areas of high severity although areas of moderate severity also show reduced regeneration rates. In areas of high overstory tree mortality, monitoring data indicate that conversion from forest to shrubland is occurring (NPS 2005, Caprio et al. 2006).

In the fall of 2011, an extreme wind event resulted in extensive tree blowdown in the monument and surrounding areas: an average of approximately 118 trees/ha were blown down within Devils Postpile NM (Hilimire et al. 2013). Although this was a natural disturbance event, the windthrown trees add to the surface fuel load, potentially increasing susceptibility to fire and insect disturbance. Monitoring of forest and fuel dynamics is important to understand future forest changes and responses to disturbance events – focusing on continued monitoring of tree regeneration plots (Caprio et al. 2006) to determine if regeneration is sufficient to sustain the forested areas in the monument. Less is known about the impacts from the wind event on other plant communities.

Nonnative and Invasive Plants

Eleven nonnative species have been documented in the monument over time. Three of these – bull thistle (*Cirsium vulgare*), woolly mullein (*Verbascum thapsus*), and cheatgrass (*Bromus tectorum*) – are considered invasive by the California Invasive Plant Council (Cal-IPC) (Cal-IPC 2006) while the other species are considered nonnative but not invasive. However, this number could quickly change as new species can be introduced, establish and spread without early detection and treatment. Introduction of nonnative and invasive species is of particular concern with a changing climate.

Invasive plants out-compete native species, degrading habitat and altering plant community function while plant species considered nonnative may become naturalized and pose less of a threat. Humans inadvertently introduce invasive and nonnative plant seeds that travel on equipment, tools, and clothing or animals may spread seeds on their fur or droppings. Many invasive species respond favorably to fire and establish readily in disturbed areas.

In some high severity areas of the 1992 Rainbow fire, forests have been replaced with shrubs and forbs and many areas remain bare (soil, gravel, or exposed rock). Most invasive species documented and controlled in or on lands adjacent to the monument have been found within severely burned areas along trails, near stock use and human use areas, or in other sparsely vegetated or naturally disturbed areas.

Active invasive plant management began in 2001, and nearly all populations of bull thistle and wooly mullein have been contained and appear to be at a maintenance level. Many of the populations of bull thistle were found in the Buttresses areas away from trails. The abundance of the populations in this area may indicate that some other vector (rather than trails) may have been responsible for the establishment and spread and is likely tied to the Rainbow Fire of 1992.

Small populations of cheatgrass persist in the Rainbow Falls and Buttresses areas and rigorous annual treatment may be helping to limit further spread.

However, cheatgrass populations also occur on nearby USFS lands providing a potential seed source and need for continued survey and treatment. Four of the nonnative species identified in the monument (*Phleum pratense, Poa annua, Poa pratensis, and Spergularia rubra*) are found only within the Soda Springs Meadow complex immediately adjacent to the ranger station. The heavy visitor use of this area makes this area vulnerable to nonnative plant introduction and spread. In addition, historic sheep grazing prior to 1933, when introduction of nonnative forage grasses was common, likely contributed to current conditions. It is unknown if these populations are spreading or impacting native plants and if treatment is warranted.

Salsify (*Tragopogon dubius*) and dandelion (*Taraxacum officinale*), occur in the monument although populations are limited to small patches or isolated individuals. Although detected in previous years, no prickly lettuce (*Lactuca serriola*) or goosefoot (*Chenopodium album*) was found in the most recent survey. As surveys in the monument over time have demonstrated, nonnative species can establish in locations not surveyed in any previous year. Some species may persist at some locations due to a persistent seed bank, new inadvertent reintroductions from visitors or pack stock, or failure to eradicate populations prior to seed dispersal

The monument currently operates under an invasive plant management plan, developed in 2011 that set a five year strategy. The strategy focuses efforts on prevention, early detection, surveying, and removal. Thus far, the monument's emphasis on and success with this strategy has provided a good example of an NPS unit that is at a maintenance level of invasive plant management.

Vertebrates

According to all sources, 163 - 179 vertebrate species (https://irma.nps.gov/NPSpecies/Search/ SpeciesList/ DEPO) are confirmed or expected to occur in Devils Postpile NM. Confirmed species include 33 mammals, 114 bird, six reptiles, two amphibians and four fish. The varied topography and vegetation (including mixed-conifer forests, shrublands, wetlands, and riparian areas) provide a diversity of habitats for vertebrates. Numerous wetlands, highly productive systems with substantial biodiversity (USEPA 2001), in the monument are known to be important feeding areas for bird and bat species. In addition, the close proximity of relatively low passes (Mammoth Pass and Minaret Vista) contributes to local biodiversity by allowing movement of animals among surrounding diverse habitats.

The most comprehensive surveys have been done for birds, followed by bats, and then non-volant mammals, with less information available for amphibians and reptiles. An inventory of species in the monument is maintained through the NPSpecies database (now incorporated into the NPS Integrated Resource Management Applications, or IRMA) and accounts for confirmed or reliable observations of species presence but has not always been regularly updated. Informal species counts include observations or unconfirmed reports from independent research or anecdotal observations. These species are not added to the official NPSpecies list until an observation can be confirmed.

It is more meaningful to discuss vertebrates in the context of the larger Middle Fork of the San Joaquin River watershed, due to the mobility of many animals and their habitat requirements that extend well beyond the monument boundaries. Although no comprehensive survey has yet occurred in the larger watershed, vertebrate species for the Upper Middle Fork San Joaquin River (UMFSJ) are probably more diverse as the elevation gradient of the watershed is greater than that of the monument, spanning a larger diversity of habitat types and life zones. Further inventory and research are desirable to better document animal distribution, abundance and condition within this watershed.

The Middle Fork of the San Joaquin River corridor and valley bottom, the ascending slopes to the Minaret, Mammoth and Donahue Passes, and the surrounding high peaks of the Minaret Range, Banner, Ritter, and Mammoth Mountain provide diverse habitats and habitat connectivity for a wide range of wildlife assemblages. The topography of the Middle Fork of the San Joaquin valley is at the ecotone of the central Sierra and Great Basin, resulting in a high diversity of plant species and habitat. It also provides important migratory corridors across the low passes, San Joaquin Ridge and the San Joaquin River Corridor. Further enhancing the diversity of the watershed is the relatively low elevation (7,500 feet) in such close proximity to the Sierra Nevada Divide. This habitat is further enriched by the Middle Fork of the San Joaquin River

that sustains forest, riparian and wetland habitats. The north-south axis of the UMFSJ and 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.

The structurally diverse range of habitats in the watershed are nestled primarily in wilderness with a small footprint of low-key development in the recreation corridor of Devils Postpile NM/ Reds Meadow, providing high quality habitat and maintaining important linkages between terrestrial and aquatic species. Furthermore, the watershed provides critical linkages to the surrounding contiguous protected areas that includes the Ansel Adams and John Muir Wilderness, Inyo and Sierra National Forests, and Yosemite and Sequoia Kings Canyon National Parks.

Mammals (Non-Volant)

Knowledge of non-volant (unable to fly) mammals largely comes from a one-time survey and anecdotal observations. In 2003, a survey primarily targeting small mammals was done in Devils Postpile NM as part of the Sierra Nevada Network's biological inventory program (Werner 2004). Other vertebrates were also surveyed opportunistically. From all survey methods (including opportunistic observations), the survey recorded 10 mammal species. Two new mammal species were added to the list of known species within the monument: dusky shrew (*Sorex monticolus*) and brush mouse (*Peromyscus boylii*). With the additions from this survey to the earlier observation records from monument staff, there are 19 non-volant mammal species known to be present in the monument, four "probably present" and one "unconfirmed" (NPS 2013).

CARNIVORES

Carnivores in the Sierra Nevada include black bear (*Ursus americanus*), coyote (*Canis latrans*) , mountain lion (*Puma concolor*) , bobcat (*Felis rufus*), badger (*Taxidea taxus*), Pacific fisher (*Martes pennant pacifica*), Sierra marten (*Martes americana*) and smaller weasels, shrews, gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*) and ringtail (*Bassariscus astutus*). The grizzly bear (*Ursus arctos horribilis*) is currently the only known native carnivore that has been extirpated from the Sierra Nevada (Graber 1996, Zielinski 2004). Two of the other 20 native carnivores were thought to have been extirpated but recent sightings confirm their presence. The wolverine (*Gulo gulo*) historically occupied the Sierra Nevada and has been absent for many decades (Aubry et al. 2007). An individual recently sighted in the Tahoe area was determined to be a long-distance migrant from the Rocky Mountains, but another sighting at the nearby Red Cones area may mean a small local population may exist. In addition, the Sierra red fox (*Vulpes vulpes necator*) was thought to be locally extinct, but recent confirmed sightings near Sonora Pass means they now are locally rare. In addition, although never documented in DEPO despite the appropriate habitat, Pacific fisher distribution throughout the Sierra Nevada has declined significantly and is now restricted to the southern portion of their historic range (Zielinski et al. 2005). The Sierra marten is listed as a management indicator species by the USFS.

There are confirmed observations of eight carnivores – black bear, coyote, mountain lion, Sierra marten, raccoon, long-tailed weasel (*Mustela frenata*), short-tailed weasel (*Mustela ermineas*) and dusky shrew (*Sorex monticolus*) - in the monument. There are unconfirmed observations of ringtail, water shrew and gray fox.

Raccoons, coyotes and black bears typically have an omnivore diet and can be observed pursuing human food, presenting a management challenge.

Black Bear

Black bears are common throughout the planning area. The primary issue facing managers is keeping bears wild and insuring they do not become habituated to human food sources. Bears have, in the past, aggressively sought campers' food both in campgrounds and in the wilderness. Beginning in 2001, the monument installed bear boxes in the campground and the Inyo National Forest installed bear boxes at all campground sites in the valley. Some day-use and overnight hiker parking sites have bear boxes. Additionally, bear proof food canisters are required on all trails and in backcountry areas in surrounding wilderness and are available for rent at the monument ranger station and several locations in the town of Mammoth Lakes. Though not allowed in the monument, there is currently a bear hunting season on adjacent Inyo National Forest lands permitted by the California Department of Fish and Wildlife from the second Saturday in October running for seventy-nine days or until a quota is met.

HERBIVORES

The primary herbivore at the monument is the mule deer (*Odocoileus hemionus*). Does and fawns are typically associated with meadows, and lake and stream riparian habitats and adjacent forests, while bucks can be found anywhere including subalpine and alpine habitats in the upper parts of the watershed. The watershed planning area provides a significant portion of their summer range. Deer migrate out of the UMFSJ to lower elevations in the fall as storms push them out of the high country.

Hunting is allowed on USFS lands but is not allowed in the monument, although hunters may transit the monument. Most of the watershed is contained within the eastern portion of hunting zone D7, with small portions in X9A (http://www.dfg.ca.gov/wildlife/hunting/deer/cazonemap.html). Hunting seasons vary but generally run from late August through mid-October and permits and regulations are under the jurisdiction of the California Department of Fish and Wildlife.

There are occasional sightings outside the monument of the yellow-haired porcupine (*Erethizon epixanthum epixanthum*), an herbivore species of increasing concern due to a possible decline in their distribution.

STATUS OF NON-VOLANT MAMMALS

Stressors on vertebrate species include ecological impacts from nonnative species, changes in species composition and abundance due to the altered fire regime, bioaccumulation of contaminants, isolation and fragmentation of come species due to differences in land-use practices on adjacent lands and potential conflicts with visitors.

Trends related to the status of mammals in the monument are not known. Recent research from Yosemite National Park shows that many small mammals have altered their distributions in portions of the Sierra Nevada, probably in response to a regionally warming climate (Moritz et al. 2008, Moritz et al. 2011). Following the previous work of Grinnell and Storer (1924), Moritz et al. (2008, 2011) surveyed for 28 small mammal species along a wide transect from the Central Valley to the Eastern Sierra Nevada that passed through Yosemite. Compared to the Grinnell survey of 1914-1920, most species' elevation limits shifted upward, more frequently at the lower elevational limits rather than upper limits. Lower elevational limits increased for 10 species, while upper elevational limits increased for four species while five species experienced a lowering of their upper elevational limits. High-elevation species typically found in the monument saw range contractions as would be expected as temperatures warm.

Moritz et al. (2008, 2011) modeled the expected historic range as well as the current elevation range of each species based on survey results. From their analysis, they concluded that three species should have ranges that would include the monument but have now shifted above it: Belding's ground squirrel, alpine chipmunk, and pika. However, while both alpine chipmunk and pika have not been officially recorded in the monument, Belding's ground squirrel is still frequently seen in the monument - though was last officially documented in 2003 (Werner 2004). Based on this study and empirical evidence, species richness in the high elevation zone that includes Devils Postpile NM may have declined slightly since 1920, though it is highly possible that no species have been lost. However, since limited vertebrate surveys have been conducted at Devils Postpile NM, additional work is needed to fully document the status of mammals and other species in and near the monument

Bats

Seventeen species of bats are known or believed to occur in the Sierra Nevada. The first documented detection of bat species in the monument occurred at four mist netting sites and with 5-10 acoustic monitors during a short two-night survey in August of 2001. At that time 10 species were identified (Pierson and Rainey 2002) – eight in mist nets and two acoustically although the authors of that report expect that up to 13 bat species likely use all or part of the monument. Using both nets and acoustic sampling, Pierson and Rainey (2009) surveyed bats again at six mist net sites and 5-10 acoustic monitoring sites for three nights in July of 2004. From these surveys, the same 10 species were recorded along with potentially three new species. These three species had not been previously documented and acoustic records of them were not definitive even though they were unlikely to be anything else.

For both sampling years, a total of eight species and 111 individuals were captured in mist nets. One species – the big brown bat (*Eptesicus fuscus*) – accounted for

51.4% of the captures. Another two species – silver-haired bat (*Lasionycteris noctivagans*) and little brown bat (*Myotis lucifugus*)– accounted for another 26.1% of captures. The remaining five species accounted for the remaining 22.5% of captures. Bats are known to travel large distances between roosting habitat and foraging habitat, between 15 – 25 miles (Rabe et al. 1998, Chambers et al. 2006, Brown and Berry 2007). Due to the small size of the monument and limited habitat variability, it is highly likely that at least some species occurring in the monument either only roost or only forage there (Pierson and Rainey 2009) and different land uses outside of the monument on Inyo National Forest or private land may be affecting bat species that use the monument for foraging or roosting. It has been found that reproductive females tend to use the warmest and thus lowest habitats available, and thus would be outside of Devils Postpile NM (i.e. downstream in the Upper San Joaquin River watershed).

Pierson and Rainey (2009) ranked all species documented in the monument as to the extent that they rely on habitat types (Table 4.20). Most if not all roosting sites in the monument would be in trees and in small caves or overhangs in rock outcrops and small cliff areas. Several habitats within the monument are important foraging areas for bats: 1) water, either river pools or ponds; 2) meadows (wet and dry); 3) rocks (outcrops and exposed river banks); and, 4) forests and forest edges. Fire, or lack of fire, climate change, and visitor use can present potential disturbances to bat roosting and foraging habitats. The Sierra Nevada Ecosystem Project concluded that bat population numbers seem to be declining (as of mid-1990s) and suggest that pesticide use, loss of large old trees and snags, and loss of riparian habitats are to blame (Sierra Nevada Ecosystem Project 1996), though at the time, no evidence supported these conclusions. Few data are available on the longer-term population status and trends of bat species in the Sierra Nevada.

Threats to bats include a changing climate impacting habitat and food sources (invertebrates), altered fire regimes, land use/fragmentation, local visitor impacts (such as light pollution) and nonnative pathogens and disease. White-nose syndrome (WNS) is caused by a cold-loving fungus and has devastated populations of hibernating bats in caves of the eastern and midwestern US. It is unknown if the disease will reach the Sierra Nevada and pose a problem (Pierson and Rainey 2009) as little is known about winter hibernacula for bats in

TABLE 4.2: BAT SPECIES OF SPECIAL CONCERN IN DEVILS POSTPILE NATIONAL MONUMENT

BAT SPECIES OF SPECIAL CONCERN		
Common Name	**Designation**	**Designating Group**
Spotted Bat (*Euderma maculatum*)	*Species of Special Concern* *High Priority*	CDFW WBWG
Long-legged myotis (*Myotis volans*)	*High Priority*	WBWG
Pallid bat (*Antrozous pallidus*) *	*Sensitive* *Species of Special Concern* *High Priority*	USFS CDFW WBWG
Western Mastiff bat (*Eumops perotis*)	*Species of Special Concern* *High Priority*	CDFW WBWG
Western Red Bat (*Lasiurus blossevillii*) *	*Sensitive* *Species of Special Concern* *High Priority*	USFS CDFW WBWG
Fringed myotis (*Myotis thysanodes*) *	*High Priority*	WBWG

USFS = U.S. Forest Service

CDFW = California Department of Fish and Wildlife

WBWG = Western Bat Working Group.

* = unconfirmed acoustic record but species are likely to occur in monument.

TABLE 4.3: BIRD SPECIES OF SPECIAL CONCERN DETECTED AT DEVILS POSTPILE NATIONAL MONUMENT AND ADJACENT INYO NATIONAL FOREST

(Based on surveys conducted by Point Reyes Bird Observatory (PRBO) now Point Blue Conservation Science, The Institute for Bird Populations (IBP), the Sierra Nevada Network Inventory & Monitoring Program (SIEN), Eastern Sierra Audubon, and other citizen scientists.)

BIRD SPECIES OF SPECIAL CONCERN				
Common Name (Scientific Name)	**BSSC**	**USFWS**	**Inyo NF**	**Audubon Watchlist**
Bald Eagle (*Haliaeetus leucocephalus*)		X	X	
Black Swift (*Cypseloides niger*)	X	X		
Brewer's Sparrow (*Spizella breweri*)		X		X
Cooper's hawk (*Accipiter cooperii*)	X			
Calliope Hummingbird (*Selasphorus calliope*)		X		
Cassin's Finch (*Haemorhous cassinii*)		X		
Eared Grebe (*Podiceps nigricollis*)		X		
Golden Eagle (*Aquila chrysaetos*)		X		
Green-tailed Towhee (*Pipilo chlorurus*)		X		
Hermit Warbler (*Setophaga petechia*)				X
Lewis' Woodpecker (*Melanerpes lewis*)		X		
Mountain Quail (*Oreortyx pictus*)				X
Northern Goshawk (*Accipiter striatus*)	X		X	
Olive-sided Flycatcher (*Contopus cooperi*)	X	X		X
Sharp-shinned hawk (*Accipiter striatus*)	X			
Spotted Sandpiper (*Actitis macularia*)	X			
Sooty Grouse (*Dendragapus fuliginosus*)				X
Vaux's Swift (*Chaetura vauxi*)	X			
Williamson's Sapsucker (*Sphyrapicus thyroideus*)		X		X
White-headed Woodpecker (*Picoides albolarvatus*)		X		X
Willow Flycatcher (*Empidonax trailli*)		X	X	X
Yellow Warbler (*Setophaga petechia*)	X			

BSSC: California Bird Species of Special Concern (Shuford and Gardali 2008)

USFWS: United States Fish and Wildlife Service Birds of Concern Regions 9 and 15 (USFWS 2002)

Inyo NF: USDA Forest Service Pacific Southwest Region Sensitive Animal List for Inyo National Forest (2008)

Audubon Watchlist (Audubon 2007)

California but efforts should be made to limit the threat of this deadly disease.

Birds

Although small, Devils Postpile NM provides important habitat for many breeding, migrating, and wintering bird species Bird species occupy niches of year round residents, nesting species that often return throughout their life span to the same area, migrants that move north or upslope for summer foraging and then south or downslope for the winter. Including both formal and unofficial surveys that go back to the mid-1990s, the total number of species detected within the monument is at least 114. A formal species list is tracked in the online database NPSpecies. This list was certified in 2007 and needs to be updated and re-evaluated with more current data.

Twenty bird species documented in or near the monument are listed on one or more sensitive species lists (Table 4.3 and 4.5). In addition, the U.S. Fish and Wildlife Service announced April 8, 2013 that it will conduct a full status review to determine whether genetically distinct populations of black-backed woodpeckers — which thrive in forests where fires have burned — will get protection under the Endangered Species Act in two regions, including California/ Oregon. Black-backed woodpeckers have been documented in the monument, and the 1992 Rainbow Fire likely helped create additional habitat for this fire-dependent species. Federally and state threatened or endangered bird species potentially occurring in and around the monument are presented under Special Status Plants and Animals.

TABLE 4.4: THE TWELVE MOST ABUNDANT LANDBIRD SPECIES
(documented in 2003 by Siegel and Wilkerson (2004) in Devils Postpile National Monument.)

Type	Density (birds/ha)*
American robin (*Turdus migratorius*)	0.18
Brown creeper (*Certhia americana*)	0.63
Dark-eyed junco (*Junco hyemalis thurberi*)	0.59
Fox sparrow (*Passerella iliaca*)	0.37
Golden-crowned kinglet (*Regulus satrapa*)	0.34
Hairy woodpecker (*Picoides villosus*)	0.10
MacGillivray's warbler (*Geothlypis tolmei*)	0.31
Mountain chickadee (*Poecile gambeli*)	0.58
Olive-sided flycatcher (*Contopus cooperi*)	0.18
Warbling vireo (*Vireo gilvus*)	0.29
Western wood-pewee (*Contopus sordidulus*)	0.33
Yellow-rumped warbler (*Setophaga coronate auduboni*)	0.52
*Density adjusted after accounting for variable detectability by species.	

IBP conducted a bird inventory in June 2003 and this study documented 59 bird species in the monument. Seven of the species – Virginia rail, Vaux's swift, white-throated swift, Anna's hummingbird, rock wen, common yellowthroat, and red-winged blackbird – had not been detected previously. The most abundant species (based on detectability and adjusted densities) was brown creeper followed by dark-eyed junco, and mountain chickadee (Table 2) (Siegel and Wilkerson 2004). The 11th most abundant species – olive-sided flycatcher – is a species of increasing conservation concern throughout the mountain Western U.S. (Altman and Sallabanks 2000, Meehan and George 2003).

The following list summarizes the main projects that have provided information about birds in the monument:

- Monitoring Avian Productivity and Survivorship (MAPS): PRBO conducted the first bird monitoring project at the monument during the breeding season in June and July from 2002-2006.

A lack of funding resulted in halting the MAPS project, however, in 2009 it was re-initiated for a single year (Richardson and Moss 2010)

- Monitoring Bird Density and Distribution: The Sierra Nevada Inventory and Monitoring Network and IBP implemented a bird monitoring protocol across all Sierra Nevada network parks in 2011 (Siegel et al. 2010). In Devils Postpile NM, the bird monitoring point counts are done at the same grid points established in the original 2003 inventory.

- Willow Flycatcher Survey: On July 17, 2011, a PRBO biologist surveyed a transect along the San Joaquin meadow and willow thicket for Willow Flycatchers.

- Breeding Bird Surveys: The USGS Patuxent Wildlife Research Center manages the Breeding Bird Survey (BBS), a regional monitoring effort that is relevant to the monument. The BBS has established 36 transects in the Sierra Nevada since 1968. Although no transects occur within or close to the monument, the data from these transects would be potentially indicative of conditions within the Sierra Nevada as a whole (USGS 2001).

Extensive research has been done on birds, and while not possible to capture all relevant information, the following list identifies additional local research with implications for the monument:

- Climate change –related studies: Tingley et al. (2009) and Audubon (2009) (58%) demonstrate climatic niche-tracking and range shifts, likely related to warming temperatures.

- Bird elevation ranges on the Sierra Nevada's west slope (Siegel et al. 2011)

- Fire-related effects on bird populations (Siegel and Wilkerson 2005) and numerous other studies from other regions.

- Species-specific studies in the Sierra Nevada and other regions that may have relevance to the monument. These are too numerous to list here, but see Steel et al. (2012b) for species-specific status summaries and references.

Although substantial data have been collected in Devils Postpile NM, it is not sufficient to evaluate trends in bird populations at the monument. Desired condition of the bird community in Devils Postpile NM would include presence of all species known to historically use the monument and all with healthy reproductive, stable populations, and population sizes within historic variability. Although some critical information is missing, available research suggests that the condition of the bird community in the monument is fair to good (NPS 2013a). The bird community has likely been negatively impacted by a number of threats that could have already caused declines and/or likely will lead to population declines in the future.

The threats to Sierra Nevada birds are described extensively in Steel et al. (2012a, 2012b) and in the Natural Resource Condition Assessment (NPS 2013a). The primary regional, large-scale threats include:

- Climate change impacts, resulting in range shifts in some bird populations (Audubon 2009, Tingley et al. 2009)

- Altered fire regimes – response of bird species to fire is variable depending on the species. Many birds are favored by habitat changes that result from fire, while others prefer forests in later stages of succession. It can be expected that overall bird diversity would increase within a heterogeneous landscape that contains a patchwork of fire history and severity (NPS 2013a). Both timber harvest and fire suppression have been implicated with a decline in birds in North America (Hejl 1994).

- Habitat fragmentation and loss – For resident birds that migrate to lower elevations on the western slope of the Sierra Nevada, logging and development leading to habitat fragmentation in these lower elevation areas(particularly the rapidly developing foothills to the west) and the resulting habitat fragmentation could impact birds that use the monument for a number of reasons (Hansen et al. 2005; Schlesinger et al. 2008). In logged areas, even many years after stand harvest, the even-aged stands that follow do not provide the structural diversity needed for healthy bird habitat (Graber 1996). Migratory birds face additional challenges due to habitat loss along their routes and wintering grounds.

- Non-native invasive species or disease – The West Nile Virus arrived in California in 2003 and is known to infect a number of species in the state, leading to mortality in many cases (Wheeler et al. 2009). Non-native bird species such as brown-

headed cowbird (a nest parasite), European starlings, and barred owls have the potential to negatively impact Sierra Nevada birds, although to date few studies have been done. One limited study on cowbird impacts on songbirds in Sequoia and Kings Canyon and Yosemite national parks found small impacts on songbirds studied (Halterman and Laymon 1999, 2000). More current and comprehensive work is needed to document non-native bird impacts in the Sierra Nevada.

- Pollution (pesticides, ozone, heavy metals, etc.) – Since the presence of mercury, other heavy metals, pesticides, and other pollutants are known to biomagnify up the food chain and bioaccumulate in fish, piscivorous (carnivorous diet that consists largely of fish, but may also include similar aquatic foods such as aquatic insects, mollusks and crustaceans) birds may be at risk in the Devils Postpile area. High concentrations of many pollutants were found in fish from two lakes within Sequoia National Park, not far from Devils Postpile NM and at elevations above the monument (Landers et al. 2008).

- Localized human use impacts such as packstock grazing, collisions with cars, and noise in proximity to nests can also be important for some species.

Nine riparian and ten coniferous forest focal species have been identified for the region that includes Devils Postpile NM (CALPIF 2002, RHJV 2004). Focal species are those whose requirements define different spatial attributes, habitat characteristics, and management regimes representative of a healthy system (CALPIF 2002). The species with the most demanding or exacting requirements for an ecological characteristic such as territory size determines its minimum acceptable value in an area that is protected or managed for biodiversity. The assumption is that a landscape designed and managed to meet the focal species' needs encompasses the needs of other species (Lambeck 1997). This approach offers a strategy for protecting and managing specific habitats and their associated bird species and would be most useful as an approach to work with multiple agencies and organizations. Monitoring data already being collected on Devils Postpile focal species could be used to inform larger regional bird management and conservation efforts (CALPIF 2002, RHJV 2004).

Reptiles and amphibians

The Pacific chorus frog (*Pseudacris regilla*) – also known as the tree frog - is the most common amphibian in the monument. A single Yosemite toad (*Anaxyrus canorus*), was recently sighted in the monument although it is unknown if this indicates a larger or established and breeding population. The western terrestrial garter snake (*Thamnophis elegans*) is often seen in the meadows, northern alligator lizards (*Elgaria coerulea*) and rubber boa (*Charina bottae*) have been found in dry forest habitat, sagebrush lizard (*Sceloporus graciosus*), western fence lizard (*Sceloporus occidentalis*) and Gilbert's skink (*Eumeces gilbert*) occur in shrub habitat and two unconfirmed western rattlesnake (*Crotalus viridis*) observations have been reported.

Threats to amphibians include climate change, habitat loss and fragmentation, pollution (both wet and dry deposition) due to their highly porous skin, nonnative diseases and pathogens (chytrid fungus) and drought (loss of breeding habitat). Yosemite toad populations have decreased dramatically and are proposed threatened under the Federal Endangered Species Act. Additional information about this species is discussed in that section.

Fisheries

Essentially all waters above Rainbow Falls within the planning area were barren of fish prior to the arrival of European settlers. Rainbow Falls created a barrier to native fish by preventing upstream migration. In the 1870s, mountaineers, ranchers, sheepherders, and the U. S. Calvary began introducing fish into the streams and lakes of the high country. Later, sportsmen's groups, the Sierra Club and the California Department of Fish and Wildife (CDFW) made significant efforts to populate suitable waters with trout until the 1940s, when CDFW assumed the responsibility for fish stocking. Recent concern related to declining amphibian populations native to the high elevation Sierra lakes, streams, and wetlands has resulted in a suspension of fish stocking in many lakes. The impact of these nonnative fish on native aquatic biota in the monument is unknown.

Fish stocking continues in the Middle Fork of the San Joaquin River, upstream of Devils Postpile NM at Pumice Flat and Soda Springs campgrounds, and at

Sotcher and Starkweather Lakes although within the monument, fish stocking ceased in 1971. Since then, populations of all four trout species found in the river – rainbow trout (*Oncorhynchus mykiss*), golden trout (*Oncorhynchus mykiss aguabonita*), brown trout (*Salmo trutta*), and brook trout (*Salvelinus fontinalis*) – have continued to provide angling opportunities. In 1995, the value of this opportunity was recognized when the river was designated as a Wild Trout Water by the California Department of Fish and Wildlife. Angling remains a popular activity throughout the valley and wilderness providing a range of opportunities of fishing experiences (NPS 2013).

Invertebrate Communities

Although there has been some limited inventory of invertebrates in Devils Postpile, these fauna are an important group to survey because of the variety of ecosystem services that they provide. Invertebrates include primary, secondary, tertiary, and higher-level consumers, and in turn invertebrates are a critical food resource for a variety of terrestrial, aquatic, and flying species (Holmquist and Schmidt-Gengenbach 2005). The information available on invertebrates in the monument comes from two inventories: a benthic macroinvertebrate assessment done in the Middle Fork of the San Joaquin River (Shroeter and Harrington 1995) and a survey of invertebrate fauna throughout the riparian corridor of the Middle Fork of the San Joaquin River and adjacent meadows (Holmquist and Schmidt-Gengenbach 2005).

The current status of knowledge is less than adequate. The benthic macroinvertebrate assessment (Shroeter and Harrington 1995) represents a point-in-time survey that took place over two days (June 23-24, 1994) in the Middle Fork of the San Joaquin River. While it provides some baseline information, it does not represent the spatial or temporal variability of aquatic invertebrates in the monument or surrounding areas. Holmquist and Schmidt-Gengenbach (2005) conducted a more comprehensive survey along the corridor of the Middle Fork of the San Joaquin River and in adjacent meadows. The survey took place in the summers of 2003 and 2004 from snowmelt until snow fall, with some preliminary data collected in the summer of 2002, thus it provided an opportunity to get some information on seasonal and inter-annual variability in both aquatic and terrestrial invertebrates. Considering these limited efforts, Holmquist estimates invertebrate inventory efforts for the monument can only be considered to be about 15% complete (Holmquist, personal communication).

Special Status Species

Special-status Plants and Animals

Federal land management agencies, including the National Park Service and the U.S. Forest Service, are charged with protecting native biodiversity as a part of the public trust. However, the Federal Endangered Species Act requires these agencies to focus particular management emphasis on organisms threatened or endangered of becoming extirpated or extinct. Federal agencies generally provide focused protection for organisms listed as rare, not only under the Federal Endangered Species Act, but also by State Endangered Species Acts, by agency-specific programs, and occasionally by non-governmental entities.

Special status animal species observed or believed to be present in the monument, the UMFSJ watershed and/or the Crystal Crag quadrangle are summarized in Table 4.5 and discussed in detail below. No plants are state or federally listed.

BALD EAGLE (*HALIAEETUS LEUCOCEPHALUS*)

(Description adapted from CDFW 2010)

The largest raptor in North America, the bald eagle has a wingspread of about 7 feet and weights 8 to 14 pounds. Adults have a dark brown body and wings, a characteristic "bald" white head and white tail, and a yellow beak. Juveniles are mostly brown with white mottling on the body, tail, and undersides of the wings. These birds obtain their easily identified adult plumage by their sixth year. In flight, a bald eagle often soars or glides with its wings held at a right angle to its body.

Normally, the eagles build their large stick nests in the upper canopy of the tallest trees in the area. The adults may repair the same nest annually, increasing its size over time, or they may build a new nest in their territory

or repair one they had used formerly. In many cases, the territory of a pair of eagles may include several nests in addition to the one they most recently used.

In most of California, the breeding season lasts from about January through July or August. One or two eggs (occasionally three) are laid in late winter or early spring, and incubation lasts about 35 days. Chicks fledge when they are 11 or 12 weeks old.

Bald eagles prey on a variety of small animals, usually fish or waterfowl, and they eat carrion, including salmon, deer, and cattle.

Bald eagles are endemic to North America, with a large native range extending from Alaska, Canada, the contiguous United States, and northwest Mexico. Within California some resident birds stay year-round in scattered locations in the central and southern Sierra Nevada mountains and foothills, in several locations from the central coast range to inland southern California, and on Santa Catalina Island. In addition, migratory birds arrive from farther northern portions of the range to overwinter in central and southern California.

Although the bald eagle was removed from the US endangered species list in 2007, it remains a California State endangered species.

CALIFORNIA SPOTTED OWL (*STRIX OCCIDENTALIS OCCIDENTALIS*)

(Description adapted from CDFW 2008)

The California spotted owl (Strix occidentalis occidentalis) is one of three subspecies of spotted owls that occurs within the United States, and the only spotted owl of the southern Sierra Nevada. Birds exhibit gray-brown plumage scattered with white speckles, or spots. A typical California spotted owl has a wingspan of about four feet. These birds are year-round residents within most of the range, breeding from mid-February to mid-September or early October.

This owl breeds and roosts in forests and woodlands with large old trees and snags, high basal areas of trees and snags, dense canopies with greater than 70% canopy closure, multiple canopy layers, and downed woody debris. Large, old trees are a key habitat component; they provide nest sites, cover from inclement weather, and add structure to the forest canopy and woody debris to the forest floor. In the Sierra Nevada, this bird predominantly uses Sierran mixed-conifer, white fir (Abies concolor), montane hardwood-conifer, and montane hardwood forests at mid elevations. To a lesser extent, it inhabits California red fir (Abies magnifica) forests at high elevations and Pacific ponderosa pine (Pinus ponderosa) forests, blue oak (Quercus douglasii)–gray pine (P. sabiniana)

TABLE 4.5: ORGANISMS ON FEDERAL AND STATE ENDANGERED SPECIES LISTS OBSERVED OR BELIEVED TO BE PRESENT IN THE UPPER MIDDLE FORK OF THE SAN JOAQUIN RIVER WATERSHED.

FEDERAL AND STATE ENDANGERED SPECIES LIST		
Common Name (Scientific Name)	**List Status**	**Location**
Bald eagle (*Haliaeetus leucocephalus*)	CA endangered	Devils Postpile NM
California spotted owl (*Strix occidentalis occidentalis)*	US species of concern	Crystal Crag Quad
Cooper's hawk (*Accipiter cooperii*)	CA species of concern	Devils Postpile NM
Great gray owl (*Strix nebulosa*)	CA endangered	Crystal Crag Quad
Long-eared myotis (*Myotis evotis*)	US species of concern	Devils Postpile NM
Long-legged myotis (*Myotis volans*)	US species of concern	Devils Postpile NM
Sharp-shinned hawk (*Accipiter striatus*)	CA species of concern	Crystal Crag Quad
Spotted bat (*Eudezema maculatum*)	CA species of concern	Devils Postpile NM
Willow flycatcher (*Empidonax traillii*)	US species of concern	Devils Postpile NM
Yellow warbler (*Dendroica petechial*)	CA species of concern	Devils Postpile NM
Yosemite toad (*Anaxyrus canorus*)	US proposed threatened	Devils Postpile NM
Yuma myotis (*Myotis yumanensis*)	US species of concern	Devils Postpile NM

woodlands, and valley foothill riparian forests at low elevations. Roost sites at lower elevations tend to have smaller-diameter trees, a lower basal area of live trees, higher shrub densities, and less downed wood than those at higher elevations.

Grinnell and Miller (1944) considered the California spotted owls to be "only fairly common." They mapped and described two areas of occurrence: one along the west slope of the Sierra Nevada from eastern Tehama County south to Tulare County, the other in the mountains of southern California from Santa Barbara, Ventura, and southwestern Kern counties southeast to central San Diego County. Gutiérrez (1994) argued that because of dramatic habitat losses from logging, and urbanization the California Spotted Owl is less widespread and abundant today than it was before the 19th and 20th centuries. Beardsley et al. (1999), for example, estimated that old-growth forest in the Sierra Nevada declined by about 76% from 1945 to 1993.

COOPER'S HAWK (*ACCIPITER COOPERII*)

(Description adapted from Grindrod and Walton)

The Cooper's hawk is the mid-sized North American accipiter, larger than the sharp shinned hawk (Accipiter striatus) and smaller than the northern goshawk (Accipiter gentilis). Like these other members of its genus, it is a species adapted to woodlands, with relatively short, rounded wings and a long, somewhat rounded tail that allow a high degree of maneuverability in thick cover. Juvenile Cooper's hawks are brown on the back with individual feathers edged in rufous, which gives them a slightly warm tone. The species shows a large degree of sexual size dimorphism, with the female as much as one-third larger than the male. Its diet consists mostly of songbirds, but also it also relies on small mammals, especially when nestlings are fledging. The Cooper's hawk infrequently breeds in immature plumage in the second calendar year, but more often at greater than two years of age. Pairs generally return to the same territory year after year, but often will build a new nest in the vicinity of an existing one. Cooper's hawks nest in deciduous, conifer, and mixed woodlands, predominantly in oaks and pines. They tend to prefer older, taller, and less dense woodlots than other Accipiter species.

There is no evidence of a decline in migratory populations of Cooper's hawks in the Western United States. Habitat destruction, pesticide contamination, and shooting are the primary identified mortality factors for Cooper's hawks. More importantly, destruction of riparian habitat, including loss of nest trees from depletion of the water source, damage by livestock, and invasion of non-native plants may have reduced the amount of breeding habitat for Cooper's Hawks.

GREAT GRAY OWL (*STRIX NEBULOSA*)

(Description adapted from CDFW 2007)

One of the world's largest owls, with a wingspan of approximately five feet, the great gray owl is dark grey overall interspersed with bars and flecks of light grey and white. When perched it appears bulky because of its dense, fluffy plumage, long wings extending past the body, relatively long tail, and large head. The size of the head and prominent facial disk make the yellow eyes appear small. The birds' feet are heavily feathered and remain hidden from view. Like most raptors, this species exhibits sexual dimorphism with females averaging about 30 percent larger than males.

Great gray owls are found world-wide in northern latitudes, but are rare throughout the range. The Southern Sierra Nevada is the southern-most limit of the species range in North America, where it breeds at elevations between 3,000 to 8,000 feet, and has a strong affinity for forests affiliated with wet meadows. In the Sierra Nevada, breeding habitat may be limited to elevations of roughly 3,000 to 8,000 feet above sea level. In California and Oregon, great gray owls appear to select nesting sites in stands of trees with dense overstory canopy closure and a preponderance of large, old trees and snags. In California, nesting sites are normally associated with large meadows or complexes of smaller meadows of 10 acres or more. Great gray owls prey on small mammals, predominantly pocket gophers, voles in the Western United States. In the Central Sierra Nevada, these owls also rely on shrews and moles. A variety of predators prey on eggs, nestlings, and fledglings, but most often include raven, goshawk, and great horned owl, especially if grouse and hares are scarce.

In 1986, it was suggested that the California great gray owl population was limited to only 60 to 70 individual birds. However, discovery of additional individuals and pairs has increased the estimated population to 200 to 300 individuals, although this includes a distinct subspecies of an estimated 50 pairs that only occur in Yosemite National Park. Loss of mature forest habitat for nesting and the degradation of meadow foraging

habitat by livestock grazing remain the major sources of habitat loss.

LONG-EARED MYOTIS (*MYOTIS EVOTIS*)
(Description adapted from CDFW 2008)

A typical long-eared myotis measures 75 to 97 mm in total length. Its large ears, extending about seven mm past the muzzle, a gradually sloping forehead, black wing membranes and ears, and light to dark brown fur, can distinguish this bat.

The long-eared myotis range extends from British Columbia, south to Baja California and east to North Dakota, and then southward through South Dakota, Nebraska, and New Mexico; excluding the southern deserts of Arizona and California. Two subspecies exist in North America (M. e. evotis, M. e. pacificus) and both are found in California.

The long-eared myotis occurs throughout California, except in the hot central valley and the dry hot deserts of southern and southeastern California. This bat uses brush, woodland and forests habitats up to 9,000 feet, preferring coniferous woodlands and forests, yet is uncommon in most of its range.

The long-eared myotis feeds on many different arthropods and eats more beetles than other myotis. It emerges late in the evening, hovering over water, among trees and shrubs within four feet of the ground and catches insects while in flight, feeding from the ground, or gleaning from foliage.

The long-eared myotis roosts in buildings, rock crevices, under bark and in snags and may use caves at night. They typically roost singly or in small groups of 12-30 animals, including maternity colonies. Mating likely occurs in the fall with usually one young born in May to June. The young are able to fly by early August. Knowledge of winter habits of the long-eared myotis is limited but it is suspected that they make short journeys to hibernating sites.

The destruction of suitable roosting sites and maternity colonies is probably the main reason for decline. Pesticide use, eradication from buildings and destruction of foraging habitat could also play a critical role.

LONG-LEGGED MYOTIS (*MYOTIS VOLANS*)
(Description adapted from CDFW 2008)

The long-legged myotis is a red to dark brown bat, with lighter brown to buff fur on its abdomen. Its hair extends from the body outward to the elbow and knee on the wing, and has an abruptly sloping forehead and small rounded ears. Typical body length for this large bat is 87 to 103 mm. The long-legged myotis occurs from North Dakota, south through Texas and west to the Pacific coast of the United States, central Mexico, Baja California, and central to northwestern Canada. There are four subspecies described by Hall (1981) with two (M. v. interior and M. v. longicrus) occurring in California.

This is a common bat found in all the mountain ranges of California above 4,000 feet and within the state is it absent only from California's central valley, the southern deserts, and eastern Lassen and Modoc counties. The long-legged bat occurs in woodland, forest, chaparral, shrub and coastal scrub habitats and is uncommon in arid grasslands.

Long-legged myotis forage near trees and cliffs, over water, and in wooded openings, at ten to 15 feet from the ground. They hunt primarily moths and other flying insects, emerging later in the evening than other myotis species but still near dusk. Little information on this bat's winter habits is available; it probably makes short migrations to hibernating sites.

Roosting sites can be found in rock crevices, buildings, under bark, in snags, and caves. Hundreds of bats may make up nursery colonies that are typically found under the bark of trees or in hollow cavities and occasionally in crevices of rocks or buildings. Mating takes place in the fall and young are born from June to July. Females lactate from July to August and young may begin flying in July.

This bat is easily disturbed at roost sites, which may be causing a decline in the species. The destruction of suitable roosting sites, pesticide use, eradication from buildings and destruction of foraging habitat could also play a critical role.

SHARP-SHINNED HAWK (*ACCIPITER STRIATUS*)
(Description adapted from CDFW 2008)

This jay-sized hawk is small and slim bodied, measuring 10 to 14 inches in length with a wingspan

of 20 to 28 inches. The sharp-shinned hawk can be distinguished from the Cooper's hawk by its shorter and squarer tail, which often appears notched when it is folded. Additionally, the sharp-shinned hawk has a proportionately smaller head and neck. The adults have a dark back and rusty-barred breast. The immature birds are dark brown above and streaked with rusty colored underparts. The sexes are very similar in plumage but the females are noticeably larger than the males.

Sharp-shinned hawks breed April through August with a peak in activity in late May, June, and July. This hawk usually nests in dense pole and small-tree stands that contain conifers and are cool, moist, and well shaded, often near water. The clutch averages four to five eggs with an incubation period of 34 or 35 days, which is shared by both adults. The young fledge in approximately 60 days. Roosting cover of intermediate to high canopy forests is also a requirement, but it will nest is dense stands that are in close proximity to open areas.

The diet of the sharp-shinned hawk is primarily small birds that are usually no larger than jays but may also include small mammals, insects, reptiles, and amphibians. Habitat loss is the primary reason for decline of this hawk.

SPOTTED BAT (*EUDEZEMA MACULATUM*)

(Description adapted from CDFW 2008)

The spotted bat has extremely large ears, dark body, and a white patch on the rump and each shoulder. Its abdominal hairs are white-tipped with black bases with a bare patch of skin on its throat. The ears, wing and tail membranes are pinkish-red. Total length of a typical spotted bat is 107 to 115 mm.

The spotted bat is considered to be one of North America's rarest mammals. In California, it occurs mostly in the southeastern Sierran foothills, mountains and desert regions and only occasionally occurs outside this range. This bat may be a yearlong resident with recorded occurrences in Yosemite Valley, California; and Reno, Nevada.

Little is known about spotted bats in California but they occur in arid deserts, grasslands, and mixed coniferous forests. Horizontal rock crevices provide optimal roost sites although they may occasionally use caves and buildings as well. Spotted bats may migrate from high elevations to lowlands in fall.

This bat is a late flyer compared to most other bats and is not frequently caught until after midnight. The spotted bat flies 15 to 45 feet above the ground in large elliptical paths (600 to 900 feet long) while foraging. It feeds primarily on moths although there is some evidence that it also will take beetles. Spotted bats have been observed to land on the ground and capture food items (like the pallid bat). The spotted bat is apparently a solitary animal. Spotted bats mate in late fall with a single young born before mid-June; lactating females have been found from June to August.

WILLOW FLYCATCHER (*EMPIDONAX TRAILLII*)

(Description adapted from Green et al. 2003)

Willow flycatchers are a small olive-brown bird with dark bars on wings and shoulders, and a yellow-olive underside. The species range includes nearly all of the contiguous United States, excluding the Southeast and far north. These birds hunt insects over streams and rivers, perching on and nesting in patchy deciduous riparian vegetation, particularly stands of alder and willow (Alnus spp. and Salix spp.). The collective studies of Willow Flycatcher diet indicate that this bird feeds on a wide variety of insect and other arthropod prey and, on rare occasions, fruit (berries). However, willow flycatchers appear to have a predilection for hymenopterids insects such as bees, wasps, and sawflies; dipterids such as deer flies and bee flies; moths and butterflies (and their caterpillars); and small flying beetles.

Territory size can vary widely depending on habitat structure, forage density, pressures from adjacent territories, and mating strategy. The breeding home range and territory are nearly synonymous for this species.

As with other regions of the species range, male willow flycatchers in the Sierra Nevada generally arrive at breeding areas first, with females typically arriving approximately 1 week later. Earliest arrival dates range from late May to early June in the southern Sierra Nevada.

Populations of willow flycatchers have exhibited marked declines throughout the western United States. Nesting willow flycatchers in the Sierra Nevada appear to occupy a narrowly defined niche. Based on

available data, willow flycatchers nest in willow patches averaging about 1 ha but are more frequently associated with meadows greater than 6 ha. Once willow patches are degraded, possibly due to past direct grazing by cattle or indirect meadow desiccation from natural (climate change, drought) and other anthropogenic causes (water diversions, adjacent timber harvest and fuels treatments, fire suppression, mining, roads, recreation), the ability of these patches to support nesting flycatchers is lost, and the birds do not have the plasticity to nest in other habitat types. Evidence for this is the large number of meadow sites that no longer support breeding willow flycatchers.

YELLOW WARBLER (*DENDROICA PETECHIA*)

(Description adapted from CDFW 2008)

Grinnell and Miller (1944) described the yellow warbler Yellow Warbler as a "common" to "locally abundant" breeder throughout California, except for most of the Mojave Desert. Despite many local declines, yellow warblers currently occupy much of their former breeding range, except in the Central Valley, where they are close to extirpation. Broad-scale significant declines have been documented in California, but local abundance and long-term trends, however, vary greatly by region. On the west slope of the Sierra Nevada, yellow warblers breed from foothill woodlands up to the mixed-conifer zone, and at select sites in the north they may be as abundant in montane chaparral as in riparian habitat. Verner and Boss (1980) considered them "fairly common" summer residents in the late 1970s, and Beedy and Granholm (1985) reported declining numbers.

Yellow warblers generally occupy riparian vegetation in close proximity to water along streams and in wet meadows. Throughout their range, they are found in willows (Salix spp.) and cottonwoods (Populus spp.), and in California they are found in numerous other species of riparian shrubs or trees, varying by biogeographic region. Because the yellow warbler is a generalist, it appears to adapt its foraging based on variation in local vegetation structure. Its diet in California contained over 97% i, including ants, bees, wasps, caterpillars, beetles, true bugs, flies, and spiders.

Yellow warblers have shown a high degree of site fidelity, with about 60% of males and 40% of females returning to their previous year's breeding grounds and many to the same territory. In California, they will make several nesting attempts throughout the season and will typically produce only one brood per year, although double brooding has been documented.

Human population growth and resulting habitat degradation in California will likely continue to pose a threat to yellow warblers given their sensitivity to decreases in deciduous habitat and riparian corridor width. Brown-headed Cowbird parasitism is a commonly reported cause of yellow warbler declines in California. Documented warbler nest failure is high in the northern (93% of 40) and eastern Sierra (76% of 521). In the wet willow meadows of the northern Sierra, yellow warbler nest success was negatively associated with the high activity of Douglas squirrels (Tamiasciurus douglasii), Stellar's jays (Cyanocitta stelleri), and brown-headed cowbirds, and nest proximity to trees and forests edges likely increases exposure to predators.

YOSEMITE TOAD (*ANAXYRUS CANORUS*)

(Description adapted from CDFW 2013)

Adult Yosemite toads are one and three quarters to two and three quarter inches (4.4-7 cm) from snout to vent and are robust and stocky with dry, uniformly warty skin. Males are pale yellowish green or olive above, with few or no dark blotches while females and young are heavily blotched on a light background. Throat and belly is pale on both sexes and parotid glands are large, flat and oval.

Typical habitat includes wet mountain meadows, willow thickets and the borders of forests, typically not more than 100 meters from permanent water, at elevations ranging from 4,800- 12,000 feet. Unlike many amphibians, Yosemite toads use nearby terrestrial meadow habitats for foraging, refuge, and movements, and they overwinter in mammal burrows, willow thickets, under boulders and logs, and underground. Eggs are laid in shallow pools and slow moving meadow streams and females can deposit over a thousand eggs at one location. Eggs hatch in 10-12 days with tadpoles metamorphosing in approximately two months. During this time, they are vulnerable to predation by fish, other frogs, diving beetles and garter snakes.

The Yosemite toad was once one of the most common high-elevation Sierra amphibians. Active for only four to five months per year, it has just a short time in which to reproduce and eat enough to survive the long season of hibernation under the snow. The number of Yosemite

toads has now declined precipitously throughout the Sierra Nevada, particularly in Yosemite National Park, where the toad was first discovered and after which it is named.

The causes of the decline are unclear. Disease, degradation of habitat by grazing livestock, increased ultraviolet radiation, introduced predatory fishes, a severe 1980's drought, windborne pesticide contamination, and increased predation by common ravens, whose population has increased greatly due to human activities, are all likely contributors to the decline. After entire populations of Yosemite toads disappeared, the Yosemite toad became a candidate species for listing under the protection of the Endangered Species Act.

YUMA MYOTIS (*MYOTIS YUMANENSIS*)

(Description adapted from CDFW 2008)

The Yuma myotis is a medium-sized light buff to dark brown bat with lighter underparts and short rounded ears. The bat's head rises sharply from its nose giving it a steep sloped appearance. A typical Yuma myotis bat measures 73 to 91 mm in total length.

The Yuma myotis occurs along the western quarter of North America from Canada, south to Mexico and eastward to Idaho and Texas, including parts of Montana, Utah and Colorado. Excluding most of Nevada and areas northeastward, the species includes six subspecies with four subspecies (M.y. saturatus, M.y. oxalis, M.y. sociabilis, M.y. yumanensis) occurring in California.

This bat is common in California and found throughout the state except in the Mojave and Colorado deserts of southeastern California. It occupies a variety of habitats below 11,000 feet, but is rare above 8,000 feet. It's most typically found in open forests and woodlands usually feeding over water, emerging after sunset to feed on a variety of flying insects low to the ground, and roosting in buildings, mines, caves, or crevices.

The bat may make short seasonal migrations from higher elevations to preferred hibernacula. These bats form large maternity colonies of several thousand in buildings, caves and bridge structures. Yuma myotis bats mate in the fall and bear one young from late May to mid-June. This species has been found roosting with other bats including pallid and Mexican free-tailed bats. Animals have lived up to 8.8 years.

Yuma myotis can be very difficult to distinguish from the little brown myotis (Myotis lucifigus) which is not listed. The two species may hybridize and ranges overlap in the mid to northwestern, northeastern and eastern parts of California. Little brown myotis usually has shiny tipped fur compared to dull tipped fur of Yuma myotis. Size is generally larger in M. lucifigus, but overlap does occur in measurements and slope of forehead. Some subspecies of the Yuma myotis have shiny fur.

Reasons of decline for this species include loss of suitable roosting sites habitat, including destruction and disturbance, and pesticides.

Hydrology and Floodplains

HYDROLOGY AND HYDROLOGIC PROCESSES

The hydrological force of the Upper Middle Fork of the San Joaquin River (UMFSJ) and its tributaries is the dominant geomorphic process (and important resource) acting today in Devils Postpile NM (Mutch et al. 2008).This river flows within the monument from north to south near the eastern boundary. In the northern portion of the monument, it meanders through meadows, then begins to descend more rapidly in the southern portion and includes scattered pools, quickly flowing rapids, cascades, and waterfalls.

As one of the twelve primary rivers originating in the Sierra Nevada (Mount 1997), the San Joaquin River is one of California's most important sources of water for human uses in the state (California Department of Water Resources 2009). It is part of the Sacramento-San Joaquin River watershed, which is under jurisdiction of California's Central Valley Regional Water Quality Control Board.

The waters of the San Joaquin originate near the Sierra crest and drain southwest, due to the tilt of the range. The 330-mile San Joaquin River begins as three headwater tributaries:

- The North Fork originates at an unnamed lake in the Ansel Adams Wilderness in the Sierra National Forest;
- The Middle Fork, which flows through the monument, originates at Thousand Island Lake in the Ansel Adams Wilderness; and

- The South Fork originates at Florence Lake in the Sierra National Forest.

The North and Middle Forks join at Junction Butte, nine river miles below the monument. The river meets the South Fork at Balloon Dome then travels through the foothills to meet the Fresno, Merced, Tuolumne, Stanislaus, Calaveras, and Mokelumne Rivers. After joining these rivers, the San Joaquin River waters continue through the Central Valley of California to join with the Sacramento River at the San Francisco Bay Delta, and then flows through the bay to the Pacific Ocean.

The San Joaquin River's watershed exceeds 32,000 square miles, or over 19% of the state of California. The river is impounded by hydroelectric dams at Mammoth Pool Reservoir, Redinger Lake, and Kerchoff Lake. Downstream of these reservoirs, the mainstem of the river is impounded by the massive Friant irrigation dam. However, there are no impoundments within or upstream of Devils Postpile National Monument and the river flows unimpaired downstream for 32.5 river miles before reaching Mammoth Pool Reservoir.

The river originated as long as 60 million years ago as a low-gradient drainage meandering east-west across the low hills that would later be uplifted to form the Sierra Nevada, with its headwaters far to the east. The main trunk stem of the Middle Fork originated in the Ritter Range (as it does now) but a large tributary channel crossed what is now the San Joaquin Ridge approximately one half of a mile south of Deadman Pass and presumably drained areas that are now the Mono Basin (east of the Sierra Crest). About 3.5 million years ago, this tributary channel was filled by a 1600 foot thick stack of basaltic lava flows originating from a Pliocene cinder cone between Minaret Summit and Deadman Pass. This lava flow diverted the tributary southeastward to join the Owens River in the area that is now Long Valley, long before the caldera subsided. As the Sierra Nevada rose, the west-slope waters altered their courses to find the least resistant rocks and greatest slope as it established a branching structure of tributaries and cut a set of v-shaped valleys. The numerous glaciers of the Pleistocene epoch ice ages carved these valleys into u-shaped flat-bottomed valleys, with the geopmorphic potential to support wide riverside floodplains.

The Middle Fork of the San Joaquin River is conceptually divided into upper and lower sections. The 19.3 mile Upper Middle Fork (UMFSJ) runs from its headwaters at Thousand Island Lake to the junction of the San Joaquin and Fish Creek. 3.7 miles of this segment runs through Devils Postpile National Monument. The UMFSJ receives waters from Beck, Iceberg, Shadow, and Garnet Lakes below Mount Ritter and Banner Peak, all within the Ansel Adams Wilderness of the Inyo National Forest. Major tributaries of the UMSFJ include Minaret Creek, King Creek, Reds Creek, Boundary Creek, Crater Creek and Fish Creek. Reds, Boundary, and King Creek are the primary drainages in and near the monument. The river channel runs from its headwaters almost due south, before making a westward turn at Cold Creek just above its confluence with Fish Creek. Fish Creek heads eastward through Fish Valley towards Iva Bell Hot Springs while the Middle Fork San Joaquin begins to head west at this point.. The watershed for the Upper Middle Fork of the San Joaquin River encompasses over 47,474 acres.

The headwaters of the UMFSJ River are located in the area of the Ritter Range and Thousand Island Lake, 14 km (8.7 miles) upstream, north and west of Devils Postpile. The fundamental resources of the river system include the mineral springs, wetlands, waterfalls, aquatic communities, riparian areas, and associated habitats and terrestrial communities of the corridor that are all sustained by the naturally functioning river that is supplied by relatively unpolluted surface and ground water. The greater San Joaquin River and its tributaries ecologically link the monument to areas up and downstream and the main river corridor is thought to provide a natural migration corridor for animals and birds (NPS 2013a).

As with other Sierra high-elevation rivers and streams, the majority of the UMFSJ water originates as snow during the months of October through March each year (Kattlemann 1996). Accordingly, river runoff varies greatly throughout the year, with the greatest streamflow volume in warm summer months (59% of total annual flow in May through July), and next-greatest stream flow in early spring (29% of total annual flow in February through April) (Cayan and Riddle 1993). However, some of the highest flows occur in winter months from rain-on-snow events.

WATER QUALITY

Although observations are few, water quality in the Upper Middle Fork of the San Joaquin is excellent as there is very limited human development upstream of the monument (NPS 1998). Minor, localized

degradation of water quality – consisting of greater than background concentrations of organic nutrients and animal-derived organisms such as fecal coliform, Enterococcus coli, and Giardia lamblia – can be attributed to stock use and recreational activities. Water quality in the watershed is also degraded by wet and dry deposition of wind transported pesticides and other agricultural products originating in the Central Valley. These chemicals can have disproportionately large impacts on Sierra biota relative to their naturally low concentration in Sierra waters. However, detection of the presence and trends of this impact is minimal due to the high cost of monitoring these trace chemicals in high-elevation streams and lakes.

FLOODPLAINS

There is no long-term hydrology gaging station in or upstream of the monument on the Upper Middle Fork of the San Joaquin River (Andrews 2012). A recently-installed gage within the monument provides streamflow data from October 2009 through the present. During that period runoff peaked at 1,520 cubic feet per second on June 23, 2011, and reached its minimum of 7.5cubic feet per second on September 21, 2013. For Sierra Nevada streams, the annual high water event typically occurs in late spring or early summer and is fed by seasonal snowmelt. High water events may also be caused by runoff from late summer thunderstorms. However, many of the highest magnitude floods occur during winter months due to rain on snowpack. The USGS stream gaging station is important for detecting the change in seasonality of spring run-off, in addition to high/low/extreme discharge events.

Although there is no long-term gage on the San Joaquin in or near the monument, a gaging station on an adjacent river at a similar elevation and similar watershed size as the San Joaquin provides insights into typical flood events. The gage on the North Fork of the San Joaquin River is located about seven miles from the monument and has a twenty-five year observation record (1922-1928 and 1952-1969). During these years, all but three of the peak annual flows occurred between May and July, likely driven by seasonal spring/summer snowmelt. One peak occurred in late August, likely as a result of a large thunderstorm. Another peak occurred at the end of December, likely due to a rain-on-snow event. Therefore, if hydrology on the North Fork of the San Joaquin is similar to conditions on the Middle Fork in the monument, annual peak floods can occur in most months of the year, including months with high visitation and months with very little to no visitation. Typical spring peak runoff events are occurring earlier in the year, corresponding with the trend of warming temperatures in the Sierra Nevada (Andrews 2012). In addition, recent data suggest that a greater percentage of Sierra runoff is occurring in winter months when compared to the historic record (Andrews 2012).

Monument staff reported that the winter flood of 1997 inundated the ranger station up to about three feet above the ground surface but did not flood the buildings in the vicinity of the Superintendent's cabin (Martin 2011). In other watersheds in the Sierra Nevada, the winter flood of 1997 was approximately a 100-year high water event.

GROUNDWATER

Groundwater systems help to support meadow and riparian areas as well as other hydrologic and geologic features such as Rainbow Falls and mineral springs. Although water quality is generally high, the interactions between groundwater and surface water in the monument are poorly understood and are now being addressed by researchers. The U.S. Geological Survey has collected samples from numerous springs in a series of studies including cyclic collection of analysis of spring waters and measurements from the groundwater public drinking well at the monument and a study looking at emerging contaminants in springs and wells.

The monument would like to address how changing climate and others stressors may affect stream temperatures, peak and low flow discharges, and stream channel disturbance regimes, and how these physical changes will translate into impacts on native species and their habitats. The NPS is establishing climate and weather, river, and wetland monitoring in the monument, as well as wetlands, rivers and streams, weather and climate, and lakes monitoring in Yosemite and Sequoia-Kings Canyon National Parks. Monitoring of the Soda Springs Meadow in the monument is ongoing. DEPO management hopes that these efforts will provide sustained data collection and analysis well into the future. This monitoring will help managers to assess how the entire Middle Fork of the San Joaquin River watershed is responding to climate change and other stressors.

WETLANDS AND RIPARIAN AREAS

Within the monument the river and its tributaries are perennial and channel beds consist of volcanic bedrock, boulders, cobbles, and gravel. River- and creek-bed gradients are general low in reaches with sand or gravel substrate. These are punctuated by reaches with bedrock or boulder controls and much higher gradients or steep drop offs – such as at Rainbow Falls. In reaches without hard substrate and banks, trampling by visitors can cause loss of riparian vegetation and associated accelerated erosion of banks. A 2009 reconnaissance of bank stability conditions just north of the monument showed that 63% of four miles of banks surveyed were in very stable conditions, 17% were in slightly disturbed conditions, 6% exhibited considerable signs of vegetation and soil disturbance, and 14% was highly disturbed (NPS 2009). Riverbank condition within the monument boundaries is generally more stable, as more of the bed and bank substrate is hardened bedrock or boulder. However, a limited number of high-visitation areas exhibit high degrees of vegetation disturbance and soil erosion. Monument staff have installed fencing to minimize resource degradation from trampling in several high-visitation areas, while maintaining river access in reaches with hardened or resistance substrate. Indicators and standards have been developed to monitor and mitigate effects of social trailing in these sensitive areas.

The UMFSJ provides habitat for aquatic and wetland species in the monument. Riparian trees bordering the river include willow species (Salix lasiolepis, S. lemmonii), aspen (Populus tremuloides), and black cottonwood (Populus balsamifera ssp. trichocarpa) (Denn and Shorrok 2009). During spring and summer months the UMFSJ and its tributaries are "losing" streams: water leaves the channels, feeding adjacent wetlands. The monument lands include over forty acres of vegetated wetlands dependent on UMFSJ-derived surface- or ground-water. Dominant vegetation types in these wetlands include herbaceous sedge (Carex spp, Schoenoplectus spp.) and rush (Juncus spp.) communities as well as shrubby willow stands (Denn and Shorrok 2009). Soda Springs Meadow – a wetland complex supported by UMFSJ river water and visited by most travelers to the Postpile – contains the greatest diversity of invertebrates per area observed in the Sierra Nevada (Holmquist and Schmidt-Gengenbach 2005).

Soundscapes

The soundscape is the total acoustic environment of an area. Both natural and human sounds may be desirable and appropriate in a soundscape, depending on the purposes and values of a managed area. For example, the sound of an amplified evening ranger program at the Devils Postpile amphitheater may be appropriate and desirable, but not within the Ansel Adams Wilderness. The soundscape often varies in its character from day to night and from season to season and can be affected by changes in numbers of visitors who introduce human-caused sound into the environment. Natural sounds are often sought by visitors and comprise an important part of their experience. A 2006 survey by the Outdoor Industry Association found that more than two-thirds of those surveyed want a quiet, secluded national park visit. The natural sounds of the planning area, emerging from sources such as rivers, creeks, and wildife, can be easily degraded or destroyed by inappropriate sounds or sound levels. As a result, the soundscape requires careful management if it is to remain unimpaired for future generations. There is no documented historical use of the airspace over the monument and no commercial air tours are permitted as overflights of the monument.

Natural soundscapes are also vital to the natural functioning of wildland ecosystems. Studies suggest that the acoustical environment is important to wildlife in a number of ways including intra- and inter-species communication, territory establishment, finding desirable habitat, courtship and mating, nurturing and protecting young, predation and predator avoidance, and effective use of habitat.

Chronically-elevated sound levels due to aircraft noise mean that visitors and wildlife experience smaller effective listening areas than they would experience under natural conditions. The full effects of this chronic loss of listening opportunity on wildlife are not known, but two presumed consequences are increased search times and increased antipredator vigilance. Loss of listening opportunity also has the potential to endanger park visitors: avalanches, flash floods, and landslides will all have acoustic signatures similar to distant jets.

DEVILS POSTPILE NATIONAL MONUMENT

Devils Postpile National Monument represents a vestige of the traditional undeveloped park experience. Generations of visitors have sought and continue to expect a relatively quiet and natural setting where natural sights and sounds predominate. New visitors often come to experience a threshold wilderness experience, expecting a setting that emphasizes wilderness values such as natural sounds and low manmade ambient sound levels.

Extrinsic sounds (any sound not forming an essential part of the park unit, or a sound originating from outside of the park boundary) within the monument vary in type, duration, and audibility according to season and location. A 2006 Acoustic Monitoring Report found that while aircraft noise accounted for the majority of extrinsic sounds in the monument's wilderness, vehicles, people, and domestic animals can also be heard and account for a large portion of the audible noise in the monument's developed areas. The largest contributions to extrinsic noise in the developed area surrounding the ranger station, for example, came from vehicles. These sounds were predominantly caused by buses, specifically the sound of back up alarms and air breaks (Formichella et al. 2007).

WILDERNESS IN THE MONUMENT AND SURROUNDING AREAS

Comprised mostly of designated wilderness, the surrounding watershed preserves important opportunities for visitors to experience natural sounds, solitude, and quiet and for wildlife to benefit from uninterrupted natural soundscapes. The watershed has relatively few noise intrusions, but does experience overflights of aircraft, including commercial aircraft from the Mammoth Yosemite Airport. In fact, the sound of aircraft accounts for the majority of audible manmade noise in these wilderness areas. Acoustic monitoring at a wilderness site within Devils Postpile National Monument during the winter, for example, found aircraft to be audible 40 percent of the time during peak hours and an average of 15.9 percent overall.

The Reds Meadow Valley provides relatively easy access to large undeveloped areas where the visitor can not only catch a glimpse of natural processes at work, but also feel that they are a part of the larger community of life. Visitors to the valley generally seek traditional, non-motorized outdoor recreation experiences, such as hiking, fishing, horseback riding, and camping, in a setting that emphasizes the enjoyment of natural sights and sounds. The activity that most affects noise levels in the valley is motorized transportation, which includes buses, cars, motorcycles, and, infrequently, snowmobiles. Traffic volumes are generally low and intermittent, due to the shuttle bus schedule.

The 2005-2006 Acoustic Monitoring Report for Devils Postpile National Monument yielded valuable results that allow park managers to better understand the existing acoustic environment of the park. Monitoring existing conditions and trends allows managers to take action to move towards desired future conditions. Activities that can be managed will also focus on efforts to eliminate or minimize the extrinsic sounds during the early- and mid- morning hours when wildlife communications are often at their peak.

Cultural Resources

Archeological Resources

Archeological sites are important in several ways: 1) American Indian archeological sites are important to today's traditionally associated American Indian tribes, groups and individuals. They form tangible links to their cultural heritage, and demonstrate the long history and traditional associations to their ancestral homelands. 2) American Indian and Euro-American archeological sites provide tangible links to the broad patterns of our collective, multicultural history and are therefore valuable to the larger public; 3) Sites can hold material remains that embody distinct cultural adaptations or characteristics of a particular time period; 4) Some types of sites are important for their high artistic value (such as those that contain rock art, tree carvings, etc.); and 5) Most archeological sites are significant for the scientific information they can provide regarding prehistoric and historic lifeways.

Federal and state agencies, as well as universities, have conducted extensive archeological research in the Sierra Nevada. Such regional research on both the eastern and western flanks of the Sierra has generated regional chronologies of human occupation and land use, and exploration of various research topics. Importantly, these studies have often highlighted the

inter-connection of the peoples along both sides of the Sierra, particularly with regard to trade.

Most prehistoric archeological sites in the Sierra Nevada generally include scatters of flaked and/or ground stone tools, and waste flakes from stone tool manufacture; caches of tools; quarries used to obtain raw materials for stone tool manufacture; food procurement and processing features; fire hearths; and structural remains. The sites' settings include other important landscape features such as historic or prehistoric trail routes, spiritual places, gathering and hunting areas, habitation areas and meeting places. Historic American Indian archeological sites can include aboriginal and Euro-American materials and features.

Historic archeological sites include such tangible resources as remains of prospector, herder, or miner cabins; mine prospect pits, adits, shafts, and other features; trash scatters; fencelines; tree blazes (both directional and artistic); trail alignments; garden patches; water conveyance features; remnants of logging operations (such as railroad grades, flumes, chutes, and ditches); remains of research installations; and remnants of recreational facilities.

To date, only a very small fraction of the Upper Middle Fork of the San Joaquin River watershed has been inventoried for archeological resources, most of which as occurred in support of the agency's issuance of commercial pack station and pack stock outfitter/guide permits.

The entire land base of the Devils Postpile National Monument has been surveyed for archeological resources. Eleven sites have been documented, representing both prehistoric and historic-era uses of the area. Most recently, a 1993 study documents the complete inventory of monument lands after the large scale wildland Rainbow Fire of 1992 (Hull and Hale), and a 2007 report (Schaffer) provides condition assessments for all of the documented sites. None of the sites has been studied in detail; most information has been generated from surface surveys only. A unique discovery of buried archeological materials occurred during 2011 as a result of the severe windstorm that toppled many of the monument's mature trees. A small historic dumpsite was revealed, documenting the material remains of mining and early recreation activity along the Middle Fork San Joaquin River.

The majority of the Devils Postpile archeological sites likely represent seasonal American Indian use. Ten of the eleven sites contain debris from manufacturing flaked stone tools or tool blanks. Interestingly, at least seven of these sites have basalt as well as obsidian waste flakes, possibly a sign of quarrying from the exposed basalt outcroppings. One site contains what appears to be a cache of stone tool blanks, artifacts which likely represent the important trans-Sierran trade of toolstone obsidian. No food procurement or processing features have been documented. However, the monument environment is rich in resources that are valued by contemporary descendant tribes for their utilitarian, food and medicinal purposes.

Two artifacts, one spear or dart point and one arrow point, were noted during the archeological studies. These indicate that human use of the monument could extend back at least 5,000 years before present. Archeological objects in the Devils Postpile museum collections confirm this tentative time span. Artifacts generally thought to represent the time period between A.D. 500 and 1500 have not been located, which may represent a period of decreased human use related to the increase in volcanic activity in the Mammoth area, or simply reflect the limited research conducted to date.

Three of the sites with American Indian resources also contain one or more objects or features of presumed Euro-American manufacture. For example, one site contains many lodgepole pine trees with geometric blazes, cut letters and numbers, and axe-cut notches. Together with glass and metal surface artifacts, this site is likely the remains of a pre-1931 sheepherder camp (Schaffer 2007). Other historic archeological resources include isolated artifacts along the King Creek trail corridor, probably relating to use of the French Trail (Hull and Hale 1993), and the remnants of Postpile Joe's cabin, possibly built before 1909 and occupied sequentially until 1933 by miners Moore and Joe "Postpile Joe" Ivanhoe (Johnson 2013).

TRADITIONAL ASSOCIATIONS

Many Indian people retain a deep, abiding concern about what occurs within their aboriginal territory. These lands are considered the center of their universe, their homeland; tribal members often express spiritual reverence for the land. Thus these lands are important not only for cultural survival, but spiritual survival as well.

Archeological sites and landscapes have a value to Indian people beyond the scientific information they contain. Although surface materials have, in some cases, disappeared or have been greatly diminished, the cultural values to Indian people remain intact. These cultural values can be represented in prehistoric archeological sites, prehistoric and historically used trails, springs, gathering areas, and sacred places, among other resources.

The planning area likely represents the traditional homelands and territory of American Indian peoples who today belong to the following tribes, communities and organizations.

Federally Recognized Tribes: The Bishop Paiute, the Bridgeport Indian Colony, the Lone Pine Paiute-Shoshone, the Big Pine Paiute, the Fort Independence Paiute, the Benton Paiute, and the North Fork Rancheria of Mono Indians.

Federally non-Recognized Tribes (Tribes in the process of seeking federal recognition): Mono Lake Kutzadika'a Indian community and the North Fork Mono Tribe.

Consultations that have occurred to date reveal several issues important to these tribes and groups. Among others, they include: the need for unencumbered access to lands and resources; desire to conduct traditional resource gathering; ability to hold regular gatherings for elders and youth in order to maintain vital cultural connections to the land; the need to protect the fragile ecosystems; the need to reduce fire danger; and the desire to have viable employment opportunities.

CULTURAL LANDSCAPES AND HISTORIC STRUCTURES

The entire land base of Devils Postpile National Monument has been surveyed for cultural landscapes and historic structures. Within the monument, cultural landscape and historic structural resources are very limited. Also considered an archeological resource, Postpile Joe's cabin ruins and associated "icebox" features convey the early mining history of the monument. The ruins and the associated archeological deposit have been determined, in consultation with the California SHPO, to be eligible for listing in the National Register of Historic Places. While alignments have changed over the years, the historic Pacific Crest, Mammoth Pass, and John Muir Trails traverse the valley, maintaining a continuity of trans-Sierran access vital to today's cultural values of access to and enjoyment of wilderness. The monument's ranger station was built in the early 1940s and represents historic federal land management and interagency cooperation. The front room of the building represents the original structure from the 1940s, and the back room was added during a 1970s era renovation. Additional research and evaluation will be undertaken during 2014 to establish the historical integrity and authenticity of the building. The remaining administrative and residential facilities have been constructed since the 1960s and therefore are not considered historic buildings. A recent Historic Resource Study (Johnson 2013) also identifies the following potentially significant historic resources: Natural features including the Postpile formation, Reds Meadows, Soda Springs Meadow, and the Middle Fork San Joaquin River as cultural landscapes with cultural significance to Indian tribes in the area; as sites in the development of geologic interpretations of the Sierra Nevada; and as locations linked to the history of conservation, tourism, and recreation in the Mammoth Lakes region and the Sierra Nevada as a whole.

Within the Upper Middle Fork San Joaquin watershed, cultural landscape and historic resources primarily comprise trails, evidence of herding, and mining resources. The vast majority of these are in designated wilderness. At this scale and throughout the Sierra Nevada, cultural landscapes and historic resources reflect several themes. These include:

- Mining and resource extraction
- Indian wars
- Sheep and cattle herding
- Water impoundment diversion
- Agriculture
- Rustic development of early federal agency land management practices
- Early tourism

Reds Meadow Valley cultural landscape and historic resources reflect the historical themes of tourism and rustic development. The Reds Meadow Pack Station is documented as a significant historic resource, consisting of cabins, corrals, circulation systems, and small scale features representative of a historic pack stock operation providing visitors with stock

for recreational travel in the adjacent wilderness. The Reds Meadow Guard Station is a historic building. Construction began in 1927 and was completed in 1932 by USFS staff to support agency management within the valley. The neighboring Bath House, constructed by the Civilian Conservation Corps in 1935, historically diverted water from the Reds Meadow Hot Springs into the bath house for showers. The Inyo National Forest manages these structures. Both structures are currently closed to public access due to health and safety concerns.

Museum Collections and Body of Knowledge

SCOPE OF COLLECTIONS

The museum collections of the Devils Postpile National Monument represent and preserve the natural and social history of a significant region of the Sierra Nevada. The collections help to document several of the monument's fundamental resources and values. The collections also advance the identified fundamental values to provide opportunities for science and learning and to document the monument's natural and administrative history, cultural significance, and topographic importance in the Sierra Nevada eco-region (NPS 2010a).

The Devils Postpile Museum Collection comprises a range of objects and paper documents reflecting the natural, cultural and administrative history of the monument. Noteworthy among this collection are the following:

- Type specimens of the geologic resources;
- A herbarium which, when complete, is intended to provide thorough representation of all native plants, as well as established exotic plants;
- Aquatic and terrestrial organisms including worms, mollusks, anthropods, crustaceans, insects, sponges, etc. used to establish baseline water quality
- A collection of vertebrates for the region, housed in the Museum of Vertebrate Zoology at the University of California, Berkeley;
- A small but valuable collection of prehistoric material consisting primarily of field-collected flaked stone tools, tool fragments and waste flakes from stone tool manufacture;
- A collection of historic photographs documenting infrastructure and development;
- Records (primary field data collection information, reports, etc.) of investigations that have resulted in acquisition of museum collections (such as botanical and archeological inventories);
- A history collection consisting of a series of reports and maps, including the 1934 monument boundary report and the original plant checklist.
- Archival material documenting the monument's administrative history.

TABLE 4.6: MUSEUM COLLECTIONS

Collection	Space	Current Location
Herbarium	28 cf	Devils Postpile NM (Monument residence)
Aquatic Invertebrates	13 cf	Seqouia-Kings Canyon NP
Geology	30 cf	Devils Postpile NM (Mammoth Lakes office)
Archeology	0.75 cf	Seqouia-Kings Canyon NP
History	9 cf (est)	Primarily Devils Postpile NM (Mammoth Lakes office)
Archives	9 lf	Yosemite NP
	10 lf	Seqouia-Kings Canyon NP
	3 lf (est)	Devils Postpile NM

LOCATION OF COLLECTIONS

These collections are housed primarily in the Museum Collections Area of the Ash Mountain Headquarters Building at Sequoia and Kings Canyon National Parks. A smaller number of objects are kept in the monument's office in Mammoth Lakes or onsite at the Postpile, and digital information about archeological resources is maintained at Yosemite National Park. The vertebrate zoological collection is maintained at the Museum of Vertebrate Zoology in Berkeley. A duplicate of the 2001 plant collection is curated at the University of Wyoming at Laramie and there is also a collection at the Jepson collection at the University of California, Berkeley. The monument's archival collection is not well understood, and is split between the facilities at

Sequoia and Kings Canyon, Yosemite National Park, and the monument.

STATUS OF MUSEUM COLLECTIONS CATALOGING

In 2010, backlog cataloging funds were obtained and nearly all the uncataloged Devils Postpile materials in the Ash Mountain collections were cataloged and records were entered into the Interior Collections Management System (ICMS). This included over one thousand aquatic invertebrates collected in the 1990s, thirty years of daily ranger logs, approximately one linear foot of park administrative records, an important collection of photographs documenting changes in infrastructure, and the last known of the monument's prehistoric obsidian.

The majority of the archival records and the monument's slide collection remain uncataloged.

COLLECTIONS LOCATION AND CURATORIAL STRATEGY

Except for the herbarium, geology specimens, and some archival maps and records, the majority of the collections are adequately housed and managed at Sequoia and Kings Canyon National Parks administrative facilities, managed by a staff curator and overseen by a Curator of Record at Yosemite National Park. Collections are stored in newly renovated facilities in the Ash Mountain headquarters area, space which meets NPS museum requirements for security and climate control. Museum staff at Sequoia and Kings Canyon National Parks performs all inventory, cataloging, conservation, and reporting tasks. However, the current location of the collections and associated records does not provide for ready access to park staff, researchers or tribal partners.

The collections stored onsite at the monument are not adequately housed, and security and accountability are issues that must be addressed. Having the monument's archives split between three locations also presents issues of access, accountability and security. A Museum Collections Emergency Operations Plan for collections in the monument was completed in 2013.

The monument museum collections will expand as additional research occurs. In particular, type and voucher specimens, primary research documents, and administrative records will be added as part of ongoing monument management and administration. Particularly important is the accessioning of records of research conducted within the monument, given the interagency nature of these activities. Additional direction on the scope of the monument's collections can be found in the Scope of Collections Statement for Devils Postpile National Monument (NPS 2010a).

CONSERVING KNOWLEDGE OF HISTORY AND PREHISTORY

Information and data reflecting the history and prehistory of the monument exist in numerous reports, documents, and records that are, or should be, part of the museum collections. These include records of the monument's administrative and physical history, archeological sites, and historic resources. Copies of many of these documents exist at either the monument facilities or the Mammoth Lakes office. Issues associated with these storage practices include the lack of ready access to information for park staff and the confidentiality of sensitive data contained in document copies stored in monument facilities.

The monument is surrounded by the Inyo National Forest. The records and data for the history and prehistory of adjacent forest lands are important to understanding the monument's resources. Many of these are housed in the Forest Supervisor's offices in Bishop, California.

CONSERVING KNOWLEDGE OF ECOSYSTEMS

Currently the scientific knowledge of Devils Postpile ecosystems resides in museum specimens, archival museum collections, published and unpublished scientific reports, and digital records. Collectively, these data are managed as indicated above (museum collections) and as prescribed in the Sierra Nevada Network Data Management Plan (NPS 2008) This plan provides Sierra Nevada Network Inventory and Monitoring staff as well as park staff, researchers, and partners with a system of data management that "will ensure the production and dissemination of timely and usable scientific information about the status and trends of park resources to park managers" (NPS 2008) This data management plan addresses extant data as well as acquisition of new scientific information, and provides for a stable and consistent environment for storing, managing, and migrating data to ensure its quality, interpretability, security, longevity and availability.

The majority of data reflecting the scientific knowledge of Devils Postpile ecosystems is stored digitally, in a variety of NPS applications and data repositories.

These include the NPS Data Store, NPS Focus Digital Library and Research Station, NPS Data Clearinghouse, ICMS, NatureBIB, NPSpecies, Biodiversity Data Store, and NPSTORET. The range of data included in these repositories spans digital imagery, bibliographic data, Geographic Information System spatial and tabular data, and biological and physical science data sets.

It is likely that traditionally associated American Indian tribes, groups and individuals hold traditional ecological knowledge pertaining to the monument and its resources. As the monument's tribal partnerships expand, this traditional knowledge may become available to the monument's managers and collaborating scientists.

Records management amongst the Sierra Nevada Network parks is also guided by the network Data Management Plan. The plan identifies document naming standards and format for directory structure, as well as specifications for archiving completed data sets and information. As with museum collections, accessibility of data and synthetic information is an issue for monument staff, however this is somewhat mitigated by the availability of information in digital format.

Wilderness

Overview

Approximately 85% of Devils Postpile NM is contained within the Ansel Adams Wilderness. Congress established the Minarets Wilderness in 1964 honoring the jagged range of peaks known as the "minarets" which are considered to be one of the most spectacular mountain ranges in the Sierra. Under the California Wilderness Act of 1984, the wilderness area was enlarged and the name was changed to the Ansel Adams Wilderness in honor of the famous landscape photographer. The Ansel Adams Wilderness contains a total of 231,279 acres, and the remaining acreage outside of Devils Postpile NM is managed by the Inyo and Sierra National Forests.

In the monument and surrounding valley, the wilderness landscape predominates as the towering peaks of the west side of the valley and high walls of the eastern ridge encompass a wild river that originates at a high pass. For many visitors, a trip to Devils Postpile NM is one of their first experiences in a natural setting surrounded by a relatively large wilderness landscape. Many of these visitors are from large urban areas and, in addition to being novice hikers, have never experienced designated wilderness. The proximity of the wilderness boundary to the frontcountry areas, and location of Rainbow Falls within the Ansel Adams Wilderness on the popular and relatively short 3.5 mile loop hike from the Visitor Contact station at the bus stop to Devils Postpile and Rainbow Falls, means that many visitors have a first-time wilderness experience within the monument.

For many others users, Devils Postpile is a portal to one of the largest contiguous wilderness areas in the lower 48 states, offering longer day hikes, backpacking trips, pack trips, and mountaineering opportunities in the greater Sierra Nevada. Sections of the internationally recognized John Muir and Pacific Crest Trails are also contained within the monument and Devils Postpile NM and Reds Meadow Valley provide a key resupply stop for many, if not most, John Muir Trail (JMT) and Pacific Crest Trail (PCT)hikers.

Devils Postpile NM provides opportunities for experiences that help visitors develop curiosity, understanding, and appreciation of the wilderness character and values. Based on the 2006 Visitor Services Project (VSP) survey, visitors indicated that prior to visiting the monument only 41% of visitor groups were aware of the wilderness designation in the monument. The remaining 59% of monument visitor groups were not aware that the monument provides hiking access to the high Sierra backcountry and John Muir Wilderness areas, or that 85% of the monument is designated wilderness (Manni et al. 2007).

Visitors indicated that they learned about and appreciated wilderness values during their visit. These values included the preservation of early American heritage (Native American and pioneer) (46% of visitors), the value of untouched or undeveloped landscapes (44% of visitors), and the value of habitats in the original state with minimum impacts from human activities (43% of visitors). This survey and visitor comments also identified that in future visits, visitors wanted opportunities to learn more about the undeveloped landscape and additional opportunities for solitude.

Wilderness Character

Agencies responsible for administration of designated wilderness are required by law to preserve the wilderness character of the area. Managers at the monument use a Minimum Requirement Analysis to determine if, when, and how administrative actions that might impact wilderness character can be implemented. There are four qualities derived from the statutory language of the 1964 Wilderness Act that are used to describe wilderness character:

- Untrammeled: wilderness is essentially unhindered and free from modern human control or manipulation.
- Natural: wilderness ecological systems are substantially free from the effects of modern civilization
- Undeveloped: wilderness is essentially without permanent improvements or modern human occupation
- Outstanding opportunities for solitude or a primitive and unconfined type of recreation: wilderness provides outstanding opportunities for people to experience natural sights and sounds, solitude, freedom, risk, and the physical and emotional challenges of self-discovery and self-reliance.
- Other features of wilderness: wilderness may also contain ecological, geological, or other features of scientific, education, scenic, or historical value.

"UNTRAMMELED"

Wilderness within Devils Postpile NM is generally unhindered and free from most human manipulation. However, fire suppression does occur within designated wilderness in Devils Postpile NM and degrades the untrammeled quality of wilderness character. Fire suppression is a preferred management action when fire threatens life, improvements, or is determined to be a threat to natural and cultural resources or improvements. However, the act of suppressing the fire, regardless of how many acres it has burned or will burn, manipulates wilderness.

"Natural"

Ecological systems inside Devils Postpile NM wilderness are affected by things that happen both inside and outside the wilderness boundary. Compared to other locations and national parks in the U.S., the conditions of natural resources in Devils Postpile NM are relatively good (NPS 2013a). Due to its relative isolation and its position within a largely intact landscape managed as wilderness, resources within the monument enjoy a relatively unimpacted environment. However, local or regional empirical evidence as well as local anecdotal evidence suggests that there are stressors and threats. Affected components are grouped by physical resources, biological resources, and landscapes.

Physical Resources

The assessment of physical resources for Devils Postpile NM relies heavily on data and research from outside the monument as data collection within the monument has only recently begun. The physical resources of the monument vary in their current condition from poor to good (NPS 2013a).

Although limited data collection from the monument indicates that both air and water quality are fair to excellent, the spatial and temporal extent of the data collection and targeted pollutants are limited. Both air and water quality may be worse than what limited local data reveals, due in large part to the proximity of the polluted air from the California Bay Area and Central Valley. The San Joaquin Valley is consistently found to be the most polluted air mass in the U.S. and research has shown that at least some of those pollutants are making their way up into the high Sierra Nevada (NPS 2013a)

A recent study measured surface ozone (O3) at the monument during the 2007 (low-fire) and 2008 (high-fire) summer seasons (Bytnerowicz et al. 2012). While mean and median values of O3 concentrations for the 2007 and 2008 summer seasons were similar, maximum O3 concentrations in June and August 2008 were higher than in any month of the 2007 summer season. This increase of maximum concentrations in the high-fire year is attributed to emissions of O3 precursors from wildland fires downwind of the monument in addition to transport of polluted air from the California Central Valley and the San Francisco Bay Area. Generally, the monument can be considered as a low pollution site when compared with other locations in central Sierra

Nevada Mountains (Cisneros et al. 2010). However, due to the strongly pronounced diurnal differences, with low O3 values at night and high daytime concentrations reaching more than 80 ppb in 2007 and close to 100 ppb in 2008, the monument exceeded the California O3 air pollution standards for several days in both years (Bytnerowicz et al. 2012).

While at first look the surface and groundwater dynamics of the monument may appear to be functioning unimpaired, data and research from within the Sierra Nevada have found some apparent alterations of temporal surface flow patterns, as well as possible changes in annual discharge. This change is in response to regionally rising temperatures and the resultant earlier spring snowmelt, earlier peak surface flows, and extended period of low flows in summer and fall. In many areas groundwater levels are closely tied to river flow so are also expected to lower earlier in the season. If regional climate continues to warm, it is likely that the monument will start to experience decreased snowpack and snow water content (NPS 2013a).

The geologic resources of the monument are in good to excellent condition, but this is entirely based on anecdotal evidence. While it is unlikely that the geologic resources (e.g. the Postpile, Rainbow Falls, granitic domes) have been degraded by one or more stressors, no empirical monitoring has occurred to support this assumption (NPS 2013a).

Biological Resources

The native flora of the monument appear to be faring better than other areas of the Sierra Nevada bioregion, particularly the lower elevation western foothills that are heavily impacted by development, grazing, and nonnative and invasive plants. The presence of nonnative and invasive plants in the monument is a persistent though relatively minor stressor for native flora and natural processes at this time. However, reintroductions or persistence of some nonnative or invasive species seems to be occurring and therefore some species may continue to present a low level threat. This threat may grow if regional climate trends continue.

The condition of forests and woodlands within the monument has largely been affected by the 1992 Rainbow fire that burned much of the monument. Although fire severity varied, leaving some unburned pockets, most of the forests in the monument comprises early successional characteristics. . A small proportion of the forests and woodlands in the monument have not burned in over 135 years, far out of their natural fire return interval. Assuming that fire is the most important disturbance mechanism in these forests and based on recent assessments of regeneration, the current state of the forests is fair to good, but may improve in the future (Caprio, A. pers comm). Thus, in areas of moderate to high fire severity, forest condition ranges from poor to fair. In areas of lower fire severity where overstory tree mortality was limited and high tree regeneration rates are occurring, the forest condition can be considered good in terms of regeneration.

On November 30, 2011 a severe windstorm lasting 12 hours with winds between 100-200+ miles per hour blasted the Reds Meadow Valley and Devils Postpile NM. The storm produced very rare, very strong north winds. Thousands of large trees toppled to the ground throughout the valley. Scientists continue to study the effects of this storm on ecosystems in the valley and what they may mean for managers and resources in the future.

A spatially comprehensive assessment of all wetlands within the monument in 2006 found most wetlands to be at or above the desired condition. Staff used the California Rapid Assessment Method for Wetlands and Riparian Areas (CRAM) (Denna and Shevrock 2009). The project concluded that thirty-seven percent of DEPO's wetland acres achieve desired condition, sixty-three percent are in good condition, and less than one-half of one percent are in poor condition. Although depressional wetlands, by acreage, generally conform to the monument's ideal (58% in desired condition), the only two DEPO wetlands in poor condition fall into this wetland class. Most riverine wetland acres (71%) are in good condition, while almost all (99%) of the monument's seep/slope wetland acreage achieves desired condition. On average, the conditions of the wetlands are good.

Field staff also noted anthropogenic disturbances in wetlands which may adversely affect wetland health and function. Evidence of fire, passive recreation, and active recreation are the three most common stressors at DEPO.

Considering available information, the condition of the bird species and the entire bird community is fair to good and the condition of mammal species and the entire mammal community are fair to good, though any one species may be better or worse. It is estimated that

overall condition of amphibians and reptiles is poor to fair considering the documented global and regional declines of many species in response to pathogens and climate change.

Macro-invertebrates were studied on two separate occasions in the recent past. Both found apparently healthy populations and diversity of taxa. Although no long-term monitoring has documented any changes in these invertebrates as a result of fish introductions or altered water quality, it appears that today the conditions for these animals are good to excellent.

Taking the entire set of species together, the overall condition of the biodiversity of the monument is also good.

Landscapes

Due to its relative isolation, and location within a matrix dominated by federal lands and designated wilderness areas, the landscape context of the monument is good. Though tourism in the monument, and especially in the nearby town of Mammoth Lakes and Mammoth Mountain Resort and ski area, will continue to increase in all seasons, the patterns of landscape status and use will remain relatively static for the near future. Devils Postpile NM benefits from being surrounded by other protected lands. However, roads and associated impacts may be contributing to at least some degradation of natural resources in the monument (NPS 2013a).

"UNDEVELOPED"

For the purpose of this description, and following guidance in "Keeping it Wild: An Interagency Strategy to Monitor Trends in Wilderness Character across the National Wilderness Preservation System" (Landres et al. 2008), this section only monitors non-recreational developments, such as administrative or instrumentation sites. Recreation-focused developments, such as trails, camps, two bridges, signs, and toilets are monitored under the solitude or primitive and unconfined recreation quality because of the strong connection these features have to recreational experiences.

The "undeveloped" quality of wilderness character in Devils Postpile NM wilderness is generally good. Installations include small temperature sensors, USGS river gaging equipment, and piezometers in the meadow to measure groundwater. Motorized equipment, such as chainsaws, may be used for administrative purposes within wilderness, consistent with minimum requirement analyses.

"OUTSTANDING OPPORTUNITIES FOR SOLITUDE OR A PRIMITIVE AND UNCONFINED TYPE OF RECREATION"

Opportunities for solitude within Devils Postpile NM wilderness exist. The easy access to wilderness within Devils Postpile NM, including Rainbow Falls, 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 offer visitors and wilderness enthusiasts more solitude, even at Rainbow Falls. Similarly, the shoulder seasons offer visitors opportunities for solitude.

Opportunities for primitive and unconfined recreation are reduced by a several facilities that decrease self-reliant recreation. Trails within wilderness are well-developed and signs at trail junctions are common. The viewing area at Rainbow Falls, within designated wilderness, includes interpretive panels, a hitching post, formalized viewing platforms, and a staircase to the base of the river. Some of these facilities serve to manage impacts from visitor use by confining impacts to specific, localized areas. In addition, the Soda Springs and stock bridge, as well as signage, reduce opportunities for primitive recreation in these specific areas.

In other areas of the monument, primitive and unconfined recreation is available with cross-country travel that is permitted in designated wilderness.

OTHER QUALITIES

The NPS has developed draft guidance in "Keeping it Wild in the National Park: A User Guide to Integrating Wilderness Character into Park Planning, Management, and Monitoring (April 2012). This guidance addresses a fifth quality of wilderness character, that is, the other features of scientific, educational, scenic, or historical value. This fifth quality is unique to an individual wilderness based on the features that are inside that wilderness. These features typically occur only in specific locations within a wilderness and include cultural resources, paleontological localities, or any feature generally not under the other four qualities that has scientific, educational, scenic, or historical value. These include specific features such as Rainbow Falls, mentioned in the monument's enabling legislation, as

well as others that are significant or integral to the park and wilderness.

The many unique qualities manifest in the monument's wilderness remain generally in good condition and continue to contribute to the wilderness character. These include the scientific and educational values embodied in the geologic features and evidence of geologic processes for which the monument was established, the scenic qualities inherent in Rainbow Falls and Upper Middle Fork San Joaquin River, and the historical, educational, and scientific values of the archeological and historic sites.

This quality is preserved or improved by the preservation or restoration of such features, even when such management actions degrade other qualities of wilderness character. Loss or impacts to such features degrade this quality of wilderness character.

Surrounding Areas

ANSEL ADAMS WILDERNESS

The Ansel Adams Wilderness encompasses 231,279 acres in the Sierra Nevada and is administered by the U.S. Forest Service, with the exception of the portion contained within and managed by Devils Postpile National Monument. Congress originally established this wilderness area as the Minarets Wilderness in 1964. These "minarets", a jagged ridge of peaks, are considered to be the one of the most spectacular massifs in the Sierra. The minarets are part of the Ritter range, an exposed roof pendant of metavolcanic rock that provides a stupendous skyline from both the east and west side of the Sierra. In 1984, Congress passed the California Wilderness Act, closing the gap of the proposed Trans-Sierra Highway, enlarging the overall wilderness area, and changing its name to the Ansel Adams Wilderness, in honor of the famous landscape photographer known for his photography of Yosemite and the Sierra Nevada.

The Ansel Adams Wilderness is contiguous with Yosemite National Park to the north. Elevations in the wilderness area range from 3,500 feet to a high of 13,157 at Mt. Ritter. There are a number of streams and lakes, which form the headwaters of the North and Middle Forks of the San Joaquin River. The wilderness is extremely popular and experiences high and varied visitor use, including day hiking, packstock and backpacking use. Overnight use is controlled by a trailhead quota system that limits the amount of use entering each day from May thru October.

There are approximately 349 miles of trail, including sections of both the John Muir Trail and the Pacific Crest Trail that traverse portions of the wilderness. Some trails originating on the National Forest also provide access into Yosemite National Park.

JOHN MUIR WILDERNESS

The John Muir Wilderness encompasses 651,992 acres in the Sierra Nevada and is administered by the U.S. Forest Service. Congress established the John Muir Wilderness in 1964 in honor of the man who spent his life advocating for the protection of the wild parts of the Sierra Nevada. Muir believed that public support for the protection of these lands would come about if more of the public experienced these areas and he formed the Sierra Club for just that reason. The wilderness area today includes many of the lands that he explored in the late 1800's.

From east of Fresno, California in the north, the John Muir Wilderness forks around Sequoia/Kings Canyon National Park and extends some 100 miles to the south with its southern most boundary just west of Lone Pine, California. Elevations in the wilderness area range from 4,000 feet to just below the Mt. Whitney summit at 14,497 feet. There are numerous peaks over 12,000 feet. Deep canyons, lofty peaks, meadows, lakes and expansive alpine terrain characterize this wilderness. The south and middle fork of the San Joaquin River, the North Fork of the Kings River and many creeks that flow into the Owens valley to the east originate here.

The John Muir Wilderness is heavily visited and has use limits in the form of trailhead quotas on all the trailheads accessing the wilderness from both the east and west side of the Sierra Nevada. There are over 590 miles of maintained trails and the John Muir Trail and Pacific Crest Trail traverse portions of the wilderness. Many trails originating in this wilderness access the backcountry of Sequoia/Kings Canyon National Park.

The John Muir Wilderness is bordered by the Ansel Adams Wilderness to the northwest, the Dinkey Lakes Wilderness to the west, the Sequoia-Kings Canyon Wilderness to the south, the Monarch Wilderness to the southwest, and the Golden Trout Wilderness to the south. Together, these areas form one of the largest contiguous wilderness areas in the lower 48 states.

Scenic Resources

Dramatic scenery is an integral part of the visitor experience at the monument and its surrounding watershed. Devils Postpile National Monument is located on the western slope of the Sierra Nevada Mountains between 7,200 and 8,000 feet. The highly scenic Sierra Nevada landscape includes mountains, volcanoes, lakes, streams, forests, and meadows that formed over time from volcanic events and the mountain building forces of plate tectonics.

As part of the GMP planning process, the planning team identified the significance of the monument through its legislative history. Scenic resources are among the most important resources within the monument including the glacially exposed columns of the Devils Postpile, Rainbow Falls, and the wilderness landscape of the upper Middle Fork San Joaquin River in the Sierra Nevada. This section describes the range of scenic resources within the monument and in the surrounding area.

The river's source is just above Thousand Island Lake which sits at the base of Banner Peak (12,936 feet) in the Ritter Range. Thousand Island Lake's spectacular scenery, with its many small islands, was made famous by photographer Ansel Adams. Thousand Island Lake is one of many in the upper watershed that were carved by glaciers during the Pleistocene. Visitors can experience the scenery of the river and its watershed on the John Muir and Pacific Crest Trails and through developed visitor areas in Reds Meadow Valley.

Upper portions of the river, from Agnew Meadows to Upper Soda Springs Campground, are characterized by long riffles and deep pools which flow through dense forest with areas of swamps and high rock cliffs. The section through Devils Postpile National Monument has riffles, falls, and springs. It meanders through the Soda Springs Meadow at the north of the monument and descends over 100 feet down Rainbow Falls in the southern portion of the monument. The river continues south to the Lower Rainbow Falls after which it drops into a narrow granite gorge.

DEVILS POSTPILE

The main attraction at the monument is the Devils Postpile, a scenic outcrop of volcanic basalt composed of parallel, multi-sided columns that reach 60 feet in height. The basalt covers a large area of the adjacent Inyo National Forest, but the Devils Postpile formation is exceptional for its regularity and symmetry. The Devils Postpile is considered one of the top geological sites in California. Many national and international visitors travel specifically to visit this geologic wonder. Visitors can experience the majesty of the geometric columns from the base of the formation and can hike to the top to view the regularity and symmetry where the columns were sheared by glaciers.

RAINBOW FALLS

The other main scenic attraction at the monument is Rainbow Falls. This 101 foot waterfall drops sharply to a shallow pool at the bottom where visitors are often treated to rainbows that form in the spray of the waterfall.

SODA SPRINGS AND MEADOW

Soda Springs refers to both the iconic spring and meadow of the monument and highlights the beauty and importance of meadows and mineral springs. Soda Springs is part of a complex of smaller springs located in Soda Springs Meadow and is located next to the river just upstream of the trail bridge. This spring appears to continuously bubble, and when the river level lowers it is exposed on the bank. Its iron rich red color and bubbles draw visitors to the site, and due to the lack of delineated access, informal trails to and around the springs have proliferated.

Soda Springs Meadow, located adjacent to the main visitor area, is the largest meadow within the monument. The meadow is filled with perennial sedges, grasses, and wildflowers and is bisected by the Upper Middle Fork of the San Joaquin River. The trail to the Postpile traverses the meadow providing monument visitors with visual access to wildflower displays and wildlife that frequent the meadow.

THE UPPER MIDDLE FORK OF THE SAN JOAQUIN RIVER

The Upper Middle Fork of the San Joaquin River is a free flowing river with mineral springs, wetlands, riparian areas, and other water-dependent features. The majority of its watershed is designated wilderness. Within the monument, the river changes form, at times slowly meandering through alpine forests and meadows, and elsewhere changing to fast-flowing rapids with cascades and dramatic waterfalls.

BUILT ENVIRONMENT OF THE MONUMENT

Surveys indicate that visitors appreciate the rustic architectural style of the monument. Rustic architecture uses natural materials such as wood and rough, irregular stonework. Building forms are generally simple and small with steeper roof lines. Signs, benches, overlooks, bridges, and other site elements also reflect a rustic character.

Visitors generally appreciate that only a minimal amount of facilities are located in the monument. Those that exist are small in scale and tend to have rustic qualities. For example, the small ranger station moved to the monument from Yosemite in 1946 greets monument visitors. The 21-site monument campground located along the river is also highly valued for its "rustic" quality. There are no RV hook-ups and very few built amenities associated with the campground.

SURROUNDING AREAS

Reds Meadow Valley

Reds Meadow Valley is the entry point for visitors to Devils Postpile National Monument, the Inyo National Forest, and the Ansel Adams Wilderness area. Highway 203 proceeds through the Mammoth Lakes to Minaret Road that transits the Mammoth Mountain Ski Area to Minaret Vista Station. From there the steep and narrow Reds Meadow Valley Road descends eight miles to the Devils Postpile Access Road turnoff, and then another mile to the end of the road at Reds Meadow Resort and Packstation that . This drive affords visitors many spectacular views as they descend into the valley. Visitor use areas and trail heads provide access to the scenic sites and features described below.

Minaret Vista

Located on the Sierra Crest, Minaret Vista offers one of the most breathtaking viewpoints in the Sierra Nevada. Most prominent are the views of the Ritter Range, located west in the Ansel Adams Wilderness area. Uplifted millions of years ago, the basalt range is composed of numerous jagged pinnacles and peaks shaped by ancient glaciers moving down both sides of the crest below the peaks. The most prominent peaks are Mount Ritter, at 13,157 feet, and Banner Peak at 12,945. South of Mount Ritter and Banner Peak stand the 17 jagged peaks known as "The Minarets." These peaks were named as a group due to their resemblance to towers commonly found on mosques. Minaret Vista is an ideal location to provide visitors with an orientation to area resources and attractions.

Sotcher Lake, Agnew Meadows and Reds Meadow

Lakes, meadows, and hot springs located off of Minaret Road on the Inyo National Forest are scenic areas that also provide visitors with ample recreational opportunities such as hiking, camping, picnicking and fishing.

The small and scenic Sotcher Lake provides opportunities for paddling, fishing, and viewing wildlife. Agnew Meadows is a primary entry point for hikes on the Pacific Crest and John Muir Trails. This scenic meadow also features a wildflower trail where visitors can view prolific summer displays of wildflowers. Reds Meadow campground lies at the confluence of Sotcher and Reds Creeks. Many of the sites are located directly on Reds Creek. Natural hot springs are also a feature of this site.

Climate Change

Global climate is naturally in flux, and there has been a documented rapid rise in observed global temperatures in the past 50-100 years. Recent documented trends in global temperatures have been linked to anthropogenic greenhouse gas emissions and have gained much attention (Miller 2003, IPCC 2007, Rosenzweig et al. 2013). Climate change presents significant risks and challenges to the National Park Service and specifically to Devils Postpile NM. Scientist cannot predict with high certainty the severity of climate change and the associated implications, but a range of plausible climate futures for the region is available (Kunkel et al., 2013).

Climate in California over the next 100 years is predicted to become hotter and Sierra Nevada snowpack is predicted to shrink significantly by the year 2100, leaving ecosystems with a greater water deficit during the seasonal summer drought (Cayan et al. 2007). A conservative climate model predicts a 30 –70% reduction in seasonal snowpack while another predicts a 73 – 90% reduction by the end of this century (Hayhoe et al. 2004). In the Sierra Nevada, there has already been a dramatic documented retreat in the size and volume of glaciers over the last century (Basagic 2008).

Projections of the impact of regional warming on the western U.S. and the Sierra Nevada are cause for concern. Even a moderate projected temperature warming of 2.5 C (4.5 F) would be expected to affect precipitation, fire regimes, and organism habitats in the local ecosystems. The most pronounced changes are likely to be seen in snowpack volume, surface water dynamics, and hydrologic processes. For example, regional average temperature increases would cause earlier snowmelt runoff, reduce summer base flow in local streams and rivers, lower snowpack volume at mid-elevations, and increase the frequency and severity of winter and spring flooding. Changes in the type and timing of precipitation are already being observed within the monument and surrounding areas, as flow in many western Sierra Nevada streams have been observed to begin one to three weeks earlier than in the mid-20th century. Prolonged summer droughts have altered natural fire regimes and increased the potential for high severity wildfires.

Climate change is expected to cause changes in plant and animal species distributions. Climate change will cause both range contractions and range expansions and may impact the composition and function of the ecosystems currently found in the watershed. High elevation habitats and associated species could be particularly vulnerable to climate change. Increasing temperature and changing precipitation patterns could result in a shift of specific habitat to higher elevations. As climate warms, entire plant communities will likely not shift in unison, but rather each species will respond differently, resulting in new species associations and communities. This shift in habitat could pose challenges to the wildlife species currently associated with existing plant communities. High alpine habitat may shrink or even disappear, leading to an irreversible loss in species such as pika (Loehman 2009).

In the Sierra Nevada, recent changes in the response of plants and behavior of animals have been observed, and could be attributed to changing climate. The timing of seasonal activities like bud-break, flowering, migrations, nesting, and hatching are happening earlier globally (Root et al. 2003) and in the western U.S. (Cayan et al. 2001). Range-shifts in butterflies have been observed northward and upward in elevation along the Pacific coast (Crozier 2003) and upward in elevation in the Sierra Nevada (Forister et al. 2010). Upward elevational range shifts have also been observed in migratory birds and small mammals in the Sierra Nevada (Moritz et al. 2008, Moritz et al. 2011). Response of species to climate change will likely be complex and variable and may be counter-intuitive (NPS 2013a).

Drier summers would also probably lead to further increases in wildfire occurrences and fire severity. Wildfire frequency and burn area have already increased dramatically in the U.S. in recent decades, and these changes have been linked to a warmer and drier climate (Westerling et al. 2006). The response of fire to a changing climate is complex and is potentially exacerbated by decades of fire suppression. However, predictions are for an increase in area burned and fire severity in the future under a warmer climate (Liu et al. 2010; Pechony and Shindell 2010). Although 85% of the monument and thousands of acres of the UMFSJ watershed burned during the 1992 Rainbow Fire, much of the watershed's forest is still overgrown due to fire suppression (NPS- DEPO Fire and Fuels Management Plan 2005). A prolonged drought or a trend towards longer, drier summers may create conditions favorable for catastrophic wildfire, with implications for built structures, recreation, and habitat.

Climate change is also likely to lead to changes in other stressors of the Sierra Nevada, resulting in even greater negative impacts. Besides increasing fire frequency, a warmer and drier climate is likely to result in increased production of some atmospheric pollutants, and a potential increase in the distribution and abundance of some nonnative invasive species (Loehman 2009). The *Regional Climate Trends and Scenarios for the U.S. National Climate Assessment* provides the most recent climate change projections for the region (Kunkel et al. 2013).

Understanding the effects of projected climatic changes on the ecosystems of the monument is critical to developing policy that protects at-risk natural resources. Extensive research has been conducted in the Sierra Nevada at large and the Sierra Nevada Network parks, but little has been done to examine the vulnerabilities within the monument.

In Devils Postpile and the UMFSJ watershed, climatic changes are of concern for several resources. The most apparent is the riparian corridor of the Upper Middle Fork San Joaquin River and associated wetland habitats. Changes in snowpack, snowmelt, and streamflow may alter the hydrology of these wetlands and impact the important seasonal trends that sustain and support many plant and animal species. Additional effects from changes in climate and precipitation patterns in

Devils Postpile could include diminished integrity of meadows, wetlands, seeps, springs, tributaries, and the San Joaquin River, thus compromising the vitality, diversity, and distribution of native species and habitats.

A major challenge for resource managers at the monument and partner organizations is managing the monument's resources and values within the context of uncertain climate futures. Assessing the condition and vulnerability of these resources and values while also understanding the range of climate futures possible for the region is part of this challenge. Monitoring changes in climate over time to validate which climate future is becoming a reality, along with the associated ecological responses, is another part of the challengeThe monument has identified high-resolution climate monitoring as a research priority. This includes research into micro- and meso-scale weather and climatic patterns and how these may be buffered by or accelerated by changing climate.

Devils Postpile NM also belongs to a network of parks nationwide that are putting climate-friendly behavior at the forefront of sustainability planning. Devils Postpile NM is a participant in the NPS Climate Friendly Parks (CFP) program and the monument completed a Climate Friendly Parks Workshop and finalized a Climate Friendly Parks Action Plan (NPS 2010c). Participation in the CFP program included conducting an emission inventory, setting emission reduction goals, developing the Action Plan, and committing to educate park staff, visitors, and community members about climate change. As a result of this work, the monument provides a model for climate-friendly behavior within the park service.

Visitor Opportunities

Access and Circulation

Sightseeing, hiking, wildlife watching, fishing, backpacking, camping, horseback riding, and artistic inspiration are some of the many of the reasons visitors come to Reds Meadow Valley and the Middle Fork San Joaquin River watershed. With the John Muir and Pacific Crest Trails meeting in and continuing through the valley, hikers of all abilities utilize monument and valley trails. A variety of experiences are available to visitors in front- and back-country settings. On both a valley and monument scale, hiking and sightseeing are the primary activities in which visitors participate.

VISITOR USE PATTERNS

The peak season of visitation for the monument is mid-June through Labor Day weekend. Heavy snows limit visitor access and forces prohibit automobile access to the monument in winter and determine when the monument opens in the spring. Access to the monument is via a narrow, seven-mile road through the Inyo National Forest. The winding spur road into the monument is less than a half-mile. From mid-June through the Wednesday after Labor Day, access is primarily provided by a mandatory shuttle bus system operated by agreements between the Inyo National Forest and Eastern Sierra Transit Authority (ESTA). When the mandatory shuttle bus ends sometime in September, fall colors and good weather bring many private vehicles to the monument that often require parking management for visitor safety and resource protection.

Visitor services cease after October 31, or when the road to the monument is closed due to snow and ice after October 15 when plowing services are no longer available. The road typically re-opens and visitor services resume in early to mid-June, though winters with exceptionally high snowfall have pushed opening day into late June. Private vehicle use is regulated during most of the summer season when mandatory shuttle service brings visitors in and out of the monument.

During the 2004 to 2007 period, average summer use was 143,868 visitors per year, with an estimated daily average of approximately 2,000 during peak season. The average length of stay for day use is 4-5 hours and for overnight use is 2.5 days. The monument is also used as an access point for backcountry hikers heading for the Pacific Crest Trail and the John Muir Trail.

A commercial use operator provides day-use stock trips to Rainbow Falls between June and September and service days are managed through an Inyo National Forest permit. There are approximately 200 private stock users on the John Muir and Pacific Crest trails in the monument each year. Personal stock use numbers in the monument are small and have yet to be accurately counted (Mutch et al. 2008).

The number of visitors accessing the monument during the winter months is probably less than 100 per year, though winter use has been increasing in recent years (Mutch et al. 2008). Legal winter access is by backcountry skiing or snowshoeing, though snowmobiles that are allowed on the Reds Meadow Road occasionally trespass into the monument.

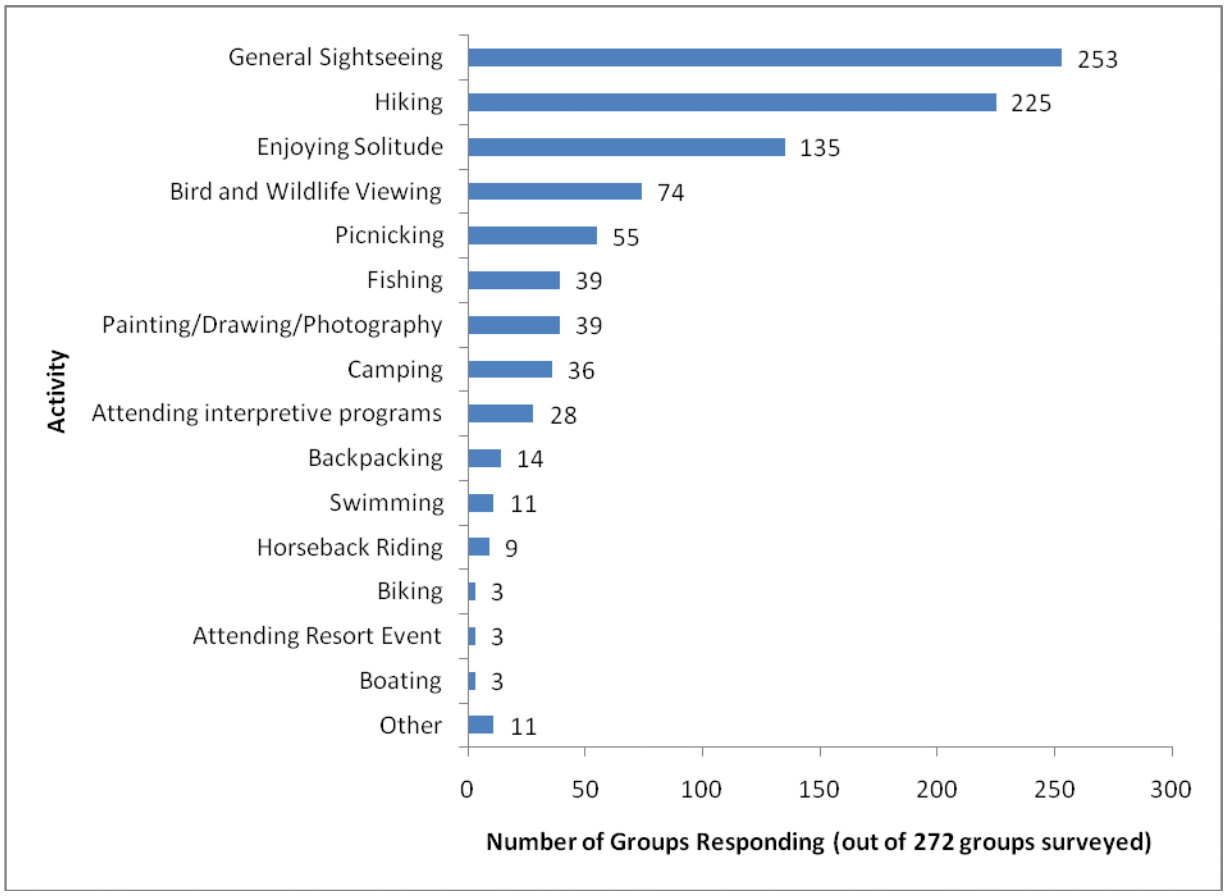
Within the peak season, July is the busiest month for the monument. During peak season about one thousand people per day visit the base of the Postpile. Saturday is the busiest day of the week, when about 1,200 people visit the base of the Postpile. Rainbow Falls, the second most visited attraction in the monument, sees 600-700 visitors on a weekend day during peak season. Almost half of the visitors who begin hiking at the monument headquarters walk the two and a half miles to Rainbow Falls and then out to the Rainbow Falls trailhead on USFS land.

TRANSPORTATION AND ACCESS

During the summer season, most visitors (75%) ride the shuttle bus into Reds Meadow Valley. Transportation for overnight visitors staying in the campground is primarily by personal vehicle. During the shoulder seasons, many visitors arrive via personal vehicle. However, given the road closures that take place during the non-peak season, visitation is concentrated during July, August, and September.

The monument has only one paved road, a 0.34 mile-long access road to the headquarters and ranger station. Transportation through the rest of the monument is provided by 5 miles of unpaved trail. One pedestrian bridge and one stock/pedestrian bridge provide access across the river within the monument.

FIGURE 4.1: VISITOR ACTIVITIES AT AND NEAR DEVILS POSTPILE NATIONAL MONUMENT (NPS 2006)



Visitor Use Opportunities

Most visitor use is focused in the northeastern portion of the monument, in the day use area, campground, parking lot, and ranger station. Another large concentration of visitor use is distributed along the northern reach of the river and the trails that lead to the Postpile and Rainbow Falls. Designated wilderness encompasses the western portion of the monument, totaling 85% of the park unit area. It receives less day-use but substantial use of John Muir and Pacific Crest Trails.

The most common activities visitors reported participating in on their visit to the monument included general sightseeing (92%) hiking (82%) and enjoying solitude (49%) respectively (NPS 2006).

VISITOR CONTACT AND INFORMATION STATIONS

Although the monument contributes seasonal and volunteer staff as budgets allow for NPS visitor information services at the Interagency Mammoth Lakes Welcome Center and the Minaret Vista Station during the peak field season, there is only one primary contact station within the monument. The ranger station is a small building with a few basic exhibits and a small bookstore. No maximum capacity has been identified. It serves as an office, first aid station, bookstore, and wilderness permit center. It is the only federally-operated information facility in the valley. The small size of the building limits the number of visitors that can be contacted there. On average, rangers contact about 46,000 visitors at the ranger station in a season. In addition, monument rangers contact visitors on informal roves and as visitors disembark shuttle buses at the monument headquarters.

HIKING AND TRAIL SYSTEMS

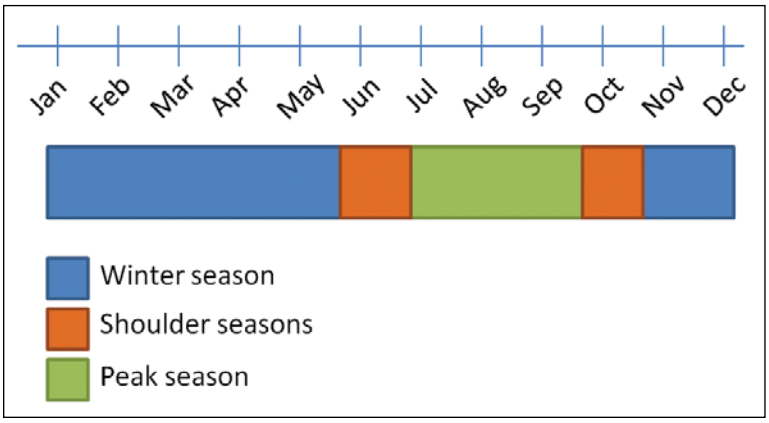
There are 5.3 miles of trail within monument boundaries (NPS 2010c). These trails are accessed from the Devils Postpile trailhead near the visitor center or via the Rainbow Falls trailhead, which is on USFS land. The only trail and destination combinations that are strictly in the monument are the trails to Devils Postpile and Soda Springs. The trail to Rainbow Falls winds in and out of monument boundaries. Although Rainbow Falls is located in the monument, the trail leaves the monument again as it continues to Lower Falls. The trail to Minaret Falls starts in the monument; however, Minaret Falls lies outside monument boundaries in the Ansel Adams Wilderness and the Inyo National Forest.

The trails offer a variety of opportunities for all fitness levels. The John Muir and Pacific Crest Trails combine to become one trail in the monument. Many through-hikers take advantage of the shuttle system and other amenities at Devils Postpile to refuel and rest.

CAMPING

The monument maintains a two-loop, 21-site first-come, first-served campground. Some of the monument's campsites can accommodate campers and trailers up to 30 feet in length. Recreational vehicle users account for approximately 30 percent of campground occupants. There are no hook-ups or dump stations in the campground. Bear boxes are located at every site to promote proper food storage. The restroom facilities include flush toilets and running water. There is one ADA-accessible site in the A-loop with a nearby ADA accessible comfort station. The campground fills most weekends during the busiest part of the summer season. Use of the campground typically tapers off from late-August through the end of the season.

FIGURE 4.2: APPROXIMATE TIMES OF VISITOR USE SEASONS FOR REDS MEADOW VALLEY



FISHING AND WATER ACCESS

Fourteen percent of visitors listed fishing as an activity in which they would participate (Manni et al. 2007). The river is accessed in the monument at several locations. Trails to access the river include the trail from the day-use area through the edge of the meadow to the river; a trail near the B-Loop of the campground; and a multitude of social trails along the edge of the Soda Springs Meadow. Although most fishing in the monument occurs near Soda Springs Meadow and the campground, there are

also popular areas downstream toward Rainbow and Lower Falls. There is no lake fishing available within the monument.

Fish are not native to the UMFSJ and the NPS halted fish stocking within the monument in 1971; however wild trout populations persist in the San Joaquin River within the monument. The California Department of Fish and Wildlife stocks fish upstream of the monument at Pumice Flat and Upper Soda Springs Campgrounds.

In 1995 the California Department of Fish and Wildlife designated the San Joaquin River within the monument as a Wild Trout Waters.

BIRD WATCHING AND WILDLIFE VIEWING

Common wildlife observed by visitors to the monument includes mule deer, black bear, coyotes, ground squirrels, and a variety of bats. Since 2001, counts of birds in the monument conducted by Point Reyes Bird Observatory (Point Blue) and other groups have documented 114 bird species in the monument and have identified Soda Springs Meadow as a particularly valuable habitat for fall migrants, making the meadow a good bird watching throughout the entire field season. Bird banding events in cooperation with the Point Reyes Bird Observatory have become popular visitor activities in the monument during the fall, with 368 visitors attending eight separate bird banding sessions in 2010 up from 160 attending the demonstrations in 2009.

HORSE AND STOCK USE

With only 5.3 miles of trail in the monument, horse and stock use is limited. Day trips to Rainbow Falls with the length of field season and snowpack, and from 2009 to 2013 varied from approximately 600-1200 day use rides. Many visitors participate in concession-run day rides from Reds Meadow Resort to the top of Rainbow Falls within the monument. Stock riders that transit the monument are generally less than 100 per season in a combination of primarily commercial trips and some private stock is permitted on the King Creek and John Muir/Pacific Crest Trails; and at Rainbow Falls where the only hitching post inside the monument boundary for visitors is at the top of Rainbow Falls. The trail to Devils Postpile and the Soda Springs bridge is closed to stock use. The only river crossing for stock is at the Arch Bridge that connects to the John Muir Trail on the west side of the bridge.

Stock use is prohibited on the Devils Postpile trail between the ranger station and the Postpile formation due to the high volume of hiker traffic. Therefore, visitors with stock must enter the monument via the Rainbow Falls trailhead or other valley trailheads. There is no stock trailer parking in the monument parking lot without a permit from the Superintendent due to the limited trail access for stock and lack of parking and turning space for stock trailers within the monument.

WILDERNESS

Except for the visitor use developed area and road corridors, most of the monument (85%) is designated wilderness. Wilderness destinations from the monument trailhead include Beck Lakes, Trinity Lakes, Minaret Lake, and Rainbow Falls. In 2009, 4,347 visitors began or ended their wilderness trip in the monument, or passed through the monument during their trip (Inyo National Forest Wilderness Statistics 2009).

SURROUNDING AREAS

Reds Meadow Valley

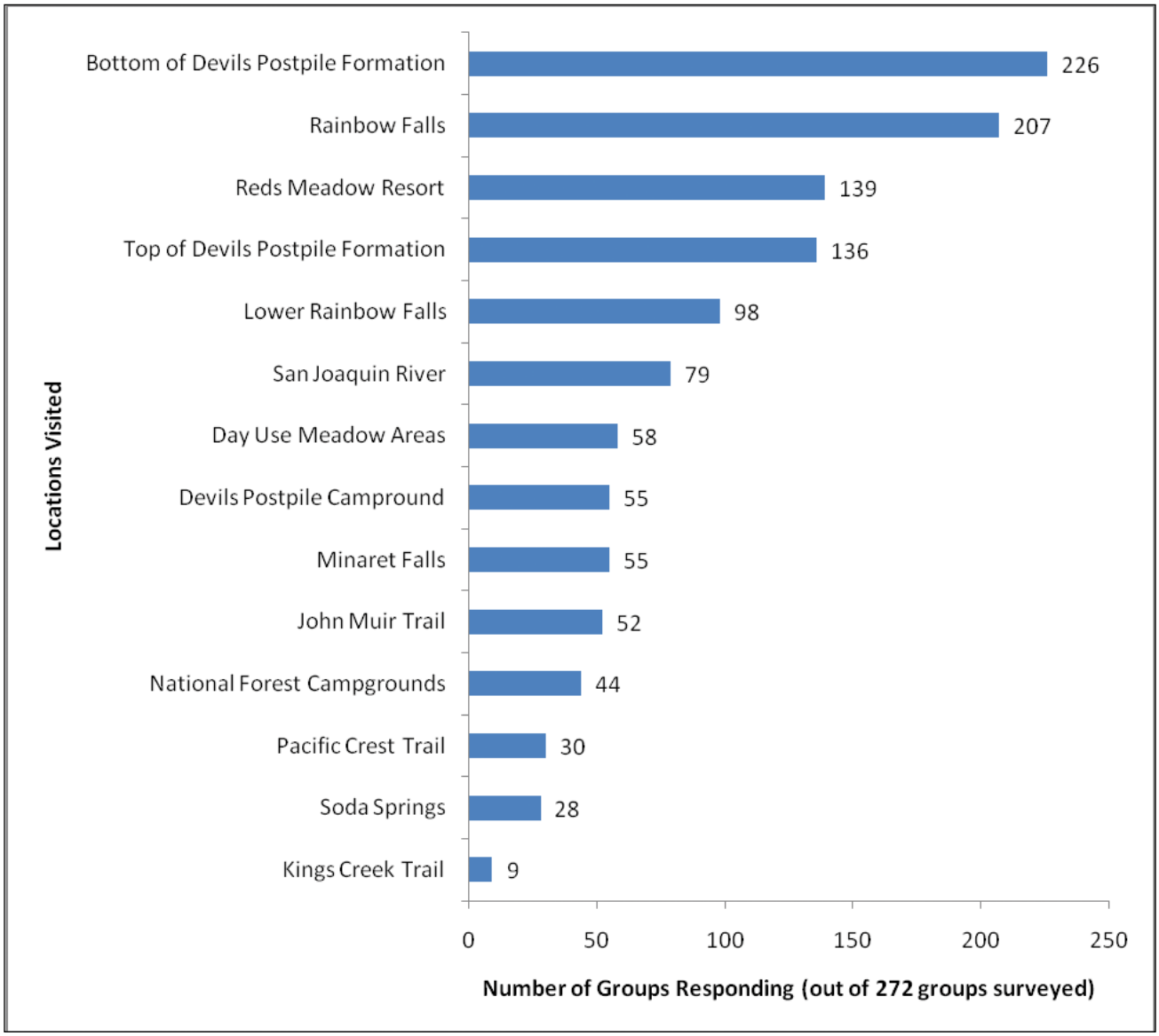
Like Devils Postpile NM, visitor use patterns for Reds Meadow Valley vary strongly by season. Visitation trends are distinct three seasons: peak summer season, shoulder summer seasons, and winter season.

During the peak summer season months - usually mid-June through Labor Day weekend - the USFS and NPS restrict private vehicle access into Reds Meadow Valley in order to maintain safe road conditions on the narrow road and to protect natural and cultural resource values. Only visitors meeting a small set of exceptions (below) may drive personal vehicles into the valley during peak season. The USFS administers a shuttle system to provide pedestrian and bicycle access to the valley. Visitors board the bus at the Village at Mammoth (located in the Town of Mammoth Lakes) or at the Mammoth Mountain Adventure Center (located near Mammoth Mountain Main Lodge). Bus riders then travel down into the Reds Meadow Valley and can alight at various locations within the valley.

Visitors to the valley most commonly report visiting the bottom of Devils Postpile (83% of visitors queried), Rainbow Falls (76%), Reds Meadow Resort (51%), and the top of Devils Postpile (50%).

FIGURE 4.3: PLACES VISITED IN THE REDS MEADOW VALLEY

From survey of 272 visitor groups (Manni et al. 2007)



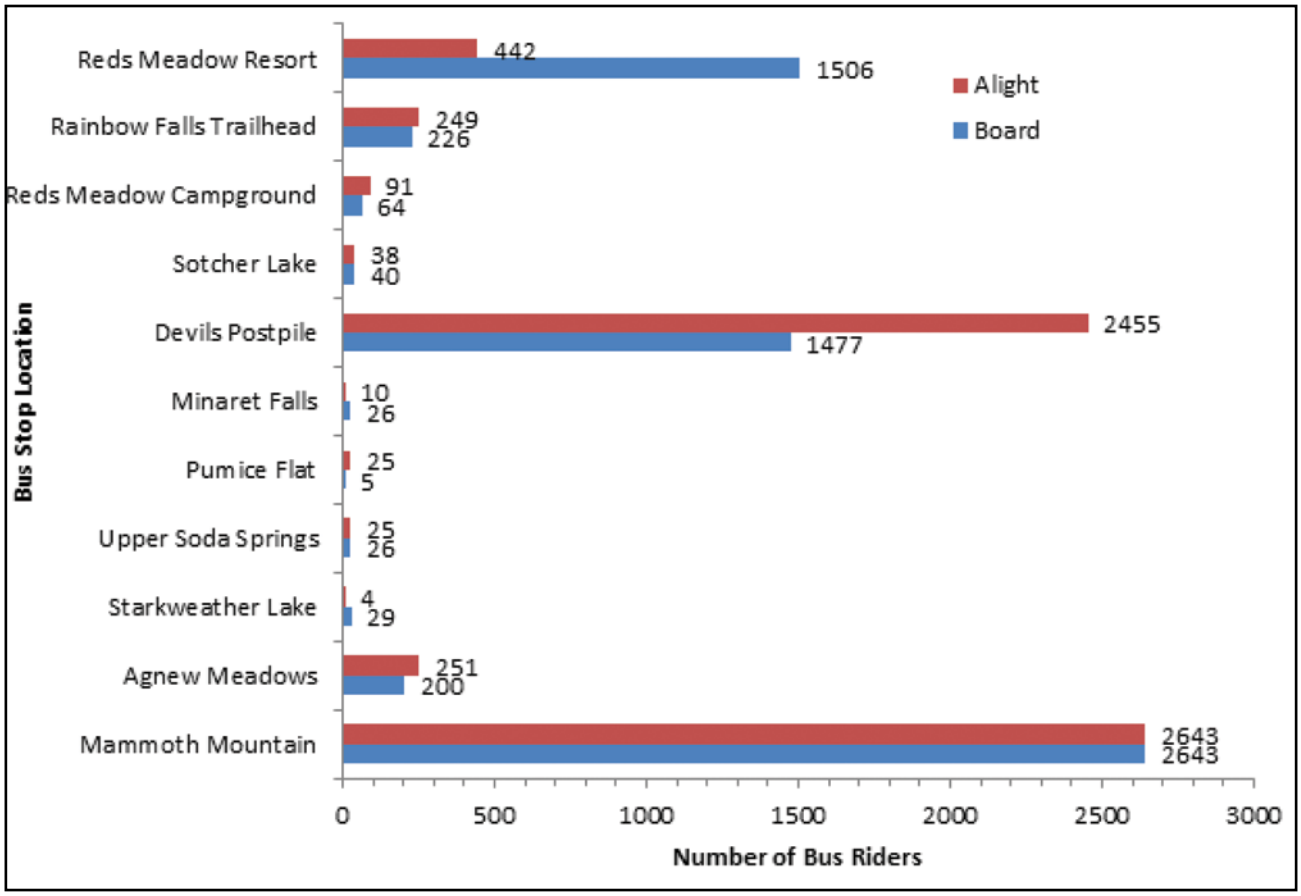
In addition, visitors report:

- 65% of respondents come with their families;
- 32% come in groups of two, 33% come in groups of three;
- 15% of visitors were 10 years of age or less,
- 6% of all visitors were from foreign countries, with 14% of international visitors coming from Germany.

Visitors may drive personal vehicles into the valley if they meet one of the exceptions listed below. Exception vehicles are required to pay a standard amenity fee at the Minaret Vista Station, operated by the Inyo National Forest.

- Visitors planning to camp at one of the five USFS campgrounds or the NPS campground within the monument
- Vehicles displaying a disability placard or who present an Access Pass
- Vehicles pulling horse trailers
- Vehicles towing or carrying small boats, rafts, or large float tubes

FIGURE 4.4: BOARDINGS AND ALIGHTINGS OF PASSENGERS AT LOCATIONS WITHIN REDS MEADOW VALLEY (as observed from Thursday through Saturday, August 4-6, 2005). Boardings at Mammoth Lakes during this time period: 2,643 passengers (Vanasse 2007).



- Visitors staying at the Reds Meadow Resort
- Hunters transporting weapons or game
- Visitors arriving before 7:00 A.M. or departing after 7 P.M.

Bus riders can board the shuttle at multiple locations in the valley. Some travelers alight at one location, walk to another, and board the bus for the trip back to the town of Mammoth Lakes. The following figure quantifies bus use patterns.

The Inyo National Forest manages five campgrounds in Reds Meadow Valley, including Agnew Meadows, Soda Springs, Pumice Flat, Reds Meadow, and Minaret Falls. In 2011, these campgrounds contained 136 campsites. Some of the campgrounds (Reds Meadow, Minaret Falls, and Soda Springs) are occasionally full, particularly on July weekends.

Reds Meadow Resort also operates under permit with the Inyo National Forest in the valley. The resort offers overnight lodging in the form of cabins, a general store, dining at the Mule House Café, showers, and horseback excursions and pack trips from pack stations at Reds Meadow and Agnew Meadows.

Mammoth Mountain Ski Area & Resort Facilities

Mammoth Mountain Ski Area also manages several facilities that provide information for visitors to Devils Postpile NM and Reds Meadow Valley.

Mammoth Mountain Adventure Center

Bus tickets to Devils Postpile NM and Reds Meadow Valley are sold at the Mammoth Mountain Adventure Center. The Adventure Center and Mammoth Mountain also provide the primary parking lot for visitors to the monument. The Adventure Center area is a central location for Mammoth Mountain visitors during the summer season and is a critical part of the welcome experience for monument visitors. Currently there is no federal presence at this sales area and it can be a complicated area for visitors to navigate given the

mixture of NPS, USFS, and Mammoth Mountain signs, activities and facilities around the complex. On a busy day, parking can be congested and confusing and can require a long walk alongside the road to the Adventure Center, creating potentially unsafe conditions. However, selling tickets from the Adventure Center contributes to the sustainability of the shuttle system and is a logical location given the amount of available parking.

Top of the Sierra Interpretive Center

This facility is an excellent vantage point of the Sierra and allows visitors a glimpse of the geologic features surrounding the monument. A geology exhibit shows the history of volcanic flows in Reds Meadow Valley. In addition to a small panel with information and some information on a computer, viewing tubes identify major peaks and geologic features.

Interpretation and Education

INTERPRETIVE PLANNING

Devils Postpile developed a Long Range Interpretive Plan (LRIP) in connection with the General Management Plan (NPS 2011). This was the monument's first LRIP and was designed to complement the efforts of the GMP. The LRIP has set a framework and goal set for the division of interpretation, providing manageable, organized, and achievable goals for the next 5-10 years. The LIRP developed primary interpretive themes for the monument as a basis for interpretive planning and direction. Because the monument has never completed an exhibits and waysides plan, the LRIP also provides direction and focus for non-personal interpretive services in the monument.

INTERPRETIVE PROGRAMS

Formal Programs

Monument staff offers a variety of interpretive programs throughout the summer. Traditional offerings have included daily interpretive walks to Devils Postpile and weekend campfire programs. These programs are core to monument functions and are the longest running interpretive programs in the monument. Other formal programs that have been recently added to the schedule include astronomy talks, special event programs such as the Summer Solstice Hike, and interpretive talks at Rainbow Falls.

Attendance at formal interpretive programs since 2004 has fluctuated between a low of 3,069 visitors in 2005 and a high of 4,066 in 2007. This variation does appear to correlate with visitation. The number and types of programs offered has varied from year to year depending on staffing levels. Average attendance at formal interpretive programs from 2004-2007 was 3,665 visitors each season.

Informal Interpretation

As part of the traditional visitor experience, informal interpretation is a significant part of the interpretive operation. Visitor comments from 1979 to the present indicate that visitors generally appreciate the visibility and accessibility of rangers in the monument. Key elements of informal interpretation the monument include the Junior Ranger program, greeting buses as they arrive, roves to Rainbow Falls and other popular destinations within the monument, and informal interpretive programs on the porch of the ranger station.

Informal interpretation represents a large portion of visitor contacts at the monument. The high percentage of visitor contacts can be explained primarily by the shuttle bus system. Rangers greet most buses that arrive at the monument and a formula is used to determine how many of those visitors are contacted by rangers. Rangers also perform traditional roves and patrols, which account for a smaller amount of annual contacts, but still a much larger number than those visitors attending formal interpretive programs. 10,598 visitors were contacted during informal roves and patrols in 2010, more than three times as many as attended formal programs.

Educational and Community Outreach

In recent years, Devils Postpile National Monument has committed to developing an educational outreach program. Monument staff presents educational programs in local schools covering a variety of topics including geology and basic ecology. Students visited the monument for NPS-led geology and bird banding programs. The monument recently developed two curriculum-based educational programs on climate science that fit into the Exploring Climate Science and Climate Science in Focus curriculum. These programs are designed to meet national teaching standards and

can be adapted to schools and parks throughout the nation.

Monument staff has also increased community outreach recent years. The most successful programs have been the First Bloom project (a partnership with the Bishop Paiute Tribe), the Mammoth Lakes Library Story Hour, and the Girl Scout Ranger Program. These projects and programs have increased the visibility of the monument in the community and provided educational opportunities, both on and off-site for a diversity of youth.

Non-personal Interpretation

Within the monument boundaries, a variety of wayside exhibits provide orientation, information, and interpretation for monument visitors. There are several orientation and information waysides in the day-use area that also provide safety information. Interpretive exhibits are located along the trail to the Postpile, at the base and top of the Postpile, and at Rainbow Falls. These waysides cover both natural and cultural resource topics and with the exception of those in the day use area, have all been installed after 2007. New waysides were installed in the day-use area in 2013.

The monument also produces publications including an interagency newspaper, species lists, official map and guide, junior ranger books, and visitor information in Spanish, French, Chinese, and German. Other printed media available tends to be from partners or other outside sources including the United States Geological Survey, the Inyo National Forest, and the Town of Mammoth Lakes.

The monument maintains a standard NPS website which contains trip planning, resource, and area information. There is an extensive transportation page as well. The media features on the web-site include both photo galleries and videos.

SURROUNDING AREAS

Interpretive Planning

The NPS and USFS have collaborated to improve opportunities for visitor interpretation within the Reds Meadow Valley. Formal collaborative planning efforts have resulted in the Mammoth Lakes Welcome Center Interpretive Plan and The Mammoth Lakes Welcome Center Exhibit Plan, both produced by the Inyo National Forest in 2008 (USFS 2008). The interpretive plan identifies key interpretive themes and opportunities throughout the Mammoth Ranger District, of which the Reds Meadow Valley is a part. The exhibit plan identifies strategies for waysides and exhibits including those in the valley. Both of these plans have been referenced and incorporated into interpretive planning in the monument in order to provide consistent themes and opportunities for valley visitors. Collaborative exhibits that have been developed after the plans were released in 2008 have incorporated themes from both the Mammoth Ranger District and Devils Postpile National Monument.

Interpretive Partners

As with other aspects of visitor services, the interpretive experience for visitors often starts at the Mammoth Lakes Welcome Center. The Inyo National Forest and Devils Postpile National Monument collaborate to provide both personal and non-personal services at the Welcome Center. Non-federal interpretive partners for the Reds Meadow Valley include the Eastern Sierra Interpretive Association, the Town of Mammoth Lakes, Eastern Sierra Institute for Collaborative Education, Friends of the Inyo, Mammoth Lakes Library, the Owens Valley Paiute, the Mammoth Lakes Unified School District, and the Point Reyes Bird Observatory.

Interpretive Programs

Both Devils Postpile National Monument and the Inyo National Forest offer interpretive programs. Throughout the summer interpretive programs are offered daily at the Mammoth Lakes Welcome Center, generally as informal orientation talks at the interpretive plaza. NPS and USFS rangers conduct informal interpretive roves to destinations such as Minaret Falls and the Rainbow Falls trailhead. The NPS also conducts formal astronomy programs at the Minaret Vista. Other interpretive efforts include roving and informal contacts at the Mammoth Mountain Adventure Center by USFS, NPS, and Mammoth Mountain employees. Limited informal interpretation and orientation is provided on the shuttle buses by bus drivers.

Non-Personal Services

The NPS and USFS collaborate to produce interpretive media for the Reds Meadow Valley and Devils Postpile National Monument. These include two interagency newspapers: The Inyo National Forest Visitor Guide, published by the Eastern Sierra Interpretive Association

and The Post: Visitor Guide to the Reds Meadow Valley, produced by Devils Postpile National Monument in cooperation with the Inyo National Forest, the Eastern Sierra Interpretive Association, and the Sequoia Natural History Association.

In addition, the NPS and USFS collaborated with the Inyo National Forest to produce wayside orientation panels for the Mammoth Mountain Adventure Center, Minaret Vista, and the Rainbow Falls trail junctions. The National Park Service maintains all interagency waysides at the Adventure Center and Minaret Vista. The Inyo National Forest maintains wayside exhibits at Starkweather Lake and Sotcher Lake. Inyo National Forest bulletin boards containing safety, trail, wilderness and camping information are located in all valley campgrounds and at all wilderness trailheads and parking areas.

No formal exhibit space exists in the valley, although a few small exhibits are placed in the monument ranger station. A broader range of exhibits and larger exhibit space is available at the Mammoth Lakes Welcome Center.

Both the Inyo National Forest and monument maintain websites to provide valley information for visitors. Although there is overlapping information, particularly related to the shuttle bus system, both websites also provide distinct information related to the individual agencies. There are links on both websites that reference shared information and allow visitors to navigate back and forth between the Inyo National Forest site and the monument site.

A range of other media exists and is provided by monument and forest partners including the Town of Mammoth Lakes. Mammoth Lakes Tourism and Recreation Department produces a publication called "The Mammoth Insider." They also produce the readily available and often used shuttle map which includes the valley shuttle route and shows visitors how to connect the various shuttle routes. Monument and Inyo National Forest programs are often listed in town-produced publications such as the Mammoth Lakes Recreation Guide.

Socioeconomics

LOCATION

Devils Postpile National Monument is located in Madera County. Uniquely, travel access to the population centers of the county are geographically removed by the Central Sierra Nevada Mountains and numerous federal lands within. Residents in Madera County are geographically distant from the monument as is true with many other western Sierra Foothills counties. Due to numerous Trans-Sierra highway closures, access is more prohibitive in the late fall, winter, and early spring seasons. As a result, most of the socioeconomic area of interest directly affects Mono and Inyo Counties as a result of the transportation corridor infrastructure. Thus, the affected environment as outlined by this plan includes Mono and Inyo Counties. It is also important to note that the seasonality of access to the monument and other federal lands has a cumulative impact socioeconomically. Access to the monument is available seasonally and is dependent on winter snow accumulations on the Minaret Summit Road. The monument is generally accessible from June to the end of October. A significant percentage (86%) of visitors who visit the monument stay overnight away from home in the Devils Postpile National Monument/ Mammoth Lakes area (within 75 miles of the monument) (Manni et al. 2007).

Mammoth Lakes serves as the largest town in Mono County and the most immediate gateway community to the monument. It is also a major destination for those recreating on U.S. Forest Service (USFS) land and participating in year-round recreation opportunities

TABLE 4.7: POPULATION

POPULATION			
Counties/Cities	**2000**	**2010**	**% change 2000 to 2010**
Mono County	12,853	14,202	10.50
Inyo County	17,945	18,546	3.35
Mammoth Lakes	7,093	8,234	16.09
Bishop	3,575	3,879	8.50
California	33,871,648	37,253,956	9.98
Source: United States Census Bureau, 1990;2000			

TABLE 4.8: POPULATION PROJECTIONS

POPULATION PROJECTIONS THROUGH 2030				
Counties	**2010**	**2020**	**2030**	**% change 2010-2030**
Mono County	14,202	15,010	16,153	13.7
Inyo County	18,546	19,388	20,657	11.4
California	37,312,510	40,817,839	44,574,756	19.5
Source: California Department of Finance, 2012				

TABLE 4.9: RACE AND ETHNICITY OF MONO AND INYO COUNTIES

RACE AND ETHNICITY			
	Mono County (N=14,202/%)	**Inyo County (N=18,546/%)**	**Combined (N=32,748/%)**
Race			
White	11,697/82.4	13,741/74.1	25,438/77.7
Black or African American	47/0.3	109/0.6	156/0.4
American Indian and Alaska Native	302/2.1	2,121/11.4	2,423/7.4
Asian	192/1.4	243/1.3	435/1.3
Native Hawaiian and Other Pacific Islander	11/0.1	16/0.1	27/0.08
Some Other Race	1,539/10.8	1,676/9.0	3,215/9.8
Ethnicity			
Hispanic or Latino	3,762/26.5	3,597/19.4	7,359/22.5
Source: U.S. Census Bureau; 2010			

TABLE 4.10: PER CAPITA PERSONAL INCOME

PER CAPITA PERSONAL INCOME				
Area	**2000**	**2006**	**% of State Average, 2006**	**State Rank, 2006**
Mono County	$25,576	$38,486	97	17th out of 58
Inyo County	$24,277	$32,396	82	26th out of 58
California	$32,462	$39,626		
United States	$29,469	$36,276		
Source: Bureau of Economic Analysis, U.S. Department of Commerce, 2012				

TABLE 4.11: UNEMPLOYMENT RATES

UNEMPLOYMENT RATES			
Counties	2000 (%)	2010 (%)	Rate Change 2000 to 2010 (%)
Mono County	4.7	10.3	+119
Inyo County	4.7	10.0	+113
California	5.0	12.4	+148
United States	4.0	9.6	+140
Source: U.S. Deparment of Labor, 2012			

TABLE 4.12: POVERTY RATES

POVERTY RATES			
Counties	2000 (%)	2010 (%)	Rate Change 2000 to 2010 (%)
Mono County	11.5	12.0	+4
Inyo County	12.6	11.9	-6
California	14.2	15.9	+12
United States	12.4	15.9	+28
Source: U.S. Census Bureau, 2012			

provided by Mammoth Mountain Ski Area, permitted by Inyo National Forest. A collaborative effort between the ski area, U.S. Forest Service, Eastern Sierra Transit Authority, and the monument provides shuttle transit to and from the Mammoth Mountain Adventure Center and Reds Meadow Valley when open/accessible. The closest airport is approximately 21 miles away.

DEMOGRAPHICS

Mono and Inyo Counties as an affected region for socioeconomics are predominantly rural. This two-county area had a combined population of 32,748 persons in 2010 (See *Table 4.7: Population*). Local population centers include the towns of Mammoth Lakes and Bishop.

Population

Mono County has a total estimated population of 14,202 residents. The Town of Mammoth Lakes is the largest population center in Mono County with 8,234. Table 4.7 displays the percent change that has occurred in both counties in comparison to the state between 2000 and 2010. Mono County's growth (10.5%) was relatively consistent with the state (9.98%), and Inyo County experienced only 3.35 percent growth (U.S. Census Bureau 2012). Both Inyo and Mono Counties combined grew at a lower rate than California as a whole during the past decade (6% compared to 10% for the state of California).

In future years, the population of Mono and Inyo Counties is expected to grow at a much lower rate than California, as shown in Table 4.8. Mono County is estimated to grow to a population of 15,010 residents by 2020 and 16,153 residents by 2030. Comparably, Inyo County is projected to grow to 19,388 residents by 2020 and 20,657 by 2030.

Ethnicity

For Mono and Inyo Counties combined, the largest single U.S. Census identified race in the affected area is White (78%) at 25,438 individuals in 2010. American Indian/Alaskan Native was the second largest race in

TABLE 4.13: ECONOMIC BENEFITS TO LOCAL COMMUNITY FROM DEVILS POSTPILE NM, 2011

SPENDING AND ECONOMIC IMPACTS							
	Public Use Data		Visitor Spending 2011		Impacts of Non-Local Visitor Spending		
	2011 Recreation Visits	2010 Overnight Stays	All Visitors ($000's)	Non-Local Visitors ($000's)	Jobs	Labor Income ($000's)	Value Added ($000's)
Devils Postpile NM	97,207	4,215	3,642	3,394	41	1,028	1,961
All NPS units in California	34,633,664			1,192,000			
Source: Natural Resource Report NPS/NRSS/ARD/NRR–2013/632							

the two counties at 7% at 2,423 individuals. Hispanic/Latino ethnicities comprised of 23% of all residents.

PERSONAL INCOME AND VISITOR SPENDING

In 2006, California's per capita personal income (PCPI) was $39,626 (the 9th highest in the nation). Mono County had a PCPI of $38,486 (See *Table 4.10*). Inyo County had a PCPI of $32,396 (82% of the state PCPI).

The total personal income for the two-county region was more than $1.07 billion in the year 2006. This figure represents only a small percentage (0.07%) of the total personal income for California (U.S. Department of Commerce 2012).

EMPLOYMENT

The unemployment rates in the regional counties have been slightly lower than both the state and consistent with national rates from 2000 to 2010 (See *Table 4.11*). However, unemployment rates steadily increased for both Mono and Inyo Counties over the past ten years, similar to the national trend. Unemployment rates for the two-county area estimates that approximately one out of 10 people in the labor force were unemployed in 2010.

POVERTY

The national average for persons living in poverty in 2010 was 15.9% (See *Table 4.12, Poverty Rates*). The poverty rates for California were slightly higher than the national rate. For 2010, the poverty rates in the both counties were all lower than the state rates. Although the poverty rates for both counties were similar to national rates in 2000, the increase of the percent of individuals at the national level meeting the U.S. Census criteria on poverty in 2010 is greater than Mono and Inyo Counties in 2010.

REGIONAL TOURISM

Major components of the local economy include tourism, trade services and utilities. Accommodation and food service sales for the two counties combined were $309 million (U.S. Census 2012). Retail sales for both counties contributed $396 million to the regional economy. These sectors provide a significant amount of funding to the area, and the presence of Devils Postpile NM is a component of that economic benefit to the local economy.

In order to estimate National Park Service impacts to regional economies and local communities, the agency applies the Money Generation Model. This spreadsheet model allows survey data on visitor spending and travel characteristics to establish direct and indirect effects. The estimated spending and economic impacts of visitors (both local and non-local) to Devils Postpile NM is estimated at $3.64 million in 2011, shown in Table 4.13. Non-local visitors contributed the bulk of that funding at $3.39 million (Cui et al. 2013). In comparison to all NPS units in California, Devils Postpile NM contributes a very small proportion (0.25%) of visitor spending to the state's economy.

INYO NATIONAL FOREST VISITATION

The U.S. Forest Service plays a significant role in the region. The lands completely surrounding the monument are managed by the USFS as part of the Inyo National Forest. The forest consists of 1,979,407 acres of which 1,654,392 acres are administered directly by the U.S. Forest Service. In 2006, the Inyo National Forest received approximately 2,862,000 visits (USFS 2012). The primary activities of visitors include relaxing, downhill skiing, hiking/walking, fishing, viewing natural features and wildlife, and driving for pleasure. Facilities used the most include developed campgrounds, swimming areas and trails.

Monument Operations

Staffing

Devils Postpile National Monument staffing consists of one permanent, full-time superintendent; two subject to furlough permanent program leads for Visitor Services and Administration; a permanent subject to furlough wage grade worker, two career seasonal positions for resources and maintenance program leads, and several seasonal employees and student interns during the field season. The average full-time equivalents (FTEs) for 2012 was 8.3 staff. Staff at Devils Postpile provides a hub for many visitors throughout the valley to receive information, identify emergency search and rescue and medical needs, and as a launching point for some of the primary hiking destinations.

Facilities

Devils Postpile NM has 42 assets listed in the NPS Facility Management Software System. These include (1) a highest priority group for maintenance that is comprised of utility systems (water, electrical, and sewage), the ranger station, and a comfort station; (2) a high priority group that includes trails and two bridges; (3) a medium priority group that includes buildings, campgrounds, and other infrastructure. Lower priority groups included infrastructure elements such as tent pads, sheds, and storage buildings. Devils Postpile National Monument also manages the largest water tank in the valley with a 100,000 gallon storage capacity, which in addition to providing transient non-community drinking water also provides a large volume of water for emergencies including fire response.

MAINTENANCE FACILITIES

The maintenance facilities are small and modest. The maintenance division has one small shop that provides storage space but minimal space to work. Most work is performed outside the maintenance shop on work tables within visual and hearing impacts to the residents. Maintenance also has two 20 foot storage containers. One container is used to house motorized equipment, such as a bobcat during winter months, and the second has adequate shelving for storing items that are not used on a regular basis. A new maintenance shop has long been identified as a need for the monument.

ADMINISTRATIVE FACILITIES

Park headquarters is located in Mammoth Lakes, California. Monument staffs co-locate at the Mammoth Lakes Ranger Station, which serves as the administrative headquarters for the USFS Mammoth and Mono Ranger Districts and is adjacent to the Mammoth Lakes Interagency Welcome Center. The NPS is provided two offices to coordinate administrative and operational support, and access to use the conference room as available.

Within the monument in the valley, there is a small administrative office space in the back of the ranger station that is used primarily by seasonal staff. Being located in the ranger station does afford some operational efficiency for the seasonal staff, thought the space is often crowded. Recently, two of the cabins in the administrative area were converted to a shared office space. Cabin #5 provides office space for law enforcement and interpretation, as well as a couple of additional work stations . There is a small office in the maintenance building for the program lead. Interpretation and Visitor Services has a cargo container for storage of newspapers, maps, and other interpretive media.

Cabin 1, also known as the superintendent's cabin, contains the superintendent's office adjacent to the kitchen. This area also serves as storage for collections of the herbarium as well as some documents. This cabin also provides some additional meeting and work space as there are no dedicated areas on site to accomplish this need. The resource program lead, student interns, and all the resource management equipment are located here.

HOUSING

Devils Postpile currently has four cabins (one is used as an operational center at Cabin 1) and three tent cabins in the housing inventory. Cabin 5 was converted to office space and is no longer part of the housing inventory. A new employee facility was completed in the summer of 2012. This building provides a temporary tough-shed kitchen, as well as showers and toilets previously located in the maintenance building. The housing units are in good condition. The tent cabins are aging and may become obsolete. Currently three cabins are available for employee housing.

In June 2012, Devils Postpile NM completed a housing needs assessment (HNA) and certification. In determining its housing needs, a local market analysis (LMA) of housing in the local community was also completed. The monument identified a need for housing for both required and permitted occupants for its two reporting stations—Headquarters and Mammoth Lakes Ranger Station.

The LMA found suitable housing units for sale to meet the need of the single year-round permitted occupant. However, the analysis did not find an acceptable number of suitable seasonal rental units to meet the needs of any seasonal permitted staff members. The rents in and around Mammoth Lakes, California, are very high, and affordable (under $750 per month) short-term rental units are very scarce (Pak et al. 2012).

The monument's Housing Needs Assessment (HNA) shows that there is a need for one additional bedroom for a seasonal staff member for a total of eight

bedrooms (Pak et al. 2012). The monument disagreed with this assessment and certified a need for five additional bedrooms for a total of twelve bedrooms. The NPS Directorate, deciding to keep Devils Postpile's entire current housing inventory and to add five additional seasonal bedrooms, certified the following:

- Two required occupants
- 0 units for paid permanent staff members
- 12 bedrooms for paid seasonal staff members at a combination of Headquarters and the Town of Mammoth Lakes
- 0 bedrooms for unpaid staff members

One of the housing units is dedicated for use by the permanent required occupant (RO). Although the position is a permanent employee, he/she has dual reporting stations. Therefore, the RO is only required to live in park housing during the summer and fall when the Headquarters Reporting Station is accessible and open to visitors. For this reason, the monument certified a seasonal bedroom for the permanent RO instead a housing unit for a permanent staff member. Another bedroom is dedicated to the seasonal law enforcement required occupant.

Interagency Coordination

Devils Postpile National Monument and Inyo National Forest recognize it is in the best public interest and resource protection to coordinate many aspects of the management of visitor services, shuttle bus operations, visitor information, resource protection strategies, and emergency response in the Reds Meadow Valley and the surrounding watershed. Both agencies have focused on continuing to develop coordinated and complementary efforts that enhance each agency's ability to provide more effective and efficient management of resources and visitor services

The Inyo National Forest maintains several utilities within the valley that serve both USFS and NPS sites. The Inyo National Forest manages two wells for public drinking water sources located in Agnew Meadows and at Pumice Flat. Additionally, a small water system and storage tank is located at Reds Meadow Resort. A water line and sewage system line connects from Pumice Flat to Rainbow Falls trailhead where a leach field and septic system provide septic facilities for both the monument and sites on the system from Pumice Flat to Reds Meadow Resort. Devils Postpile National Monument also manages the largest water tank in the valley with a 100,000 gallon storage capacity, which provides transient non-community drinking water and a large volume of water for emergencies including fire response. Electrical and phone lines follow the road from Minaret Vista and are in a somewhat functional but deteriorating condition. Payphones are located at Pumice Flat, Devils Postpile National Monument, and Reds Meadow Resort.

Both Inyo NF and Devils Postpile NM staff provide subject matter expertise, support and coordinate projects to support operations within the valley, implement projects, and respond to emergencies. Fire and Fuels management crews from the Inyo NF provide fire response and coordination and planning and implementation of fuels management projects. These crews also provide crucial support during emergencies such as the 2011 windstorm that resulted in extensive tree blowdown.

NPS staff contributes subject matter expertise in design and production of visitor information and interpretive media including exhibits, newspapers, and maps that enhance visitors understanding of services, safety, regulations, and resources. As staffing and budgets allow, NPS contributes visitor information services staffing to the Interagency Mammoth Welcome Center and Minaret Vista Station entering the Reds Meadow Valley.

NPS staff from Devils Postpile NM and Yosemite National Park have contributed to stabilization efforts for the Reds Meadow Guard Station including preparing a draft Determination of Eligibility for the USFS on the Guard Station and Bathhouse.

Trained NPS staff respond to search and rescue calls and medical emergencies throughout the Reds Meadow Valley, often providing an initial contact for visitors in need who come to the monument's ranger station in search of assistance.

One of the cornerstones of interagency collaboration is the continuation of the transportation system that serves Devils Postpile NM and other destinations in Reds Meadow Valley. The shuttle service is operated under the cooperative supervision of the U.S. Forest Service, National Park Service, and Eastern Sierra

Transit Authority. The shuttle is funded through transportation fares charged by Eastern Sierra Transit Authority (ESTA) (a non-profit joint powers authority) to shuttle riders entering the Reds Meadow Valley. Inyo National Forest manages the agreements for operation with ESTA within Reds Meadow Valley and ESTA operates at the monument with a Special Use Agreement. . Both the Inyo National Forest and monument recognize the importance of a safe and successful transportation system from the Mammoth Mountain/Minaret Summit area to the Reds Meadow Valley. This transportation system provides resource protection, decreased traffic congestion and a quality visitor experience. Both agencies will work collaboratively to achieve a successful and sustainable transportation system.

Visitor and Employee Safety

In 2009, Devils Postpile National Monument developed a Visitor and Employee Safety Program to address needs and opportunities.

The mission of this program is to provide park staff with the necessary tools, training, assistance to plan and implement improvements, monitor results, adjust processes as needed, and standardize or plan for further improvements. Devils Postpile National Monument will adopt a method of continuous improvement so they provide an opportunity for the public to have a safe and enjoyable experience in the beautiful resources and natural processes within the monument.

The plan also identified the vision and goal for visitors: When entering Devils Postpile National Monument and the surrounding areas visitors will be informed of the hazards, risks, and dangers while being able to enjoy the monument without being injured, becoming ill, succumbing to death, or incurring property damage as a result of their visit.

Devils Postpile National Monument is focusing on five priorities to establish a proactive safety program and to enhance each visitor experience.

- Identify and mitigate the hazards in the monument and surrounding areas.
- Establish an effective data collection and information management system on injuries and hazards in the monument to identify trends.
- Provide visitors with accurate and consistent information to reduce risk.
- Establish an effective communication and education effort to provide needed training to park staff, volunteers, and partnering agencies and organizations to successfully communicate the hazards and risks associated with the monument and surrounding areas.
- Adopt a proactive stance on safety and develop a plan of action to address the results and any future needs.

Partnerships

In addition to the Inyo National Forest, a number of other partnerships augment the capacity of Devils Postpile NM and help provide visitor services and resource management expertise.

TOWN OF MAMMOTH LAKES

The Town of Mammoth Lakes provides a connection to monument visitors through the visitors' bureau, recreation programs, and other means. The town advertises monument functions and activities in a variety of publications and has provided assistance in the GMP process though advertisements and participation. The Mammoth Lakes Library has provided the monument with an outreach venue through its weekly Story Hour and has helped advertise and publicize other monument programs.

SCIENTIFIC RESEARCH ENTITIES

Devils Postpile NM is an area of scientific interest across different agencies/entities, including USGS, Scripps Institute of Oceanography, California Department of Water Resources, USFS Pacific Southwest Research Station, CalTrout, University of Nevada Desert Research Institute, University of California, University of Washington, and the Owens Valley Paiute tribes. Research conducted by these entities provides scientific information that helps inform management decisions within the monument

and provides broader understanding and knowledge of resource management issues and concerns.

EASTERN SIERRA TRANSIT

The Eastern Sierra Transit Authority (ESTA) currently operates the shuttle service in the Reds Meadow Valley. This is a critical link in the information dissemination chain (Craven 2009). Working with ESTA to provide quality interpretive, safety, and trip planning information will be crucial to the success of the shuttle bus system.

Visitors have identified that they want a better explanation of the bus system and trails- where to obtain the bus tickets, boarding locations, and shuttle stops. Ninety percent of monument visitor groups consider the shuttle bus to be "extremely important" or "very important."

SEQUOIA NATURAL HISTORY ASSOCIATION

During the summer months, the monument's ranger station features a bookstore, operated by Sequoia Natural History Association (SNHA), a non-profit organization that provides vital services to Sequoia and Kings Canyon National Parks and Devils Postpile NM, which are not otherwise available through federal funding. SNHA provides a wide range of books and educational materials in their bookstore at Devils Postpile. Sales items are also available online (http://www.sequoiahistory.org). SNHA also provides an employee that manages the bookstore full-time during the field season.

EASTERN SIERRA INTERPRETIVE ASSOCIATION

The Eastern Sierra Interpretive Association (ESIA) is a non-profit organization which works in cooperation with the Inyo National Forest to promote and enhance the visitors' understanding and enjoyment of the natural, cultural, historic and recreational resources of the National Forests. Proceeds from bookstores and donations support interpretive programs, printed materials and visitor center displays. ESIA employees provide assistance in terms of visitor information and provide a significant amount of information about Reds Meadow and DEPO during the summer months. They are now a primary partner in visitor services at the Welcome Center.

AMERICAN INDIAN TRIBES AND GROUPS

Nine American Indian federally-recognized tribal governments and two federally non-recognized tribal organizational governments were active participants in GMP scoping efforts. These groups remain connected with the NPS through demonstrated interest in various activities and efforts that support both NPS and tribal goals. These include identifying and evaluating cultural and natural resources with traditional cultural and religious significance, sharing histories and cultural stories with the visiting public, expanding youth environmental and cultural education, managing natural and cultural resources, partnering with the NPS to maintain the spiritual significance of the monument, and collaborating in employment opportunities for tribal members. For example, the First Bloom Program and the Owens Valley Environmental Youth Camp are programs in which the youth of the tribes have been engaged in learning activities and in the restoration and stewardship of monument resources.

Chapter Five: Environmental Consequences

Previous page: Wildflowers © Rod Planck

Chapter Five: Environmental Consequences

The National Environmental Policy Act (NEPA) requires that environmental assessments disclose the environmental impacts of a proposed federal action and feasible alternatives to that action. In addition, compliance with NEPA is also based on other federal laws, including effects on historic properties considered in accordance with the National Historic Preservation Act (NHPA). In this case, the proposed federal action is the adoption of a general management plan for Devils Postpile National Monument.

The alternatives in this general management plan provide broad management direction. Thus, this environmental assessment is considered a programmatic document. As specific developments or actions are proposed subsequent to this General Management Plan for implementation, appropriate detailed environmental, including cultural, analysis would be prepared in accordance with NEPA and NHPA requirements. Actions that implement guidance provided in the GMP may therefore tier from this document as they undergo additional environmental impact analysis.

This chapter begins with a discussion on terms and definitions used to analyze environmental consequences, followed by a discussion on policy related to cumulative impacts. The second part of this chapter describes the methods and assumptions used for analyzing each impact topic or resource category. The impacts of the alternatives are then analyzed. Each impact analysis section includes a description of the impacts of the alternative actions, a discussion of cumulative effects, and a conclusion. Where data are limited, professional judgment has been used to identify environmental impacts. Professional judgment is based, in part, on observation, analysis of conditions, and responses described for similar areas.

The impacts of each alternative are briefly summarized in the "Summary of Impacts" chart at the end of the Alternatives chapter.

Terms and Definitions

The following section defines the terms used for determining the environmental consequences of the actions in the alternatives. The environmental consequences are defined based on impact type, intensity, and duration, and whether the impact would be direct or indirect. Cumulative effects are also identified.

IMPACT TYPE

The effects that actions would have on specific resources are considered either adverse or beneficial. Adverse impacts involve a change that moves the resource away from a desired condition or detracts from its appearance or condition. Beneficial effects would improve the condition or appearance of a resource or would be a change that moves the resource toward a desired condition. In some cases, the action could result in both adverse and beneficial effects for the same resource.

INTENSITY

Defining the intensity or magnitude of an impact is taken directly from Director's Order 12: Conservation Planning, Environmental Impact Analysis and Decision-making (NPS 2001). Impact intensity is the magnitude or degree to which a resource would be adversely affected. Each adverse impact was identified as negligible, minor, moderate, or major. Due to the broad nature of actions called for in this GMP, most impact analysis is qualitative, rather than quantitative. For the purposes of this analysis, intensity or severity of the impact is defined as:

- Negligible – Impact to the resource or socioeconomic environment is at the lower level of detection; no discernible effect.
- Minor – Impact is slight, but detectable; impacts present, but localized, and not expected to have an overall effect.
- Moderate – Impact is readily apparent; clearly detectable and could have appreciable effect on the resource or socioeconomic environment.

- Major – Impact is severely adverse; would have a substantial, highly noticeable influence on the resource or socioeconomic environment.

DURATION

Duration refers to how long an impact would last. The following terms are used to describe the duration of the impacts:

- Short term - The impact would be temporary in nature, generally lasting one to three years, such as disturbance associated with construction.

- Long-term - The impact would last more than one year and could be permanent in nature, such as the loss of soil due to construction of a new facility. Although an impact may only occur for a short duration at one time, if it occurs regularly over a longer period of time the impact may be considered to be a long-term impact. For example, the noise from a vehicle driving on a road would be heard for a short time and intermittently, but because vehicles would be driving the same road for the foreseeable future life of the plan, the impact on natural soundscape would be considered to be long-term.

Except where otherwise specified, the impacts in this analysis are long-term in duration. Short-term impacts are identified as such in the analysis.

DIRECT VERSUS INDIRECT IMPACTS

Direct effects would be caused by an action and would occur at the same time and place as the action. Indirect effects would be caused by the action and would be reasonably foreseeable but would occur later in time, at another place, or to another resource.

Except where otherwise specified, the impacts in this analysis are direct impacts on the resource being described. Some indirect impacts are also described and identified as such in the text.

CUMULATIVE IMPACTS

Cumulative impacts result from the incremental impact of an action when added to other past, present, and reasonable foreseeable future actions, regardless of what agency or person undertakes the action. Cumulative impacts can result from individually minor, but collectively important actions taking place over a period of time.

Cumulative impacts are considered for all impact topics and alternatives. The National Park Service assumes the types of use that are occurring now would continue, but that there may be new or different future uses. These actions are evaluated in conjunction with the impacts of each alternative to determine if they have any cumulative effects on a particular resource. For most of the impact topics, the geographic area defined for the analysis was the monument. For some impacts, such as for air quality or threatened and endangered species as well as for analysis of cumulative impacts, the geographic area is broader.

To determine potential cumulative impacts, projects in the area surrounding the monument were identified. Projects included in this analysis were identified by examining other existing plans, communication with local governments and state and federal land managers, and consideration of the recommendations made in this plan for the Inyo National Forest. The recommendations are analyzed as reasonably foreseeable cumulative impacts.

Methods and Assumptions for Analyzing Impacts

The planning team based the impact analysis and the conclusions in this chapter on the review of existing literature and studies, information provided by experts in the NPS and other agencies, and park staff insights and professional judgment. The team's method of analyzing impacts is further explained below. Impacts have been assessed assuming that mitigation measures would be implemented. If mitigation measures were not applied, the potential for resource impacts and the magnitude of those impacts would increase.

The impact analyses for the no-action alternative describe resource conditions as existing conditions, based on the continuation of current management. The impact analysis for the action alternatives (alternatives B and C) compares the action alternative to the no action alternative. In other words, the impacts of the action alternatives describe the difference between no action and implementing the action alternatives. To understand a complete "picture" of the impacts of implementation any of the action alternatives, the reader must also take into consideration that impacts would occur under the no-action alternative.

Mitigation Measures for the Action Alternatives

Congress charged the NPS with managing the lands under its stewardship "…in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (NPS Organic Act, 16 USC 1). In addition, NPS Management Polices (2006) requires NPS managers to "seek ways to avoid or minimize adverse impacts on the resources and values to the greatest degree possible." As a result, NPS staff routinely evaluates and implements mitigation measures whenever conditions occur that could adversely affect the sustainability of national park system resources.

To ensure that implementation of the action alternatives protects unimpaired natural and cultural resources and the quality of the visitor experience, a consistent set of mitigation measures would be applied to actions proposed in this plan. The National Park Service would prepare appropriate additional environmental analysis (as required by the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), and other relevant legislation) for proposed implementation of these future actions.

As part of the environmental review, the NPS would avoid, minimize, and mitigate adverse impacts when practicable.

The following mitigation measures and best management practices would be applied to avoid or minimize potential impacts from implementation of the action alternatives.

MITIGATION MEASURES

Mitigation measures are the practicable and appropriate methods that would be used under all alternatives to avoid and/or minimize harm to monument natural and cultural, wilderness, and socioeconomic resources. These mitigation measures have been developed by using existing laws and regulations, best management practices, conservation measures, and other known techniques from past and present work in and around Devils Postpile National Monument.

The GMP provides a management framework for the monument. Within this broad context, the alternatives include the following measures that may be used to minimize potential impacts from the implementation of the alternatives. These measures would be applied to all alternatives, subject to funding and staffing levels. Additional mitigation would be identified as part of implementation planning and for individual projects to further minimize resource impacts.

MANAGEMENT AND PROTECTION OF NATURAL RESOURCES

Air Quality

- Minimize NPS vehicle use and emissions and employ the best available control technology.
- Encourage public and commercial tour bus companies to employ transportation methods that reduce emissions.
- Encourage employee carpooling and strive to accommodate employee work schedules to maximize carpooling ability.
- Implement a no idling policy for all government vehicles.
- Coordinate and consolidate trips to town and other locations with monument wide communication system to accomplish multiple tasks and carpooling, when possible.
- Implement sustainable practices in monument operations and building designs that reduce energy demands, thus reducing air pollution emissions.
- Strive for carbon neutral status in the monument by reducing greenhouse gas emissions while increasing carbon sequestration through improved forest health management.

Natural Sounds

- Implement standard noise abatement measures during monument operations, including: scheduling to minimize impacts in noise-sensitive areas, using the best available noise control techniques, using hydraulically or electrically powered impact tools when feasible, and locating stationary noise sources as far from sensitive habitat and concentrated visitor use areas as possible.
- Locate and design facilities to minimize above-ambient noise.

- Avoid idling motors when power tools, equipment, and vehicles are not in use.

- Implement a soundscape management policy that would the predominance of natural sounds unimpacted by operational, visitor, and recreational uses.

Dark Night Skies (Lightscapes)

- When outdoor lighting is needed, install energy-efficient lights equipped with timers and/or motion detectors so that light would only be provided when it is needed to move safely between locations.

- Use low-impact lighting, such as diffused light bulbs, and techniques such as downlighting to prevent light spill and to preserve the natural lightscape.

Hydrologic Systems, Water Quality, and Wetlands

- For projects requiring ground disturbance, implement erosion control measures as appropriate, including mitigating unnatural discharge into water bodies. Regularly inspect construction equipment and vehicles for leaks of petroleum and other chemicals to prevent water pollution. Avoid the use of heavy equipment nearby and/or within wetlands or riparian habitat.

- Wash heavy equipment and vehicles prior to use in or near water bodies.

- Use bio-lubricants (such as biodiesel and hydraulic fluid) in construction equipment.

- Develop and implement a spill prevention and response plan and acquire supporting equipment.

- Integrate runoff management and mitigation systems into the designs of parking areas near water resources.

- Develop sediment control and prevention plans and implement best management practices for projects that could impact water quality.

- Delineate wetlands and avoid all impacts (to the extent possible) to these habitats. Where impacts are unavoidable follow appropriate law and policy to mitigate loss.

- Conduct project activities near wetlands in a cautious manner to prevent damage from equipment, and related to compaction, erosion, siltation, etc. Apply protection measures during projects.

- Consult with NPS Water Resources Division regarding the wetlands Statement of Findings process for any potential wetland impacts.

- Avoid infrastructure development in frequently-inundated floodplains and adjacent to wetland and riparian habitat.

- Reduce and reuse wastewater

Soils

- Site new facilities on soils suitable for the type and scale of development proposed.

- Minimize soil erosion by limiting the time that soil is left exposed and by applying other erosion control measures, such as erosion matting, silt fencing, and temporary sedimentation basins in construction areas to reduce erosion, surface scouring, and discharge to water bodies.

- Require all project managers to implement the monument's invasive plant management prevention and treatment program.

- Once work is completed, revegetate construction areas with appropriate native plants in a timely period according to revegetation plans.

Vegetation

- Monitor areas used by visitors (e.g., trails, campsites) for signs of native vegetation disturbance. Use public education, revegetation of disturbed areas with native plants, erosion control measures, and barriers to control potential impacts on plants from erosion, trampling or social trails.

- Minimize size and number of staging areas, overflow parking and operational impacts to vegetation by delineating these areas and revegetating if necessary.

- Develop revegetation plans for disturbed areas and require the use of genetically appropriate native species. Revegetation plans would specify

species to be used, seed/plant source, seed/plant mixes, site-specific restoration conditions, soil preparation, erosion control, ongoing maintenance and monitoring requirements, etc. Salvaged vegetation would be used to the greatest extent possible.

- Implement the monument's invasive plant prevention, treatment and management plan focusing on prevention and rapid response. Standard measures could include the following elements: use only weed-seed-free materials for road and trail construction, repair, and maintenance; ensure equipment arrives on site free of mud or seed-bearing material; certify all feed as weed-free for administrative pack stock; identify areas of invasive or nonnative plants pre-project and treat any populations or infested topsoil before construction (e.g., topsoil segregation, storage, herbicide treatment); when depositing ditch spoils along the roads, limit the movement of material to as close as possible to the excavation site; scrupulously and regularly inspect areas that serve as introduction points for invasive or nonnative plants (campgrounds, staging areas, maintenance areas, and corrals on nearby sites); revegetate with genetically appropriate native species; inspect rock and gravel sources to ensure these areas are free of invasive and nonnative plant species; and monitor locations of ground-disturbing operations for at least three years following the completion of projects.

Wildlife

- Employ techniques to reduce direct human impacts to wildlife, including visitor education programs, proper food storage, restrictions on visitor and park activities when warranted, development and use of best management practices for management activities (including construction), permit conditions, temporary and/or permanent closures of sensitive sites, and law enforcement patrols.

- Implement measures to reduce adverse effects of nonnative plants and wildlife on native species.

- Protect and preserve critical habitat features, such as nest and granary trees and migration corridors, whenever possible.

Special Status Species

- Mitigation actions would occur during normal park operations as well as before, during, and after projects to minimize immediate and long-term impacts on rare, threatened, and endangered species. These actions would vary by project area, and additional mitigation measures may be added depending on the action and location. Many of the measures listed for vegetation, wildlife, and water resources would also benefit species that are rare, threatened, endangered and /or of management concern by helping to preserve or minimize impacts on habitat.

- Conduct surveys and monitoring for special status species as warranted.

- Locate and design facilities/actions/operations to avoid or minimize impacts on special status species habitat. If avoidance is infeasible, minimize and mitigate for adverse effects as appropriate and in consultation with technical experts.

- Minimize disturbance to special status species, nesting, and migratory bird habitat through spatial and temporal planning.

- Develop and implement restoration and/or monitoring plans as warranted. Plans should include methods for implementation, performance standards, monitoring criteria, and adaptive management techniques.

Management and Protection of Cultural Resources

- Pursue strategies to protect cultural resources, including museum collections and archeological, historic, ethnographic, and archival resources, while encouraging visitors and employees to recognize and understand their value.

- In accordance with NPS management policies, protect and maintain cultural resources that have been included in wilderness according to the pertinent laws and policies governing cultural resources, using management methods that are consistent with the preservation of wilderness character and values (6.3.8). These laws include the National Historic Preservation Act, the Archeological Resources Protection Act, the American Indian Religious Freedom Act, the Native American Graves Protection and Repatriation Act, and Executive Order 13007

that addresses government-to-government consultation.

- Avoid adverse impacts to properties determined eligible for listing in the National Register of Historic Places. If adverse impacts could not be avoided, mitigation would be developed in consultation with SHPO, tribes, and other consulting parties pursuant to 36 CFR Part 800, the implementing regulations for the National Historic Preservation Act.

Archeological Resources

- Known archeological sites will be periodically monitored to track their condition, identify any new or emerging threats, and identify any treatment measures necessary for their preservation and protection.

- Consultation with traditionally associated American Indian tribes and groups will help inform managers of the traditional cultural and religious significance of these resources.

- Archeological surveys would precede ground-disturbance required for new construction or other management activities. Known archeological resources would be avoided to the greatest extent possible.

- If previously unknown archeological resources are discovered during any project work, work in the immediate vicinity of the discovery would be halted until the resources could be identified, evaluated, and documented and an appropriate mitigation strategy could be developed, if necessary, in consultation with the state historic preservation office and associated American Indian tribes and groups.

- If previously unknown archeological resources are discovered as a result of natural processes, these resources will be documented, added to the monument's inventory, stabilized where feasible and appropriate, and included in the periodic monitoring program.

Ethnographic Resources

- Maintain active tribal consultation program for identification, evaluation, and management of natural and cultural resources with cultural and religious significance to traditionally associated American Indian tribes and groups.

- Consult with tribes and groups regarding monument undertakings with the potential to affect resources of cultural and religious significance to ensure tribal perspectives are understood, and adverse effects are avoided or minimized.

Historic Resources

- Documented historic sites, structures, buildings and landscapes will be periodically monitored to track their condition, identify any new or emerging threats, and identify any treatment measures necessary for their preservation and protection.

- Cyclic maintenance, periodic repair, and rehabilitation of historic buildings, structures, and landscapes will be undertaken in keeping with the Secretary of the Interior's Standards for the Treatment of Historic Properties in order to protect and maintain the integrity and significance of the resources.

Scenic Resources

- Design, site, and construct facilities to minimize adverse effects on natural and cultural resources and visual intrusion.

- Provide vegetative screening, where appropriate.

Socioeconomic Environment

- During the future planning and implementation of the approved management plan for Devils Postpile National Monument, National Park Service staff would pursue partnerships with tribes, local communities, and county governments to further identify potential impacts and mitigating measures that would best serve the interests and concerns of both the National Park Service and the local communities.

Sustainable Design

- Sustainable practices would be used in the selection of building materials and sources and building location and siting. Design standards specific to the monument would be developed in all repair, rehabilitation, and construction projects.

- Projects would use sustainable practices and resources whenever practicable by recycling, reusing, and minimizing materials, minimizing energy consumption during construction, and reducing energy needs throughout the lifespan of the project.

- As required by Management Policies (NPS 2006), new buildings would be designed to meet a minimum silver LEED standard.

- As stated in the Devils Postpile Climate Friendly Parks Action Plan, the monument will reduce greenhouse gas emissions by increasing energy efficiency in all park buildings and housing, utilizing alternative energy sources, and reducing transportation-related emissions through behavioral change."

Wilderness

- The Minimum Requirement / Minimum Tool process provides a method for developing, evaluating, and selecting the actions that would be the least intrusive on wilderness character and values. The concept is applied to all management actions, programs, and activities within Devils Postpile National Monument that might affect wilderness. The minimum requirement / minimum tool concept is applied as a two-step process. The first step (minimum requirement) is used to determine whether a proposed management action is appropriate and necessary for the administration of the area as wilderness, and a determination that it would not cause unacceptable impacts on wilderness resources and character, in accordance with the Wilderness Act. The second step (minimum tool) is used to analyze the techniques and types of equipment needed to ensure that impacts on wilderness resources and character are minimized. If the project is found to be appropriate and necessary, then a management method (tool or technique) is selected that would result in the least amount of impact to the wilderness resources and character.

Natural Resources

Geologic and Soil Resources

The area of consideration for this topic is the monument. Potential impacts from management actions are based on professional judgment and experience with similar actions.

GEOLOGICAL RESOURCES – IMPACTS FROM ALTERNATIVE A (NO ACTION)

The monument's two primary visitor sites, Devils Postpile and Rainbow Falls, are non-renewable geologic features. The continuation of current management under alternative A would have minor adverse impacts on the monument's these and other geologic resources, as explained below. The geologic features of the monument would likely continue to be worn, damaged, and/or degraded by visitor activities in localized areas, particularly adjacent to existing trails, near visitor facilities, and wherever social trails exist. Of particular concern, but unknown level of impact, is the glacial polish located at the top of the Postpile. Unrestricted access to this area would continue under this alternative, potentially impacting the quality of some examples of glacial polish, to an unknown extent, over a long period of time.

Geologic resource condition at Rainbow Falls and Devils Postpile would continue to benefit from current levels of protection and visitor education, as well as the actions identified as common to all alternatives (Table 3.2). These actions include the establishment of a comprehensive monitoring program for geologic resources, emphasizing the Postpile itself, increasing intra- and inter-agency coordination for resource management, and developing a baseline inventory of the Postpile formation. All of these actions would benefit geologic resources in the monument by elevating the monument's understanding and informing its management.

GEOLOGICAL RESOURCES – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

Impacts under alternative B would be the same as alternative A, with the following differences:

Construction and reconfiguration proposed in alternative B, including an outdoor addition to the ranger station, redesign of the day use parking area, and removal of the campground, would have negligible adverse impacts on geological resources due to their locations on previously disturbed pumice soils. Exposed rock is not found in these areas, except along the riverbank, which these changes are designed to protect by removing concentrated use and vehicle parking. See *Soils* for a broader description of impacts.

Truncating or shortening the trail at the top of the Postpile formation may benefit the preservation of glacial polish in some areas by reducing foot traffic on the polish. Although it is currently unknown how foot traffic affects glacial polish, reducing such traffic would mitigate any possible issues.

Under alternatives B and C, the monument would conduct a study to evaluate options to make the trail from the ranger station to Devils Postpile more accessible to a wider variety of users. Because building a more accessible route to the Postpile would likely involve heavy equipment and/or rock modification, it would require further planning and environmental analysis to ensure that the effects are mitigated.

GEOLOGICAL RESOURCES – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Impacts under alternative C would be largely the same as alternative B. Although different trail routing methods would be employed to protect glacial polish as compared to alternative B, the objective and impacts would be the same.

Construction of a joint maintenance facility will not impact geologic resources because it will be located on loose pumice soils. This impact is more appropriately described under *Soils*.

GEOLOGICAL RESOURCES – CUMULATIVE IMPACTS

Air pollution, especially from urban areas to the west and south, may increase erosion through the effect of pollutants on rock, or may otherwise alter natural erosional processes by, for example, adversely impacting lichens. These effects are negligible to minor and adverse. The actions described in the alternatives above are not expected to add to the effects of pollution on rock surfaces in any perceptible way.

The GMP recommends additional measures for the Inyo National Forest which could impact geologic resources if implemented. Because the USFS has not adopted these recommendations and have had a limited role in the their development, these recommendations are treated at most as reasonably foreseeable. Small-scale development at Minaret Vista and new trails developed under a multi-modal trail plan has the potential to affect exposed rock at the vista and within the valley. Overall cumulative impacts would remain minor under all alternatives.

GEOLOGICAL RESOURCES – CONCLUSION

Most of the monument's geologic resources would not be affected by the actions in the alternatives. Some features could be degraded or altered due to new developments, access opportunities, and increased visitor use in localized areas. These adverse impacts would be negligible to minor and long-term.

SOILS – IMPACTS FROM ALTERNATIVE A (NO ACTION)

Soils would likely continue to be disturbed, compacted, and eroded by visitors in localized areas, particularly along existing trails, near visitor facilities, and near social trails. Monument staff and visitors, including hikers and stock users, both commercial and non-commercial, would continue to use existing trails and social trails, producing long-term, negligible to minor, adverse impacts. In some areas, new visitor-created, social trails may form with increased visitation or changes to visitation patterns, particularly in areas with high visitor use. These long-term, adverse visitor impacts on soils would likely be minor and limited in extent.

Soils within the monument would continue to benefit from current levels of protection and visitor education, as well as the actions identified as common to all alternatives (Table 3.2). These actions include the establishment of a comprehensive monitoring program for geologic resources, increasing intra- and inter-agency coordination for resource management, and completing a resource stewardship strategy. All of these actions would benefit soil resources in the monument by further identifying trends and management opportunities.

SOILS – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

As in alternative A, soils would continue to be disturbed, compacted, and eroded by visitors in localized areas, particularly along existing trails, near visitor facilities, and in the vicinity of social trails.

In alternative B, some soils would be degraded or lost to compaction, disturbance, erosion, or substantially altered in local areas due to development activities at the ranger station, the day use parking area, the shuttle stop, and the removal of the campground. Site preparation and landscaping work would disturb soils temporarily, and soils would be modified in the footprint. Construction equipment would disturb and compact soils in proposed project areas. With the mitigation described earlier in this chapter, these actions would have minor to moderate, adverse, short-term impacts on soils in areas previously impacted by development. Rehabilitation of areas within and surrounding the campground and day use parking area to natural surfaces and with fewer vehicle impacts near the riverbanks would have long-term beneficial impacts. This would include removal of the campground (fewer vehicles in the area) and moving vehicle parking further away from the river in the day use area.

This alternative would likely involve some ground disturbance in the Pumice Flat cabin area, which consists of primarily previously disturbed soils, due to adaptive reuse construction activities. With the mitigation described at the beginning of this chapter, the impact to soils is expected to be adverse, minor, and short-term during construction and negligible long-term. Additional environmental analysis would occur to support proposed construction once designs have identified the scope of maintenance activities to occur there and the changes needed to accommodate those activities.

Because commercial stock use would not increase under this alternative, any associated impacts would not increase over the levels described under alternative A. The potential management actions described in the Visitor Capacity section (Chapter 3) and the Extent Necessary Determination (Appendix D) would benefit soils by requiring the monument to proactively address trail width and depth issues as they begin to appear.

Efforts to remove social trails would help reduce soil degradation and result in long-term, localized, beneficial impacts on soils. Compaction and disturbance would be reduced compared to present conditions, a long-term and beneficial effect. Instituting and monitoring visitor capacity indicators and standards, taking appropriate management actions in response, and mitigating unacceptable impacts if/when they occur, would help ensure that an unacceptable increase in the number of visitor-created trails (and resulting increased soil disruption) and degradation of existing trails beyond acceptable depth and width measures do not occur. Compared to the no-action alternative, this alternative would result in a long-term, beneficial effect.

SOILS – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Impacts under alternative C would not differ materially from alternative B., except that the preferred alternative would also involve ground disturbance for the construction of a joint maintenance facility outside of the monument. Pumice Flats Group Campground, a previously disturbed area primarily covered in loose pumice stone, has been considered as a functional location for this joint facility. Other previously disturbed areas that would functionally serve both the NPS and USFS would also be considered. Given the mitigation described at the beginning of this chapter, the impact to soils is expected to be adverse, minor, and short-term during construction and negligible long-term. Additional environmental analysis would occur to support proposed construction once designs have identified the location and footprints related to the building and circulation. Because the area characterized by seismic activity, the NPS would complete a geotechnical report for the construction of the new facility to inform the design. If this report were not completed, there could be adverse impacts as a result of geohazards. With this mitigation, the designs will reflect recommendations for seismic stability and soil stabilization. As such, any impacts as a result of geohazards are expected to be negligible to minor.

SOILS – CUMULATIVE IMPACTS

Soils throughout the monument have been damaged by past management practices, altered fire regimes, concentrated visitor use, and development. Social trails due mostly to fishing along streambanks continue to contribute to erosion through the loss of riparian vegetation. Camping, parking, hiking, and other uses also contribute to erosion throughout the monument, of particular concern in riparian areas. The loss and alteration of soils due to past land uses and ongoing

management actions under the alternatives would result in minor adverse cumulative impacts on area soils.

New development by the Inyo National Forest, recommended in the GMP, could result in long-term, localized impacts to soils, if implemented. Small-scale development at Minaret Vista, new trails under a multi-modal trail plan, and a joint maintenance facility would all require planning and further environmental analysis. While short-term adverse impacts are likely to occur due to construction activities, each project also carries the potential for long-term beneficial impacts with best management practices applied.

Climate change could increase wildfire frequency and intensity, reduce groundwater and surface water, change water chemistry (e.g., increase water temperature, decrease in dissolved oxygen), change seasonal snowmelt, decrease snowpack, and increase erosion of soils from wildfire impacts and drier conditions (Kunkel et al. 2013). The adverse impacts described in alternatives A-C would not add appreciably to these cumulative impacts, largely because development is small-scale and limited in all alternatives and "common to all" actions related to climate change response, along with the beneficial actions in these alternatives are designed to respond adaptively and promote system resilience.

When the potential minor long-term adverse effects from actions in alternatives A, B, and C are added to past and future impacts external to the monument, there would continue to be a localized, minor to moderate, adverse overall cumulative impact on area soils.

SOILS – CONCLUSION

Most of the monument's soils would not be affected by the actions proposed in these alternatives. In some areas, however, soils would be compacted and disturbed, and soil properties would be altered due to new developments and visitor use in localized areas such as along trails.

In alternative A, adverse impacts would likely be minor, adverse, and long-term. Alternatives B and C would have higher level of impact due to short-term construction activities associated with the developed visitor services area. Establishing and monitoring user capacity indicators and standards would prevent the establishment of new visitor-created (social) trails and prevent resulting soil degradation resulting in long-term beneficial effects. Overall, long-term impacts under the action alternatives would be beneficial.

Cumulative impacts would be long-term, minor to moderate, and adverse.

Biological Resources

Vegetation

The area of consideration for this topic is the monument and analyses are based on available information. Potential impacts from management actions are based on existing information, professional judgment and experience with similar actions.

Wildlife

The area of consideration for this topic is the monument and analyses are based on existing information on wildlife species and populations. Impacts on wildlife are closely related to impacts on vegetation communities. Therefore, evaluations of potential impact considered whether actions would be likely to displace some or all individuals of a species in the monument or would result in loss or creation of habitat conditions needed for the viability of local or regional populations.

Special Status Species

The area of consideration for this topic is the monument. No species currently listed as Threatened or Endangered by the U.S. Fish and Wildlife Service are found in the monument. Focal species include rare and endemic species, and species of special concern.

BIOLOGICAL RESOURCES - IMPACTS FROM ALTERNATIVE A (NO ACTION)

Biological resource condition in the monument would continue to benefit from current levels of protection and visitor education, as well as the actions identified as common to all alternatives (Table 3.2). These actions include the establishment of a comprehensive monitoring program for ecological resources, actions related to climate change research and response, increasing intra- and inter-agency coordination for resource management, and completing a resource stewardship strategy. All of these actions would benefit biological resources in the monument by increasing the monument's under-

standing of these resources and mapping out strategies for their management. In particular, the monument's ongoing actions related to climate change, including monitoring , mitigating, and developing adaptation strategies where possible, working with other public and private landowners, and participation in regional and NPS-wide efforts, would benefit the monument's ability to restore native species and promote ecosystem and landscape resilience.

Vegetation

Ongoing vegetation impacts would include damage to or loss of native vegetation due to maintenance activities, minor modifications to developed areas, recreational use, including trampling and soil compaction, and the spread of non-native species. The actions in alternative A that would have adverse effects include those related to development such as trail maintenance and construction, recreational use (including stock use), and nonnative invasive plant introduction. Ongoing invasive plant treatment and ecological restoration efforts would provide beneficial impacts.

Some vegetation may be damaged or lost near popular use areas in the monument due to human created social trails. Although these impacts would be unlikely to affect the integrity, distribution, or presence of native plant communities at a large scale, localized effects include additional loss of vegetation over time as more people used the social trail. Overall, visitor use would likely continue to have a localized long-term minor adverse impact on the monument's native vegetation.

In addition to direct loss of vegetation through the creation of social trails or trampling, there would be localized, long-term, minor adverse impacts from current visitor use levels and from the potential for increased visitor use levels to impact native plant populations through the introduction and spread of non-native invasive plants. Current non-native invasive plant control, including selective treatment of nonnative invasive plants would continue to result in long-term beneficial effects on native vegetation. Even with visitor education efforts, some nonnative invasive plants might be introduced or spread by visitors (as well as by wildlife and vehicles) in the monument.

Small populations of nonnative species would continue to be present in the monument and would potentially spread to new developed areas. It is difficult to determine the impact this would have on native species, due to uncertainties about the type of species that might be introduced and the locations and frequencies of such introductions. It is likely that even with continuing monitoring and control efforts the impacts would be long-term, adverse, and minor to moderate.

Long-term beneficial impacts would be realized from ongoing treatment efforts. Current efforts to eradicate nonnative species would continue.

Wildlife

Existing natural resource management activities would continue based on the best available science, including results presented in peer-reviewed journals and from monitoring programs. Removal of nonnative invasive species and restoration of degraded areas would also continue, resulting in long-term beneficial effects on wildlife species through habitat improvement.

Wildlife populations and habitat could be affected to varying degrees by continuing maintenance activities and visitor use that could affect natural movement of wildlife, habitat, and food sources. Visitation is not expected to increase appreciably and would likely have little additional effect on the extent of impacts. The very low incidence of collisions between vehicles and wildlife would not likely increase.

Special Status Species

Most maintenance and visitor activities would continue to occur in previously disturbed areas along existing trails, roads, and in the developed areas. Visitation is not expected to increase appreciably and there would be no new development under this alternative. Also, NPS actions to manage and protect special status species would continue to be employed, such as monitoring and ecological restoration programs. Consequently, there would be no change in the habitat or disturbance to special status species within the monument as a result of the no action alternative.

BIOLOGICAL RESOURCES - IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

A Wild and Scenic River suitability finding could provide some benefit to riparian vegetation and wildlife by requiring the monument to prepare a comprehensive river management plan that details resource protection and creates standards for management. A finding of suitability, however, does not by itself impact resources, since the river and its related values have been protected and will continue to be protected

under the 1991 eligibility findings. A separate environmental analysis was conducted at that time to identify outstandingly remarkable values, classifications, and overall eligibility.

Vegetation

The beneficial and adverse impacts described under alternative A would continue.

A focus on interagency management of natural resources, with a watershed emphasis, would benefit vegetation management in the monument by addressing needs and treatments at a biologically relevant scale.

Emphasizing demonstrations of resource management techniques to involve visitors in natural resource management activities would increase understanding of natural resource issues, building stewardship and program support – potentially resulting in a small beneficial effect.

The ranger station deck would be expanded and the shuttle bus stop and parking area would be reconfigured. Because these facilities are concentrated in the already developed and disturbed day use and campground area, and because tree removal is unnecessary, adverse impacts associated with these facilities would be negligible to minor. Removal of the campground would result in long-term beneficial impacts because impacted sites would be restored to more natural conditions, sites near the riparian corridor would be removed, and vehicle use in the monument would be reduced. A new day-use design, including delineation of parking, may provide additional space to better design foot access along the river, avoiding sensitive riparian resources and leading to less trampling of vegetation. With the mitigation described in this chapter, short-term construction impacts due to these actions would be negligible to minor.

Outside of the monument, this alternative would likely involve some disturbance to vegetation in the Pumice Flat cabin area, due to adaptive reuse construction activities. With the mitigation described at the beginning of this chapter, the impact to vegetation is expected to be adverse, minor, and short-term during construction and negligible long-term. Additional environmental analysis would occur to support proposed construction once designs have identified the scope of maintenance activities to occur there and the changes needed to accommodate those activities.

Redesign of the current trail alignment at Rainbow Falls would contribute to minor, short-term construction impacts, but would likely produce long-term benefits to vegetation by reducing erosion. Potential impacts to vegetation and wildlife habitat through continued commercial stock use, limited to current levels in the Extent Necessary Determination (Appendix D), would not increase appreciably over the impacts described in alternative A.

Wildlife

The beneficial and adverse impacts described under Vegetation would also apply to wildlife habitat. For example, removal of the campground would result in beneficial effects because riparian habitat and associated species would experience less trampling. Also, crepuscular and nocturnal species would benefit from less night-time light and noise. There would also be fewer opportunities for wildlife habituation to human food sources and greater habitat connectivity with the removal of overnight camping.

Removal of some operational buildings and housing from the edge of Soda Springs Meadow would have beneficial effects because of the reduction of human disturbance in ecotonal habitat for meadow-foraging species.

Special Status Species

Because changes to development and visitor use are small in alternative B, impacts to sensitive species closely mirror impacts on vegetation and wildlife in general.

BIOLOGICAL RESOURCES - IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

The beneficial and adverse impacts described under alternative B would also occur under alternative C, with the exception of impacts associated with removal of the campground and maintenance facility. Campground improvements which include removing sites close to the river will have beneficial impacts. Construction of a joint maintenance facility outside of the monument, possibly at Pumice Flats Group Campground, would occur under this alternative. Given the mitigations described at the beginning of this chapter, the impact to biological resources is expected to be adverse, minor, and short-term during construction and negligible

long-term. Additional environmental analysis would occur to support proposed construction once designs have identified the location and footprints related to the building and circulation.

BIOLOGICAL RESOURCES - CUMULATIVE IMPACTS

Over time, some native plant communities have been affected by use, development, and recreation both within and outside of the monument, causing minor, long-term, adverse impacts on native vegetation in the monument. Wilderness designation of most of the watershed has benefitted the monument as it has limited the amount of development and the types of recreation in the surrounding region. The long-standing shuttle program produces long-term benefits through reducing cars in the valley and monument, while also creating adverse impacts on vegetation and wildlife through pulsing (as visitors arrive to trailheads in pulses, larger groups travel together) and the associated trail widening and elevated noise.

When comparing annual mean temperature for 1971-2000 to future projections for the region, annual mean temperature is projected to increase 1.5-3.5 °F by 2050 and 2.5-4.5 °F by 2070. In looking at seasonal changes in mean temperature, summer is projected to have the greatest increase (+5.0 –6.0 °F) by 2070. There is less certainty with precipitation for the region. The modeled projections indicate a decrease in annual mean precipitation over time when compared to the 1971-1999 annual mean. By 2050, annual mean precipitation is projected to range from no change to a 3% decrease and a 3-6% decrease by 2070. So an overall warmer and dryer climate is projected for the region that includes DEPO. Associated influences could include increase in wildfire frequency and intensity, reduction in groundwater and surface water, changes in water chemistry (e.g., increase water temperature, decrease in dissolved oxygen), changes in seasonal snowmelt, decrease snowpack, increased erosion of soils from wildfire impacts and drier conditions, increase in non-native species, changes in visitation patterns associated with changing environment conditions (e.g., visitation occurring earlier in the spring season and the associated influence on operational costs) and associated biological responses (Kunkel et al. 2013). The adverse impacts described in alternatives A-C would not add appreciably to these cumulative impacts, largely because development is small-scale and limited in all alternatives and "common to all" actions related to climate change response are designed to respond adaptively and promote system resilience.

Reasonably foreseeable actions outside of the monument, resulting from recommendations made in this GMP, could affect the area's native vegetation, wildlife, and wildlife habitat. At Minaret Vista, if the recommendations were adopted, construction of new trails and facilities would contribute to vegetative loss, a short-term, minor adverse effect in localized areas. Changes to facilities and infrastructure, including relocation of the parking area would also result in minor adverse impacts to vegetation, although many of these changes are likely to occur on previously disturbed areas. The minor impacts described in alternatives A-C would not add appreciably to these cumulative impacts, largely because they would primarily occur in developed areas. Ongoing and proposed ecological restoration efforts, however, would benefit some areas.

BIOLOGICAL RESOURCES - CONCLUSION

Under alternative A, long-term, minor, adverse impacts would occur in local areas due to visitor and administrative use and the continuing introduction and spread of non-native invasive plants. Continuation of current efforts to control these species would continue to result in long-term beneficial effects in many areas.

Long-term, minor, adverse impacts would occur in local areas under alternatives B and C, due to visitor use and improvements to existing facilities. A reduction of facilities near riparian areas and an emphasis on collaborative management at a biologically relevant scale, however, would provide beneficial impacts.

Hydrologic Systems and Processes, Including Water Quality, Wetlands, and Floodplains

The area of consideration for this topic is surface waters within the monument and associated wetlands. Assessments of potential impacts from management actions are based on available information on surface hydrologic systems, including surface hydrology, wetlands, and floodplains, professional judgment and experience with similar actions. Potential impacts to groundwater is also considered.

The primary sources of impacts on hydrologic systems at the monument arise from modifications to streams and wetlands or changes to the flow, amount and/or timing of water and/or debris flowing into them. Modifications to streams and wetlands include structures in stream channels such as bridges and culverts or structures on floodplains such as buildings and elevated roads or trails. The amount and/or timing of water or debris flowing into these areas may be affected by the amount of vegetation or paved areas in a watershed. Additionally, damage to native plant cover from streambank trampling and social trailing in wetlands can cause long-term degradation of these systems and reduce their ecological function by altering surface water flow direction and duration (e.g., wildlife habitat, late-season water storage).

HYDROLOGIC SYSTEMS AND PROCESSES – IMPACTS FROM ALTERNATIVE A (NO ACTION)

Under alternative A, no new structures or modifications are planned that would either affect stream flow, alter or be developed in floodplains, affect wetlands, or increase the amount of hardened surfaces in the monument.

The effects of management actions would continue to be localized and would primarily affect the Middle Fork of the San Joaquin River. Maintaining access to and retaining facilities in their current condition would be unlikely to increase impacts on water quality. Long-term impacts in the monument would continue, including effects from development located in floodplains that alter the passage and quality of water flow in some areas. In these areas water would flow rapidly, rather than seep into the ground, thereby picking up and discharging more contaminants into nearby water bodies, depending on how close these are to roads and parking areas. In these locations, contaminants in storm water from vehicle fluids that are deposited on hardened or surfaced and gravel roads would alter water quality conditions, including chemical and physical properties, with long-term negligible to minor impacts, during and following storms. Periodic storms could also cause soil from gravel roads in the campground and day use area to wash into the river, increasing turbidity. Ongoing erosion associated with existing facilities, such as trails, would also continue to occur.

Infrequently, water quality at Devils Postpile may also be affected by inadvertent spills (oil, paint, chemicals, etc.), removal of shade, loss or alteration of organic material (leaves, logs, etc.) entering the river or increased turbidity from erosion due to trampling/removal of vegetation or construction of trails, road maintenance activities, etc.

Because the river originates outside of the monument, there would also continue to be impacts on water quality from external sources. Sources within and outside of the monument would continue to produce localized minor to moderate impacts on water quality (see *Cumulative Impacts*).

Due to its small size within the larger watershed and its low level of development, the monument itself likely has a negligible impact on groundwater resources. Groundwater in the monument benefits greatly from the protection of the surrounding wilderness areas and related lack of development. The monument is currently studying groundwater flows, especially in the Dry Creek drainage, to test for potential emerging contaminants originating from activites outside of the monument. A suite of springs and the monument's supply well are being tested for a large number of organic compounds associated with human activity. These ongoing efforts benefit groundwater resources in the monument by increasing the monument's baseline understanding for future planning. In addition, common to all actions described in Table 3.2 include the establishment of a comprehensive monitoring program for hydrologic resources, increasing intra- and inter-agency coordination for resource management, and the inventory and evaluation of facilities that could discharge into water sources and mitigating threats to water resources and hydrologic processes. All of these actions would benefit geologic resources in the monument by elevating the monument's understanding and informing its management.

HYDROLOGIC SYSTEMS AND PROCESSES – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

Alternative B includes reconfiguration of the day use parking area and removal of the monument campground. A careful redesign of these areas could produce long-term beneficial impacts on hydrology and restore some natural floodplain processes. Because these surfaces would remain unpaved, impervious surface area would not increase in the monument. With the mitigation measures described in this GMP, short term adverse impacts due to removal and construction activities associated with the campground, parking, and ranger station areas would be minor and localized in an area already disturbed and heavily used.

Implementation of a watershed approach to resource management by expanding and prioritizing interagency collaboration and coordination would increase the monument's capacity for a holistic approach to watershed issues at a biologically relevant scale and would help ensure that the Middle Fork of the San Joaquin River is managed as an interconnected fluvial system; a long-term beneficial effect.

Removal of operational buildings from the edge of the meadow would have a beneficial effect on groundwater by reducing soil compaction and improving natural hydrologic connectivity between the developed area and the meadow. Moving the maintenance function from its current location would also provide a beneficial effect by helping to reduce the building footprint near the meadow and reducing the potential for spills near the meadow. This alternative would likely involve some alterations of natural processes in the Pumice Flat cabin area, due to temporary adaptive reuse construction activities and activities associated with ongoing maintenance. With the mitigation described at the beginning of this chapter, the impact is expected to be adverse, minor, and short-term during construction and negligible long-term. Additional environmental analysis would occur to support proposed construction once designs have identified the scope of maintenance activities to occur there and the changes needed to accommodate those activities.

Alternative B includes the redesign of a portion of trail approaching Rainbow Falls and a potential redesign of the Postpile trail for accessibility. Trails sometimes alter runoff from hillsides and can also increase erosion. Continued access to Rainbow Falls by equestrian users, including commercial stock use under the Extent Necessary Determination, also carries a continuing potential for trail impacts. NPS management policies, however, require the monument to design and build sustainable trails that minimize these effects. In particular, both the Extent Necessary Determination and Visitor Capacity sections of this GMP set forth monitoring and response requirements that mitigate impacts due to increasing trail width or depth. As a result, the trails would likely have minor, long-term, adverse effects.

Joint maintenance activities, and construction of structures to support them, with the USFS outside of the monument could have adverse effects on hydrologic systems, primarily through soil erosion. These impacts are described above in the section on soil resources.

Impacts on water quality and groundwater resources from alternative B would be similar to those described under alternative A. Short-term construction activities related to the small-scale projects described above would be managed, with the mitigation described in this chapter, to avoid impacts on water quality, with anticipated short-term minor adverse effects.

A Wild and Scenic River suitability finding could provide some benefit to water quality by requiring the monument to prepare a comprehensive river management plan that details water quality objectives and creates standards for management. A finding of suitability, however, does not by itself impact resources, since the river and its related values have been protected and will continue to be protected under the 1991 eligibility findings.

HYDROLOGIC SYSTEMS AND PROCESSES – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Impacts under alternative C are the same as those described for alternative B, with a few exceptions. For example, removal of the campground would not occur, although some redesign of sites near riparian areas would also benefit hydrologic systems and processes by shifting campsites to locations where impacts are less likely to occur. Also, the monument's partnership primary focus would not be on watershed management, although the monument would continue to seek opportunities to holistically manage watershed resources through cooperation with the Inyo National Forest. Importantly, construction of a joint maintenance facility outside of the monument, possibly at Pumice Flats Group Campground, would occur under this alternative. Given the mitigations described at the beginning of this chapter, the impact to hydrologic resources is expected to be adverse, minor, and short-term during construction and negligible long-term. Additional environmental analysis would occur to support proposed construction once designs have identified the location and footprints related to the building and circulation.

HYDROLOGIC SYSTEMS AND PROCESSES – CUMULATIVE IMPACTS

Due to the generally steep and varied terrain of the watershed, most development has occurred in the relatively flat valley bottoms where it is most likely to impact hydrologic processes and water quality. Many of the structures in Reds Meadow Valley, as well as

roads, trails, parking lots, bridges, and culverts contribute cumulatively to degraded hydrologic function. In the monument, most development and visitor activities occur near the river due to the small size of the monument and the proximity of its primary attractions to the river. Runoff from hardened and/or impervious surfaces, including buildings, roads, trails, parking areas, campgrounds, and picnic areas may adversely affect water quality, due to sedimentation, introduction of contaminants, and increases in water temperature. These actions have led to localized, minor to moderate, long-term, adverse impacts where these facilities occur within the valley and monument. Potential sources of water quality degradation also exist upstream of monument boundaries, with possible external sources including stock use and other recreational activities.

Climate change could increase wildfire frequency and intensity, reduce groundwater and surface water, change water chemistry (e.g., increase water temperature, decrease in dissolved oxygen), change seasonal snowmelt, decrease snowpack, and increase erosion of soils from wildfire impacts and drier conditions (Kunkel et al. 2013). The adverse impacts described in alternatives A-C would not add appreciably to these cumulative impacts, largely because development is small-scale and limited in all alternatives and "common to all" actions related to climate change response and the beneficial actions in these alternatives are designed to respond adaptively and promote system resilience.

Implementation of the recommendations in this GMP on the Inyo National Forest could also affect hydrologic processes and water quality. Many of the recommendations would likely result in beneficial impacts, such as relocating campsites and parking areas away from riverbanks, wetlands, and meadows. Other recommendations could result in localized impacts, particularly short-term impacts related to construction of an interagency maintenance facility and the redesign of Minaret Vista. Both of these projects would require environmental analysis and planning at the time of their design. Alternatives A, B, and C would contribute negligible to minor adverse effects on hydrology. The action alternatives would mitigate some cumulative impacts by the removal or redesign of some development, such as reconfiguration of the monument parking area (alternatives B and C), removal of the campground (alternative B), redesign of the campground (alternative C), and moving the maintenance facility (alternatives B and C). Compared to the effects of past development, however, these actions and modifications would not add appreciably, negatively or positively, to existing impacts on hydrological systems and processes. As a result, overall cumulative impacts under all alternatives would remain minor and adverse, with some long-term beneficial effects.

HYDROLOGIC SYSTEMS AND PROCESSES – CONCLUSION

Alternative A would not contribute further impacts beyond the current baseline because it does not propose additional development that would affect hydrologic systems, floodplains, water quality or wetlands but existing impacts would continue. Alternatives B and C combine increased restoration efforts, and associated beneficial impacts, with a limited amount of short-term, minor adverse impacts.

Soundscapes

The area of consideration for this topic is the monument and valley. The impacts described here are generalized, due to a lack of specific data, and apply to both visitors and wildlife. More direct examples of soundscape impacts to wildlife are described in the Biological Resources section. Context, time, and intensity together determine the level of impact for an action or activity related to soundscapes. Noise for a certain period and intensity would be a greater impact in a highly sensitive context, and a given intensity would be a greater impact if it occurred more often, or for longer duration. For example, in very low-level ambient soundscapes, like the wilderness, noises can be much more audible, thereby having greater impact intensities. It is usually necessary to evaluate all three factors together to determine the level of noise impact.

SOUNDSCAPES – IMPACTS FROM ALTERNATIVE A (NO ACTION)

The monument would continue to maintain existing facilities and roads with their associated sound levels. In developed areas, soundscapes experience minor to moderate, adverse impacts depending on increases or decreases in visitor use levels, shuttle frequency, and maintenance activities when machinery is used. Much of the wilderness in the monument is susceptible to unintentional operational and visitor use noise impacts because of its proximity to developed areas. These

adverse impacts would continue to be minor, with some minor to moderate localized impacts on peak days.

Actions common to all alternatives (Table 3.2) include developing and implementing a soundscape management policy that includes an emphasis on preserving natural soundscapes. Joined with the monument's ongoing efforts to monitor and minimize or prevent unnatural sounds that affect monument resources and values, as well as the mitigations described earlier in this chapter, these efforts comprise a benefit to the monument's soundscapes.

SOUNDSCAPES – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

Alternative B includes reconfiguration of the day use parking area, improvement of the ranger station, and removal of the monument campground. These activities would have minor to moderate, short-term, adverse impacts on the monument's soundscape during construction or removal, but would not increase long-term impacts because the development is located in areas currently used for visitor services and operational functions. Adding maintenance functions to the Pumice Flat cabin would increase soundscape impacts locally in a low-traffic area, adding additional minor to moderate impacts. Moving some maintenance functions from their current location in the developed area would also provide a beneficial effect by helping reducing noise coming from the developed area.

Some benefit would be realized by removal of overnight camping opportunities, including through reduction of vehicles and RVs in the monument.

Moving some maintenance functions from their current location in the developed area would also provide a beneficial effect by helping reducing noise coming from the developed area.

Alternative B includes the redesign of a portion of trail approaching Rainbow Falls and a potential redesign of the Postpile trail for accessibility. The associated construction would have minor to moderate, short-term, localized, adverse impacts on the monument's soundscape, but would not increase long-term impacts.

SOUNDSCAPES – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Impacts on natural quiet and soundscapes would be similar to those described for alternative B, except that removal of the campground would not occur and a new joint maintenance facility would be built in the valley. The impacts to soundscape resources due to the joint maintenance facility are expected to be adverse, moderate, and short-term during construction and throughout its operation. Some maintenance activities would create noise that would be readily apparent, but should not be highly noticeable when the mitigation described above is implemented. Additional environmental analysis would occur to support proposed construction once designs have identified the location and footprints related to the building and circulation.

SOUNDSCAPES – CUMULATIVE IMPACTS

Soundscape levels associated with human activities outside of the monument vary depending on location within the monument. The main impacts are from high altitude commercial jets and general aviation traffic and vehicle noise from nearby roads. Visitors experience minor to moderate seasonal impacts on the natural soundscape.

If the recommended joint maintenance facility were built in the valley, it could increase noise on the Inyo National Forest while reducing noise in the monument; a potential localized, minor to moderate impact. Selection of a suitable location would occur in a separate planning process with its own environmental analysis. Potential locations include places where the noise associated with maintenance and operations would not affect popular visitor use areas.

When the minor to moderate long-term adverse effects of the actions under alternatives A, B, and C are added to the effects of actions outside the monument, they would continue to result in a long-term, minor to moderate, adverse overall cumulative impact on the monument's soundscape.

SOUNDSCAPES – CONCLUSION

Adverse impacts under alternatives A, B, and C would be minor to moderate, due to ongoing impacts from visitor and operational noise, cumulative impacts from sources outside of the monument, and short-term impacts from a few small-scale construction projects.

Cultural Resources

Cultural Resources Listed, or Eligible to be Listed in the National Register of Historic Places

Potential impacts on those resources listed or eligible for listing in the National Register of Historic Places (NRHP) were identified and evaluated. The categories considered include archeological resources, cultural landscapes and historic buildings and structures. Evaluation was completed in accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800, Protection of Historic Properties). This evaluation was done by (1) determining the area of potential effect; (2) identifying cultural resources in the area of potential effect that are listed in or eligible for listing in the National Register; (3) applying the criteria of adverse effect to affected resources; and (4) considering ways to avoid, minimize or mitigate adverse effects. Information used in this assessment was obtained from relevant literature and documentation, maps, and consultation with cultural resource professionals, as well as from interdisciplinary team meetings, field trips, and site visits.

Under the regulations of the Advisory Council on Historic Preservation, a determination must be made for the collection of actions identified within the GMP and must identify whether or not these actions would result in an adverse effect to the historic properties of the monument. A determination of adverse effect or no adverse effect must be made for affected National Register-listed or National Register-eligible cultural resources. The following definitions are provided:

No effect: There are no historic properties in the Area of Potential Effect (APE); or, there are historic properties in the APE, but the undertaking would have no impact on them.

No adverse effect: There would be an effect on the historic property by the undertaking, but the effect does not meet the criteria in 36 CFR Part 800.5(a)(1) and would not alter characteristics that make it eligible for listing on the National Register. The undertaking is modified or conditions are imposed to avoid or minimize adverse effects. This category of effects is encumbered with effects that may be considered beneficial under NEPA, such as restoration, stabilization, rehabilitation, and preservation projects. Undertakings determined to have no adverse effect by a qualified cultural resource manager can be documented under the streamlined process of the 2008 Programmatic Agreement.

Adverse effect: The undertaking would alter, directly or indirectly, the characteristics of the property making it eligible for listing on the National Register. An adverse effect may be resolved by developing a memorandum of agreement in consultation with the SHPO, ACHP, tribes, other consulting parties, and the public to avoid, minimize, or mitigate the adverse effects (36 CFR Part 800.6(a)).

The thresholds of change for the intensity of an impact are defined as follows.

Negligible: The effects on cultural resources would be at the lowest levels of detection, barely measurable without any perceptible consequences, either beneficial or adverse to cultural landscape resources, historic buildings or structures, ethnographic, or archeological resources. For the purposes of Section 106 of the National Historic Preservation Act, the determination of effect would be no effect.

Minor: The effects on cultural resources would be perceptible or measurable, but would be slight and localized within a relatively small area. The action would not affect the character or diminish the character-defining features of a National Register-eligible or listed cultural landscape, historic structure, or archeological site, and it would not have a permanent effect on the integrity of any such resources. For the purposes of Section 106 of the National Historic Preservation Act, the determination of effect would be no adverse effect.

Moderate: The effects would be perceptible and measurable. The action would change one or more character-defining features of a cultural resource, but would not diminish the integrity of the resource to the extent that its NRHP eligibility would be lost. For the purposes of Section 106 of the National Historic Preservation Act, the cultural resources' NRHP eligibility would be threatened and the determination of effect would be no adverse effect or adverse effect.

Major: The effects on cultural resources would be substantial, discernible, measurable, and permanent. For NRHP eligible or listed cultural landscapes, historic structures, or archeological sites, the action would change one or more character-defining features, dimin-

ishing the integrity of the resource to the extent that it would no longer be eligible for listing in the National Register. For purposes of Section 106, National Register eligibility would be lost and the determination of effect would be adverse effect.

All preservation, restoration, and rehabilitation treatments proposed under all of the alternatives would be in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Archeology

Devils Postpile National Monument contains archeological resources that are likely eligible for listing in the National Register of Historic Places. The implementing regulations for Section 106 of the National Historic Preservation Act require agencies to apply the criteria for listing properties in the National Register and determine whether properties are eligible. In 2013, Devils Postpile NM received a consensus determination of eligibility for a collapsed cabin associated with the mining boom of the late 1870s. Other Devils Postpile archeological resources are likely eligible for listing in the National Register for their cultural and religious value for traditionally-associated American Indian peoples and their scientific value for the public. Therefore, under Section 106 of the National Historic Preservation Act, actions described in this GMP may have the potential to affect historic properties.

ARCHEOLOGY – IMPACTS FROM ALTERNATIVE A (NO ACTION)

Under alternative A, the regional office and staff from other NPS units would continue to support monument staff in performing site condition assessments and archeological surveys as needed. This continuing work would contribute to long-term preservation and enhanced understanding of archeological resources and human use in the monument, resulting in beneficial impacts. The entire monument has been surveyed for archeological resources, although none of the known sites have been studied in detail. Ongoing assessment of known and recorded sites would be conducted by regional office staff as time permits to continue to meet legal requirements.

Resources adjacent to or easily accessible from trails or day-use areas would continue to be vulnerable to surface disturbance, inadvertent damage, and vandalism. Loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence could result in loss of site integrity.

Known archeological resources would be avoided to the greatest extent possible whenever ground disturbing activities such as road and trail maintenance or construction of new facilities was needed. Archeological surveys would precede any ground disturbance for construction or removal of facilities, as required by the mitigation identified in this plan. As additional detailed plans for each undertaking are developed, the monument would ensure that archeological resources would be minimally affected by surveying the proposed sites, consulting with traditionally associated tribes and groups, and monitoring actions so that resources can be protected to the greatest extent feasible. Any unavoidable impacts to archeological sites would be addressed through project-specific compliance with Section 106 of the NHPA, in consultation with the SHPO and tribes.

Given the mitigation identified in this plan (including ongoing actions described in Table 3.2 *Common to All NPS Alternatives*), law, and NPS policy directives, this alternative has the potential for negligible to minor adverse impacts and would result in a determination of "no adverse effect" under Section 106.

ARCHEOLOGY – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

Effects described under alternative A would continue. Alternative B would include improvements to the ranger station facilities, conversion of the campground to day use, and construction related to the redesign of the parking and shuttle stop areas that could affect previously unidentified archeological resources.
If previously unidentified resources are present in areas proposed for development, these actions have the potential to result in minor to moderate adverse impacts. As in alternative A, however, these changes would be designed and constructed in concert with the mitigation measures identified in this plan. Known archeological resources would be avoided. If previously unidentified archeological resources are later found, actions would be taken to alter the design or alignment of the day use area to avoid impacts. Any unavoidable impacts to archeological sites would be addressed through project-specific compliance with Section 106 of the NHPA, in consultation with the SHPO and tribes.

ARCHEOLOGY – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Impacts under alternative C would be similar to alternative B with the exception of effects related to the removal of the campground and construction of a joint maintenance facility. Also, the redesign of the picnic area near the Postpile could result in both negative and beneficial impacts at the Postpile Joe cabin ruins. Actions include improved interpretation and visitor use delineation designed to reduce inadvertent resource impacts. However, this work would be preceded by archeological investigations designed to identify the nature and extent of buried resources. Subsequent rehabilitation of the picnic area would be designed and implemented to avoid adverse effects to the historic archeological property. However, ground disturbance associated with these actions has the potential to impact buried historic-era archeological deposits known to occur in this area.

Construction of a joint maintenance facility outside of the monument, possibly at Pumice Flats Group Campground, would occur under this alternative. Given the mitigations described at the beginning of this chapter, the impact to archeology resources is expected to be adverse, minor, and short-term during construction and negligible long-term. Additional environmental analysis would occur to support proposed construction once designs have identified the location and footprints related to the building and circulation.

Emphasizing demonstrations of cultural resource projects, including archeological investigations, to engage visitors with cultural resource issues could produce beneficial effects by increasing awareness of archeological resources and consequently reducing inadvertent impacts.

ARCHEOLOGY – CUMULATIVE IMPACTS

Over the years, visitors have caused direct damage to known sites throughout the valley. Indirect damage by visitors is more difficult to measure but likely has affected sites that are adjacent to high public use areas such as roads, trails, geologic features, and visitor service areas. Natural processes, including river channel migration, tree fall, effects of fire, and erosion, also affect archeological sites. Road and facility construction in the past likely resulted in cumulative adverse impacts on cultural resources, including archeological resources.

Reasonably foreseeable actions outside of the monument include implementation of the recommendations presented in this GMP. Recommendations that could affect known and unknown archeological resources include improvements at Minaret Vista, location of a joint maintenance facility in the valley, and repurposing of the Pumice Flat cabin. Each of these projects would require further environmental analysis in the planning stages where the potential for archeological resource impacts would be assessed and mitigation strategies identified.

Implementation of an interagency, multi-modal trail plan, as recommended, would likely impact known and unknown resources throughout the valley to an unknown extent. Again, this project would require further environmental analysis to ensure that new trails are sited and constructed in a way that produces minimal impacts to archeological resources.

Some archeological sites in the monument have probably experienced long-term, localized, minor to major adverse cumulative impacts in the past, ranging from gradual deterioration to loss of sites and artifacts. The ongoing study efforts described under all alternatives, however, would benefit these resources. Implementation of alternatives A, B, or C would not increase the overall adverse cumulative effects on archeological resources.

ARCHEOLOGY – CONCLUSION

The continuation of current management under alternative A to preserve and document archeological resources is in keeping with NPS responsibilities as they pertain to agency policies, and NHPA, resulting in beneficial impacts. Continued limited understanding of the extent of archeological resources, daily operations, and visitor use would produce minor adverse impacts and result in a determination of no adverse effect under Section 106.

The actions identified in alternative B and C would generally benefit the preservation and interpretation of archeological sites and associated collections. Construction activities, limited to existing developed footprints, could result in overall minor to moderate short-term adverse impacts, with somewhat more potential impact in alternative B due to the campground removal. Actions that might result in a determination of adverse effect under Section 106 will be avoided. Impacts in alternatives A-C are expected to result in a determination of no adverse effect under Section 106

of the NHPA. However, if any actions in alternatives A-C would pose adverse effects to a newly-discovered resource, or a known resource in an unanticipated manner, the monument would undertake project-specific compliance with Section 106 of the NHPA in consultation with SHPO and tribes. Impacts in alternatives A-C result in a determination of no adverse effect under Section 106 of the NHPA.

Historic Sites, Structures, Buildings, and Cultural Landscapes

Devils Postpile National Monument contains historic-era resources that are possibly eligible for listing in the National Register of Historic Places. These include the monument Ranger Station and the ruins of the Postpile cabin, for their representation of economic development of the area and the history of interagency and regional cooperation during the period of federal government administration. Similarly, the Mammoth Pass trail may qualify for inclusion in the National Register for its association with economic development of the region (including Native American access, trade, and use), early mining, and recreational and preservation in the 20th century. Lastly, natural features such as the Postpile formation, Reds Meadows, Soda Springs Meadow, and the Middle Fork San Joaquin River may be eligible as cultural landscapes for their cultural and religious significance to Indian tribes, as sites in the development of geologic interpretation of the Sierra Nevada, and as locations linked to the history of conservation, tourism, and recreation in the Mammoth Lakes region and the Sierra Nevada as a whole. The NPS plans to evaluate several of these resources in 2014-2016 in consultation with SHPO and tribes.

HISTORIC SITES, STRUCTURES, BUILDINGS, AND CULTURAL LANDSCAPES - IMPACTS FROM ALTERNATIVE A (NO ACTION):

Under Alternative A, the regional office and staff from other NPS units would continue to support monument staff in performing evaluations under the National Register criteria, consulting with tribal partners, documenting resources, performing condition assessments, and advising/assisting with stabilization and treatments. This continuing work would contribute to long-term preservation and enhanced understanding of historic and ethnographic resources and human use in the monument, resulting in beneficial impacts.

The historic-era resources of the monument have recently been addressed in the 2013 Administrative History and Historic Resource Study Nature and History on the Sierra Crest, which provides the baseline information on possible National Register-eligible resources. The ethnographic resources of the monument will be the subject of an ethnographic overview and assessment, currently underway and projected for completion in 2015. Results of the 2014 National Register evaluations of historic-era resources (e.g., Ranger Station, Mammoth Pass Trail), and results of ongoing consultation with traditionally associated tribes and groups regarding ethnographic resources, will be factored into the final Section 106 consultation for the General Management Plan.

Resources would continue to be vulnerable to environmental processes and vandalism. Loss of resource integrity could result from inappropriate treatment, fire, extreme weather events, and deferred maintenance.

Depending on the outcome of the 2014 evaluation of historic resources, known historic resources would be managed consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Consultation with traditionally associated tribes and groups would continue to inform protection of any ethnographic resources. As additional detailed plans for any undertaking are developed, the monument would ensure that historic and ethnographic resources would be managed to avoid adverse effects.

Given the mitigation identified in this plan, law, and NPS policy directives, this alternative has the potential for negligible to minor adverse impacts, and would result in a determination of "no adverse effect" under Section 106.

HISTORIC SITES, STRUCTURES, BUILDINGS, AND CULTURAL LANDSCAPES - IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS):

Effects described under alternative A would continue. Alternative B would include improvements to the ranger station facilities, conversion of the campground to day use, and construction related to the redesign of the parking and shuttle stop areas that could affect the integrity of the ranger station, if the ranger station is determined to be eligible for listing in the National Register. However, these changes would be designed

and constructed to meet the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings. In this manner, the monument would avoid adverse effects to the ranger station if the ranger station is indeed historically significant.

Alternative B would include removal of operational buildings from the edge of the meadow, such as Cabin 5, the SAR cache, and the temporary fee collection facility. Cabins 1 and 5 would be reused for operational functions. Since none of these buildings are historic, these actions would not affect historic resources.

Alternative B would include seeking to work collaboratively with the USFS to adaptively use the Pumice Flat cabin as an interagency maintenance shop. However, since this is a modern building, the action does not have the potential to affect historic properties.

Alternative B would entail reducing the amount of wayside exhibits and signage at the Postpile area, and truncating or shortening the trail at the top of the Postpile. Removing some of these modern small-scale structures or features would not affect the potentially significant cultural landscape resources of the Postpile area.

HISTORIC SITES, STRUCTURES, BUILDINGS, AND CULTURAL LANDSCAPES - IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE):

Impacts under alternative C would be similar to those described under alternative B with the exception of effects related to the removal of the campground.

Alternative C would include several small site improvements at the Postpile feature, however these would be designed to take into consideration the potential historic and cultural significance of the area. Rehabilitating the picnic area at the postpile cabin ruins would be designed to avoid or minimize potential effects on the historic resources present.

Climate change could increase wildfire frequency and intensity and increase erosion of soils from wildfire impacts and drier conditions (Kunkel et al. 2013). These potential impacts could threaten historic sites, structures, buildings and potential cultural landscapes. The adverse impacts described in alternatives A-C would not add appreciably to these cumulative impacts, largely because "common to all" actions related to climate change response and the beneficial actions in these alternatives are designed to respond adaptively and promote system resilience.

Alternative C would include seeking a boundary adjustment increasing monument lands. If implemented, this action may affect resources of cultural and religious significance to tribes by changing the regulations and administrative policies governing the lands subject to the boundary change. Further consultation with traditionally associated tribes and groups would be necessary to understand whether such properties occur on the subject lands, whether effects would occur, and how any potential effects could be avoided, minimized, or otherwise addressed in consultation with SHPO and tribes.

HISTORIC SITES, STRUCTURES, BUILDINGS, AND CULTURAL LANDSCAPES – CONCLUSION

The continuation of current management under alternative A to preserve and document historic and ethnographic resources is in keeping with NPS responsibilities as they pertain to agency policies, and NHPA, resulting in beneficial impacts. Continued environmental processes, daily operations and visitor use may result in minor adverse impacts, however employing the Secretary of the Interior's Standards for Treatment of Historic Properties and continuing consultation with traditionally associated tribes and groups would result in a determination of no adverse effect under Section 106.

The NPS would first evaluate the ranger station for National Register eligibility, and if eligible, seek to avoid adverse effects by employing the Secretary of the Interior's Standards for Treatment of Historic Properties and guidelines for rehabilitation. Some actions proposed in alternatives B and C have the potential to affect historic properties with religious and cultural significance, if the Postpile formation is determined eligible for listing in the National Register, or if any other such properties are identified in the area proposed for addition to monument lands. The NPS would seek to identify cultural and religious values in these areas, determine the potential for the actions to cause adverse effects, and design and implement these actions in consultation with traditionally associated tribes and groups and the SHPO.

Museum Collections

Museum collections (prehistoric and historic objects, artifacts, works of art, archival documents, and natural history specimens) are generally ineligible for listing in the National Register, and are therefore not subject to Section 106 of the National Historic Preservation Act.

MUSEUM COLLECTIONS – IMPACTS FROM ALTERNATIVE A (NO ACTION)

Under this alternative, the monument's existing museum management program would continue to improve the quality of documentation of collections for use by park staff and the public. Under an agreement, management of collections is directed by the Curatorial Facilities Strategy (2006) that calls for consolidating collections at Sequoia/Kings Canyon National Park until curatorial storage becomes available at another NPS unit on the eastern side of the Sierra Nevada (such as Manzanar National Historic Site).

The current museum collection facility would continue to be monitored and maintained to provide for the preservation and protection of the collections. The monument's ability to focus efforts toward current expectations for documentation is limited by both the level of staffing and the available expertise in the monument, having an overall minor adverse impact on museum collections. It is likely, however, that a change in the location and management of collections, due to the development of a shared facility nearer to the monument, would occur and would mitigate these adverse impacts.

In all alternatives, the monument would keep reference collections (herbarium specimens, artifacts needed for interpretation and display, and other items needed on a periodic basis for park operations) in adequate museum storage facilities and would continue to manage, maintain and process museum collections.

MUSEUM COLLECTIONS – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

Impacts would be the same as alternative A, with regard to storage and preservation if these remain the same. As in alternative A, it is likely that museum collections would be moved to a shared facility outside the monument. Other beneficial actions include maintaining some small collections storage for non-sensitive items in Mammoth Lakes at the NPS administrative offices to better enable their use for interpretation and education, and provision of electronic access to museum collections through virtual options.

MUSEUM COLLECTIONS – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Impacts would be the same as in alternative B, with one additional beneficial effect. Some new exhibit space would accompany expansion of the NPS presence in Mammoth Lakes.

MUSEUM COLLECTIONS – CUMULATIVE IMPACTS

It is reasonably foreseeable that the monument would house the majority of its collections at a location nearer to the monument, either at the Manzanar National Historic Site facility or another NPS facility, providing a long-term beneficial effect to museum collection storage and management.

MUSEUM COLLECTIONS – CONCLUSION

Under the current plan for museum collections, some minor adverse impacts could continue to occur due to the monument's inability to easily access and interpret the existing collections.

In alternatives B and C, the monument's ability to focus efforts toward current expectations for documentation, exhibit design, and use for interpretation through the ability to move resources closer to the monument, provide some exhibit or storage space in Mammoth Lakes, and provide electronic access to the collections would provide increased beneficial effects.

Wilderness Character

Working from definitions included in the Wilderness Act, Management Policies (NPS 2006), interagency wilderness monitoring strategies, and the tradition of wilderness preservation and management at the monument, the following wilderness qualities have been identified for consideration in this analysis:

Untrammeled: The Wilderness Act states that wilderness is "an area where the earth and its community of life are untrammeled by man." Essentially, wilderness is unhindered and free from modern human control

or manipulation. This quality is degraded by modern human activities or actions that control or manipulate the components or processes of ecological systems inside the wilderness.

Undeveloped: The Wilderness Act states that wilderness is an area of undeveloped land retaining its primeval character and influence, without permanent improvements or human habitation." This quality is degraded by the presence of structures, installations, habitations, and by the use of motor vehicles, motorized equipment, or mechanical transport that increases people's ability to occupy or modify the environment.

Natural: The Wilderness Act states that wilderness "is protected and managed so as to preserve its natural conditions." Wilderness ecological systems are substantially free from the effects of modern civilization. This quality is degraded by intended or unintended effects of modern people on the ecological systems inside the wilderness since the area was designated.

Solitude or a primitive and unconfined type of recreation: The Wilderness Act states that wilderness has "outstanding opportunities for solitude and/or a primitive and unconfined type of recreation." This quality is about the opportunity for people to experience wilderness. This quality is degraded by settings that reduce these opportunities, such as visitor encounters, signs of modern civilization, recreation facilities, and management restrictions on visitor behavior.

The Wilderness Act also states that wilderness "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." This quality addresses the unique aspects of each individual wilderness area and is degraded by actions that remove or otherwise damage the unique features of a wilderness area.

Impacts on natural and cultural resources, visitor access, soundscape, night sky, and other resources are evaluated elsewhere in the environmental consequences section. The analysis for this topic focuses on wilderness character and wilderness experience, which are integrally related because much of wilderness character can only be subjectively determined by the visitor's experience (for example, solitude or freedom of movement).

WILDERNESS CHARACTER – IMPACTS FROM ALTERNATIVE A (NO ACTION)

Under alternative A, the monument's designated wilderness would continue to be managed as it is now. The minimum requirement analysis, as required by NPS policies (2006), would continue to be used to determine if, when, and how actions that might impact wilderness character could be implemented. Actions described under Table 3.2 would continue to be implemented, resulting in benefits to wilderness character by continued attention to preservation of wilderness qualities.

Untrammeled

Much of the designated wilderness within Devils Postpile NM is essentially unhindered and free from modern human influence or manipulation. A few ongoing actions within designated wilderness manipulate or constrain the biophysical environment. Invasive non-native plant control would continue in wilderness under all alternatives. Because invasive plant removal is accomplished on a small scale and without power equipment, this action would not rise above minor in intensity. Some erosion control measures are in place along trails, with one example at Rainbow Falls where a wide log staircase descends the fall line to the upper viewing platform. Altogether, alternative A would continue to have a minor adverse impact on this wilderness quality.

Undeveloped

Aside from some user-created trails, predominately fishing trails along the riverbank, there are no non-recreational infrastructure and facilities within designated wilderness. Because the user-created trails are human-built intrusions on the primeval character of the landscape, they would have a minor adverse effect on this wilderness quality.

Natural

Natural resource impacts due to current management are barely discernible to most observers. The overall condition of biological and physical resources in designated wilderness is generally good. The presence of some small populations of non-native invasive species would continue to impact this quality. Long-term adverse impacts on the natural quality of wilderness character from the implementation of this alternative would range from negligible to minor.

Solitude or a primitive and unconfined type of recreation

Opportunities for visitors to experience wilderness would continue to be abundant. Although occasional high visitor use at Rainbow Falls, particularly mid-day on weekends, would continue to impact this quality, opportunities for solitude abound elsewhere and at Rainbow Falls, especially in off-peak hours and during the shoulder seasons. The Rainbow Falls trail serves as an introductory or "gateway" wilderness experience for many visitors to the monument who may not otherwise visit a wilderness area, providing an important opportunity and beneficial impact made possible by a combination of its scenic quality, its proximity to trailheads and transportation, and its location within an expansive wilderness area.

Trails in wilderness provide ample opportunity for solitude. Other existing recreational development in wilderness, including various visitor aids such as handrails, waysides, viewing platforms, signs, and steps, is primarily concentrated at Rainbow Falls. These existing facilities have a moderate adverse effect on this wilderness quality as they are designed to accommodate high numbers of visitors and groups, decreasing opportunities for solitude at this location, and decreasing self-reliant recreation by facilitating easy access, information and interpretation.

Trail maintenance and resource management projects sometimes use mechanized equipment in wilderness. Although these projects are evaluated and approved using a minimum requirement / minimum tool analysis, they have localized, short-term impacts on both the undeveloped quality of wilderness and opportunities for solitude and unconfined recreation.

Some portions of designated wilderness, particularly near the developed visitor services and operational area, would continue to experience unintentional operational and visitor use noise impacts due to proximity and the character of the landscape which carries sound upward from the river bottom. Adverse impacts on this wilderness quality would range from minor to moderate. Likewise, minor to moderate visual impacts, including dark sky pollution and loss of visibility due to air pollution occur from activities outside of wilderness.

Some visitor use restrictions in wilderness, including current bans on overnight use, diminish "unconfined" recreational opportunities. These restrictions constitute minor to moderate adverse impacts on this wilderness quality, but are often necessary to protect the natural quality of wilderness character, for public safety reasons, or to meet park mandates. Such restrictions are managed through the superintendent's compendium, which can be updated annually.

WILDERNESS CHARACTER – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

Untrammeled

The impacts on this wilderness quality would be the same as described under alternative A, except that the log stairs leading down to Rainbow Falls would be removed and less intrusive erosion control measures through sustainable trail design would benefit this wilderness quality.

Undeveloped

The impacts on this wilderness quality would be the same as described under alternative A.

Natural

The impacts on this wilderness quality would be essentially the same as described under alternative A, except that a focus on interagency management of natural resources, with a watershed emphasis, would benefit resource management in the monument by addressing needs and treatments at a biologically relevant scale.

Solitude or a primitive and unconfined type of recreation

Opportunities for visitors to experience wilderness would continue to be abundant and impacts would be the same as described in alternative A, with the exception of impacts associated with recreational development at Rainbow Falls.

At Rainbow Falls, removal of the log stairs and interpretive panels would benefit wilderness character by decreasing the number of agency-provided recreation facilities and increasing self-reliant recreation.

Commercial day stock rides would continue in the monument as described in the Extent Necessary Determination (*Appendix D*). Under the Extent Necessary Determination, commercial stock use would continue at current levels but could be restricted in the future to avoid displacing non-commercial use in wilderness if use levels change. The Extent Necessary Determination allows a variety of options to avoid displacement while

ensuring that commercial stock use can continue at current levels by adjusting commercial use temporally. Because commercial stock use will continue, but will be continually monitored for its relationship to this wilderness quality, the potential actions described in the Extent Necessary Determination constitute a benefit to the protection of solitude.

Overall, minor to moderate adverse impacts to this wilderness quality would continue under this alternative.

WILDERNESS CHARACTER – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Untrammeled

The impacts on this wilderness quality would be the same as described under alternative B.

Undeveloped

The impacts on this wilderness quality would be the same as described under alternatives A and B.

Natural

The impacts on this wilderness quality would be the same as described under alternative B.

Solitude or a primitive and unconfined type of recreation

The impacts on this wilderness quality would be the same as described under alternative B.

WILDERNESS CHARACTER – CUMULATIVE IMPACTS

The potential for landscape-scale changes occurring from actions outside of the monument, especially from non-native invasive species, wildfire, fire suppression, prescribed fire, climate change, dark sky pollution, and ecological effects and decreased visibility due to air pollution, would continue to exist. These factors would continue to contribute to minor to moderate adverse impacts, particularly to the natural quality. None of the action alternatives would add appreciably to this impact. Therefore, cumulative impacts under alternatives B and C would remain minor to moderate, similar to alternative A.

WILDERNESS CHARACTER – CONCLUSION

While each alternative has the potential to continue some minor to moderate adverse impacts related to visitor use and monument operations, alternatives B and C provide the greatest benefits to wilderness qualities and the least adverse impacts, primarily due to changes at Rainbow Falls that enhance opportunities for solitude and a primitive and unconfined type of recreation.

Scenic Resources

The area of consideration for this topic is the monument and watershed. Potential impacts from management actions are based on professional judgment and experience with similar actions. Important scenic resources within the monument include Devils Postpile, Rainbow Falls, Soda Springs Meadow, the river, and the rustic architectural style of the monument's built infrastructure.

SCENIC RESOURCES – IMPACTS FROM ALTERNATIVE A (NO ACTION)

In alternative A, no new developments are proposed that would impact scenic resources within the monument. Existing minor impacts from equipment and storage containers visible from the entry road and developed area and operational structures visible from Soda Springs Meadow and the ranger station would continue.

Ongoing actions described in Table 3.2 *Common to all NPS alternatives* and mitigations described earlier in this chapter continue to protect scenic resources in the monument and beyond, especially through the monument's commitment to maintain traditional, natural design characteristics of facilities, exhibits, signs, and infrastructure, as well as the siting and screening of such facilities in order to limit impacts on visual and scenic resources. These benefits are carried through all alternatives.

SCENIC RESOURCES – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

Alternatives B and C include zoning of the monument's developed area that requires all facilities to be rustic in appearance and to be compatible with the historic

character and natural setting of the monument – a beneficial effect.

Because of these requirements, the proposed changes to existing facilities in the developed area (ranger station, shuttle bus stop, and parking area) would not adversely impact scenic resources beyond the current condition, except in the short-term. Short-term construction impacts related to these improvements would be adverse and moderate. One of the goals for the redesign of the shuttle bus stop and parking area is to reduce visual impacts. While these projects will require further environmental analysis when the designs are undertaken, they are intended to produce beneficial effects.

Removal of the monument's campground would have both beneficial and adverse effects. While many returning visitors enjoy the rustic look of the campground as an integral part of their experience and would feel a moderate, long-term adverse impact, the removal of RVs and other vehicles and restoration of this area would improve the visual experience for many.

Relocation of maintenance functions to a location outside of the monument could improve the visual experience of visitors who currently see these activities taking place near Soda Springs Meadow and the ranger station.

Minimizing signage and waysides at the Postpile would improve the photographic and viewing experiences of many visitors, a long-term benefit. Likewise, removal of interpretive panels at Rainbow Falls would provide an improved, uncluttered visual experience at this iconic wilderness location.

A Wild and Scenic River suitability finding could provide some benefit to riparian vegetation and wildlife by requiring the monument to prepare a comprehensive river management plan that details resource protection and creates standards for management. A finding of suitability, however, does not by itself impact resources, since the river and its related values, including scenic values, have been protected and will continue to be protected under the 1991 eligibility findings. A separate environmental analysis was conducted at that time to identify outstandingly remarkable values, classifications, and overall eligibility.

SCENIC RESOURCES – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Impacts under alternative C would be the same as those under alternative B, but without the adverse and beneficial impacts associated with campground removal.

SCENIC RESOURCES – CUMULATIVE IMPACTS

Because the monument sits low in a mountain valley and is surrounded by designated wilderness, views from the monument are excellent. Wilderness designation and other earlier protections ensured that views throughout the watershed received consistent protection over the last century -- a long-term beneficial effect which continues into the foreseeable future.

Recommendations for the Inyo National Forest include a redesign of the Minaret Vista experience. Improving the viewing experience by separation of vehicles from the viewing area is an objective of this recommendation. If this recommendation is undertaken, it could benefit scenic views from within the watershed by reducing the amount of visible development and parking on the divide and from the vista itself by removing parking and other infrastructure from the immediate viewing area.

The beneficial and minor to moderate adverse effects of alternatives A, B, and C do not add appreciably to overall cumulative effects in the monument and the surrounding watershed.

SCENIC RESOURCES – CONCLUSION

Alternative A would have minor, long-term, adverse impacts on visual resources, primarily from visible infrastructure both within and outside of the monument. Beneficial effects would occur under alternatives B and C, with a greater potential for moderate adverse impacts under alternative B due to removal of the campground. Minor to moderate short-term impacts would occur due to construction, maintenance, and rehabilitation projects under both action alternatives.

Visitor Opportunities

Access and Circulation

This section evaluates how each alternative would change access and orientation in the monument and the capacity of roads, trails, and facilities to accommodate that change. Beneficial impacts would be associated with a decrease in the level of visitor congestion or improvement in visitor access to portions of the monument. Adverse impacts would be associated with the actions that reduce access to an area or increase the level of congestion.

ACCESS AND CIRCULATION – IMPACTS FROM ALTERNATIVE A (NO ACTION)

Few actions in alternative A would affect access and circulation in the monument. Most visitors would continue to access the monument via shuttle bus or private vehicle, depending on the time of day and season. Use of the shuttle would continue to result in "pulsing", where visitors arrive at trailheads and visitor areas in groups, possibly resulting in greater perceptions of crowding by some visitors during peak visitation.

Existing parking areas and trailheads would continue to be available and these would continue to experience some crowding during peak use. These would continue to be minor to moderate adverse effects, although existing roads and parking areas would continue to provide beneficial effects to most visitors attempting to access the monument on most days.

Ongoing maintenance and improvement of the monument's entrance road and parking areas would continue to have a long-term beneficial effect on visitor access and circulation by accommodating vehicular and pedestrian access throughout the developed portion of the monument.

The shuttle bus stop and parking area would be retained in their current configuration, producing mixed effects on access and transportation. Both provide easy access to the primary trailhead and ranger station. However, incremental improvement over the years without a comprehensive site design has led to poor separation between the shuttle stop and ranger station, poor delineation of parking, some congestion, and a lack of coordinated messaging or orientation for recently arrived visitors, resulting in minor to moderate impacts.

The use of monument trails is concentrated between the ranger station, the Postpile, and Rainbow Falls. The trails that access these areas would continue to be crowded on peak days, a seasonal minor to moderate long-term adverse effect on visitor access and circulation.

ACCESS AND CIRCULATION – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

Access and circulation impacts described under alternative A would largely continue. Alternative B would not change vehicle or shuttle entry to the monument. While parking capacity would remain similar to alternative A, there would be some modifications to its design. These actions would have minor short-term effects due to construction activities associated with reconfiguration of the parking area and shuttle bus stop and associated congestion related to temporary closures or re-routes.

Vehicle use in the monument could decline slightly with removal of the campground, resulting in beneficial effects due to less vehicle congestion as compared to alternative A.

Trails and their alignments remain essentially unchanged in this alternative, except for some improvements at Rainbow Falls and some changes at the top of the Postpile. While the modest realignments at Rainbow Falls would not likely affect congestion or access to the falls, they do impact visitor experience, as described under *Visitor Recreation Opportunities*. At the top of the Postpile, truncation or shortening of the trail would result in minor adverse effects to visitor access in order to protect glacial polish, although access to examples of glacial polish would be retained. Short-term minor construction impacts may occur with both projects as trail crews manage visitors hiking through work zones. However, neither project would require complete closure of trails to accomplish the tasks.

A study to make the trail from the ranger station to the Postpile more accessible to a wider variety of users would benefit visitors by facilitating access to one of the monument's fundamental resources by many of those not currently able to hike the trail.

Commercial day stock rides would continue in the monument as described in the Extent Necessary Determination. It is likely that some participants of these commercial day rides would not otherwise be able to access Rainbow Falls due to mobility limitations. Under the Extent Necessary Determination, commercial stock use would continue at current levels but could be restricted in the future to avoid displacing non-commercial use in wilderness if use levels change. The Extent Necessary Determination allows a variety of options to avoid displacement while ensuring that commercial stock use can continue at current levels by adjusting commercial use temporally. Because commercial stock use will continue, the potential actions described in the Extent Necessary Determination constitute no more than a potential minor to moderate impact on visitor access.

The proposed boundary adjustment includes the main trail connecting Devils Postpile with Rainbow Falls and would bring its entire length into the monument. Currently, most visitors are unaware of the jurisdictional changes and where they occur, leading to potential problems with different regulations, allowable uses, and trail management. Including the entire trail in the monument would ensure consistent trail management and maintenance, a benefit to access and orientation.

Aside from the campground removal and day use area redesign, this alternative does not contain projects that would involve major construction activities impacting access and transportation.

Potential management actions described in Table 3.11, taken in response to visitor capacity standard monitoring, could affect visitor access. To understand these potential impacts, it is important to note that less restrictive management actions would always precede more restrictive management actions in an attempt to meet the standards outlined without undue impact to visitor access. For example, visitor education and signage would be the monument's first options for controlling problems related to overuse. Selective closures and limited access along portions of trails or other areas would be designed to address the resource or visitor experience standard without instituting full or permanent closures. These actions could include temporal restrictions, group size limits, or rerouting, among other options of similar effect. Because the visitor capacity standards and monitoring protocols are designed address issues before such measures are needed, and because it is not foreseeable that these standards will be exceeded, the impact on visitor access and circulation from the visitor capacity standards described in this plan constitutes no more than a minor to moderate potential adverse impact.

Improved maintenance of trails would occur from additional maintenance staffing and could have beneficial effects by reducing impacts from crowding on trails and improving trail junction signage to ensure that visitors access their intended destinations.

ACCESS AND CIRCULATION – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Impacts under alternative C would largely be the same as those described under alternative B, with some exceptions. First, the campground would not be removed in this alternative. The long-term benefits and short-term adverse impacts associated with removal would not occur.

Second, enhancement of NPS presence in Mammoth Lakes could have a beneficial effect by providing greater orientation to visitors before they begin their trip to the monument, allowing monument staff to better direct visitors to lesser used areas or to plan travel during less congested times, decreasing impacts on access and circulation in currently congested areas.

Third, an interagency multi-modal trail plan to evaluate long-term trail connections and opportunities in the valley could benefit visitor access and transportation in the long-term, providing new ways for visitors to access monument resources and better connectivity with surrounding resources.

Finally, the proposed boundary adjustment on the east side of the monument would benefit management of the trail between Devils Postpile and Rainbow Falls, ensuring consistent recreation management and signage by a single agency and potentially improving the efficiency of maintenance along this popular trail.

ACCESS AND CIRCULATION – CUMULATIVE IMPACTS

Past projects, including the development of the existing trail system and the provision of an interagency shuttle system, have expanded access to the monument and improved circulation over time, resulting in beneficial impacts.

The GMP contains recommendations for a redesign of Minaret Vista. These recommended changes include relocation and redesign of the parking area, improved transit compatibility, new trails, and improved orientation, all of which could benefit visitor access to the monument. Added to the benefits associated with increased visitor service and orientation in Mammoth Lakes under alternative C, these changes would provide an overall benefit to access and transportation in the monument.

ACCESS AND CIRCULATION – CONCLUSION

The effects of actions under alternative A would have overall long-term benefits on access and circulation within the monument, with some minor to moderate adverse impacts.

The effects of proposed actions under alternatives B and C would have long-term benefits on access and circulation within the monument, primarily due to a redesign of the shuttle stop and day use parking, increased maintenance staffing, and improved delivery of orientation, shuttle, trails, and parking information to visitors. A boundary adjustment proposed under alternative C would provide the additional benefit of trail management consistency on a popular trail. Reconfiguration of the parking area and shuttle stop could produce minor, short-term adverse impacts related to construction.

Visitor Use Opportunities

This impact analysis evaluates how visitor use opportunities might vary among alternatives as a result of implementing proposed actions and applying different management zones in the alternatives. The analysis is qualitative rather than quantitative because of the conceptual nature of a GMP. Professional judgment was used to reach reasonable conclusions regarding the intensity, duration, and type of potential impact. Impacts could be temporary or short-term (for example, delays and inconvenience caused by the construction of facilities) or long-term (ongoing and lasting effects over time).

This section analyzes the availability and variety of recreational opportunities for visitors in each alternative, such as hiking and camping, and analyzes the different facilities available to visitors in each alternative, including visitor services, campgrounds, trails, and other day use facilities, as well as commercial services, when applicable. The quality of visitor experiences in designated wilderness is analyzed under Wilderness Character.

VISITOR USE OPPORTUNITIES – IMPACTS FROM ALTERNATIVE A (NO ACTION)

Hiking, sightseeing, fishing, private equestrian use, bird watching, wildlife viewing, and camping in the developed campground are common activities and would continue to be available in alternative A. Support for the continuation of these traditional activities was strongly voiced in the public comments received during the preparation of the GMP. Visitor use opportunities are greatly enhanced by the continuation of these activities.

Some activities are currently restricted by the superintendent's compendium, a document that can be updated annually. Camping outside of the Devils Postpile campground, group size limits, winter access, boating and floatation devices, skateboards and similar devices, and traveling with pets will continue to be managed through the compendium. Because many of these activities, like backcountry camping, are readily available throughout the valley and surrounding the monument on USFS lands, the current restrictions may constitute minor to moderate impacts on visitor use opportunities in some cases, but are variable according to how they are addressed in the compendium year-to-year.

In alternative A, there would be no changes in visitor use facilities. A variety of activities would continue to be accommodated, including a small ranger station and overnight camping at the established campground within the monument, as well as picnicking opportunities, trails and interpretive features throughout the monument. There would continue to be long-term beneficial effects from these facilities, although the ranger station would continue to be cramped, providing extremely limited opportunities for indoor ranger contact with visitors or adequate shelter for visitors from weather conditions. This lack of space is noticeable to visitors and has an appreciable effect on the ability of the monument to provide visitor services, a moderate adverse effect.

VISITOR USE OPPORTUNITIES – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

The variety of recreational opportunities would continue to be the same as in alternative A.

Visitor facilities would be enhanced, especially at the ranger station where an expanded deck, removal of operational functions, and an information window would improve the ability of the monument to serve visitors, providing long-term benefits. These improvements would include greater accessibility to the ranger station for those currently unable to negotiate the cramped quarters of the small building.

Truncation of the trail on the top of the Postpile would have minor effects on recreational opportunities. Although visitors would still be able to access and view glacial polish, some convenience associated with the current loop trail would be lost. The effects of proposed changes at Rainbow Falls on visitor experience are analyzed under Wilderness Character.

Horseback riding is an important historical use of the monument. Many visitors experience this opportunity through commercial rides. Commercial day stock rides would continue in the monument as described in the Extent Necessary Determination. Under the Extent Necessary Determination, commercial stock use would continue at current levels but could be restricted in the future to avoid displacing non-commercial use in wilderness if use levels change. The Extent Necessary Determination allows a variety of options to avoid displacement while ensuring that commercial stock use can continue at current levels by adjusting commercial use temporally. Because commercial stock use will continue and private stock use will not be affected, the Extent Necessary Determination constitutes a potential minor to moderate impact on this visitor experience.

The viewing opportunity at the Postpile would be improved by minimization of waysides and signage. Too much development at the Postpile, including signage, could detract from values related to visitor experience since many visitors wish to photograph the Postpile without visual distractions. These actions would provide long-term benefits by enhancing the protection and quality of visitor use opportunities in the monument.

Removal of the Devils Postpile Campground would result in a moderate, long-term, adverse impact. The conversion of this area to day-use would affect a large number of people who desire a campsite within the monument, or even specific campsites in the campground, often because of long-standing traditions. While the impact would be readily apparent, with an appreciable effect on some people, the action is not considered to be severe because of the availability of nearby camping on the Inyo National Forest. Also, the conversion to day-use would benefit a greater number of visitors by providing enhanced access to the riverbank a short distance from parking, more opportunities for short-length trails, and higher quality opportunities for picnicking.

The proposed boundary adjustment includes the main trail connecting Devils Postpile with Rainbow Falls and would bring its entire length into the monument. Currently, most visitors are unaware of the jurisdictional changes and where they occur, leading to potential problems with different regulations, allowable uses, and trail management. Including the entire trail in the monument would ensure consistent regulations and allowable uses, a benefit to visitor use.

A finding that the river is suitable for designation as a Wild and Scenic River could provide some benefit to visitor use opportunities by requiring the monument to prepare a comprehensive river management plan that details visitor uses in the river corridor and creates standards for management. A finding of suitability, however, does not by itself impact visitor opportunities, since the river and its related values, including fishing and other river-dependent activities, have been protected and will continue to be protected under the 1991 eligibility findings. A separate environmental analysis was conducted at that time to identify outstandingly remarkable values, classifications, and overall eligibility.

VISITOR USE OPPORTUNITIES – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Impacts under alternative C are the same as under alternative B, except that the campground would not be removed, increased staffing would allow the monument to provide more hands-on engagement for visitors in a wide variety of program areas, including cultural and natural resource projects, and a greater focus on partnerships would provide additional programming opportunities; all long-term benefits to visitor use opportunities.

In the campground, a redesign of Loop B to include walk-in camping and greater separation between car camping, day use, and walk-in camping would provide new camping experiences and increase the quality of camping experiences. Because redesign of Loop B would reduce current opportunities for drive-in campers to camp nearer to the river, some visitors would experience minor to moderate adverse impacts, even while other types of campers experience beneficial impacts. However, there would be increased access for day users along the river corridor to walk along a riverfront trail and viewpoint looking northward upstream to the San Joaquin Ridge.

An enhanced presence in Mammoth Lakes could help the monument provide information and orientation to more visitors, particularly in the off season and shoulder seasons, potentially helping visitors to plan their recreational experiences more effectively.

VISITOR USE OPPORTUNITIES – CUMULATIVE IMPACTS

Ample recreational opportunities would continue to be available regionally that complement opportunities available at the monument. Additional recreational opportunities available outside of the monument, in the valley, include snowmobiling, boating, hunting, long-distance hiking, climbing, and backcountry camping.

Many commercial services and facilities, including lodging, food services, and additional recreational, cultural, and educational opportunities would continue to be provided in the region.

Taken as a whole, the reasonably foreseeable past, present, and future cumulative actions would continue to provide diverse and expansive visitor experiences, recreational opportunities, and visitor services and facilities in the region, resulting in long-term benefits to visitors.

Climate change could change visitation patterns associated with changing environment conditions (e.g., visitation occurring earlier in the spring season) and could affect water-based recreation, like fishing, particularly if snowmelt decreases dramatically (Kunkel et al. 2013). The adverse impacts described in alternatives A-C would not add appreciably to these cumulative impacts, largely because the actions do not increase the likelihood of climate change and "common to all" actions related to climate change response and the beneficial actions in these alternatives are designed to respond adaptively and promote system resilience.

This GMP recommends that the surrounding Inyo National Forest partner with the monument to make several improvements to visitor use opportunities near the monument. A redesign of Minaret Vista is recommended, including new trails and an improved viewing experience through separation of parking and restrooms. Interpretation and orientation enhancements at the Boundary Creek trail junction, along with trail realignment to separate pedestrian and stock use, could improve the Rainbow Falls experience for all visitors. Preparation of an interagency multi-modal trail plan focused on the improvement of trail connectivity throughout the valley and beyond is recommended. Improvement of camping throughout the valley, including separation of types of camping, increased interagency ranger contact, and retention of the area's camping capacity, including group camping, is also recommended. All of these reasonably foreseeable actions, while requiring further environmental analysis if implemented, would be expected to provide long-term benefits to monument visitors. Combined with the effects of each alternative, the wealth of existing visitor use opportunities available in the region and the foreseeable actions of the Inyo National Forest would continue to provide overall beneficial impacts to monument visitors.

VISITOR USE OPPORTUNITIES – CONCLUSION

Overall, alternative A would benefit monument visitors, with a continuing long- term, moderate, adverse impact on the visitor experience resulting from inability of the monument to provide adequate visitor services from the cramped ranger station.

Compared to alternative A, alternative B improves many aspects of recreational experience in the monument, while adding a minor to moderate adverse impact due to the potential need for temporal management of commercial stock use in the future. In addition, a moderate adverse impact is identified in the removal of the Devils Postpile Campground.

While many of the impacts are similar to alternative B, alternative C would provide the greatest benefit because, although several drive-in campsites would be removed, the campground would be retained and improved, with new walk-in camping opportunities, and opportunities for contact with visitors, especially in Mammoth Lakes, would be improved.

Interpretation and Education

This section analyzes two aspects of the visitor experience: education and interpretation, including the elements of visitor information, orientation, and inspiration. These two visitor experience components evaluate opportunities for and the quality of visitor information and orientation, as well as interpretive and educational experiences.

This assessment focused on the intensity and duration of adverse impacts that would result from the proposed actions in the plan relative to the aspects of the visitor experience related to interpretation and education, as well as the beneficial effects of the proposed actions.

INTERPRETATION AND EDUCATION – IMPACTS FROM ALTERNATIVE A (NO ACTION)

Quality interpretive programs would continue to be offered, and all interpretive and environmental education opportunities for visitors would continue to be comprehensively planned - a long-term beneficial impact. Since no new employees would be added, however, monument interpretive staff would not be able to meet visitor demand during the spring and fall seasons and during summer holidays, nor would the monument be able to expand its program offerings. Junior Ranger programming would continue to be offered via activities that children complete on their own and/or with their families. Ranger-guided activities such as interpretive walks to the Postpile would continue to be offered.

A limited number of non-personal interpretive services would continue to be available to visitors and potential visitors, such as a park newspaper, brochures, an in-depth monument website, and wayside displays throughout the monument. Without formal exhibit space in the valley, the monument would continue to provide very limited opportunities for visitors to view exhibits, a minor to moderate adverse impact.

Under this alternative, staff would continue to be limited in their availability to present educational programs both on-site and in the classroom. Staffing levels are insufficient to allow the monument to provide an official curriculum-based education program, a minor to moderate adverse impact. The monument's interpretive staff, with contributions from members of all divisions, participates in a fair number of in-park and community outreach activities, but there is room for improvement since demand for outreach is not currently being met. Staffing constraints would continue to limit the number of interpretive and educational programs provided over time. This would have an overall long-term, minor to moderate, adverse impact on interpretive and educational opportunities, given ongoing and unmet demand for these services.

INTERPRETATION AND EDUCATION – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

All of the beneficial effects described under alternative A would continue under this alternative. Alternative B would emphasize interpretation and education efforts, primarily by increasing staff. Because self-directed learning and discovery would be emphasized in alternative B, the monument would focus more effort on providing formal interpretation and education outside of the monument when possible. This would allow visitors within the monument to enjoy high-quality self-directed experiences, while the monument focuses its interpretive staff more on community engagement, outreach, and local educational needs.

Several actions would provide additional benefits to the interpretation and education program. The proposed day-use area in the former campground would provide an opportunity for development of an interpretive trail. The proposed ranger station improvements would greatly improve exhibit space in the monument while also providing more opportunity for informal ranger contact. Several seasonal interpretive positions would be added, allowing the monument to seek to maintain current levels of visitor understanding while enhancing its outreach and education programs. Substantial strides would be made in creating effective outreach and educational programs off-site, resulting in more engaged and informed classrooms and local participants. Alternative B would result in limited, but overall beneficial impacts on the provision of interpretation and education.

INTERPRETATION AND EDUCATION – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

All of the beneficial effects described under alternative A would continue under this alternative. As in alternative B, new staff positions would increase the monument's capacity to fulfill educational requests and in-monument programming needs. Ranger station

improvements would greatly improve opportunities for exhibits and displays in the monument.

In addition, an expanded NPS presence in Mammoth Lakes would provide additional space and increased capacity for visitor services, exhibits, education, orientation, and accessibility. The monument's ability to reach non-visitors would greatly increase through an in-town presence. This presence, along with an increase in staffing, would allow the monument to provide increased educational programming in the off-season. Because these actions would provide expanded interpretation and education, both within and outside the monument, they would have a long-term beneficial impact on the monument's capacity for interpretation and education. The alternative's focus on the development of partnerships will also ensure that the monument reaches a broader scope of visitors and non-visitors throughout the region.

INTERPRETATION AND EDUCATION – CUMULATIVE IMPACTS

The demand for interpretive and educational services, such as in-classroom programs, may continue to exceed the monument's capacity to provide them. Interpretive programming available to off-season visitors will continue to be limited and the short-staffed monument may have difficulty keeping pace with changing technologies that would allow visitors to receive information and interpretation in new ways.

Improvements at Minaret Vista, increased ranger contact throughout the valley, and cultural interpretation opportunities at Reds Cabin and bathhouse, as recommended in the GMP, would add to the beneficial impacts described in the alternatives above, if implemented.

The above impacts, in combination with the adverse and beneficial impacts of alternative A, would continue to result in minor to moderate, adverse cumulative impacts on educational and interpretive opportunities. Alternatives B and C would each reduce this impact, primarily through additional staffing and programming. These benefits, however, would be greater under alternative C because of the emphasis on both internal and external interpretation and education.

INTERPRETATION AND EDUCATION – CONCLUSION

Educational and interpretive programs under alternative A would provide beneficial effects to the monument visitors. In the long-term, however, staffing and facility constraints would result in interpretive and educational opportunities that don't meet demand, resulting in minor to moderate, adverse cumulative impacts on education and interpretation.

Primarily through facility enhancement and increased staffing, alternative B would provide beneficial impacts on the provision of interpretation and education, as compared to alternative A.

Educational and interpretive programs under alternative C would experience greater beneficial effects to monument visitors, school groups and teachers, local communities, and organizations than in alternative B, mostly due to an increased NPS presence in Mammoth Lakes.

Socioeconomics

Economic effects are commonly expressed in terms of the number and types of jobs supported, changes in income, the number of visitors to the recreation area, and the resulting changes in local tourism spending. Less well-defined economic effects include the indirect effects from ongoing NPS operations and the effects on local government fiscal conditions. Examples of social impacts include effects on regional population growth and land use.

Socioeconomic impacts were determined based on applied logic, professional expertise, and professional judgment. The approach to these issues was based on the following factors directly related to implementation of the general management plan:

- estimated costs of building new facilities and infrastructure
- changes in the number of NPS staff and federal spending to operate the recreation area
- changes in the number of visitors to the recreation area

This analysis relies on qualitative analysis of the impacts of each alternative, as actual visitor numbers are not estimated, spending values are for comparison only, and influence area data was mainly available at the broad county and regional district level.

Beneficial impacts result in generally recognized improvements to established social and economic environment, or can be recognized as improvements to specific sectors and stated as such. Adverse impacts are those effects that are generally recognized to diminish the established social and economic environment, or diminish the environment for particular sectors and stated as such.

SOCIOECONOMICS – IMPACTS FROM ALTERNATIVE A (NO ACTION)

Alternative A should not affect the monument's regional status as a destination for travelers on both single and multiple day excursions. It often serves as an additional destination for travelers intent on visiting both Yosemite National Park and Inyo National Forest, both within a short drive of the monument. The monument is also a secondary destination for visitors to Mammoth Lakes during the summer months.

Under alternative A, no new major changes would be made that would affect the current, short-term local or regional economic impacts of the monument. Road access, recreational opportunities, and facilities would remain relatively unchanged, and would therefore provide a continuation of economic opportunities, tax revenues, and jobs.

The current level of NPS employment would be maintained, continuing to have a small beneficial effect on the local economy. Total annual spending on staff is approximately $560,000 per year.

SOCIOECONOMICS – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

Although the monument campground would be removed, day use could offset the difference in daily visitors. The adverse effects on the local economy would likely be negligible as the monument works with the Inyo National Forest to preserve camping capacity in the valley.

The expansion of partnership efforts proposed in this alternative could help to bring sustained visitation to the area, resulting in a beneficial impact to the local and regional economies. The total one-time costs of construction and other projects would be approximately $7,116,564 (in 2012 dollars), much more than the one-time capital costs of alternative A. NPS employment would be increased under alternative B by $232,754 to a total annual expenditure of $796,282, providing some benefit to the local employment market and the economy through employee spending.

SOCIOECONOMICS – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

Impacts under alternative C would be the same as alternative B, with the following exceptions:

The campground would not be removed under alternative C.

The development of an interagency maintenance facility in the valley would likely generate local contracting needs to construct the facilities. However, these economic benefits to various sectors would be very small in comparison to other tourism-related facility construction in Mammoth Lakes.

The provision of increased office space in Mammoth Lakes could benefit the local economy by allowing the monument to keep staff productively employed longer in the shoulder seasons and provide greater certainty around commitments to seasonal staff when recruiting before the monument's opening date is known. New opportunities for increased interpretation and education resulting from new services in Mammoth Lakes could result in a slight increase in visitation and better outreach to new, previously underserved groups.

The actions proposed in alternative C would produce negligible long and short term impacts on regional economies. While actions propose some construction, these actions would be taken be park staff or constitute small construction contracts with little influence in the economy.

The total one-time costs of construction and other projects would be approximately $6,861,506 (in 2012 dollars). When added to the additional staffing, as described in alternative B, this increased spending would result in beneficial impacts on the local economy.

SOCIOECONOMICS – CUMULATIVE IMPACTS

Past and ongoing monument management has had a beneficial effect on the region's economy through tourism. The monument provides a national park experience that draws visitors from around California and beyond, including international visitors. When considered in concert with the socioeconomic effects of other recreation and tourism sites in the region, the actions proposed in each alternative would add little to the existing cumulative effects. Local attractions, including associated recreation in the Inyo National Forest and Yosemite National Park, will continue to attract tourists and provide a myriad of activities similar to the experiences found in the monument. Local travel spending in Mono County is approximately $451 million annually, supporting 4,720 travel industry jobs (Dean Runyon Associates, 2013). Local and regional economies, while benefitting to some degree from the management of Devils Postpile NM, are not tied to its existence except as part of a larger package of recreational and educational opportunities available in the area.

SOCIOECONOMICS – CONCLUSION

None of the alternatives would have a great impact on the local economy, but all would provide some amount of benefit in terms of jobs and spending. Alternatives B and C would provide the greatest benefit to local economies through spending and job creation. Monument visitation is not expected to change noticeably due to actions within the alternatives, although improvements to services at Minaret Vista and in Mammoth Lakes could provide new opportunities for those who do not visit the monument.

Monument Operations

Monument operations refers to the current management structure of the monument to provide policy direction for the protection, public use, and appreciation of the monument, and the ability of the current staff to adequately protect and preserve vital resources and provide for an effective visitor experience. The discussion of impacts on management, operations, and staffing focuses on the type of management structure, the amount of staff available to ensure public safety, and the ability of the staff to protect and preserve resources given current funding and staffing levels. Staff knowledgeable about the management of the monument was consulted to evaluate the impacts of implementing each alternative.

OPERATIONS – IMPACTS FROM ALTERNATIVE A (NO ACTION)

Under this alternative, administrative offices and operational facilities would remain in their current locations in the monument and in Mammoth Lakes. Cooperative efforts with partners and universities would continue on an as-needed basis as staffing and funding allows. The current organizational structure, with very limited staffing and operations, is generally centralized and would continue to function with some deficiencies. Although some staff could be added over time, staffing levels throughout the monument would continue to be inadequate to meet public demands for increased interpretation and education as well as meeting the resource management and operational needs of the monument.

The ranger station would remain unchanged. The current ranger station is small and often crowded, lacks accessibility, and contains both operational functions and visitor services in the same limited space. The lack of sufficient space to accommodate groups, provide accessibility, install interpretive displays or exhibits, or provide adequate working space for staff would continue to produce moderate, adverse impacts to monument operations.

The campground places a moderate demand on staff time and generates park fee revenue funds which contribute to approved projects that improve visitor experience through enhanced interpretive programs, exhibits, multimedia, website enhancements, and improved habitat protection surrounding the campground and day use facilities.

The maintenance facility is adjacent to the area of highest visitor concentration which has both beneficial impacts, in terms of the availability of resources to address immediate maintenance issues, and detrimental impacts, in terms of a lack of separation from visitors.

The monument currently partners with the Inyo National Forest, the Town of Mammoth Lakes, Mammoth Mountain, and Eastern Sierra Transit Authority, among other organizations and agencies. Although these effective partnerships have yielded beneficial effects on monument visitors and resources, a lack of staff capacity has limited the monument's ability to take advantage of more robust partnership opportunities with these and other entities.

The monument's administrative space in Mammoth Lakes and its operational space in the monument do not provide adequate space for the monument's administrative staff. The offices in Mammoth Lakes provide very limited storage opportunities, leaving working space cluttered and crowded. Likewise, storage space for equipment is at a premium in the monument, where the monument has resorted to using cargo containers to keep equipment protected from the elements.

Overall, the effects of alternative A would continue to be moderate, long-term and adverse.

OPERATIONS – IMPACTS FROM ALTERNATIVE B (WATERSHED EMPHASIS)

As in alternative A, administrative offices would remain in their current location in Mammoth Lakes.

The current ranger station would remain, but would be rehabilitated to improve accessibility. Outside, the deck space would be increased, allowing visitors to be served through an information window. Inside, operational functions would be removed to create more space for visitors, allowing staff to better serve groups and provide greater accessibility. In addition, exhibit space would be expanded. Also, two new interpretive staff positions are proposed under this alternative. All of these changes would benefit operations at the monument because staff could better meet the needs of visitors at this central location. Operational functions removed from the ranger station would be moved to the operations and housing area, with no loss in capacity as compared to alternative A.

Conversion of the campground to a day use area would greatly reduce staff needs in the monument, a beneficial impact. Although the day use area would still require maintenance, the needs associated with managing a day use area would be less than an overnight facility with access roads. Better delineation of parking and redesign of the shuttle stop would also benefit operations by reducing the need for staff to deal with congestion and confusion.

Increased education efforts outside of the monument could strain interpretive staff already spread thin, but the addition of two seasonal interpretive staff, as proposed under this alternative, would alleviate this impact.

The addition of one seasonal maintenance worker would increase the ability of the monument to respond to maintenance needs and to work collaboratively with the Inyo National Forest on shared interests, a beneficial impact. Moving the maintenance facility to Mammoth Lakes, however, would have an adverse impact on maintenance operations at the monument. This minor to moderate impact would be partially alleviated through appropriate planning and protocols, but would still likely result in times when needed parts and resources were not readily available for projects, especially when responding to maintenance emergencies. Recognizing that one of the maintenance workers is a required on-site occupant and others commute from Mammoth Lakes, some of these impacts can be mitigated through proper planning and ensuring that maintenance vehicles regularly carry adequate equipment.

The partnerships described under alternative A would continue and the monument would expand and focus its partnership efforts in areas related to landscape-scale watershed management, a long-term benefit.

Primary visitor destinations within the monument are Devils Postpile and Rainbow Falls. Visitors travelling from Devils Postpile to Rainbow Falls, or vice versa, exit to and from the monument across USFS lands. Most visitors are unaware of the jurisdictional changes and where they occur. This creates operational challenges for both agencies which have different regulations, allowable uses, and management approaches. For example, on Inyo National Forest lands dogs can walk off-leash while dogs must be on-leash in National Park units. Enforcement is difficult as the boundary is not readily apparent to staff. Re-aligning the trail within the monument is not feasible due to the terrain and sensitive resources located west of the river corridor. The proposed boundary adjustment includes the main trail connecting Devils Postpile to Rainbow Falls. The boundary is offset from the Reds Meadow Road and the trail, creating a more identifiable jurisdictional boundary, a benefit to monument operations.

OPERATIONS – IMPACTS FROM ALTERNATIVE C, THE PREFERRED ALTERNATIVE (CONNECTING PEOPLE TO NATURE AND HERITAGE)

With the enhancement of NPS operational presence and the provision of adequate administrative space in Mammoth Lakes, the monument would be better able to meet its operational needs and further extend its operational season to meet the needs of more visitors.

As in alternative B, the current ranger station would remain, but would be rehabilitated with additional deck space. Unlike alternative B, however, current operational functions would remain in the building. Because indoor space for visitors would remain cramped, these changes would be less beneficial than those described in alternative B.

Adverse impacts related to management of the campground would be the same as described in alternative A. Beneficial impacts related to delineation of parking and redesign of the shuttle stop would be the same as described in alternative B.

Adverse impacts related to increased education efforts and the beneficial effects of adding two additional seasonal interpretive staff would be the same as described in alternative B.

As in alternative B, the addition of one seasonal maintenance worker would increase the ability of the monument to respond to maintenance needs and to work collaboratively with the Inyo National Forest on shared interests, a beneficial impact. Moving the maintenance facility out of the monument to another location in the valley, a proposed joint project with the Inyo National Forest, could have a negligible to minor adverse impact on maintenance operations at the monument, depending on the location selected and its distance from the monument. Further environmental analysis will be done when and if the Inyo National Forest and the monument decide to implement this recommendation. This potential impact would be much less noticeable than the impact described in alternative B where the maintenance facility is located in Mammoth Lakes.

The partnerships described under alternative A would continue and the monument would expand its partnership efforts with as broad a reach as possible to introduce people to the monument and valley and provide them with opportunities to connect with nature and wilderness, a beneficial impact.

The boundary proposal described in alternative B would provide the same beneficial effects in alternative C.

OPERATIONS – CUMULATIVE IMPACTS

Past and ongoing projects, including road and facility maintenance and repairs, have had long-term, beneficial effects on monument operations by maintaining the inventory of monument structures. Aging facilities and utilities would continue to be replaced or modified as needed when funds are available.

Inadequate funding has resulted in a maintenance backlog which is often readily apparent to the public, a moderate, long-term, cumulative effect on monument operations and infrastructure.

Climate change could increase wildfire frequency and intensity, reduce in groundwater and surface water, increase erosion of soils from wildfire impacts and drier conditions, increase non-native species, and change visitation patterns associated with changing environment conditions (e.g., visitation occurring earlier in the spring season and the associated influence on operational costs). The operational costs associated with these potential impacts could be substantial. The staffing increases projected in alternatives B and C would benefit monument operations by enabling additional "on-the-ground" response to affects related to climate change. Likewise, "common to all" actions presented in this GMP would benefit operations by proactively developing climate change response strategies and increasing climate change-related research, monitoring, and planning.

OPERATIONS – CONCLUSION

Alternative A would result in little immediate change to monument infrastructure or operations and would continue current levels of funding and staffing. Alternative A would not adequately address long-term, moderate, cumulative, adverse impacts on monument operations due to past deficiencies.

Alternative B would result in several beneficial impacts to operational capacity, primarily through additional staffing and the removal of the campground. Minor to moderate impacts would occur, including by relocation of maintenance functions to Mammoth Lakes.

Alternative C would be similar to alternative B, but with a lesser impact on maintenance due to keeping the maintenance facility in the valley. As compared to alternative A, the monument would experience beneficial effects from increased staffing, new opportunities in Mammoth Lakes, and expanded partnerships.

Chapter Six: Consultation and Coordination

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Chapter Six: Consultation and Coordination

Introduction

Public involvement and consultation efforts were ongoing throughout the process of preparing this *Draft General Management Plan and Environmental Assessment*. Public involvement methods included conducting public meetings and workshops, holding stakeholder meetings, distributing newsletters, posting planning information on appropriate websites, published Federal Register notices, and sending press releases. Public involvement is a necessary and important part of the planning process that provides valuable information. Consultation and coordination among the agencies, American Indian tribes, and the public were vitally important throughout the planning process. The public had two formal avenues for participation in the development of the draft plan: participation in public meetings and opportunities to provide comments on information presented in newsletters. Public comments were also welcomed at any time throughout the GMP planning process.

Public Scoping

The Devils Postpile National Monument GMP planning team initially launched the GMP planning process in 2009. The official public scoping period was initiated on June 15, 2009 and closed on September 30, 2009. A comprehensive scoping outreach effort was conducted to elicit early public comment regarding issues and concerns, the nature and extent of potential environmental impacts, and possible alternatives that should be addressed in the preparation of the GMP. Through various scoping and outreach activities, the NPS welcomed information and suggestions from the public.

SCOPING NEWSLETTER (#1)

In June 2009, the planning team produced and mailed newsletters to approximately 200 individuals and organizations on the GMP mailing list and distributed 2,100 additional copies to visitors at the monument, neighbors in local communities, and attendees at public meetings. The purpose of the newsletter was to announce the start of the planning process; inform the public on how they could participate; and to ask for thoughts, ideas, and concerns about the monument's purpose and significance statements and what issues should be addressed in the GMP. The newsletter also contained information on the date, time and location of public scoping meetings.

Websites. The scoping newsletter was published and made available for comment on the National Park Service's Planning, Environment and Public Comment (PEPC) website and the monument's main website. Additional updates on the GMP were provided on the websites. An email list was also developed and maintained so that the public could receive updated information through email.

Announcements and Notices. Press releases announcing the GMP planning process were also distributed to local newspapers and on local radio. NPS staff worked closely with the Town of Mammoth Lakes Tourism and Recreation staff to increase outreach on public involvement opportunities. On June 15, 2009, a notice of intent to prepare a general management plan and environmental impact statement was published in the Federal Register (74 FR 28273:28274).

Public Meetings. In Spring and Fall 2009, the planning team held a series of public scoping open houses in California in the Town of Mammoth Lakes. Displays and stations were set up at the start of the meetings so that attendees could have one-on-one conversations with members of the planning team. Planning team members recorded comments on flipcharts as they were received. Radio interviews about the meetings were conducted in advance of public open houses held in July and September. A total of eighteen members of the public attended the open houses. The meeting locations and dates included the following:

- Town of Mammoth Lakes, California, Mammoth Library, May 21, 2009
- Town of Mammoth Lakes, California, Mammoth Library, July 9, 2009
- Town of Mammoth Lakes, California, Mammoth Library, September 10, 2009

- Town of Mammoth Lakes, California, Mammoth Library, September 15, 2009

STAKEHOLDER MEETINGS

In addition to public meetings, the monument staff and the planning team conducted presentations, meetings, and conversations with local organizations, agencies, and American Indian tribes. The planning team met with the Mono County Board of Supervisors (September 6), the Town of Mammoth Lakes (Council and Staff, July 8, September 7 and 9), Reds Meadow Resort, and Mammoth Mountain Ski Area. On May 21 and September 11, 2009, the planning team hosted open houses for American Indian tribes and interested American Indian individuals.

ENGAGEMENT OF PARK VISITORS

The planning team also conducted outreach on the GMP directly with park visitors. The monument published an article on the front page of the park newspaper describing the GMP process and opportunities to participate. Park staff and planning team members also conducted tabling sessions at the monument ranger station during peak visitor weekends in July 2009. NPS staff handed out newsletters and encouraged visitors to share their thoughts and ideas with the planning team.

SCOPING COMMENTS RECEIVED

During the scoping period, the monument received 17 written comment letters. Most of the comments were submitted using the comment form included in the newsletter which was also distributed at the ranger station, public and stakeholder meetings, and posted on PEPC. Most comments received were from individuals and organizations in California. Organizations that submitted comments included: National Parks Conservation Association. The comments were considered and incorporated into the issues for the plan and were summarized in the second newsletter.

SUMMARY OF SCOPING COMMENTS

The NPS distributed a second newsletter in Spring 2010, describing issues identified during public scoping. The following public comment summary reflects the wide range and diversity of comments received.

Values

Many commenters highly valued attributes of the monument and valley related to wilderness, including natural sounds, scenic views, solitude, and remoteness. The relatively undeveloped and rustic character of the monument were cited as contributing to these values, as well as to multi-generational values held by families. Some commenters appreciated the opportunity to experience a feeling of wilderness without the effort involved in accessing more remote areas. While some commenters valued the Postpile and Rainbow Falls themselves, many commenters also valued the broader context in which these resources are placed, both in terms of heritage and wilderness.

Level of Development and Rustic Character

Many commenters identified the current rustic character of the built environment as a key value. Commenters requested that any new structures proposed by the plan be consistent with the look and feel of the current built environment, and several expressed concern that the monument might over-develop the area. The comments did not include any requests for new buildings in the monument, but did recognize the need to maintain facilities as they are. When asked how they would like to see the monument in 20 years, most commenters expressed a desire to keep things exactly as they are. Accordingly, while making some trails more accessible was an identified need, commenters cautioned the monument to avoid paving any trails.

Campgrounds

Many commenters highly valued the campgrounds in the valley and at the monument. Most of their comments focused on the desire to keep the campgrounds small and relatively undeveloped, although at least one commenter wanted to see additional amenities for large RVs. Banning RVs was also supported by some. Most commenters did not want to see significant changes in the campgrounds, although some new ideas included making a new walk-in campground near the ranger station, separating RVs and tents, and providing more small-scale amenities such as fish cleaning stations and water spigots.

Trails

Many of the comments related to trails valued the diversity of trail experiences and connections available in the area. Some recommended specific projects, such

as trails that connect shuttle stops, Sotcher Lake trail improvements, a mountain biking trail from Mammoth Lakes to Reds Valley, a new trail to Rainbow Falls on the west side of the river, a bridge at Minaret Falls, and a Soda Springs interpretive trail. Several commenters asked that the current "rustic" trail experience be maintained.

Several commenters expressed concern about the impacts of horses on trails, as well as the development of unplanned "social" trails and their effects on riparian areas. Cooperation between agencies, jurisdictions, and organizations like the San Joaquin River Trail Council was identified as an important component of trail management. Several commenters, in particular, called on land managers to improve the accuracy and graphic consistency of trail signs throughout the planning area. Several of the comments related to roads requested more convenient access for personal vehicles, including cars, recreational vehicles (RVs), and motorcycles. Others felt that current restrictions on private vehicles protected the valley experience and the road. Some commenters were concerned that the road into Reds Meadow was deteriorating and identified repaving and future planning dollars as issues. Some concern was expressed about the parking areas, primarily that they blend in with the natural environment and that they are not allowed to grow in size. One commenter requested that the main monument parking lot become a campground.

Shuttle System

Commenters expressed both support and dissatisfaction with the shuttle system. Those who supported it valued it for reducing traffic and pollution in the valley, protecting a difficult-to-maintain road, and safety. Others saw the system as a hassle, especially for locals, anglers, and families with young children. Some recommended improvements to the system included more interpretation and information on the buses, improved shuttle stops (including trails), a higher frequency of trips, and the use of buses that better match the historic and rustic character of the valley.

American Indian Issues and Resources

Commenters expressed a desire to see more cooperation between the monument, the Inyo National Forest, and the tribes of the region. Commenters were concerned with a lack of knowledge of American Indian resources in the valley, and the disconnectedness of American Indians, particularly youth, with the monument. New strategies to connect American Indians with the monument through educational programming, easier access, and employment opportunities were identified, along with requests for opportunities to hold group events and engage in traditional practices. Other issues included making consultation meaningful and inclusive of other tribes and incorporating native place names and stories into monument interpretation and information.

Partnerships

Interagency coordination, particularly between Devils Postpile National Monument and the Inyo National Forest, in the planning process and the management of the planning area was highly valued by commenters. Commenters also identified tribes, local communities, the Mono Lake Committee, the Sierra Nevada Aquatic Research Laboratory, Mammoth Mountain Ski Area, Friends of the Inyo, Mammoth Lakes Trails and Public Access (MLTPA), local bicycle clubs, and the San Joaquin River Trail Council as potential partners for management or information sharing. Providing a seamless experience for visitors and improving maintenance throughout the valley were identified as important goals of interagency coordination.

Preliminary Alternatives/ Management Concepts

PRELIMINARY ALTERNATIVES NEWSLETTER (#3)

The Devils Postpile National Monument GMP planning team developed preliminary alternatives for the GMP in 2010-2011. In July 2011, the GMP team released a third newsletter with preliminary management concepts for public review. Approximately 500 newsletters were mailed to organizations and individuals on the park mailing list. In addition, over 2,000 newsletters were distributed at the ranger station, to local communities and businesses, and at public and stakeholder meetings.

The purpose of the newsletter was to provide opportunities for the public and stakeholders to comment on the preliminary alternatives to identify preferred concepts and management actions and ideas for improving the preliminary alternatives. Preliminary alternatives presented to the public included:

- Continuation of Current Management (No Action)
- Watershed Emphasis
- Connecting People to Wild Nature
- Focus on Special Destinations

A comment form was included in the newsletter so that members of the public could provide feedback to the planning team. The public comment period began July 15, 2011 and ran through September 30, 2011. Press releases asking for public comments on the preliminary management concepts were distributed to local newspapers.

The newsletter was distributed through direct mailing and email, was available on the monument's website, and hard copies were made available at key locations in the Town of Mammoth Lakes, including the library. A press release also announced the availability of the newsletter along with a public open house held in September 2011 at the Town of Mammoth Lakes Library.

The newsletter was also published and made available for comment on the PEPC website. A link to the newsletter was provided on the monument's website as well as an email message that was sent to the GMP email list.

PUBLIC MEETINGS

A public open house meeting was held in the Town of Mammoth Lakes at the Mammoth Lakes Public Library on September 15, 2011. The open house format was chosen to allow the public to provide comments and ideas on the preliminary alternatives presented in Newsletter#3 and to have one-on-one discussions with planning team members. Instead of providing a formal presentation, stations were set up around the meeting room for each alternative. Each station was staffed by a planning team member who presented a summary of the alternative and wrote down comments on flip charts. Eighteen people attended the open house, providing comments on the alternatives, suggesting new ideas to consider, asking questions and seeking additional information on the GMP.

Centennial Celebration: A Century of Conservation. Public review of preliminary alternatives was presented in summer 2011 to coincide with Devils Postpile National Monument's centennial celebration. The centennial celebration included a series of events in July 2011 ranging from programs on the history of the monument to scheduled walks and hikes with historians, community leaders, scientists, and park staff. During the course of the events, NPS announced that an extensive public outreach opportunity would be launched to complement the summer Centennial events. Throughout the 2011 field season, including Labor Day, the DEPO Superintendent held tabling events to share information and solicit visitor comments on the preliminary alternatives and the future of the monument.

STAFF AND STAKEHOLDER MEETINGS

Throughout the comment period presentations, meetings and conversations with local organizations, agencies and tribes were conducted by the Superintendent, other park staff, and members of the planning team. The planning team met with the Mono County Board of Supervisors (September 6, 2011) and the Town of Mammoth Lakes Town Council (September 15, 2011). A second open house for American Indian tribes and interested American Indian individuals was held on September 16, 2011 in Bishop, CA.

ENGAGEMENT OF PARK VISITORS

The planning team also conducted outreach on the GMP preliminary alternatives with park visitors during the 2011 field season. Park staff conducted tabling at shuttle bus stops and during campfire fire talks in September 2011. NPS staff handed out newsletters and encouraged visitors to share their thoughts and ideas with the planning team.

SUMMARY OF COMMENTS ON THE PRELIMINARY ALTERNATIVES

Twenty-nine commenters returned mail-in forms or submitted their comments online. Agencies and organizations that submitted comments include: Mono Lake Committee, National Parks Conservation Association, Reds Meadow Resort, and the Pacific Crest Trail Association. Commenters touched on a wide variety of topics. Each alternative, including the no-action alternative, had supporters and detractors. Many commenters expressed support for individual actions in different alternatives and suggested their own combination of those actions. No particular alternative emerged as a clear favorite. Comments received by mail or online were added to the comments received at public meetings. Then, each statement within the comments

was coded and analyzed by subject area. The following summary addresses the subject areas which received the highest number of comments, in no particular order:

Campground

A number of commenters addressed the Devils Postpile campground. Many asked that the campground remain, either in its current configuration or with some site removals related to restoration. Some felt that camping in the monument is a unique experience that leads to greater advocacy for the monument, a higher level of stewardship, and increased participation in monument activities and programs. A few supported removal of the campground, feeling that the USFS could more appropriately and effectively manage them which, in turn, would free up NPS resources.

Facilities

Most commenters contributed ideas related to facilities: Several wanted the monument to keep but enlarge the current ranger station, taking care to keep the same look. Several supported building a new ranger station and/or relocating it out of the floodplain. One commenter did not want the ranger station changed at all. Another felt, based on a historical perspective, that the flood risk was not significant enough to warrant relocation.

Removing administrative, housing, and maintenance functions from the monument received a great deal of support, with many commenters supporting relocation of these functions to Pumice Flats or Mammoth Lakes. One commenter was concerned that a joint USFS/NPS administrative/maintenance facility at Pumice Flats would not be in character with the primitive setting of the valley. There was widespread support for keeping the stairs at Rainbow Falls, for safety and visitor experience reasons.

Commenters were split on the redesign ideas for Minaret Vista. Many commenters favored improving the area and using it as a primary point of visitor contact, but others were concerned that it would pull resources away from the valley, that the ridge is a difficult place to maintain facilities, and that the Vista is already well-designed.

Stock Use

Many commenters addressed stock use, both private and commercial. The comments were split on the necessity of commercial day-use trips. While some felt that commercial day-use trips were not a necessary component of wilderness use, others saw commercial trips as integral to the traditional experience and necessary for the full enjoyment of the monument by those with disabilities and those who do not own their own stock. Others expressed concern about the economic viability of the pack station operation, asking the NPS to not interfere with its business or to find a better way to balance other wilderness uses and expectations with economic viability. Separating stock use from pedestrian use was widely supported. Several also expressed support for a staging area outside of the wilderness boundary.

Partnerships

Several commenters asked that the GMP include specific guidance for the integration of valley trail planning into local and regional trail planning. Specifically, commenters wanted the monument incorporated into the Mammoth Lakes Trail System and greater cooperation with the Pacific Crest Trail Association. Some commenters supported the development of the GMP with an interagency scope, citing a need for cooperative management, but others felt that incorporating USFS lands into the planning process would result in a lack of focused guidance for the monument itself. One commenter asked for greater tribal involvement in the planning process and ethnographic studies, as well as the use of Native American language in signage.

New Ideas

Many commenters provided additional ideas beyond what they saw in the GMP newsletter. These included a new group camping area in the monument, preservation of the Reds Meadow showers, additional shuttle stops, improved signage, a classroom in Mammoth Lakes, handrails to the top of the Postpile, benches between the Postpile and Rainbow Falls, “self-discovery areas” for adventurous and self-reliant visitors, a collections storage facility in Mammoth Lakes, road widening at the monument entrance, and a bicycle path in the valley. Several commenters wanted to see winter use addressed more directly, with some in favor of increasing opportunities for visitors and some wanting to ensure that illegal snowmobiling is controlled.

Consultation with Other Agencies, Officials, and Organizations (To Date)

COOPERATING AGENCY

The USFS is formally participating in the GMP process as a cooperating agency. The National Park Service and USFS developed a Memorandum of Understanding (MOU) for the GMP that was signed by both agencies in July 2009. The purpose of the MOU is to provide a framework for cooperation to facilitate the completion of the GMP and associated plans as needed. The MOU provides a basis for the two agencies to collaborate and expedite the preparation and development of the GMP. Specifically, the MOU outlines:

- That the GMP is an NPS decision document that will follow NPS planning standards, guidelines and processes
- USFS participation on an interdisciplinary GMP planning team that includes members of the USFS and a point person for the core team
- That the decision document is an NPS Record of Decision giving the USFS flexibility to integrate recommendations from the GMP into their respective planning processes.
- That the GMP will not address USFS issues related to wilderness use or visitor/user capacity on USFS lands.

In addition to participation on the GMP planning team, USFS planning team members participated in public and stakeholder holder meetings during scoping and public review of preliminary alternatives.

SECTION 7 CONSULTATION

Consultation with the U.S. Fish and Wildlife Service. The Endangered Species Act of 1963, as amended, authorizes federal agencies to enter into early consultation with the U.S. Fish and Wildlife Service (USFWS) to ensure that any federal action would not jeopardize the existence of any listed species or destroy or adversely modify its habitat. During the preparation of this plan, NPS staff initiated consultation with the Sacramento U.S. Fish and Wildlife Office in June 2009 to determine what threatened and endangered species should be considered during preparation of the EA. During the public review period for this EA, additional consultation with the USFWS will occur to affirm concurrence with the determinations of effect on listed or proposed species.

SECTION 106 CONSULTATION

Federal agencies that have direct or indirect jurisdiction over historic properties are required by Section 106 of the National Historic Preservation Act (NHPA), as amended (16 USC 270, et seq.), to take into account the effect of their undertakings on properties either listed in or eligible for listing in the National Register of Historic Places.

In accordance with 2008 Programmatic Agreement and NPS Management Policies (2006a) the NPS has used the National Environmental Policy Act (NEPA) process to document compliance with Section 106 of the National Historic Preservation Act (NHPA) for the Devils Postpile General Management Plan. To this end, the NPS instituted early scoping with agencies, tribes, and interested public, coordinated planning milestones in consideration of both the NEPA and NHPA processes, included historic preservation issues in the alternatives development and impact analysis presented in the Environmental Assessment, and articulated the results of this analysis using methods and terminology appropriate to both the NEPA and the NHPA.

Consultation with the California State Historic Preservation Office

Under the terms of stipulation IV of the 2008 Programmatic Agreement Among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers for Compliance with Section 106 of the National Historic Preservation Act, the National Park Service will follow the standard review process in accordance with 36 CFR 800 for the Devils Postpile general management plan.

In June of 2009, the NPS notified the California SHPO of the agency's intent to prepare a GMP, and invited representatives of the SHPO to participate in the scoping process. In December of 2009, the NPS provided resource reports (available at the time) as background information about historic properties on monument lands. In January 2010, the NPS notified the SHPO pursuant to 36 CFR 800.3(b) of the agency's intent to use the NEPA process to document compliance with Section 106 of the NHPA. In December of

2013, the NPS provided SHPO with the most current documentation on potential historic properties, the 2013 Administrative History and Historic Resource Study. During the public review period for this EA, the NPS will continue to consult with the SHPO to meet the remaining requirements of 36 CFR 800.

Consultation with Native American Tribes

The National Park Service recognizes that indigenous peoples have traditional and contemporary interests and ongoing rights in lands now under National Park Service management, as well as concerns and contributions to make for the future via the scoping and alternatives development process for general management plans and other projects. Related to tribal sovereignty, the need for government-to-government Native American consultations stems from the historic power of Congress to make treaties with American Indian tribes as sovereign nations. Consultations with American Indians and other Native Americans, such as Alaska Natives and Native Hawaiians, are required by various federal laws, executive orders, regulations, and policies. For example, such consultations are needed to comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended. Implementing regulations of the Council on Environmental Quality (CEQ) for the National Environmental Policy Act of 1969), as amended (NEPA), also call for Native American consultations.

The NPS consulted with consulted with traditionally associated American Indian tribes and groups in developing the GMP. These include the federally recognized Benton Paiute Reservation, Big Pine Paiute Tribe, Bishop Paiute Indian Reservation, Bridgeport Indian Colony, Fort Independence Indian Reservation, Lone Pine Paiute-Shoshone Indian Reservation, and North Fork Rancheria of Mono Indians; and federally non-recognized the Mono Lake Kutzadika'a Piute Indian Community and the North Fork Mono Tribe. During the public scoping period NPS staff invited several Native American groups to meet to discuss the general management planning process underway and any concerns they might have about protecting, preserving, and managing Devils Postpile National Monument's resources (September 11, 2009). A second open house was held on September 16, 2011 to initiate consultation on the preliminary alternatives.

The NPS will continue to consult with these traditionally associated tribes and groups during the public review period for this EA and throughout implementation of the GMP pursuant to requirements of 36 CFR 800, federal executive orders and agency management policies.

Future Compliance Requirements

The NPS will conduct additional site-specific environmental analysis as individual projects or actions included in the preferred alternative are proposed for implementation. Some of the specific future compliance requirements of the preferred alternative are described in the Alternatives and Environmental Consequences chapters. Included are the NPS determinations of how those individual requirements relate to the National Environmental Policy Act (NEPA), the Endangered Species Act (Section 7 requirements), and requirements for compliance with Section 106 of the National Historic Preservation Act regarding historic properties (2008 programmatic agreement and 36 CFR 800).

Public Officials, Agencies, and Organizations Receiving This Plan

FEDERAL AGENCIES AND OFFICIALS

- Bureau of Land Management, Bishop Field Office
- El Dorado National Forest
- Honorable Barbara, Boxer, United States Senate
- Honorable Dianne Feinstein, United States Senate
- Honorable Tom McClintock, United States House of Representatives
- Honorable Paul Cook, United States House of Representatives
- Humboldt-Toiyabe National Forest
- Inyo National Forest
- Manzanar National Historic Site
- Sequoia and Kings Canyon National Parks
- Sequoia National Forest
- Sierra National Forest
- Stanislaus National Forest
- United States Fish and Wildlife Service
- Yosemite National Park

STATE AND LOCAL AGENCIES AND OFFICIALS

- California Department of Fish and Wildlife
- California State Historic Preservation Office

- California Department of Transportation (Caltrans), District 9
- County of Madera
- Eastern Sierra Transit Authority
- Honorable Kristin Olsen, California State Assembly
- Honorable Ted Gaines, California State Senator
- Honorable Tom Berryhill, California State Senator
- Mammoth Lakes Town Council
- Mono County Board of Supervisors
- Mono County Development Department
- Town of Mammoth Lakes
- Mammoth Tourism
- Mammoth Lakes Fire Department

TRIBES

Federally Recognized:

- Benton Paiute Reservation
- Big Pine Paiute Tribe
- Bishop Paiute Tribe
- Bridgeport Indian Colony
- Fort Independence Indian Reservation
- Lone Pine Paiute-Shoshone Reservation
- North Fork Rancheria of Mono Indians

Federally Non-Recognized:

- Mono Lake Kutzadika'a
- North Fork Mono Tribe

BUSINESSES, INSTITUTIONS, AND ORGANIZATIONS

- Adventures in Camping
- American Rivers
- American Whitewater
- Andrea Lawrence Institute for Mountains & Rivers (ALIMAR)
- Backcountry Horsemen San Joaquin Sierra Unit
- Cal Trout
- California Native Plant Society
- California Conservation Corps (CCC)
- CCC Tahoe Center
- Cero Coso Community College
- Coalition for Unified Recreation in the Eastern Sierra
- Eastern Sierra Audubon Society
- Eastern Sierra Land Trust
- Friends of the Inyo
- Friends of the River
- High Sierra Hikers Association
- June Lake Chamber of Commerce
- Mammoth Chamber of Commerce
- Mammoth Lakes Tourism
- Mammoth Mountain Ski Area
- Mammoth Lakes Trails and Public Access Foundation (MLTPA)
- Mono Lake Committee
- National Parks and Conservation Association
- Natural Resources Defense Council
- Pacific Crest Trail Association
- Red's Meadow Resort and Pack Station
- Rock Creek Pack Station, Inc.
- San Joaquin River Conservancy
- San Joaquin River Trail Council
- Sequoia Parks Foundation
- Sierra Business Council
- Sierra Club
- Sierra Club, Range of Light Group
- Sierra Nevada Alliance
- Sierra Nevada Aquatic Research Lab, University of California, Natural Reserve System
- Sierra Nevada Conservancy
- The Nature Conservancy
- Trust for Public Land
- White Mountain Research Station, University of California,
- The Wilderness Society

INDIVIDUALS

Copies were also mailed to approximately 60 individuals who signed up for mailings at public meetings and events.

List of Preparers

PLANNING TEAM COMPOSITION

NPS: Pacific West Regional Office

- **Amanda Kaplan**, Outdoor Recreation Planner/ GMP Project Manager
- **Brad Phillips**, Outdoor Recreation Planner
- **Barbara Butler**, Landscape Architect
- **Debra Campbell**, P.E., Line Item Construction Program Manager
- **Martha Crusius**, Chief of Planning and Environmental Compliance
- **Katelyn Walker**, Outdoor Recreation Planner
- **Marie Denn**, Aquatic Ecologist
- **Keith Dunbar**, Chief of Park Planning and Compliance (Retired)
- **Charles Palmer**, Historian
- **Trung-Son Nguyen**, RA, PMP, Architect/Project Manager
- **Stephen Bowes**, Outdoor Recreation Planner

NPS: Devils Postpile National Monument

- **Deanna Dulen**, Superintendent
- **Isaac Vaughn**, Administrative Officer
- **Maureen Finnerty**, Interpretation and Visitor Services Lead
- **Monica Buhler**, Ecologist and Resource Manager
- **Jonathan Winters**, Facility Manager
- **John Fernandes**, Maintenance Worker
- **Holly Alpert**, Ecologist (Former)
- **David Scott**, Park Ranger/Biological Technician (Former)

Other NPS Units or Offices

- **Charisse Sydoriak**, Chief of Resources, Sequoia and Kings Canyon National Park
- **Tom Medema**, Chief of Interpretation and Education, Yosemite National Park
- **Laura Kirn**, Branch Chief of Anthropology and Archeology, Yosemite National Park
- **Bret Meldrum**, Ph.D., Branch Chief for Visitor Use and Social Science, Yosemite National Park (Former)
- **Angela Evenden**, Great Basin Research Coordinator, CESU
- **Peggy Scherbaum**, Interpretive Planner, Harper's Ferry Center
- **Erin Flanagan**, Community Planner, Denver Service Center

U.S. Forest Service

- **Jon Regelbrugge**, District Ranger Mammoth and Mono Districts, Inyo National Forest
- **Sarah Johnston**, Heritage Resources/Tribal Relations Program Manager, Inyo National Forest
- **Constance Millar**, Ph.D., Research Ecologist, Pacific Southwest Research Station
- **Jeff Marsolais**, Recreation, Lands and Wilderness Staff Officer, Inyo National Forest (Former)
- **Michael Schlafmann**, Deputy District Ranger Mammoth and Mono Districts, Inyo National Forest (Former)
- **Susan Joyce**, Forest Planner, Inyo National Forest (Former)
- **Mary Beth Hennessy**, Resource Staff Officer, Inyo National Forest (Former)

U.S. Geological Survey

- **Chris Farrar**, Hydrologist (Retired)
- Wesley Edward Hildreth, Ph.D., Research Geologist
- William C. Evans, Ph.D. Research Chemist

Appendices

Previous page: Middle Fork of the San Joaquin River © Rod Planck

Appendix A: Presidential Proclamation and Wilderness Legislation

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

July 6, 1911.

A PROCLAMATION

WHEREAS the natural formations known as the Devil Postpile and Rainbow Falls, within the Sierra National Forest, in the State of California, are of scientific interest, and it appears that the public interests will be promoted by reserving said formations as a National Monument;

Devil Postpile National Monument, Cal. Preamble.

Now, therefore, I, William H. Taft, President of the United States of America, by virtue of the power in me vested by section two of the Act of Congress approved June eighth, nineteen hundred and six, entitled "An Act For the preservation of American antiquities," do proclaim that there are hereby reserved from all forms of appropriation under the public land laws, subject to all prior valid adverse claims, and set apart as a National Monument, all the tracts of land in the State of California shown as the Devil Postpile National Monument on the diagram forming a part hereof.

National Monument, Cal. Vol. 34, p. 225.

The reservation made by this proclamation is not intended to prevent the use of the lands for Forest purposes under the proclamation establishing the Sierra National Forest. The two reservations shall both be effective on the land withdrawn, but the National Monument hereby established shall be the dominant reservation and any use of the land which interferes with its preservation or protection as a National Monument is hereby forbidden.

Forest uses not impaired. Vol. 36, p. 2728.

Warning is hereby given to all unauthorized persons not to appropriate, injure, remove, or destroy any feature of this National Monument, or to locate or settle upon any of the lands reserved by this proclamation.

Reserved from settlement, etc.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the United States to be affixed.

Done at the City of Washington this sixth day of July, in the year of our Lord one thousand nine hundred and eleven, [SEAL.] and of the Independence of the United States the one hundred and thirty-sixth.

WM H TAFT

By the President:
P C KNOX
Secretary of State.

87618°—VOL 37—PT 2——50

1984 CALIFORNIA WILDERNESS ACT
Public Law 98-425, 98 STAT. 1619

DESIGNATION OF WILDERNESS

SEC. 101. (a) In furtherance of the purposes of the Wilderness Act, the following lands, as generally depicted on maps, appropriately referenced, dated July 1980 (except as otherwise dated) are hereby designated as wilderness) and therefore, as components of the National Wilderness Preservation System-

[. . .]

(15) certain lands in the Sierra and Inyo National Forests, California, which comprise approximately nine thousand acres, as generally depicted on a map entitled "Minarets Wilderness Additions-Proposed", and which are hereby incorporated in, and which shall be deemed to be a part of the Minarets Wilderness as designated by Public Law 88-577: Provided, That the existing Minarets Wilderness and additions thereto designated by this title henceforth shall be known as the Ansel Adams Wilderness.

[. . .]

ADMINISTRATION OF WILDERNESS AREAS

SEC. 103. (a) Subject to valid existing rights, each wilderness area designated by this title shall be administered by the Secretary concerned in accordance with the provisions of the Wilderness Act: Provided, That any reference in such provisions to the effective date of the Wilderness Act shall be deemed to be a reference to the effective date of this title.

Appendix B: Proposed Adjustment to the Devils Postpile National Monument Boundary

The 1978 National Parks and Recreation Act (16 USC 1a-7(b)), and NPS Management Policies 2006, mandate consideration of potential modifications to the external boundaries of National Park Service units when developing or updating general management plans. Therefore, as part of the planning process for the Devils Postpile National Monument General Management Plan, the planning team evaluated the boundaries of the monument. In accordance with NPS Management Policies 2006, the NPS considered whether any boundary adjustments would be necessary to:

- protect significant resources and values, or to enhance opportunities for public enjoyment related to park purposes; or
- address operational and management issues, such as the need for access or the need for boundaries to correspond to logical boundary delineations such as topographic or other natural features or roads; or
- otherwise protect park resources that are critical to fulfilling park purposes.

All recommendations for boundary changes must also meet the following two criteria:

- the added lands will be feasible to administer considering their size, configuration, and ownership; costs; the views of and impacts on local communities and surrounding jurisdictions; and other factors such as the presence of hazardous substances or exotic species.
- other alternatives for management and resource protection are not adequate.

PROPOSED ADJUSTMENT TO THE DEVILS POSTPILE NATIONAL MONUMENT BOUNDARY

Using the criteria, the NPS recommends additions to Devils Postpile National Monument's eastern boundary to include significant resources related to the monument's park purpose, improve operational efficiency, and enhance opportunities for public enjoyment. The proposed boundary adjustment would include approximately 275 acres of land currently managed by the Inyo National Forest east of the current monument boundary. The proposed boundary would extend east from the northeast corner of the monument to Reds Meadow Road, following a 100-foot setback from the centerline of the road south to the northeastern edge of Government Meadow. This section would also include a setback (TBD) to exclude a U.S. Forest Service water storage tank. South of Government Meadow, the boundary would follow 1200 feet east of the existing boundary until it meets the wilderness boundary. At this point the boundary adjustment follows 100 feet east of the Rainbow Falls trail. Government Meadow would be retained by the U.S. Forest Service which allows grazing of Forest Service stock in that area (See *Map B.1: Proposed Boundary Adjustment*). The boundary adjustment would include additional portions of the geological formations associated with Devils Postpile and Rainbow Falls, the entire segment of the Upper Middle Fork of the San Joaquin River between Devils Postpile and Rainbow Falls, and the entire trail connecting the two features.

Legislation would be required to authorize the boundary adjustment and transfer of U.S. Forest Service lands to the National Park Service.

BOUNDARY ADJUSTMENT CRITERIA

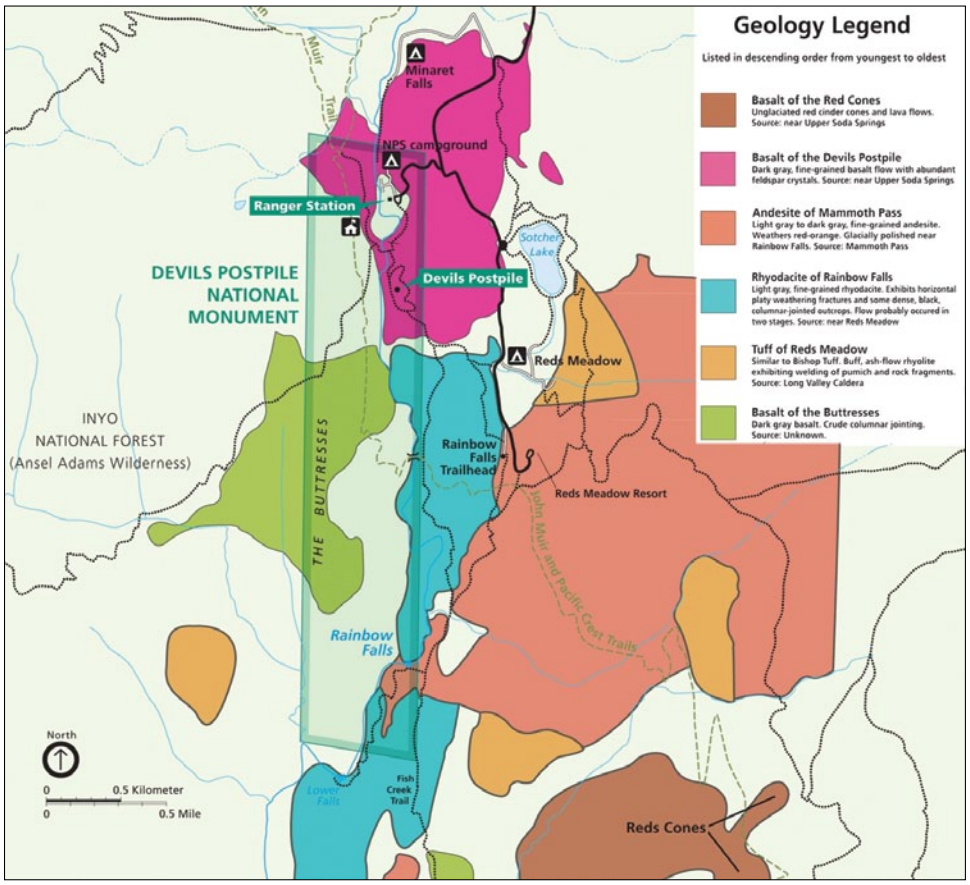
The following section addresses several criteria that must be considered for boundary adjustments in accordance with §3.5 of NPS Management Policies 2006.

Protection of Significant Resources or Opportunities to Enhance Public Enjoyment Related to the Purpose of Devils Postpile National Monument

Devils Postpile and Rainbow Falls Geologic Units

The proposed boundary adjustment would include additional resources related to park purpose and significance. The 1911 Presidential Proclamation establishing the monument called for protection of the natural features known as Devils Postpile and Rainbow Falls. Geologic surveys and mapping completed since the monument's establishment show that the formations associated with these geologic units, basalt of the Devils Postpile and rhyodacite of

FIGURE B.1: GEOLOGY OF THE DEVILS POSTPILE NATIONAL MONUMENT AREA



Rainbow Falls, extend well beyond the monument, primarily to the north and the east. For example, while the Postpile proper contains the best columns associated with the basalt of the Devils Postpile, more columnar outcrops are scattered and preserved throughout the geologic unit beyond the current monument boundaries. The proposed boundary adjustment would include additional portions of these units which lie outside of the monument. Including more of the geologic formations associated with Devils Postpile and Rainbow Falls would allow for new interpretive opportunities associated with these features. The monument could provide new trail alignments to protect sensitive areas of Devils Postpile such as the glacial polish while providing visitors with opportunities to view additional columnar outcrops and learn about the broader geologic formation.

Upper Middle Fork of the San Joaquin River

The map submitted with the 1911 Presidential Proclamation depicted an 800-acre rectangular boundary that included Devils Postpile, Rainbow Falls, and the entire stretch of the Upper Middle Fork of the San Joaquin River from just north of Soda Springs to just south of Rainbow Falls. Errors in subsequent boundary surveys resulted in a portion of the river falling outside of the monument boundary. The proposed boundary adjustment would include all portions of the Upper Middle Fork of the San Joaquin River between Devils Postpile and Rainbow Falls, as was intended in the 1911 Presidential Proclamation.

History of the Monument Boundary

At the time the monument was established, the area had not previously had any formal land surveys which made it difficult to determine an accurate boundary. In the months following the monument's establishment, Forest Service District Engineer Walter L. Huber conducted the first formal survey of the area to ensure that Devils Postpile and Rainbow Falls would be included within the boundaries of the monument.

Huber marked three corners but did not mark the boundary lines or the southeast corner of the monument. When the monument was transferred to the National Park Service in 1934 under the management of Yosemite National Park, Yosemite engineers set boundary lines based on Huber's markers and

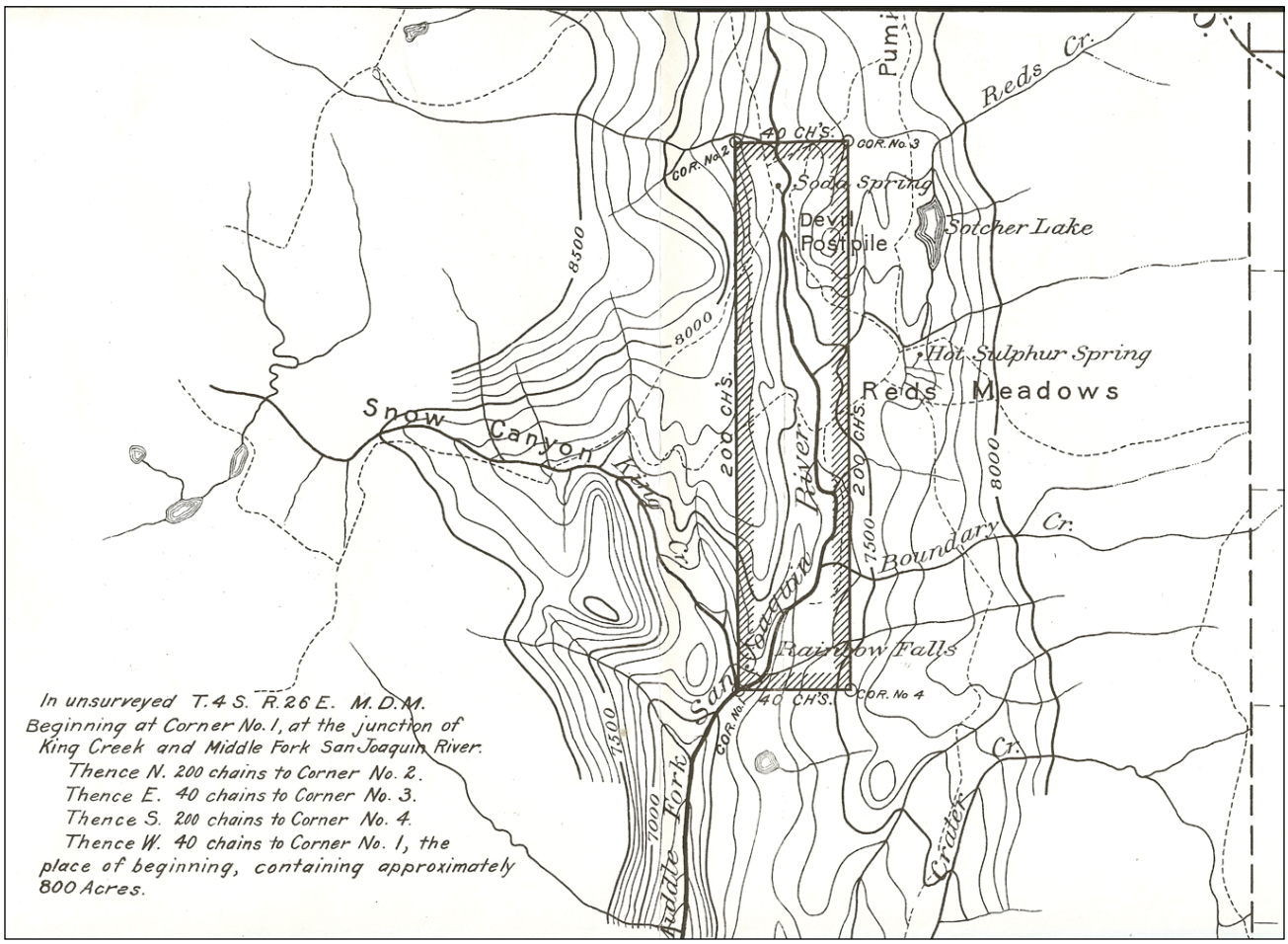
determined that Huber had laid out a parallelogram and not a rectangle. In deference to an early act of Congress that stated that field markers take precedence over paper maps, the Yosemite engineers decided not to conduct another survey to relocate the boundary to more accurately reflect the proclamation map.

Following the 1993 Rainbow Fire, which damaged survey points along the monument boundaries, a formal review of the monument boundaries was conducted. Findings from this evaluation determined that the Huber survey appeared to have gross errors within survey practice of that era. In 2012, the Bureau of Land Management Cadastral Office re-established the monument corners and created a revised boundary for the monument. However, the 2012 revised boundary still does not include a portion of the Upper Middle Fork of the San Joaquin River. The proposed boundary adjustment would include the segment of the Upper Middle Fork of the San Joaquin River that was originally intended to be included in the monument boundary.

Operational and Management Issues Related to Access and Boundary Identification or Other Natural Features

Primary visitor destinations within the monument are Devils Postpile and Rainbow Falls. Approximately, 83% of visitors to the monument visit Devils Postpile, while 76% visit Rainbow Falls (NPS 2006). A 2010 Visitor Use Monitoring Assessment found that many of the inbound trail users that visit Devils Postpile continue on to Rainbow Falls (NPS 2011). Visitors travelling from Devils Postpile to Rainbow Falls, or vice versa, exit to and from the monument across USFS lands. Most visitors are unaware of the jurisdictional changes and where they occur. This creates operational challenges for both agencies which have different regulations, allowable uses, and management approaches. For example, on Inyo National Forest lands dogs can walk off-leash while dogs must be on-leash in National Park

FIGURE B.2: HISTORIC SURVEY MAP OF DEVILS POSTPILE NATIONAL MONUMENT



units. Enforcement is difficult as the boundary is not readily apparent to staff. Re-aligning the trail within the monument is not feasible due to the terrain and sensitive resources located west of the river corridor. The proposed boundary adjustment includes the main trail connecting Devils Postpile to Rainbow Falls. The boundary is offset from the Reds Meadow Road and the trail, creating a more identifiable jurisdictional boundary.

Protection of Park Resources and Fulfillment of Park Purpose

The Presidential Proclamation for Devils Postpile National Monument specifically identifies Devils Postpile and Rainbow Falls as natural formations in need of protection. The Upper Middle Fork San Joaquin River corridor is identified as a fundamental resource in the monument's foundation document. The free flowing river, mineral springs, wetlands, riparian areas and other water-dependent features and communities are sustained by the naturally functioning, unpolluted surface and ground water systems. The proposed boundary adjustment would allow for more seamless management of these significant and fundamental resources.

Feasibility to Administer the Lands Added through Boundary Adjustment

The lands proposed for transfer are contiguous with the present monument, and form a logical boundary that provides for more efficient management of the area. Other than some expected administrative costs to carry out the transfer, no land costs would result to the federal government under this proposal.

With the exception of opportunities for new trails, the proposed area would not require additional facilities and infrastructure for protecting resources and providing for public enjoyment opportunities. There are no existing structures. The boundary adjustment would not require additional staffing beyond what is recommended in the two action alternatives proposed in the general management plan. Additional staff time would primarily be for trail maintenance.

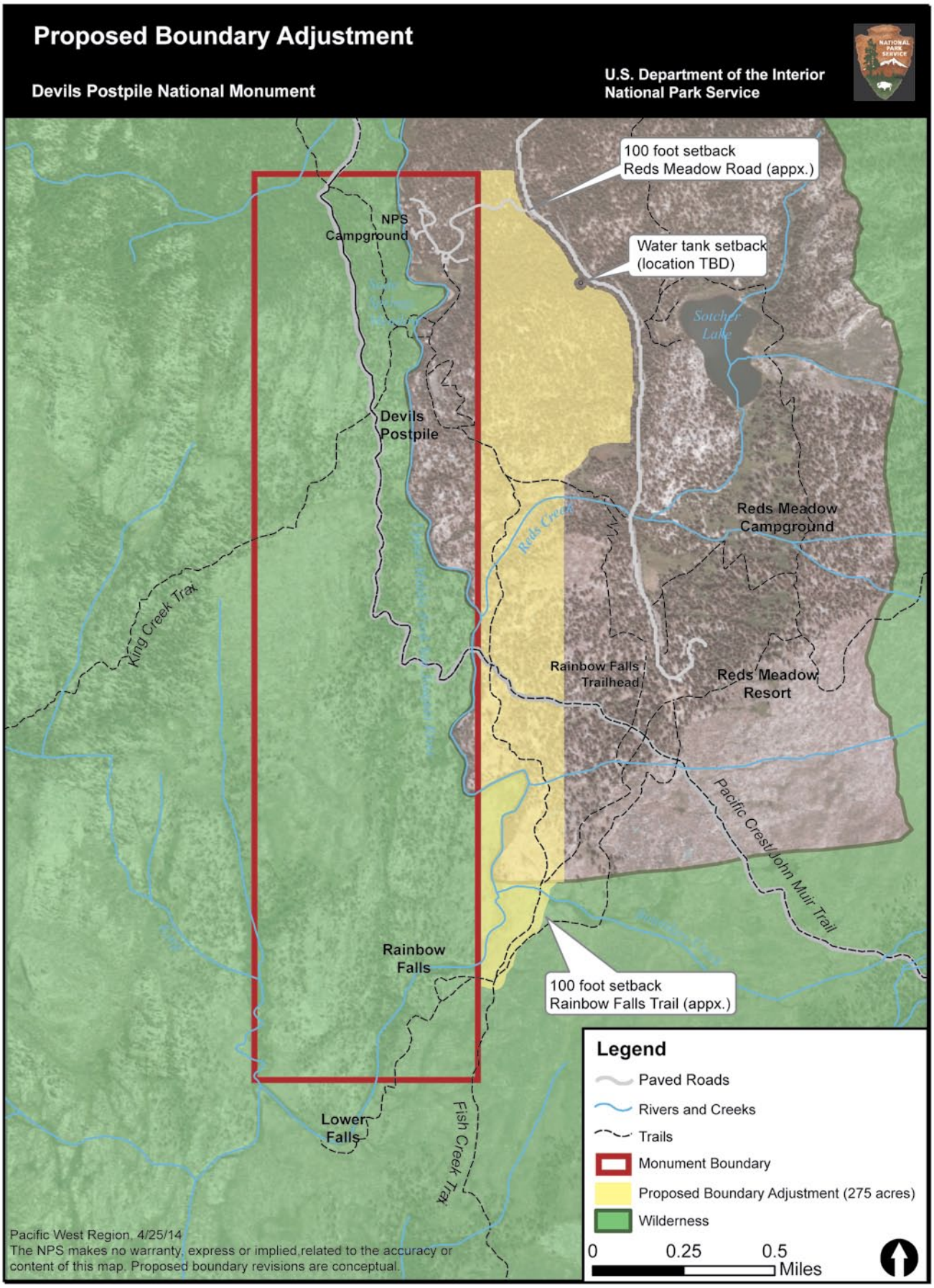
Protection Alternatives Considered

Another option considered was entering into additional agreements with the Inyo National Forest to create consistent regulatory management of the proposed boundary adjustment area. This solution would still require significant signage and educational outreach efforts to inform the public that this area has different regulations from other areas on the Inyo National Forest lands within Reds Meadow Valley.

Other Geographic Areas Considered but Rejected for Boundary Adjustment

Two other boundary adjustment proposals were considered for increased operational efficiency and resource protection. A broader boundary adjustment that would include the full extent of the geologic units associated with Devils Postpile and Rainbow Falls was considered (approximately 700 acres). This proposed boundary would include the basalt of the Devils Postpile and rhyodacite of Rainbow Falls geologic units, covering areas from Minaret Falls Campground to Lower Rainbow Falls. This option was dismissed for several reasons. A boundary tied to the geologic formations would not be easily apparent on the ground and could create administrative challenges for enforcement purposes. It was also determined that it was not necessary to include the entire rhyodacite of Rainbow Falls geologic unit to be able to protect the resource and enhance public enjoyment. Many of these areas are included in the Ansel Adams Wilderness. A second boundary adjustment was considered that would extend the monument boundary 1,000 feet further east to include the entire stretch of the Middle Fork of the San Joaquin River and the trail between Devils Postpile and Rainbow Falls (approximately 235 acres). This boundary adjustment did not include additional significant resources associated with the Devils Postpile feature, nor would it resolve the administrative challenges of enforcing a boundary that is difficult for staff and visitors to discern.

MAP B.1: PROPOSED BOUNDARY ADJUSTMENT



Appendix C: Pertinent Laws, Policies, and Procedures

The federal laws, executive orders, and policies and procedures applicable to the National Park System and the preparation of this plan are listed below.

FEDERAL LAWS APPLICABLE TO THE NATIONAL PARK SYSTEM

- Abandoned Shipwreck Act of 1987
- Acid Precipitation Act of 1980
- Act amending the act of October 2, 1968 (commonly called the Redwoods Act)
- Act of August 8, 1953
- Act of February 21, 1925
- Act of June 30, 1864
- Act of June 5, 1920
- Act of March 1, 1872
- Act of May 26, 1930
- Administrative Dispute Resolution Act
- Administrative Procedures Act
- Airport and Airway Development Act of 1970
- Airports In or Near National Parks Act
- Alaska National Interest Lands Conservation Act of 1980
- Alternative Dispute Resolution Act
- American Battlefield Protection Act of 1996
- American Folklife Preservation Act of 1976
- American Indian Religious Freedom Act
- Americans with Disabilities Act of 1990
- Antiquities Act of 1906
- Archeological and Historic Preservation Act of 1974
- Archeological Resources Protection Act of 1979
- Architectural Barriers Act of 1968
- Arizona Desert Wilderness Act (contains NPS boundary study provisions)
- Bald and Golden Eagles Protection Act
- Clean Air Act
- Coastal Barrier Resources Act
- Coastal Zone Management Act of 1972
- Comprehensive Environmental Response Compensation and Liability Act (commonly referred to as CERCLA or the Superfund Act)
- Department of Transportation Act of 1966
- Disposal of Materials on Public Lands (Material Act of 1947)
- Emergency Planning and Community Right-to-Know Act of 1986
- Endangered Species Act of 1973
- Endangered Species Conservation Act of 1969
- Energy Independence and Security Act of 2007
- Energy Supply and Environmental Coordination Act of 1974
- Estuary Protection Act
- Farmland Protection Policy Act
- Federal Advisory Committee Act
- Federal Aviation Act of 1958
- Federal Cave Resources Protection Act of 1988
- Federal Coal Leasing Amendments Act of 1976
- Federal Insecticide, Fungicide, and Rodenticide Act
- Federal Land Policy and Management Act
- Federal Power Act of 1920
- Federal Water Pollution Control Act (commonly referred to as Clean Water Act)
- Federal Water Power Act
- Federal Water Project Recreation Act
- Fish and Wildlife Coordination Act
- Flood Disaster Protection Act of 1973
- Food Security Act of 1985 (Sodbuster Law)
- Forest and Rangeland Renewable Resources Planning Act of 1974
- Freedom of Information Act
- General Authorities Act, October 7, 1976
- General Mining Act of 1872
- Geothermal Steam Act Amendments
- Geothermal Steam Act of 1970
- Grand Canyon National Park Enlargement Act
- Historic Sites Act of 1935
- Intergovernmental Cooperation Act of 1968
- Lacey Act of 1900
- Land and Water Conservation Fund Act of 1965
- Magnuson-Stevens Fishery Conservation and Management Act
- Management of Museum Properties Act of 1955
- Marine Mammal Protection Act of 1972
- Marine Protection, Research, and Sanctuaries Act of 1972 (commonly known as Ocean Dumping Act
- Migratory Bird Conservation Act
- Migratory Bird Treaty Act
- Mineral Leasing Act for Acquired Lands
- Mineral Leasing Act of 1920 (commonly referred to as Mineral Leasing Act or Mineral Lands Leasing Act)
- Mining in the Parks Act
- National Environmental Policy Act of 1969
- National Flood Insurance Act of 1968
- National Historic Preservation Act
- National Park Service Concession Management Improvement Act of 1998

- National Park Service Omnibus Management Act of 1998
- National Park System Concessions Policy Act
- National Park System General Authorities Act (Act to Improve the Administration of the National Park System), August 18, 1970
- National Park System New Areas Studies Act
- National Parks Air Tour Management Act of 2000
- National Parks and Recreation Act, November 10, 1978
- National Parks Overflights Act of 1987
- National Trails System Act
- National Trust Act of 1949
- National Wildlife Refuge System Administration Act of 1966
- Native American Grave Protection and Repatriation Act
- Negotiated Rulemaking Act of 1990
- Noise Control Act of 1972
- NPS Organic Act
- Outdoor Recreation Coordination Act of 1963
- Outer Continental Shelf Lands Act
- Park System Resource Protection Act
- Parks, Parkways, and Recreational Programs Act
- Payment in Lieu of Taxes Act
- Public Buildings Cooperative Use Act of 1976
- Rehabilitation Act of 1973
- Reorganization Act of March 3, 1933
- Reservoir Salvage Act of 1960
- Resource Conservation and Recovery Act of 1976
- Revised Statute 2477, Right-of-Way across Public Lands
- Rivers and Harbors Appropriation Act of 1899
- Safe Drinking Water Act
- Soil and Water Resources Conservation Act of 1977
- Surface Mining Control and Reclamation Act of 1977
- Surface Resources Use Act of 1955
- Surface Transportation Assistance Act of 1982
- Tax Reform Act of 1976
- Toxic Substances Control Act
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
- Urban Park and Recreation Recovery Act of 1978
- Water Resources Planning Act of 1965
- Watershed Protection and Flood Prevention Act
- Wild and Scenic Rivers Act
- Wilderness Act
- Wildfire Disaster Recovery Act of 1989

EXECUTIVE ORDERS APPLICABLE TO THE NATIONAL PARK SYSTEM

- Executive Order 11514: Protection and Enhancement of Environmental Quality
- Executive Order 11593: Protection and Enhancement of the Cultural Environment
- Executive Order 11644
- Executive Order 11987: Exotic Organisms, 42 FR 26949, Revoked by Executive Order 13112
- Executive Order 11988: Floodplain Management
- Executive Order 11990: Protection of Wetlands
- Executive Order 12003: Energy Policy and Conservation
- Executive Order 12088: Federal Compliance with Pollution Control Standards
- Executive Order 12372: Intergovernmental Review of Federal Programs
- Executive Order 12898: General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Executive Order 13006: Locating Federal Facilities on Historic Properties in our Nation's Central Cities
- Executive Order 13007: Indian Sacred Sites
- Executive Order 13089: Coral Reef Protection
- Executive Order 13112: Invasive Species.
- Executive Order 13158: Marine Protected Areas
- Executive Order 13175: Consultation and Coordination with Indian Tribal Governments
- Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds
- Executive Order 13352: Facilitation of Cooperative Conservation
- Executive Orders 11989 (42 FR 26959) and 11644 (37 FR 2877): Offroad Vehicles on Public Lands
- Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance

POLICIES AND PROCEDURES APPLICABLE TO THE NATIONAL PARK SYSTEM

- Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act
- Historic Preservation Certifications Pursuant to the Tax Reform Act of 1976, the Revenue Act of 1978, the Tax Treatment Extension Act of 1980, and the Economic Recovery Tax Act of 1981
- National Park Service Management Policies 2006
- Policies on Construction of Family Housing for Government Personnel
- Procedures for Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory

Appendix D: Determination of Extent Necessary

PURPOSE OF THIS EXTENT NECESSARY DETERMINATION

The purpose of this document is to determine limits on commercial services in the wilderness portion of Devils Postpile National Monument in accordance with the requirements of the Wilderness Act and NPS wilderness management policies. The limits described in this document apply only to the portion of the monument designated as wilderness (approximately 687 acres).

Devils Postpile NM has prepared a general management plan (GMP) for the monument. There is a relationship between this Extent Necessary Determination ("END") and the determination of overall user capacity in the GMP, which provides direction for visitor management in the monument, including wilderness. This determination tiers from the indicators and standards described in the GMP's user capacity analysis, which were developed in keeping with the Wilderness Act's requirement to preserve wilderness character.

LEGAL FRAMEWORK FOR EVALUATING COMMERCIAL SERVICES IN WILDERNESS

The Wilderness Act

The Wilderness Act was passed in 1964 to "secure for the American people of present and future generations the benefits of an enduring resource of wilderness." Section 4(c) of the Wilderness Act explicitly bars "commercial enterprises within designated wilderness areas." An exception to this ban, subject to limitations, is provided for commercial services such as guides and outfitters in section 4 (d) 6, which states that "commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas." "Wilderness purposes" are defined in section 4 (b) of the Act as "recreational, scenic, scientific, educational, conservation, and historical use."

NPS Wilderness Management Policies

The National Park Service Management Policies (2006) provides that wilderness-oriented commercial services which contribute to public education and visitor enjoyment of wilderness values or that provide opportunities for primitive and unconfined recreation may be authorized if the activities conform to NPS concessions management policies and the Wilderness Act, and if they are consistent with the park's wilderness management objectives. Commercial services must be consistent with the application of the minimum requirement concept and with the objectives of the park's management plans. See the last section of this document for the application of the minimum requirement concept for commercial allocation.

The National Park Service's Director's Order for Wilderness Stewardship requires the NPS to prepare a documented determination setting forth the types and amount of commercial services that are necessary to realize wilderness purposes. This END satisfies that requirement.

The END, together with the Environmental Assessment for the General Management Plan, was prepared using an interdisciplinary approach that included wilderness management experts, commercial services staff, and other resource specialists. Through the process of preparing this END and the Environmental Assessment, the NPS considered both the potential short-term and long-term impacts of commercial service activities.

In the sections that follow, we identify the types of "activities which are proper for realizing recreational and other wilderness purposes" and then determine the numeric amount of commercial services that are necessary to realize these purposes, ensuring that the number authorized is no more than necessary so that wilderness character will be preserved.

USER CAPACITY IN WILDERNESS

Prior to development of the general management plan (GMP), user capacities have never been determined for the wilderness portion of Devils Postpile National Monument. The GMP identifies standards and indicators related to visitor-caused impacts. Some of these standards and indicators apply to areas within wilderness, and are described below in Table D.1.

TABLE D.1: USER CAPACITY STANDARDS RELATING TO DESIGNATED WILDERNESS

USER CAPACITY STANDARDS (GENERAL MANAGEMENT PLAN)		
Location	**Indicator**	**Standard**
Visitor use levels at Rainbow Falls		
Portal Zone: Main Viewing Platform	Number of people at any one time	Visitation will not exceed 44 people at one time at the Rainbow Falls first (main) viewing platform 90% of the hours between 8am and 6pm.
Trail encounters with other people		
Natural Zone	Encounters per hour (number of times that individuals or groups are encountered by a trail user)	Wilderness visitors will not experience more than 10 encounters per hour on all wilderness trails west of the river in DEPO (inclusive of the John Muir Trail/ Pacific Crest Trail).
Wilderness trail condition		
Portal Zone:	Trail depth and width	Average wilderness trail conditions will not exceed 183cm (~6ft) wide and 46cm (~1.5ft) depth per trail mile.
Natural Zone:	Trail depth and width	Average wilderness trail conditions will not exceed 90cm (~3ft) wide and 30cm (~1ft) depth per trail mile.

DEFINITIONS

Definition of Proper Activities

Section 4 (d) (6) only allows commercial services for activities which are "proper for realizing the recreational or other wilderness purposes of the areas." Not all activities are proper or allowable in wilderness areas. Section 4(c) of the Wilderness Act prohibits public use of motor vehicles, other forms of mechanical transport, motorized equipment, and landing of aircraft. The 2006 Management Policies provide additional guidance on the types of activities that are proper in park wilderness areas. NPS policy states that recreational uses in wilderness will be of a nature that:

- Enables the areas to retain their primeval character and influence;
- Protects and preserves natural conditions;
- Leaves the imprint of man's work substantially unnoticeable;
- Provides outstanding opportunities for solitude or primitive and unconfined types of recreation; and
- Preserves wilderness in an unimpaired condition.

These restrictions apply equally to commercial and noncommercial public use. At Devils Postpile NM, proper wilderness activities are those traditionally associated with wilderness recreation, such as hiking, backpacking, stock use, rock climbing, photography, and nature study. Examples of improper (and illegal) activities include snowmobiling and mountain biking. For a commercial service to be considered, it must first be related to an activity that is proper in wilderness. Therefore, the only commercial services considered in this document are those related to the types of activities found to be proper in wilderness.

Definition of Commercial Services

Before the National Park Service can determine the types of commercial services that are necessary to further wilderness purposes, we must first determine which services are commercial in nature and which are not. The Wilderness Act does not define the term "commercial service." The word "commercial" is commonly defined as (1) "[o]f or relating to commerce," i.e., "[t]he buying and selling of goods, esp. on a large scale: business," (2) "[e]ngaged in commerce," (3) "[i]nvolved in work designed or planned for the mass market," or (4) [h]aving profit as a primary aim." The word "service" is commonly defined as, "the organized system of apparatus, appliances, employees, etc., for supplying some accommodation required by the public" or "the performance of any duties or work for another; helpful or professional activity." Activities that are necessary and proper for realizing wilderness purposes will be evaluated to determine whether they reflect consistent, commonly understood usage of the terms "commercial" and "services".

For purposes of this document, a commercial service is one that relates to or is connected with commerce wherein work is performed for another person or entity, if the primary purpose is the experience of wilderness through support provided for a fee or charge and if the primary effect is that the wilderness experi-

ence is guided and shaped through the use of support services provided for a fee or charge.

The form of the organization providing the service does not necessarily settle the question of whether the organization is offering a commercial service. For example, both for-profit and non-profit organizations could provide commercial services. Rather, the definitions above will guide a determination of whether a service is commercial or not.

Commercial services may be authorized under a number of different legal authorities, using a number of different instruments. Of relevance to designated wilderness areas within Devils Postpile National Monument are commercial use authorizations and special use permits.

Authorization Mechanisms for Commercial Services

Commercial Use Authorizations

Services authorized under commercial use authorizations are considered commercial services because the entities holding these authorizations are businesses engaged in commerce, they provide a service to the public, members of the public who use these services experience the wilderness directly as a result of this commercial support, and employees of the CUA holder direct and guide the wilderness experience of the trip participants. CUA holders who lead either stock or hiking trips are considered providers of commercial services.

Special Use Permits

Special Use Permits are used to authorize a wide range of activities, many of which are not commercial. Because Special Use Permits are issued on a case by case basis, it is not possible to evaluate all of the different activities that might be requested in a special use permit in advance. When a request for another type of Special Use Permit in wilderness is received, it will be evaluated in accordance with the criteria above to determine whether the activity constitutes a commercial service. If it does, a permit will only be authorized in accordance with the procedures set out below.

Application of the Purpose and Effect Analysis

For the majority of traditional wilderness outfitting and guide services the determination of whether an activity is considered commercial is straightforward. The commerciality of some uses is not as clear, however, and those uses are analyzed here.

Scientific Research:

Scientific research performed by faculty, postdoctoral fellows, or students enrolled in degree-granting programs in accredited colleges and universities or holding appointments with governmental agencies or scientific research institutions, even when accompanied by pack stock support, will typically not be considered commercial. Research trips using pack stock support would normally not be classified as a commercial service trip because the primary purpose and effect of the trip is the enhancement of scientific understanding of park resources, not commercial interests. The NPS will review requests for scientific research permits that involve the support of commercial outfitters to determine whether the trip is commercial. In the event that a research trip is categorized as a commercial service, a research permit will only be authorized in accordance with the procedures set out below.

Commercial Filming and Photography:

The NPS allows commercial filming and photography in national parks provided that there would not be a likelihood of resource damage, an unreasonable disruption of the public's use and enjoyment of the site, or a health or safety risk to the public. Filming involves movement or motion of the subject whereas photography does not. The NPS Management Policies define "commercial filming" as "filming that involves the digital or film recording of a visual image or sound recording by a person, business, or other entity for a market audience." All commercial filming is subject to permitting requirements, and is limited to projects that are necessary or proper for providing educational information about wilderness uses, resources or values, or necessary for other wilderness purposes. Commercial still photography activities that involve the use of models, sets or props that are not part of the location's existing setting or that promote a product or service are prohibited in wilderness. Based on the NPS policy cited above, all commercial photography and commercial filming will be treated as a commercial service. In most cases, a permit applicant will be asked to find locations outside of wilderness. If wilderness locations are justified, then the activities should minimize impacts to other visitors' enjoyment of wilderness and only use the minimum amount of the wilderness needed for the activity for the shortest possible period of time.

Trips by Educational Institutions

The park receives requests for wilderness trips by student groups from accredited educational institutions which are conducting classes for course credit. These institutions range from elementary, middle and high schools to colleges and universities. The goal of these trips is to provide environmental education to students and to foster self-reliance and knowledge of the fundamental resources and values of the monument. In some cases, employees of the educational institution guide the trip. In others, the school retains the services of an institution with expertise in environmental education. Trips by accredited academic institutions which give course credit for completion, even if facilitated by an outside institution, are not considered commercial services for the purposes of this determination. The primary purpose and effect of these trips is fulfilling academic goals, consistent with the monument's purpose and significance, for the students involved. The students' experience is guided and shaped by the institution's academic goals. Support services from environmental education organizations do not change the essential character of the trip, which is academic not commercial.

DEFINITION OF WILDERNESS PURPOSES

Recreation

All visitors to the wilderness portion of Devils Postpile NM help to realize the recreational purpose. The recreational purpose is realized when people are engaged in proper activities in wilderness. Those activities are described above. Hiking, backpacking, horseback riding, fishing, and nature study are just a few examples of the many ways that visitors help to realize this purpose.

Education

While many wilderness visitors are engaged in some type of informal, self-directed education, formal education is also necessary to realize the educational purpose.

Examples of formal education that realize the educational purpose of wilderness include, but are not limited to the following:

"How to" education on such topics as:

- Equipment selection
- Navigation
- Wilderness first aid
- Travel skills

Coursework on wilderness values, ethics or philosophy including:

- Natural history
- Human or cultural history
- Wilderness values
- Environmental social or political history
- Environmental philosophy

Coursework on scientific aspects of wilderness, such as:

- Biology
- Geology
- Zoology
- Fire ecology
- Climate change impacts

Making of educational films about wilderness, including but not limited to those about wilderness:

- Wilderness values
- Natural history
- Human or cultural history
- Famous wilderness defenders such as John Muir
- Endangered species preservation
- Instructional films covering wilderness skills and techniques
- Films covering climate change challenges for wilderness management

Exception:

- Leave No Trace training is considered a fundamental prerequisite for all wilderness

visitors and as such will not be considered formal education.

Scenic

Wilderness possesses a particular type of scenery - natural and untrammeled. The scenic purpose is realized when visitors observe the natural landscape of wilderness. It is also realized when people take photographs of scenery and share them with others outside of the wilderness. As with the educational purpose, however, there is a more formal appreciation of scenery that is enjoyed by photographers and other artists. Commercial services provide necessary support for this purpose if they offer photography, painting, or even writing workshops that focus on appreciating and interpreting the scenery. Commercial filming, videography, audiography, and photography also realize the scenic purpose if they focus on wilderness scenery and soundscape.

Conservation

Conservation means actions that help to maintain the wilderness in a largely natural and untrammeled state, with native biodiversity intact and natural processes uninterrupted.

Examples of activities in wilderness that help to realize the conservation purpose include, but are not limited to:

- Ecological restoration projects
- Trail building and maintenance
- Species preservation activities
- Eradication or removal of non-native invasive species

Realizing the conservation purpose is primarily an agency responsibility. Occasionally a visitor group conducts a "service trip" that includes conservation work. At Devils Postpile NM, however, these groups are not able to work independently of NPS control and supervision. They are designated as volunteers. If the primary purpose of the service trip is that of learning through participation in the service activity rather than that of constructing, implementing or maintaining the conservation project itself, then the purpose and effect is non-commercial.

Historic

"Historic uses" are defined as those uses which emphasize the wild, untrammeled, and natural character of the land in its historic state. Visitors help to realize the historic purpose when they encounter the land as did those of earlier historical periods. The historic purpose is realized by maintaining the wilderness character of the land, by primitive recreation in the wilderness, by the provision of opportunities for solitude, and by enjoying the scenic wonders of the natural and untrammeled landscape. The realization of this purpose is consistent with the realization of the conservation and recreational purposes.

No commercial services are necessary for the realization of the historical purpose because its realization is congruent with the realization of the conservation and recreational purposes.

Scientific

The natural and untrammeled qualities of wilderness make an area valuable to science. Realizing the scientific purpose means allowing scientific research and monitoring to take place in wilderness. Unlike conservation activities, scientific activities fall on a spectrum from administrative to independent: Some are conducted by the agency, some are conducted by academics but sponsored or overseen by the agency, and some are conducted by independent academics or graduate students. Research conducted by or for the NPS is considered administrative, not commercial. On rare occasions, an independent researcher might require commercial services to pack in supplies. However as discussed above, the incidental use of pack services to support a research trip typically would not convert a research trip into a commercial service.

At Devils Postpile, research is reviewed by an interdisciplinary permit committee and limited though a process articulated in An Interagency Framework to Evaluate Proposals for Scientific Activities in Wilderness. This framework, including the application of the minimum requirement concept, provides methods to quantify the impacts and benefits of research, compare costs and benefits, and prioritize research proposals.

EXTENT NECESSARY DETERMINATION

This section describes the thresholds and methods used to determine limits on commercial services in the wilderness portions of Devils Postpile National Monument. As noted above, no commercial services

are needed for the realization of the historic, scientific, or conservation purposes.

Overnight Use

Overnight wilderness use is not allowed at Devils Postpile. Those seeking overnight wilderness experiences may pass through the monument to the larger wilderness beyond. Commercial services originating outside of the monument and passing through the monument in transit to overnight wilderness experiences elsewhere are addressed in the Day Use discussion below.

Day Use

As part of the development of this END and the GMP, the NPS conducted user capacity studies to determine appropriate capacities for visitor use of Devils Postpile wilderness. Additional information and background on these studies are described in the GMP. Along with group size limits identified in the Superintendent's Compendium, the indicators and standards presented in Table D.1 will be used to manage visitor use of wilderness use and maintain wilderness character. These indicators and standards will be used to manage both commercial and non-commercial uses in wilderness.

Stock Use at Rainbow Falls

In the case of Rainbow Falls, stock use is considered a proper activity for enabling visitors to realize the recreational purpose of wilderness. The activity is not prohibited by law or policy and is compatible with desired conditions for wilderness character as described in the general management plan. Stock rides are a traditional and long-standing form of recreation in the mountain west and are traditionally associated with this wilderness area in particular, as an historically important mode of transportation in the Sierra. Commercial services related to stock use are also necessary for several reasons. Being relatively close to a road and with easy trail access, the area has long served as an introductory wilderness experience for visitors. In particular, continued stock use has provided introductory wilderness experiences to many who would not have otherwise visited wilderness, including people with varying physical abilities. Providing introductory wilderness opportunities has long been an important part of the visitor experience at Devils Postpile NM. Its use as a wilderness portal has been defined as a fundamental value by the NPS (See *Chapter 2, Foundation for Planning and Management*). It has been described as an entryway to exploration, understanding, and appreciation of wilderness character and values. Stock day use supports this emphasis on introductory experiences. In addition, the transportation, staging, and use of personal stock in the valley are difficult. In particular, the access road to the valley is steep and narrow, making trailering difficult. The availability of commercial stock rides makes this activity available for more visitors, when the costs and skills required would be prohibitive for most.

Stock use has not detracted from wilderness character at Rainbow Falls. The only related infrastructure in wilderness is the stock trail and hitching post, both of which are small-scale, unobtrusive, and located away from high-traffic areas. The pack station and trailhead are located well outside of wilderness. Rainbow Falls is one of two primary attractions in an approximately 800-acre monument, which itself is an entry point into a vast wilderness beyond the monument, and an opportunity for people of many abilities and experience levels to enter and learn about wilderness. This was true when Congress included Rainbow Falls within the outer edge of the Ansel Adams Wilderness and remains true today. As such, visitor expectations for solitude have been found to be low at Rainbow Falls, where most people report that encounters with others adds to their enjoyment of the area (Vezeau et al. 2011). Thus, the visitor use levels at which solitude can be maintained before being degraded is higher at Rainbow Falls than one might expect in a more remote and less well-known wilderness location.

The GMP sets visitor capacity for Rainbow Falls at no more than 44 people at one time (PAOT) at the first viewing platform, 90% of the time between 8:00 a.m. and 6:00 p.m. Monitoring will occur every 1-3 years and sampling will range from 10-15 days across a season, stratified across weekends and weekdays. Recent monitoring indicates that this standard is not being exceeded by existing levels of visitor use (Vezeau et al. 2011).

Although current use levels are not exceeding the standard set for the Rainbow Falls viewing platforms, use levels may approach this capacity limit in the future. In this event, managers will take actions to avoid exceeding the standard. These actions may include restrictions on commercial stock use. Such restrictions, if needed, will be tailored to ensure that non-commercial users continue to have access to this area at times of high use. Hourly restrictions could first be

employed, then weekend restrictions if necessary. In such an instance, the objective may be achievable with a short, mid-day commercial use restriction on weekends, rather than a full weekend restriction. Because current use levels at Rainbow Falls are not likely exceeding the management action trigger of no more than 44 people, 90% of the time, commercial stock day use at Rainbow Falls may continue at levels currently permitted by the U.S. Forest Service from their trailhead (1440 day rides per season) in realization of the purpose of wilderness.

Use of Wilderness Trails

The overall user capacity standard provided in the GMP states that wilderness visitors will not experience more than ten encounters per hour on the west side of the river. Beyond this standard, the quality of the wilderness experience is considered to be degraded. The monument has determined that allowance of two commercial groups per day on the west side of the river will not elevate use appreciably toward this standard and will not displace noncommercial users or degrade their experience. These groups will be subject to group size limits contained in the Superintendent's Compendium. Through the monitoring program associated with this indicator, the NPS will be able to track possible increases in non-commercial use of trails. If use increases in the future such that non-commercial users are being displaced by commercial use, the NPS would take action to ensure non-commercial opportunities by further restricting or eliminating commercial use in these areas.

Disabled Access

NPS Management Policies state that the agency must "make available equal opportunities for people with disabilities in all programs and activities" (NPS 2006) For some people who are mobility impaired, commercial stock services may provide the only reasonable way to access the wilderness. This Extent Necessary Determination allows commercial stock use to continue at current levels, providing plentiful "equal opportunities" for mobility impaired individuals to use commercial stock trips to visit wilderness within the monument.

Extent Necessary Calculations

The following is an application of the rules stated above to the wilderness portions of Devils Postpile National Monument. The day use allocations are summarized in Table D.2. Overnight commercial use within the monument is not permitted.

Minimum Requirements Policy

By policy, the National Park Service must also apply the minimum requirement concept to individual decisions about commercial use in wilderness. The minimum requirement concept is a two part process that determines "if administrative actions, projects, or programs undertaken by the Service or its agent and affecting wilderness character, resources, or the visitor experience are necessary, and, if so how to minimize impacts."

Part of a minimum requirement decision is determining whether an activity is wilderness dependent. Wilderness dependence as used here means that if the activity can occur outside of wilderness with little loss of value, it should not take place in wilderness. The wilderness dependence criteria will be used during the application screening process. Proposed commercial activities determined proper under an extent necessary analysis and meeting a purpose of wilderness may nevertheless be denied or restricted through a minimum requirement decision.

TABLE D.2: COMMERCIAL RESTRICTIONS SUMMARY

COMMERCIAL RESTRICTIONS	
Trails east of the river	**Trails west of the river**
Stock use: 1440 day rides to Rainbow Falls per season* Other (fishing, photography, etc): No more than two groups per day*	No more than two groups per day*
*So long as user capacity standards are not exceeded	

Appendix E: Wild and Scenic River Eligibility and Suitability

WILD AND SCENIC RIVERS ACT – CRITERIA & PROCESS

The Wild and Scenic Rivers Act (WSR), passed in 1968, protects the free-flowing waters of many of our nation's greatest rivers, while also recognizing the potential for appropriate use and development. It ensures the public's enjoyment of the river and its resources for present and future generations; new dams and other water resources projects that would have adverse impacts are prohibited on WSR segments. There are three different classification types based on the existing level of human development or impact on the river –wild, scenic, and recreational. To be eligible for inclusion in this system, a river must be free-flowing and possess at least one river-dependent outstandingly remarkable value (ORVs) or characteristic that is unique, rare, or exemplary compared on a regional or national scale. If a river is found eligible, the next step is a suitability analysis which assesses whether or not eligible segments should be included in the National WSR System. The suitability study findings are based on public input and an assessment of the ability of the river segment(s) to be managed to protect the outstandingly remarkable river values. Designation of the river into the National WSR System can happen either by Act of Congress or by the Secretary of the Interior through a recommendation from a state's Governor (Section 2(a) (ii)). The WSR Act also requires federal agencies to evaluate rivers for inclusion in the National WSR System as part of their land management planning processes. This document contains updates to a previous eligibility determination for the Middle Fork of the San Joaquin River and a suitability analysis for the portion of the river found within Devils Postpile National Monument.

Eligibility

The WSR Act has two requirements for eligibility; the river segment must be free-flowing and possess one or more outstandingly remarkable value in fish, wildlife, geological, recreational, scenic, historic, cultural, or other similar value.

FREE-FLOWING CONDITION

"Free-flowing" is defined in section 16(b) of the Act as:

…existing or flowing in natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway. The existence, however, of low dams, diversion works, and other minor structures... shall not automatically bar its consideration for inclusion: Provided, that this shall not be construed to authorize, intend, or encourage future construction of such structures within components of the National Wild and Scenic Rivers System.

OUTSTANDINGLY REMARKABLE VALUES

The second criteria that a river must meet to be eligible for inclusion in the WSR System is that it must possess one or more Outstandingly Remarkable Values (ORVs). An ORV is defined as a river-dependent feature that is unique, rare, or exemplary at a comparable regional or national level. Typically, a "region" is defined on the scale of an administrative unit, a portion of a state, or an appropriately scaled physiographic or hydrologic unit. To be considered river-dependent, a value must be located in the river or on its immediate shorelands and contribute substantially to the functioning of the river ecosystem or owe its location or existence to the presence of the river. A determination of whether or not a river area contains ORVs is based on the professional judgment of the interdisciplinary study team utilizing criteria set forth by the WSR Interagency Council. A summary of the ORVs for the Middle Fork of the San Joaquin is found in Table E.2.

WATER QUALITY

The two broad river values mentioned above (free-flowing condition and ORVs) must be protected when a river is found eligible, along with a third value; water quality. Although observations are few, water quality in the Upper Middle Fork of the San Joaquin is excellent as there is very limited human development upstream of the monument (NPS 1998). Minor, localized degradation of water quality – consisting of greater than background concentrations of organic nutrients and animal-derived organisms such as fecal coliform, Enterococcus coli, and Giardia lamblia – can be attributed to stock use and recreational activities.

Water quality in the watershed is also degraded by wet and dry deposition of wind transported pesticides and other agricultural products originating in the Central Valley. These chemicals can have disproportionately large impacts on Sierra biota relative to their naturally low concentration in Sierra waters. However, detection of the presence and trends of this impact is minimal due to the high cost of monitoring these trace chemicals in high-elevation streams and lakes.

BACKGROUND

The Middle Fork of the San Joaquin River (MFSJR) was previously determined eligible for inclusion in the National WSR System in 1991. These findings were produced and published by the Sierra National Forest in Appendix E of their Forest Land and Resource Management Plan (1991). Because they were prepared by a neighboring entity and were not published in an Inyo National Forest or Devils Postpile National Monument document, the findings have not been widely known or understood by managers or the public alike. During the GMP planning process, these findings were resurfaced. The GMP planning team elected to provide some updates to the eligibility analysis, while retaining its overall conclusions and classifications. The following sections republish the 1991 eligibility findings with some updated information relating to Devils Postpile NM. Any updates to the 1991 eligibility analysis were created through the interdisciplinary GMP planning process and apply only to the portion of the river located within Devils Postpile National Monument. Such updates are clearly noted in the text by placement in brackets.

Sections below are republished from Chapter 7 (Appendices) of the Final Environmental Impact Statement, Forest Land and Resource Management Plan, Sierra National Forest (1991). Updates pertaining to values and resources in the monument are marked with brackets.

MIDDLE FORK SAN JOAQUIN RIVER

- Study area: Confluence with the North Fork of the San Joaquin River to source at Thousand Island Lake
- Length: 22 miles
- Physiographic section: Cascade-Sierra Nevada
- State: California
- County: Madera
- Congressional District: [2013 update: 19]
- Source: Thousand Island Lake, Inyo National Forest, Madera County

PHYSICAL DESCRIPTION

The Middle Fork San Joaquin River flows from its source at 9,800 feet through volcanic formations and a sheer granitic canyon to its confluence with the North Fork at 4,800 feet. The river is one of the few remaining completely free-flowing High Sierra rivers and man-made intrusions are minimal.

Geology and Soils

The river meanders through a glacially-formed U-shaped gorge surrounded by sheer granitic domes extending through the main crest of the Sierra-Nevada.

[2014 Devils Postpile NM update: Within Devils Postpile NM, the river corridor contains several examples of exemplary geologic features. The entire length displays a diverse set of products of very recent volcanism and glaciation, along with evidence of earlier geologic activity of the Sierra Nevada, much of it carved and altered over time by the river. Some of the monument's geologic features, including examples of columnar jointing, are often found on the banks and in the bed of the river. While most Sierra Nevada waterfalls were created by glaciers, the sheer face of Rainbow Falls is due to the river's differential erosion of two volcanic rock layers.]

Except for the gorge portions of the river where the Middle Fork has cut to bedrock, soil and sediments in meadows and river terraces are of granitic and volcanic origin.

Vegetation

The river flows through a lodgepole-red fir forest in the upper reaches and ponderosa pine forest downstream. Chaparral and oak woodlands also occur at lower elevations. No unusual or notable plant communities are present.

The river is one of a few which transect a broad elevation range of the Sierra Nevada from high country to foothills, with no reservoirs or major diversions along the way. This offers an important genetic continuity to the aquatic and riparian communities as well

as for people who are interested in long-term scientific research.

[2014 Devils Postpile NM update:The following description is provided as an update to the 1991 section on vegetation but, as in 1991, it does not describe river-dependent values to be protected. See the update on *biodiversity* for related river-dependent values.

Conifer-dominated vegetation covers 69.3% of the monument while broadleaved trees including mountain alder (Alnus incana), black cottonwood (Populus trichocarpa ssp balsamifera), and quaking aspen (Populus tremuloides) comprise only 2.9% of the monument. Shrub dominated ecosystems cover 17.5% of the monument with the dominant species including whitethorn ceanothus (Ceanothus cordulatus), huckleberry oak (Quercus vaccinifolia), and manzanita (Arctostaphylos spp). Wetlands cover approximately 7.5% of the total monument land area. Dominant wetland species include willows, horsetail (Equisetum spp.), sedges (Carex spp.), and rushes (Juncus spp.).]

Wildlife

The steep slopes limit deer use, however, this is an important part of the San Joaquin deer herd summer range. About 150 wildlife species are potential inhabitants of this area. Essential habitat for federally-listed threated or endangered species does not occur. There is potential nesting habitat for peregrine falcons along the river.

[2014 Devils Postpile NM update:The following description is provided as an update to the 1991 section on wildlife but, as in 1991, it does not describe river-dependent values to be protected. See the update on *biodiversity* for related river-dependent values.

Approximately 163 - 179 vertebrate species are known or suspected to occur in Devils Postpile NM as of 2010. Counts vary by source, with those in the online NPSpecies database differing from the sum of vertebrates from independent research. While little information is known about some animal groups such as amphibians and reptiles, much more is known about others, including birds and bats.

The most frequently observed vertebrates are birds, deer, and small diurnal mammals. Two amphibian species and six reptiles are definitively documented for the monument. An inventory of species confirmed or suspected of being present in the monument is maintained through the NPSpecies database (now incorporated into the NPS Integrated Resource Management Applications, or IRMA).

It is more meaningful to discuss vertebrates in the context of the larger Middle Fork of the San Joaquin River watershed, due to the mobility of many animals and their habitat requirements that extend well beyond the monument boundaries. Although no comprehensive survey has yet occurred in the larger watershed, vertebrate species for the Upper Middle Fork San Joaquin River (UMFSJ) are probably more diverse as the elevation gradient of the watershed is greater than that of the monument, spanning a larger diversity of habitat types and life zones. Further inventory and research projects are desirable to better document animal distribution and abundance within this watershed.

The structurally diverse range of habitats in the watershed are nestled primarily in wilderness and with a small footprint of low-key development in the recreation corridor of Devils Postpile NM/ Reds Meadow, providing high species diversity and important linkages between terrestrial and aquatic species. Furthermore, the watershed provides critical linkages to the surrounding contiguous landscapes of the Sierra Nevada ecosystem that includes the Ansel Adams and John Muir Wilderness, Inyo and Sierra National Forests, and Yosemite and Sequoia Kings Canyon National Parks.

The varied topography and vegetation (including mixed-conifer forests, shrublands, wetlands, and riparian areas) provide a diversity of habitats for vertebrates. Wetlands are known to be highly productive systems with substantial biodiversity. Numerous wetlands in the monument are known to be important feeding areas for bird and bat species. The close proximity of relatively low passes (Mammoth Pass and Minaret Vista) contributes to local biodiversity by allowing movement of animals among surrounding diverse habitats.]

Biodiversity [2014 update]

Although no vegetation and wildlife ORVs were identified in 1991, this eligibility analysis is being updated to reflect the convergence of south, central, and northern Sierra Nevada biogeographic regions, overlapping boundaries of many species' ranges, and presence of migratory corridors. These factors create an unusually high level of biodiversity for the region, including river-dependent species.

Devils Postpile NM is situated in the Sierra Nevada floristic province that encompasses nearly 25,000 square miles of foothill and higher elevation habitats. Contributing to the diversity of vegetation of the monument is the location of the monument adjacent to the lowest passes on the Sierra Divide. In this part of the mountain range at Mammoth Pass and San Joaquin Ridge, several species have migrated from the Great Basin floristic province to the Middle Fork of the San Joaquin River watershed. Within California, these provinces are situated within the larger California Floristic Province that extends west from the Sierra Nevada crest. The overlap of species and floristic provinces at the monument in this region provides insights into the migrations of species over time, and the importance of the low passes within the major cordillera as important migratory corridors.

The Middle Fork of the San Joaquin River corridor and valley bottom, the ascending slopes to the Minaret, Mammoth and Donahue Passes, and the surrounding high peaks of the Minaret Range, Banner, Ritter, and Mammoth Mountain provide diverse habitats and habitat connectivity for a wide range of wildlife assemblages. The topography of the Middle Fork of the San Joaquin valley is at the ecotone of the central Sierra and Great Basin, resulting in a high diversity of plant species and habitat. It also provides important migratory corridors across the low passes, the San Joaquin Ridge and the San Joaquin River Corridor. Further enhancing the diversity of the watershed is the relatively low elevation (7,500 feet) in such close proximity to the Sierra Nevada Divide. This habitat is further enriched by the Middle Fork of the San Joaquin River that flows from headwaters to Thousand Island Lake and downstream through a riparian corridor that sustains forest and wetland habitats. The north-south axis of the UMFSJ and 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.

The UMFSJ provides habitat for aquatic and wetland species in the monument. Riparian trees bordering the river include willow species (*Salix lasiolepis, S. lemmonii*), aspen (*Populus tremuloides*), and black cottonwood (*Populus balsamifera ssp. trichocarpa*) (Denn and Shorrok 2009). During spring and summer months the UMFSJ and its tributaries are "losing" streams: water leaves the channels, feeding adjacent wetlands. The monument lands include over forty acres of vegetated wetlands dependent on UMFSJ-derived surface- or ground-water. Dominant vegetation types in these wetlands include herbaceous sedge (*Carex spp*, *Schoenoplectus spp*.) and rush (*Juncus spp*.) communities as well as shrubby willow stands (Denn and Shorrok 2009). Soda Springs Meadow – a wetland complex supported by UMFSJ river water and visited by most travelers to the Postpile – contains the greatest diversity of invertebrates per area observed in the Sierra Nevada (Holmquist and Schmidt-Gengenbach 2005).

Because the Interagency WSR Council's guidance for outstandingly remarkable values allows consideration of habitat and species diversity for both wildlife and vegetative resources, the GMP planning team has determined that biodiversity is an ORV on the MFSJ River.

Landownership and Use

Inyo National Forest: 70% or about 15 miles; Sierra National Forest: 18% or about 4 miles; Devils Postpile National Monument: 12% or about 3 miles.

Land use is primarily for recreation. There are no known mining claims on Middle Fork San Joaquin River.

The Reds Meadow Road is the only access to the upper portions of the river. From the road, four access points approach, but do not cross the river: Soda Springs, Pumice Flat, Minaret Falls Campground, and Devils Postpile National Monument. The Pacific Crest Trail traverses the river corridor for about 14 miles from the source to near Rainbow Falls. Several other foot trails provide access to the headwaters to Lower falls, a distance of 12 miles. Trail access to the river is provided by the Hells Half Acre, South Fork, Cassidy, Miller Crossing, Devils Postpile, John Muir, Rainbow Falls, Junction Butte, Pine Flat, Pond Lily Lake, Lower Falls, Shadow Lake, and River Trails. Trail crossings vary from relatively easy in the upper reaches to very hazardous fords in some of the lower areas. Bridges are located at the Cassidy, Devils Postpile, Upper Soda Springs, and Shadow Lake Trail crossing.

Recreation

The prime recreational attraction is fishing. Camping, hiking, viewing scenery, and nature study are also common recreational uses along the corridor. Horseback riding occurs along the upper reaches of the river where the terrain is more gentle. Some rock

climbing occurs on the granite walls and domes near the river. Camping and outdoor recreation is heavy near the Red Meadow/Agnew Meadow areas and light in the other areas where many portions of the river are inaccessible. In the Reds Meadow/Agnew Meadow composite area, 130,000 RVD were spent during fiscal year 1984. Existing capacity in the area is 2,500 PAOT. Potential use is 185,000 RVD with 3,200 PAOT. Including the use at Devils Postpile National Monument, which amount to 20,500 RVD, the total for the combined area was 150,000 RVD in fiscal year 1984.

From the upper reaches of the river to the source, there were 20,000 RVD. For the river gorge below lower falls to the confluence within the Forest, use is very low, estimated at 200 RVD for the same 1984 use period.

Due to the steep rugged nature of most of the stream course, there is no rafting on the river. The entire river (25 miles) is within or forms a portion of the eastern boundary of Ansel Adams Wilderness.

[2014 Devils Postpile NM update: During the 2004 to 2007 period, average summer use at Devils Postpile National Monument was 143,868 visitors per year, with an estimated daily average of approximately 2,000 during peak season. The average length of stay for day use is 4-5 hours and for overnight use is 2.5 days. The monument is also used as an access point for backcountry hikers heading for the Pacific Crest Trail and the John Muir Trail. These two nationally recognized trails intersect and follow the river corridor along much of its length. Nearly all visitors interact with the river during their visit.

Rainbow Falls, the second most visited attraction in the monument, sees 600-700 visitors on a weekend day during peak season. Almost half of the visitors who begin hiking at the monument headquarters walk the four miles to Rainbow Falls and then through to the Rainbow Falls trailhead.

Most visitor use is focused at the northeastern area of the monument, in the day use area, campground, parking lot, and visitor center, all adjacent to the river. Another large portion is distributed along the northern reach of the river and the trails that lead to the Postpile and Rainbow Falls.

In a 2006 visitor use study, visitors reported general sightseeing, hiking, enjoying solitude, bird and wildlife viewing, picnicking, fishing, and camping as popular activities in the monument. Many of these activities are carried out on or enhanced by the river itself. Fishing, in particular, is a river-dependent activity highly valued by many visitors.]

Scenery

From its source at Thousand Island Lake (made famous by photographer Ansel Adams), the river flows south through spectacular high country between Ritter Ridge with its needle-like Minarets, and the Sierra escarpment to the east. The river passes mountain meadows at Pumice Flat, Minaret Falls, and Devils Postpile. Other meadows such as Agnew and Reds are in the vicinity. The river flows the length of Devils Postpile National Monument before plunging over the 101-foot Rainbow Falls. The river then drops over Lower Falls before entering a steep canyon, with sheer granitic walls topped with impressive domes.

The entire river corridor flows through the Sierra Nevada landscape and is assigned Variety Class "A" or "Distinctive" visual rating because the corridor and surrounding lands possess an unusual visual variety that stands out from common features in the landscape.

Socio-Economic Conditions

There are presently no proposed water development projects or proposed competing resource uses.

Commercial permits for horseback riding and packing are issued by Inyo and Sierra National Forests for trail access through the river corridor to Ansel Adams Wilderness.

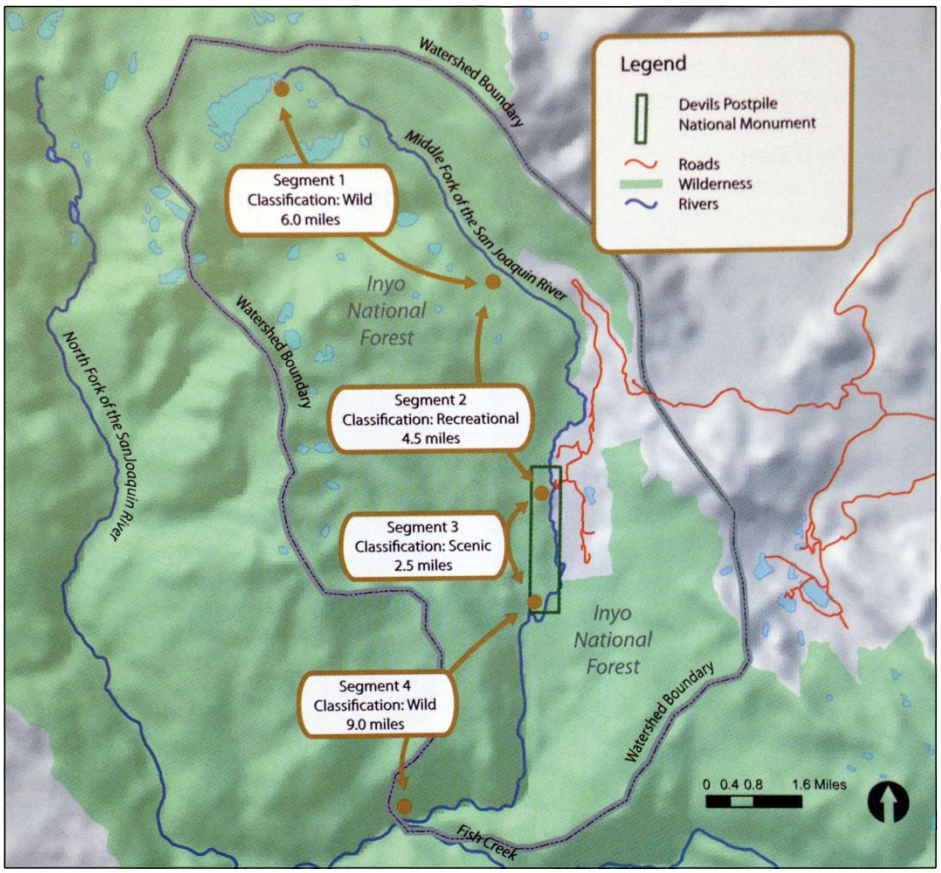
There are no opportunities for commercial whitewater rafting activities because of limited access for launching and portage [2014 Update: and given public safety concerns about the proximity of waterfalls within the monument.]

Most day users are not local residents, but come from large metropolitan areas, Bishop and the San Joaquin valley to fish, hike, and ride horseback. Visits are comparatively heavy along the river corridor between Agnew Meadow and Rainbow falls. However, the deep canyons and lack of access in the lower portion of the river tends to discourage day users.

Cultural and Historical resources

For at least 5,000 years, Mammoth Pass and the San Joaquin River have served as the principle route for the trans-Sierra transport of Casa Diablo obsidian to Central California. The Old French Trail, an American Indian trail that was later modified by miners at Mammoth and used as a year-round crossing of the Sierra, was the primary trade route of obsidian into this region. The trail passes through and crosses the river within the study area. Many areas along the trail network are of special importance to members of local Native American communities. American Indian sites are expected to occur along the river and within the study area; however systemic inventory is lacking.

FIGURE E.1: MAP OF WILD AND SCENIC RIVER SEGMENTS AND CLASSIFICATIONS



MIDDLE FORK OF THE SAN JOAQUIN RIVER SEGMENT DESCRIPTIONS

Segment 1:

Starting at the headwaters near Thousand Island Lake and ending at Agnew Meadows in Inyo National Forest, the river is free-flowing with unpolluted waters and has a primitive shoreline. The Pacific Crest Trail traverses the corridor for 7 miles, from the source to near Agnew Meadows. The segment is within Ansel Adams wilderness and is administered by Inyo National Forest. [2013 update: with the completion of the Sierra Forest Land and Resource Management Plan in 1991, this segment was classified as "wild".]

Segment 2:

This river segment starts at Agnew Meadows and ends at Soda Springs footbridge in Devils Postpile National Monument. The larger portion is managed by Inyo National Forest. The river is free flowing. From Red Meadow road, four access points lead to facility developments along the eastern shore. The Devils Postpile NM ranger station, several campgrounds, and 5 miles of the Pacific Crest Trail are within this corridor segment. There are also numerous other trails. [2013 update: with the completion of the Sierra Forest Land and Resource Management Plan in 1991, this segment was classified as "recreational".]

Segment 3:

Ending at Rainbow Falls, most of this corridor is administered by the National Park Service, with a small portion exiting and reentering the monument on Inyo National Forest lands. The river is free-flowing and unpolluted. The John Muir trail crosses this segment, as does 2 miles of the Pacific Crest Trail. Another trail runs parallel to the river. The Devils Postpile geologic feature is in this segment. [2013 update: with the completion of the Sierra Forest Land and Resource Management Plan in 1991, this segment was classified as "scenic".]

Segment 4:

Extending to the river's confluence with North Fork San Joaquin, a small northern portion of the segment

TABLE E.1: LOCATION DESCRIPTION OF MIDDLE FORK SAN JOAQUIN RIVER SEGMENTS

SEGMENT	BOUNDARY POINTS	LENGTH	STATUS
1	Headwaters to Agnew Meadows	6.0	Ansel Adams Wilderness in Inyo National Forest
2	Agnew meadows to Soda Springs Footbridge in Devils Postpile National Monument	4.5	Ansel Adams Wilderness except for developed strip in Inyo National Forest
3	Soda Springs Footbridge to Rainbow Falls	2.5	Ansel Adams Wilderness except for a portion east of the river in Inyo National Forest and Devils Postpile National Monument
4	Rainbow Falls to confluence with North Fork San Joaquin River	9.0	Ansel Adams Wilderness in Devils Postpile National Monument and Sierra National Forest
	Total Miles	**22.0**	

TABLE E.2: SUMMARY OF OUTSTANDINGLY REMARKABLE VALUES OF MIDDLE FORK SAN JOAQUIN RIVER SEGMENTS WITHIN DEVILS POSTPILE NATIONAL MONUMENT

VALUES	SEGMENT 1	SEGMENT 2	SEGMENT 3	SEGMENT 4
GEOLOGY	Glaciated granite gorge with domes volcanic activity evident *OR*	Same as previous segment, glacial polish *OR*	Premier example of basalt columns, Rainbow Falls *OR*	Glaciated granite gorge with domes, Lower Rainbow Falls *OR*
BIODIVERSITY	Unusually high level of biodiversity for the region within the watershed due to a convergence of biogeographic regions and species' ranges *OR 2014*	Unusually high level of biodiversity for the region within the watershed due to a convergence of biogeographic regions and species' ranges *OR 2014*	Unusually high level of biodiversity for the region within the watershed due to a convergence of biogeographic regions and species' ranges *OR 2014*	Unusually high level of biodiversity for the region within the watershed due to a convergence of biogeographic regions and species' ranges *OR 2014*
RECREATION	Fishing prime use, camping, rock climbing, unusual free-flowing mountain river *OR*	Same as previous segment *OR*	Viewing scenery, nature study, hiking, fishing *OR*	Camping, nature study, horseback riding *OR*
SCENERY	Spectacular domes and deep granitic canyons *OR*	Same as previous segment *OR*	101 ft. Rainbow Falls, distinctive vistas, basalt columns *OR*	Diverse and distinctive landforms *OR*

OR indicates values that met or exceeded the definition of "outstandingly remarkable" in the 1991 eligibility analysis. *Please see the text of this document for updates and details regarding these ORVs.*

OR 2014 indicates values that meet or exceed the definition of "outstandingly remarkable" in this updated analysis

**Corrections to the 1991 summary table: Camping was added to the Recreation ORV in Segments 1 and 2, where the valley's campgrounds continue to be located. It was removed from Segment 3, where no campgrounds existed in 1991. Fishing, which had long been an established recreational activity in the monument in 1991 was added to Segment 3

is administered by the National Park Service and the remainder by Inyo and Sierra National Forests. Most of this segment is in the Ansel Adams Wilderness, the remainder in the John Muir Wilderness. This segment, like the other segments of the Middle Fork of the San Joaquin River, is one of the few remaining free-flowing, unpolluted high Sierra Rivers. This segment has primitive shorelines and is accessible only by trails. [2013 update: with the completion of the Sierra Forest Land and Resource Management Plan in 1991, this segment was classified as "wild".]

End of republished eligibility findings from Chapter 7 (Appendices) of the Final Environmental Impact Statement, Forest Land and Resource Management Plan, Sierra National Forest (1991).

Suitability Evaluation

The WSR Act defines suitability as an assessment of whether eligible river segments should be recommended for inclusion into the National WSR System. It provides the basis for an agency's recommendation to Congress. This suitability analysis utilizes guidance from the Interagency WSR Council and is primarily based on the following four factors:

- The characteristics that make the river segments worthy of designation.
- The ability of NPS and its non-Federal partners to manage the river segments to protect their ORVs, water-quality, and freeflow.
- The compatibility of wild and scenic river designation with other potential uses of the river segments.
- The public's support for designation.

The report also outlines how the National Park Service intends to manage the river system. The scope of this analysis includes the portions of the Middle Fork of the San Joaquin (MFSJ) River that are within the boundary of Devils Postpile National Monument. This evaluation does not apply to the portions of the river on U.S. Forest Service lands.

CHARACTERISTICS THAT MAKE THE RIVER SEGMENTS WORTHY OF DESIGNATION

The MFSJR within Devils Postpile NM is a unique and exemplary river system both regionally and nationally. It was found to have a number of ORVs including: Geology, biodiversity, scenery, and recreation.

LAND OWNERSHIP, USES, ZONING, AND RESTRICTIONS

Land Ownership and Management

This suitability analysis applies only to the portion of the MFSJ River located within Devils Postpile National Monument, managed by the NPS. All of the lands within the likely wild and scenic boundary are owned by the NPS and the adjacent U.S. Forest Service. The area is primarily used for recreation and natural resource protection. The river lies within the unzoned eastern portion of Madera County.

Opportunities and Limitations on Hydropower Development

The Federal Power Act prohibits FERC from licensing hydropower projects in national parks or national monuments.

Mining & Logging Restrictions

Mining and logging are prohibited in Devils Postpile National Monument. These prohibitions are in place to protect the scenic character and scientific interests of this area. These restrictions will continue to protect the proposed MFSJ River WSR Corridor.

Projects and Plans that are Enhanced, Curtailed, or Foreclosed Due to WSR Status

Suitability studies must assess the potential effects of WSR designation on the goals of tribes, nongovernmental organizations, other local, state, and federal agencies, and the public. This assessment determines what other potential uses of the river may occur in the foreseeable future and if WSR designation would benefit or conflict with these uses. This assessment also helps planners and managers decide which management action is best suited for the river and the public. This section discusses other relevant plans and projects and their compatibility with WSR designation.

WSR Water Resource Project Evaluation

The intent of the WSR Act is to preserve rivers from harmful effects of water resource projects. The WSR Act prohibits any new federally licensed hydropower dams on designated river segments. It also creates a process for evaluating/determining if other water resource projects have adverse impacts to the river and its special resources. This section describes that evaluation process, types of projects subject to this evaluation, and any known or likely projects in the foreseeable future that could be affected.

Projects that are subject to a Section 7 evaluation under the WSR Act have to be:

- federally assisted projects (undertaken, permitted, or funded by a federal agency) and
- located within the high water mark of a river bed

Downstream projects are also evaluated to determine whether they would unreasonably diminish the river's ORVs.

The baseline condition for all such analysis is the condition of the river and its resources at the time of designation. Continuing operations of existing water resource projects would not trigger a Section 7 evaluation/determination (but maintenance of existing infrastructure, such as footbridges, within a WSR's bed and banks would). Generally, best practices involve conducting a river corridor reach analysis to understand the channel geomorphology before implementing site-specific water resources projects.

The following is a sample of the types of water resource projects that could potentially be affected by designation as a wild and scenic river.

Dams and Hydropower Projects

There are no existing or planned dam or hydropower projects in the study area.

Bank Stabilization

There are no bank protection projects proposed in this reach. In designated WSR segments, federally assisted water resources projects need to be evaluated to ensure there are no adverse effects on the free-flowing character, water quality, and ORVs of the river segment. It is foreseeable that bank stabilization projects will be proposed by the NPS in the future to protect current infrastructure, fishery resources, recreation resources, or cultural resources. These projects would need to be evaluated to ensure no adverse impacts occur. Corridor reach analyses that evaluate the geomorphology of the river would help inform location, size, and type of appropriate bank stabilization for the river segments. Bioengineering and natural protection methods are encouraged in WSR reaches. Guidance on important resources to protect, process for determining bank stabilization, and type of acceptable methods would be outlined in the Comprehensive River Management Plan.

Roads and Bridges

Two foot bridges, one at Soda Springs Meadow and the Arch Bridge, cross the river in the monument. No other bridges are planned. Any new bridge and/or road projects that are located with the high water mark of the river corridors would need to undergo a Section 7 analysis to ensure adverse impacts do not occur.

Habitat Restoration

There are no known proposals for water resource habitat restoration projects within the proposed WSR corridors. However, potential projects could include habitat enhancement structures, such as wood or boulders in the river corridors. A Section 7 evaluation/determination would need to occur for these projects and this evaluation would identify any adverse effects to the free-flowing character, water quality, and ORVs of the river. The need and goals for fish habitat restoration can be identified in the Comprehensive River Management Plan which would help guide implementation of in-river habitat enhancement structures.

Other Non-Water Resource Projects

Other projects and developments that are located outside the high water mark of the river corridors do not need to undergo a Section 7 evaluation/determination. However, effects of the project should be evaluated to assure that the river values are protected. These types of projects could include utility lines, vegetation management, and trails.

Geologic Features

The well-known columnar formation of Devils Postpile is one of several geologic features of scientific interest located near the river within the monument. Other places of interest are found along the entire stretch, including the geology of Rainbow Falls, examples of glacial polish, and other locations where columnar features related to the Devils Postpile are exposed. The proposed WSR designation would help the monument carry out its charge to protect these features through creation of a Comprehensive River Management Plan focusing on these values. A WSR designation would enhance protection of these geologic features as an ORV and would protect the free-flow character and natural banks of the river segments.

Scenic Values

Dramatic scenery is an integral part of the visitor experience at the monument. As most visitors spend a significant portion of their time near the river, protection of scenic values associated with the river is critical to maintaining high quality experiences. The proposed WSR designation would help the monument carry out its responsibilities through creation of a Comprehensive River Management Plan focusing on these values and, particularly, providing additional direction in the developed visitor services area. A WSR designation

would enhance protection of scenery as an ORV and would protect the free-flow character and natural banks of the river segments.

Wildlife

The watershed is at a convergence of south, central, and eastern Sierra Nevada biogeographic regions and includes the overlapping boundaries of many species' ranges and provides migratory corridors. This convergence creates an unusually high level of biodiversity for the region. The river is an important component to this system, providing life-sustaining resources to wildlife. The proposed WSR designation would help the monument carry out its responsibilities through creation of a Comprehensive River Management Plan focusing on these values. A WSR designation would enhance protection of wildlife as an ORV and would protect the free-flow character and natural banks of the river segments.

Fishing

In 1995 the California Department of Fish and Game designated the San Joaquin River within the monument as a Wild Trout Water, recognizing the value of this recreational opportunity. Although the monument hasn't stocked the river since 1971, four species of trout are found in the monument and it remains a place for anglers to enjoy fishing in a highly scenic location. The proposed WSR designation would help the monument provide high-quality recreational experiences, including fishing, through creation of a Comprehensive River Management Plan focusing on these values and, particularly, providing additional direction on the balance of fishing access, scenic values, and natural resource protection. A WSR designation would enhance protection of recreation, including fishing, as an ORV and would protect the free-flow character and natural banks of the river segments.

Protection of Water Quality

The river possesses excellent water quality, which contributes to other values such as biodiversity and fishing. The proposed WSR designation would help the monument carry out its charge to protect water quality through creation of a Comprehensive River Management Plan.

PUBLIC SUPPORT

In the summer of 2011, the NPS released a newsletter and held a public meeting on the GMP preliminary alternatives and the Wild and Scenic River eligibility findings. Approximately 500 newsletters were mailed to organizations and individuals on the park mailing list. In addition, over 2,000 newsletters were distributed at the ranger station, to local communities and businesses, and at public and stakeholder meetings. A comment form was included in the newsletter so that members of the public could provide feedback to the planning team. The public comment period began July 15, 2011 and ran through September 30, 2011. Press releases asking for public comments on the preliminary management concepts were distributed to local newspapers. The newsletter was also published and made available for electronic comment on the PEPC website. A link to the newsletter was provided on the monument's website as well as an email message that was sent to the GMP email list.

A public open house meeting was held in the Town of Mammoth Lakes at the Mammoth Lakes Public Library on September 15, 2011. Eighteen people attended the open house.

Public review of the newsletter was timed in summer 2011 to coincide with Devils Postpile National Monument's centennial celebration. The centennial celebration included a series of events in July 2011 ranging from programs on the history of the monument to scheduled walks and hikes with historians, community leaders, scientists, and park staff. During the course of the events, NPS announced that an extensive public outreach opportunity would be launched to complement the summer Centennial events. Throughout the 2011 field season, including Labor Day, the DEPO Superintendent held tabling events to share information and solicit visitor comments on the preliminary alternatives and the future of the monument.

Throughout the comment period presentations, meetings and conversations with local organizations, agencies and tribes were conducted by the Superintendent, other park staff, and members of the planning team. The planning team met with the Mono County Board of Supervisors (September 6, 2011) and the Town of Mammoth Lakes Town Council (September 15, 2011). A second open house for American Indian tribes and interested American Indian individuals was held on September 16, 2011 in Bishop, CA. The planning team also conducted outreach on the with park visitors during the 2011 field season. Park staff conducted tabling at shuttle bus stops and during campfire fire talks in September 2011. NPS staff handed

out newsletters and encouraged visitors to share their thoughts and ideas with the planning team.

Through the meeting and in written format, the majority of the public comments expressed support for WSR designation. The primary reasons why people were supportive of designation included permanent protection of the ORVs and greater overall protection to the watershed and riparian resources. A couple of commenters were opposed to designation, expressing concerns that designation would limit fishing opportunities in the valley. Because of these comments, the eligibility findings have been clarified to show that designation would be intended to enhance recreational opportunities, including fishing, as an ORV.

The NPS also met with the Inyo National Forest and received general support for WSR designation within the monument. The Inyo NF may wish to pursue designation of the remaining river miles on the national forest in the future and would receive the monument's unqualified support for this action.

MANAGEMENT INTENT

This section outlines how the NPS currently manages the eligible river segments within its boundaries, changes that would occur upon implementation of the Devils Postpile GMP, and potential changes that would occur if the river becomes designated. It also identifies a proposed WSR boundary and additional costs associated with designation.

The NPS is required by the WSR Act to manage eligible and suitable river segments in a manner that protects their free flowing character, water quality, and ORVs until the river segments become designated as part of the national WSR system or are found unsuitable.

Current Management and Direction in the Devils Postpile GMP

Regardless of WSR designation, in accordance with the WSR Act and NPS management policies, the eligible river segments would be managed by NPS to protect their free-flowing condition and ORVs. The GMP outlines the vision and management actions for the monument as a whole, including the river. The vision for the river under the GMP is continued protection of the riparian corridor and preservation of high quality day-use river recreation experiences. The river's free-flowing character, water quality, and ORVs would be protected and preserved. All management actions will be evaluated to avoid adverse effects on the river segments and their resources.

The entire list of GMP actions can be found in the alternatives section of the GMP. The most significant GMP actions and goals affecting the river segments and the identified ORVs are summarized below:

Actions common to all alternatives:

- Ecologically restore, enhance and protect meadows, riparian areas and wetland habitats to the greatest extent possible.
- Ecologically restore, enhance and protect native biota communities by prevention, early detection and removal of invasive species
- Collaborate with the U.S. Forest Service and the U.S. Geological Survey, and other stakeholders, to develop and implement best management practices to minimize impacts to water quality in the watershed
- Increase intra- and interagency coordination for resource management and restoration activities.
- Develop a resource stewardship strategy for the monument to guide subsequent resource management priorities.
- Establish a comprehensive monitoring program for geologic resources, emphasizing the Postpile itself.
- Develop a baseline inventory of the Postpile formation. Identify premier areas of glacial polish and ensure protection from visitor impacts while allowing other areas of glacial polish to be accessible to visitors.
- Establish a comprehensive monitoring program for ecologic resources that improves the understanding of distribution, condition, and trends of species, communities, and processes.
- Identify species that would be most at risk to local extinctions due to a warming climate and monitor their distribution and abundance in the monument.

- Monitor and mitigate, where possible, the pressures of climate change and other stressors on native vegetation and wildlife.

- Develop adaptation strategies to address and respond to climate change.

- Inventory and evaluate facilities that could discharge into water sources, mitigate threats to water resources and hydrologic processes, and remove or upgrade facilities that do not meet water quality standards.

- Inventory and evaluate facilities that affect habitat and native biota and mitigate, remove or upgrade to minimize impacts.

- Actively pursue inventory, research, monitoring, and study of hydrologic influences in the watershed, in partnership with the Inyo National Forest, in order to improve understanding of the influences that affect the monument's resources and to enhance management and protection of those resources.

- Continue to provide a range of traditional visitor experiences, including hiking, camping, picnicking, fishing, wildlife viewing, and equestrian use.

- Use Service First authority to formalize and potentially expand the partnership with the Inyo National Forest and institutionalize strong interagency collaboration and coordination in cross-boundary resource and recreation management at a landscape scale.

Actions that would occur upon full implementation of the preferred alternative:

- Redesign the shuttle bus stop and parking area to improve parking and circulation for shuttle buses, cars and pedestrians, reduce visual impacts, and restore riparian areas.

- Remove the camp sites in Loop B immediately adjacent to the river and redesign Loop B for walk-in users only. Riparian areas are restored and day use opportunities along the river are improved.

- Provide clear delineation of specific river access points in the campground and day use area to better protect riparian areas and manage visitor access to and use of the riverfront.

- Additional walk-in campsites would be installed, if possible, to maintain current campground capacity. Separation between car camping, day use, and walk-in camping would be a primary design factor.

- Redesign the picnic area near the Postpile to reduce inadvertent resource impacts and provide additional interpretation of the history of the area, including the cabin remnants, but with minimal infrastructure or wayside additions.

- Continue to provide visitors with quality viewing opportunities of the Postpile and maintain the general size of the viewing area at the base of the Postpile. Enhance the experience at the base of the Postpile through several small site improvements.

- Maintain current trail alignment at Rainbow Falls to minimize crowding; soften the trail design and edges and remove the log stairs to create more of a wilderness trail design and promote a greater sense of discovery and arrival to Rainbow Falls.

- Maintain safe visitor access to the river at the base of Rainbow Falls.

- Protect sensitive resources through direct and indirect visitor use management strategies, including fencing, to minimize impacts.

- Continue to document and protect cultural resources and focus interpretation of cultural resources on the broader human history of the valley as a travel corridor.

- Visitor experiences would continue to include a range of traditional recreational experiences that have traditionally been available within the monument, with an increased emphasis on self-discovery and opportunities to connect with nature.

- Emphasis would be placed on traditional, low-impact recreation such as camping, day-hiking, backpacking, birdwatching, wildlife viewing, fishing, and sightseeing while also exploring opportunities for increased trail connections.

- Partner with the USFS to create an interagency multi-modal trail plan.
- Conduct a study to evaluate the range of alternatives and feasibility of making the entire trail from the ranger station to Devils Postpile more accessible to a wider variety of users.
- Trails would be designed to blend in with natural surroundings and existing trails could be realigned and revegetated to harmonize better with surrounding nature.
- Existing trails may also be realigned to better protect resources.
- Any future facilities would be small in scale, sustainable, sited to protect sensitive resources, and sensitively designed (screening, rustic style, etc.) to enhance the feeling of being in the wild/ in nature.

Any entities pursuing future federally-assisted projects that have the potential to affect the eligible river segments should consult with NPS in an attempt to avoid or mitigate adverse effects. Consultation is required according to a directive from the Council on Environmental Quality. If the river segments are designated then a water resource evaluation/determination would be required per the WSR Act as described in the Water Resources Evaluation Section above.

COMPREHENSIVE RIVER MANAGEMENT PLAN

If the river segments are designated as WSRs, then a comprehensive river management plan would be developed. The comprehensive river management plan would further outline goals and management actions that would be acceptable and encouraged. For example, the provision of high-quality fishing experiences or the desire for natural bank stabilization methods could be detailed. As described above, any future water resource projects that are federally-assisted would need to undergo an evaluation/determination to ensure adverse effects do not occur. In addition to protections and guidance offered in the WSR Act, the Act also directs the NPS to use its general statutory authorities and the Wilderness Act where appropriate to protect the ORVs, water quality, and free-flowing character of the river segments. When conflicts arise, the more protective law would be applied.

The WSR Act directs the river management plan to address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of the Act: Best practices to achieve these requirements include:

- describing the existing resource conditions including a detailed description of the ORVs
- defining the goals and desired conditions for protecting river values
- addressing water quality issues and in-stream flow requirements
- reflecting a collaborative approach, recognizing the responsibilities of, and opportunities for, partnership with all stakeholders
- identifying regulatory authorities of other governmental agencies that assist in protecting river values
- including a monitoring strategy to maintain desired conditions

BOUNDARIES

If the river segments are designated, detailed boundaries would be determined. These boundaries are limited to an average of 320 acres or less per river mile, which equates to about one-quarter of a mile on either side of the river. It is recommended that the preliminary boundaries of the Middle Fork of the San Joaquin River be no more than one-quarter of mile from the high water mark on either side of the river segments and limited to land within the monument. If the U.S. Forest Service finds the remaining portions of the river to be suitable for designation, the NPS recommends that this boundary be extended to one-quarter of a mile on both sides of the river. NPS recognizes its responsibility to use its existing authorities to protect the ORVs that are found both within and outside the preliminary WSR boundaries.

COSTS

The NPS is already managing the river within its boundaries. Additional costs related to managing the river, if designated wild and scenic, would include the cost associated with developing and implementing a comprehensive river management plan. Minimal addi-

tional compliance work is also anticipated to comply with Section 7 of the WSR Act.

CONCLUSION

The Middle Fork of the San Joaquin River, within Devils Postpile National Monument, was found to be suitable for WSR designation. The addition of this portion of the river would create more opportunities for holistic watershed management. The public support for this designation from the general public, stakeholders, and organizations was positive. While some comments expressed concerns about the potential effects of WSR designation on fishing access, the ORVs make clear that fishing opportunities are to be protected. NPS owns the majority of the lands in the study area and manages the river system in a manner consistent with the intent of the WSR Act. Existing protections are in place prohibiting logging and mining, as well as limiting hydropower development.

WSR designation would elevate scenic, geologic, recreational, and biodiversity values, thus furthering the purpose of Devils Postpile National Monument. Designation would require the development of a comprehensive river management plan which would enable better stewardship of the river and its special resources. Therefore, the NPS recommends that Congress designate the portions of the Middle Fork of the San Joaquin River within Devils Postpile National Monument as a wild and scenic river under the Wild and Scenic Rivers Act.

Glossary

100 year floodplain (500 year floodplain): The area which has, in any given year, a 1% (1/100) chance of flood inundation. A 500 year floodplain has a 0.2% (1/500) chance of inundation each year.

accessibility: The provision of NPS programs, facilities, and services in ways that include individuals with disabilities, or makes available to those individuals the same benefits available to persons without disabilities.

adaptive management: Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs.

Advisory Council on Historic Preservation: The Advisory Council on Historic Preservation (ACHP) is an independent federal agency that promotes the preservation, enhancement, and productive use of the nation's historic resources. As directed by the National Historic Preservation Act of 1966 as amended, the council serves as the primary federal policy advisor to the president and Congress; recommends administrative and legislative improvements for protecting our nation's heritage; advocates full consideration of historic values in federal decision-making; and reviews federal programs and policies to promote effectiveness, coordination, and consistency with national preservation policies.

air quality designations: Designated under the Clean Air Act, Class I areas are those areas that are afforded the highest level of protection from air pollutants and generally consist of wilderness areas, national parks, and wildlife refuges. Class II areas are all areas not designated Class I where additional air pollutant inputs may be permitted up to certain levels.

andesite: An igneous, volcanic rock, formed from magma that cooled on or near the surface. At Devils Postpile NM, andesite is found in the Mammoth Pass formation, which is younger than the dacite of the Rainbow Falls formation, but older than the basalt of the Postpile formation.

archeology: The scientific study, interpretation, and reconstruction of past human cultures from an anthropological perspective based on the investigation of the surviving physical evidence of human activity and the reconstruction of related past environments. Historic archeology uses historic documents as additional sources of information.

archeological resource: Any material remains or physical evidence of past human life or activities that are of archeological interest, including the record of effects of human activities on the environment. An archeological resource is capable of revealing scientific or humanistic information through archeological research.

alternatives: Sets of management elements that represent a range of options for how or whether to proceed with a proposed action.

appropriate use: A use that is suitable, proper, or fitting for a particular park, or to a particular location within a park.

asset: A physical structure or grouping of structures, land features, or other tangible property which has a specific service or function.

asset management: A systematic process of maintaining, upgrading, and operating assets cost-effectively by combining engineering principles with sound business practices and economic theory.

backcountry: Remote, roadless, and less intensely used areas where the majority of use is by overnight campers those who hike or ride stock.

basalt: An igneous, volcanic rock, formed from magma that cooled on or near the surface. At Devils Postpile NM, the Postpile and Buttresses formations are both made of basalts from two separate volcanic events.

boundary modifications (potential): The description of areas or resources that meet criteria for boundary adjustments, along with the rationale for an adjustment.

carbon footprint: A measure of the amount of carbon dioxide produced by a person, organization or state in a given time.

climate change: A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is

in addition to natural climate variability observed over comparable time periods (UN Framework Convention on Climate Change 1992).

Code of Federal Regulations (CFR): A publication that codifies the general and permanent rules or regulations published in the Federal Register by the executive branch departments and agencies of the federal government and which carry the force of law. The citation "36 CFR 1.1 " refers to part 1, section 1, of title 36.

columnar jointing: Parallel, vertical fractures resulting from volcanic rock contracting as it cooled. These fractures break the rock into prismatic columns, usually with 5 or 6 sides.

commercial service: Any visitor-related service, activity, or facility for which compensation, monetary or otherwise, is exchanged. By law, all commercial services in parks must be authorized by the superintendent. Commercial services can originate within the park or outside.

conserve: To protect from loss or harm; preserve. Historically, the terms conserve, protect, and preserve have come collectively to embody the fundamental purpose of the NPS— preserving, protecting and conserving the resources contained within the National Park System.

consultation: A discussion, conference, or forum in which advice or information is sought or given, or information or ideas are exchanged.

cultural landscape: A geographic area, including both the cultural and natural resources and the wildlife or domestic animals therein, associated with an historic event, activity, or person, or exhibiting culture or aesthetic values. Cultural landscapes are investigated and defined in a way that emphasizes the interaction between human beings and nature over time. There are four overlapping types of cultural landscapes: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes.

cultural resource: An aspect of a cultural system that is valued by or significantly representative of a culture, or that contains significant information about a culture. A cultural resource may be a tangible entity or a cultural practice. For NPS management purposes, tangible cultural resources are categorized as districts, sites, buildings, structures, and objects for the National Register of Historic Places, or as archeological resources, cultural landscapes, structures, museum objects, and ethnographic resources.

cumulative impact: The effect on the environment that would result from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts can result from similar projects or actions, as well as from projects or actions that have similar impacts (40 CFR 1508.7).

dacite: An igneous rock, which may be formed from magma that cooled on or near the surface or deeper underground. At Devils Postpile NM, the Rainbow Falls formation is made of dacite.

desired conditions (also called management direction and management actions): A park's natural and cultural resource conditions that the National Park Service aspires to achieve and maintain over time, and the conditions necessary for visitors to understand, enjoy, and appreciate those resources. Desired conditions are based on ecological, social, and economic considerations during the land and resource management planning process.

developed area: An area managed to provide and maintain facilities (such as roads, campgrounds, and housing) that serve park staff and visitors. It includes areas where park development or intensive use may have substantially altered the natural environment or the setting for culturally significant resources.

easement: A right or privilege one may have on another's land. For example, an easement may allow a utility company to build and maintain electrical transmission lines through another landowner's property, but take no other actions beyond those defined in the easement.

ecosystem: A functioning system composed of a community of living organisms and their interactions with the physical and chemical environment. This term usually describes these systems at a regional or broad physiographic scale.

effect: The result of actions on natural and cultural resources, aesthetics, economic, social or human health

and safety. Effects can be direct, indirect, or cumulative. This term is used interchangeably with "impact."

enabling legislation: The law(s) that establish a park as a unit within the national park system.

environmental assessment (**EA**): A brief NEPA document that is prepared, with public involvement, (a) to help determine whether the impact of a proposed action or its alternatives could be significant; (b) to aid the NPS in compliance with NEPA by evaluating a proposal that will have no significant impacts, but may have measurable adverse impacts; or (c) as an evalua¬tion of a proposal that is either not described on the list of categorically excluded actions, or is on the list, but exceptional circumstances apply.

environmentally preferred alternative: The alternative that would best promote the policies set forth in NEPA section 101 from among all action alternatives analyzed as part of the planning process. The Council for Environmental Quality encourages agencies to identify an environmentally preferable alternative in the draft environmental impact statement or environmental assessment, but only requires that it be named in the record of decision. It is usually selected by the planning team.

erosion: The wearing away of land surface either by natural chemical or physical processes (including water, wind, or ice) or human or animal activities.

ethnographic resource: A site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, or other significance in the cultural system of a group traditionally associated with it.

executive orders, **memoranda**, **or proclamations**: Regulations having the force of law issued by the President of the United States to the executive branch of the federal government.

fauna: The animal life of an area.

Federal Register: A daily publication of the National Archives and Records Administration that updates the Code of Federal Regulations, in which the public may review the regulations and legal notices issued by federal agencies. Source citations for the regulations are referred to by the volume and page numbers of the Federal Register and the date of publication. For example, volume 65, page 2,984 might be cited as "65 FR 2984, January 19, 2000."

Finding of No Significant Impact (**FONSI**): A determination based on an EA and other factors in the public planning record for a proposal that, if implemented, would have no significant impact on the human environment.

fire management plan: An implementation plan that details how natural fire regimes and prescribed fires will be managed in a park or other area.

fire regime: The pattern, frequency, and intensity of wildfires that occur in an area.

fire suppression: All work and activities associated with fire extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.

fish stocking: the intentional introduction of fish to a river or lake to supplement an existing population or create a new one, often for recreational purposes.

floodplain: Level streamside land that may be subject to flooding..

flora: The plant life of an area.

foundation statement: A statement that begins a national park unit's planning process and sets the stage for all future planning and decision-making by identifying the unit's mission, purpose, significance, special mandates and broad mission goals. It is incorporated into a unit's GMP, but may also be produced as a standalone document for a unit.

frontcountry: Areas of a park that are easily accessible to visitors (as opposed to backcountry) and are more frequently used, often by single-day visitors. The frontcountry contains developed areas and is generally along or accessed by transportation corridors.

fundamental resources and values: Those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management because they are critical to achieving the park's purpose and maintaining its significance. A fundamental value, unlike a tangible resource, refers to a process,

force, story or experience, such as such as an ancestral homeland, wilderness values, or oral histories.

gateway community: A community adjacent to a national park unit that may serve as a point of entry for visitors to the unit. Gateway communities often have significant socioeconomic and cultural ties to the unit.

general management plan (**GMP**): A plan that clearly defines direction for resource preservation and visitor use in a park, and serves as the basic foundation for decision making. GMPs are developed with broad public involvement and usually guide parks for 15 to 20 years. GMPs are accompanied by a draft and final environmental impact statement.

geologic resources: Any natural resource or process of a geologic nature or pertaining to the physical history of the earth. Examples include mineral resources, rock strata, fossil remains, or landscape features produced by processes such as exfoliation, erosion and sedimentation, glaciation, karst or shoreline processes, fossilization, or seismic, volcanic, and tectonic activities.

geographic information system (**GIS**): Both a database designed to store geographic data and a set of computer operations that can be used to analyze the data.

glacial polish: a smooth surface on rocks, created by the scouring action of glaciers moving across the landscape.

granite: an intrusive igneous rock formed from the crystallization of magma deep beneath the earth's surface. Granite lies beneath most of the extrusive igneous rocks (andesite, basalt, and dacite) at Devils Postpile NM.

groundwater: Water below the ground surface filling voids in soil or rock layers. The source of groundwater is precipitation (rain, snow, or glacial melt) that has percolated downward from the surface.

habitat: The natural abode of an organism, including all biotic, climatic, and all factors affecting its life.

hydrology: The study of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere.

impact: see effect.

impact topic: A specific category of analysis for impacts, such as wildlife, vegetation, or historic structures. Impact topics are identified through public scoping and a determination of what aspects of the human environment would be affected if an action was implemented. Analysis of impacts for a specific topic may be required as a result of a public law or an executive order.

impairment: An impact so severe that, in the professional judgment of a responsible NPS manager, it would harm the integrity of park resources or values and violate the 1916 NPS Organic Act.

implementation plan: A plan that follows guidance from, but provides greater detail than, the general management plan and that specifies how one or more of the desired resources conditions, visitor experiences, or proposed actions will be accomplished. An implementation plan may direct a specific project or an ongoing activity.

indicators of user capacity: Specific, measurable physical, ecological, or social variables that can be measured to track changes in conditions caused by public use, so that progress toward attaining the desired conditions can be assessed.

infrastructure: A general term describing public and quasi-public utilities and facilities such as roads, bridges, sewers, sewer plants, water lines, storm drainage, power lines, parks and recreation facilities, public libraries, and fire stations. Infrastructure can also be considered permanent installations such as lighting, sidewalks, buildings, and water systems.

invasive non-native species: A non-native species (with respect to a particular ecosystem) whose introduction causes or would likely cause harm to the economy, environment, or human health.

issue: Some point of debate that needs to be resolved. For GMP planning purposes, issues can be divided into "major questions to be answered by the GMP" (also referred to as the "decision points of the GMP") and "NEPA issues" (usually environmental problems related to one or more of the planning alternatives).

kiosk: A stall or other structure set up in a public place where one can obtain information.

landscape: A collection of similar ecosystems, distributed over a large geographical area that share underlying biological, physical or human-made characteristics. See also cultural landscape.

light pollution: The illumination of the night sky caused by artificial light sources, decreasing the visibility of stars, and other natural sky phenomena. Also includes other incidental or obtrusive aspects of outdoor lighting such as glare, trespass into areas not needing lighting, alternation of nighttime landscape, and negative impact to ecosystems.

lightscape: the natural (moon and starlight) and artificial lights visible in an area at night.

management concept: A brief statement of the kind of place the park should be.

management direction (also desired condition or management prescription): A planning term referring to statements about desired resource conditions and visitor experiences, along with appropriate kinds and levels of management, use, and development for each park area.

management prescriptions: See management direction.

management zone: A geographical area for which management directions have been developed to determine what can and cannot occur in terms of resource management, visitor use, access, facilities, development, and park operations. Each zone has a unique combination of resource and social conditions and a consistent management direction. Different actions are taken by the NPS in different zones.

management zoning: The application of management zones to a park unit. The application of different type of zones and/or size of zones are likely to vary in different alternatives.

manager: The managerial-level employee who has authority to make decisions or to otherwise take an action that would affect park resources or values. Most often it refers to the park superintendent or regional director, but may at times include, for example, a resource manager, facility manager, or chief ranger to whom authority has been re-delegated.

Memorandum of Agreement or Memorandum of Understanding: Short written statements outlining the terms of an agreement, transaction, or contract between two or more parties.

minority: Defined by the U.S. Census as individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic.

mitigation: Modification of a proposed action to lessen the intensity of its impact on a particular resource; compensation for an impact.

museum collection: Assemblage of objects, works of art, historic documents, or natural history specimens collected according to a rational scheme and maintained so they can be preserved, studied, and interpreted for public benefit. Museum objects possess functional, aesthetic, cultural, symbolic, and/or scientific value, and are usually movable by nature or design. Museum collections normally are kept in park museums, although they may also be maintained in archeological and historic preservation centers (NPS DO-28).

National Ambient Air Quality Standards: Allowable concentrations of air pollutants in the ambient (public door) air as specified in 40 CFR 50.NAAQS and based on air quality criteria. These are divided into primary and secondary standards which allow for adequate margins of safety to protect the public health and welfare.

National Environmental Policy Act (**NEPA**) process: The objective analysis of a proposed action to determine the degree of its environmental impact on the human (natural and cultural) environment, alternatives to the proposed action, mitigation to reduce or compensate for the impact, and the full and candid presentation of the analysis to, and involvement of, the interested and affected public. This process is required of all federal agencies by the National Environmental Policy Act of 1969.

National Park System: The sum total of the land and water now or hereafter administered by the Secretary of the Interior through the National Park Service as park, monument, historic site, parkway, recreational area, or other purposes.

National Register of Historic Places: The National Register of Historic Places is the official list of the

Nation's historic places worthy of preservation. Authorized under the National Historic Preservation Act of 1966, it is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. The National Register is administered by the National Park Service under the Secretary of the Interior. Properties listed in the National Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture.

Native Americans: "Of, or relating to, a tribe, people, or culture that is indigenous to the United Sates," according to the Native American Graves Protection and Repatriation Act. Typically, the general term is applied to American Indian tribes, Alaska Natives, Native Hawaiians and other Pacific islanders. Federally recognized American Indian tribes and Alaska Natives have a unique status as "eligible for the special programs and services provided by the United States to Indians because of their status as Indians."

Native American consultation: Consultation required by various laws, regulations, executive orders and policies relative to indigenous peoples who may have traditional or contemporary interests in the lands now occupied by parks. Consultation done in compliance with legal requirements is considered to be government-to-government consultation when federally recognized American Indian tribes and Alaska Natives are involved.

native species: Plants, animals, or other living organisms indigenous to an area.

natural quiet: Refers to the state of having only natural sources of sound; wind, rustling leaves, water, and animal calls are examples.

night sky: A sky free of artificial light sources and light pollution.

non-native species: Plants or animals that are not indigenous to the area.

notice of availability: A notice in the Federal Register of the availability to the public of either a draft or final environmental impact statement or a record of decision on an action.

notice of intent: A notice in the Federal Register of the intent to prepare an environmental impact statement on a proposed action.

park: Any one of the over 400 areas of land and water administered as units of the National Park System. The term is used interchangeably with "unit."

peak season: High-use times, usually from mid-June to Labor Day, when most park visitation occurs.

Planning, Environment, and Public Comment (PEPC) System: An online database designed to facilitate the project management process in conservation planning and environmental impact analysis. It assists NPS employees in making informed decisions with regard to a number of compliance issues throughout the planning, design, and construction process.

prescribed fire: Fires ignited by park managers to achieve resource management and fuel treatment objectives.

preservation: In reference to cultural resources, the act or process of applying measures to sustain the existing form, integrity, and material of a historic structure, landscape, or object. Work might include preliminary measures to protect and stabilize the property, but generally focuses on the ongoing preservation, maintenance, and repair of historic materials and features rather than extensive replacement and new work (NPS DO-28).

primary interpretive themes: The most important ideas or concepts to be communicated to the public about a park.

presidential proclamation: A statement issued by a president on a matter of public policy. In the case of Devils Postpile NM, President William H. Taft used a proclamation to establish the monument under the congressionally delegated authority of the Antiquities Act.

professional judgment: A decision or opinion that is shaped by study, analysis, and full consideration of all the relevant facts, and that takes into account:

- the decision maker's education, training, and experience

- advice or insights offered by subject matter experts and others who have relevant knowledge and experience
- good science and scholarship and, whenever appropriate,
- the results of civic engagement and public involvement activities relating to the decision.

public involvement: Public input and participation sought in the planning for public lands and required under the National Environmental Policy Act. Comment is sought at the initial scoping (information gathering) and draft stages for an EIS or during initial scoping and upon publication of an EA.

pumice: An extremely lightweight, porous, igneous rock formed during explosive volcanic eruptions. Pumice covers most of the surface of Devils Postpile National Monument and the surrounding areas.

purpose: The specific reason(s) for establishing a particular park unit.

reach (of a stream or river): A classification term used in hydrology to refer to relatively similar section of stream or river based on factors such as stream gradient and valley width.

record of decision (ROD): The document that states which alternative analyzed in an environmental impact statement has been selected for implementation and explains the basis for the decision. The decision is published in the Federal Register.

Reds Meadow Road: The road accessing Reds Meadow Valley, starting from the check station near Minaret Vista and ending at Reds Meadow Resort.

rehabilitation: In reference to cultural resources, the act or process of making possible an efficient compatible use for a historic structure or landscape through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, and architectural values (NPS DO-28).

restoration: From a cultural resource perspective, (1) The act or process of accurately depicting the form, features, and character of a historic structure, landscape, or object as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period; (2) The resulting structure, landscape, or object.

From a natural resource perspective, restoration refers to the reestablishment/recovery of biological community structure, natural functions and processes in landscapes that have been disturbed or altered by people — actions taken to return disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated.

Landscapes that have been disturbed by natural phenomena, such as floods and hurricanes, generally are allowed to recover naturally in parks unless manipulation is necessary to protect other park resources, developments, or employee and public safety.

regulations: Rules or orders prescribed by federal agencies to regulate conduct, and published in the Code of Federal Regulations.

revegetation: The reestablishment and development of a plant cover either by natural means or by artificial means such as reseeding.

riparian: Wetlands adjacent to a river or stream.

rustic (style, character, design – in reference to the built environment): An attribute of design based on a philosophy that buildings should be in harmony with their landscape and each other. Rustic design typically adheres to a comprehensive plan; defers to the natural environment; and carefully sites buildings and structures to develop strong visual ties with the surrounding setting, especially orientation to views. Structures are built, when possible, with local or on-site materials. Materials, paints, and associated infrastructure are designed to blend in with the surroundings.

sacred sites: Certain natural and cultural resources treated by American Indian tribes and Alaska Natives, and Native Hawaiians as sacred places having established religious meaning and as locales of private ceremonial activities.

scoping: Includes both internal and external scoping. Internal scoping is NPS decision making on issues, alternatives, mitigation measures, the analysis boundary, appropriate level of documentation, lead and cooperating agency roles, available references and guidance, defining purpose and need, and so forth. External

scoping is the early involvement of the interested and affected public.

section 106 consultation: Discussions between federal agency officials, the state historic preservation officer, other interested parties, and when necessary, the Advisory Council on Historic Preservation, concerning historic properties that could be affected by a specific undertaking. Section 106 is the part of the National Historic Preservation Act that outlines the procedure. The procedure is codified in 36 CFR 800.

section 7 consultation: The requirement of section 7 of the Endangered Species Act that federal agencies consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service if a proposed action might affect a federally listed species or its critical habitat.

servicewide: An action, regulation, or description that relates to all units of the National Park System.

significance statements: Explanations of why, within a national, regional, and systemwide context, a park's resources and values are important enough to warrant national park designation.

shoulder season: Periods of moderate visitor use on either side of the peak season. Typically from the spring opening of Reds Meadow Valley road(late May or early June) until mid-June, and from Labor day until the fall closure of the road (mid to late October).

social trail: A trail that is created by humans and is not part of the monument's official designated trail system; also called unofficial and visitor-created trails.

socioeconomic analysis: The task of assessing the impact of a plan or project on a community's or region's social structure, on a community's fiscal health, or a region's economic basis.

soundscape (natural): The aggregate of all the natural and nonhuman-caused sounds that occur in parks, together with the physical capacity for transmitting natural sounds.

special mandates: Legal mandates specific to a park that expand upon or contradict a park's legislated purpose

special status species: Organisms which are in danger of becoming extirpated or extinct, and therefore receive focused protection and management efforts. These include species listed as rare under the Federal Endangered Species Act, State Endangered Species Acts, by agency-specific programs, and occasionally by non-governmental entities.

stabilization: According to NPS management policies, archeological resources, buildings, structures, and objects subject to erosion, slumping, subsidence, or other natural deterioration will be stabilized using the least intrusive and destructive methods. The methods used will protect natural resources and processes to the maximum extent feasible. Stabilization will occur only after sufficient research demonstrates the likely success of the proposed stabilizing action, and after exiting conditions are documented.

standards: The minimum acceptable condition for an indicator of a desired condition.

stakeholder: An individual, group, or other entity that has a strong interest in decisions concerning park resources and values. Stakeholders may include recreational user groups, people with a historic affiliation to the park, permittees, and concessioners. In the broadest sense, all Americans are stakeholders in the national parks.

state historic preservation officer or office (SHPO): An official in each state appointed by the governor to administer the state historic preservation program and carry out certain responsibilities relating to federal undertakings in the state.

stewardship: The cultural and natural resource protection ethic of employing the most effective concepts, techniques, equipment, and technology to prevent, avoid, or mitigate impacts that would compromise the integrity of park resources.

stock: Animals such as horses, mules, or llamas that can be ridden or used to carry supplies.

strategic plan: A servicewide five-year plan required by the Government Performance and Results Act in which the NPS states how it plans to accomplish its mission during that time, and the value it expects to produce for the tax dollars expended. Similarly, each park, program, or central office has its own strategic

plan, which considers the servicewide mission and its own particular mission.

superintendent: The senior NPS official in a park; used interchangeably with "park superintendent" or "unit manager."

sustainable design: Facilities designed to minimize adverse effects on natural and cultural values, to reflect their environmental setting, and to require the least amount of nonrenewable fuels/energy.

sustainable practices/principles: Those choices, decisions, actions and ethics that will best achieve ecological/ biological integrity; protect qualities and functions of air, water, soil, and other aspects of the natural environment; and preserve human cultures.

threatened and endangered species: As defined in the Endangered Species Act of 1973 as amended (Public Law 93-205; 87 Stat. 884), "endangered species" is "any species which is in danger of extinction throughout all or a significant portion of its range" and a "threatened species" is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Whether a species is threatened or endangered is determined by the following factors: (1) present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, sporting, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms, or (5) other natural or human-made factors.

traditionally associated peoples: Social cultural entities such as tribes, communities, and kinship units exhibiting a continued identity and associated with a specific park unit, area, or resource.

understory: The trees and woody shrubs growing beneath the tallest trees or other vegetation in an area.

unit: See park.

user capacity: The type and level of visitor use that can be accommodated while sustaining the desired resource and visitor experience conditions in a park without degradation. Management prescriptions in the general management plan.

viewshed: The landscape that is visible to the human eye from a fixed vantage point.

visitor: Anyone who uses a park's interpretive, recreational, and educational services, regardless of where such use occurs (such as through Internet access, libraries, or other methods).

visitor experience: The perceptions, feelings, and reactions a person has while visiting a park. Examples of visitor experiences include: a sense of being immersed in a natural landscape; a feeling of being crowded; a feeling of being in an area where the sights and sounds of people and vehicles are predominant; having a sense of challenge and adventure; or a perception of solitude and privacy.

visitor use: Passive or active recreational activity on public land.

scenic resource: A part of the landscape important for its scenic quality. It may include a composite of terrain, geologic features, or vegetation.

watershed: An area that collects and discharges runoff to a given point. It is often used synonymously with drainage basin or catchment area.

wetland: Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and which under normal circumstances will support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Typical wetlands include marshes, shallow swamps, sloughs, lakeshores, bogs, wet meadows, river overflows, mud flats, and riparian areas.

wilderness (designated): Federal land that has been designated by Congress as a component of the National Wilderness Preservation System.

zone: See management zone.

Selected References

Altman, B. and R. Sallabanks. 2000. "Olive-sided Flycatcher (Contopus cooperi)." In: The birds of North America, No. 502, edited by A. Poole and F. Gill, pp. 1-28. The Academy of Natural Sciences, Philadelphia.

Andrews, E. D. 2012. Hydrology of the Sierra Nevada Network national parks: Status and trends. Natural Resource Report NPS/SIEN/NRR—2012/500. National Park Service. Fort Collins, CO.

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. National Park Service, Three Rivers, CA.

Aubry, K., K. McKelvey and J. Copeland. 2007. "Distribution and broadscale habitat relations of the wolverine in the contiguous United States." Journal of Wildlife Management 71(7): 2147-2158.

Audubon – National Audubon Society. 2009. Birds and climate change: Ecological disruption in motion. Available at: http://birdsandclimate.audubon.org/ (accessed 5 March 2013).

Audubon—National Audubon Society. 2007. Audubon's WatchList 2007 in taxonomic order by geographic region: Red Species List continental U.S. and Alaska. Available at: http://birds.audubon.org/2007-audubon-watchlist.

Bailey, R. A. 1989. Geologic map of Long Valley caldera, Mono-Inyo Craters volcanic chain, and vicinity, eastern California. Miscellaneous Investigations Series Map I-1933, Scale 1:62,500, 11 pp. and 2 oversize sheets. U.S. Geological Survey.

Basagic, H. J., IV. 2008. "Quantifying twentieth century glacier change in the Sierra Nevada, California." MS Thesis. Portland State University, Portland, OR.

Beard, C. N. 1959. "Quantitative study of columnar jointing." Geologic Society of America Bulletin 70(3): 379-381.

Brown, P. E. and R. D. Berry. 2007. "Foraging habitat and the large home range of Allen's big-eared bat (Idionycteris phyllotis) in the Arizona desert by radiotelemetry." Bat Research News 48(4): 187-188.

Bytnerowicz, A. and N. E. Grulke. 1992. "Physiological effects of air pollutants on western trees." In The Response of Western Forests to Air Pollution. edited by D. Binkley, R. Olson and M. Bohm, pp. 183-233. Springer-Verlag.

Bytnerowicz, A., J. D. Burley, R. Cisneros, H. K. Preisler, S. Schilling, D. Schweizer, J. Ray, D. Dulen, C. Beck, and B. Auble. 2012. "Surface ozone at the Devils Postpile National Monument receptor site during low and high wildland fire years." Atmospheric Environment 65: 129-141.

Bytnerowicz, Andrzej, et. al. 2012. "Surface ozone at the Devils Postpile National Monument receptor site during low and high wildland fire years." Atmospheric Environment 46.

California Department of Fish and Game (DFG). 2007. "Great Grey Owl Species Information." DRAFT. Accessed online at https://r1.dfg.ca.gov/Portal/LinkClick.aspx?fileticket=GoCemwszSuQ%3D&tabid=986&mid=1947

California Department of Fish and Game (DFG). 2008. Species Explorer. Accessed online at https://nrm.dfg.ca.gov/taxaquery/Default.aspx.

California Department of Fish and Game (DFG). 2010. "Bald Eagles in California." Accessed online at http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/bald_eagle/

California Department of Water Resources, Interagency Ecological Studies Program. 2009. Sacramento, CA.

California Invasive Plant Council (Cal-IPC). 2006. Inventory List of Invasive Non-native Plants that threaten Wildlands in California. California Invasive Plant Council online database.

California Native Plant Society. 2001. Inventory of Rare and Endangered Plants of California, 6th ed. Rare Plant Scientific Advisory Committee, edited by David P. Tibor. CNPS Press, Sacramento, CA.

CalPIF (California Partners in Flight). 2002. Version 1.1. "The coniferous forest bird conservation plan: a strategy for protecting and managing coniferous forest habitats and associated birds in California" (J. Robinson and J. Alexander, lead authors). PRBO Conservation Science, Petaluma, CA. http://www.prbo.org/calpif/plans.html.

Caprio, A. C., M. Keifer and K. Webster. 2006. "Long-term effects of the 1992 Rainbow Fire, Devils Postpile National Monument, California." In AFE 3rd International Fire Ecology Congress, pp. 6 pp. AFE, San Diego, CA.

Cayan, D. R., E. P. Maurer, M. D. Dettinger, M. Tyree and K. Hayhoe. 2007. "Climate change scenarios for the California region." Climatic Change 87(Supplement 1): 21-42.

Cayan, D. R., S. A. Kammerdiener, M. D. Dettinger, J. M. Caprio and D. H. Peterson. 2001. "Changes in the onset of spring in the western United States." Bulletin of the American Meteorological Society 82: 399-415.

Cayan, D.R. and L.G. Riddle. 1993. "A multi-basin seasonal streamflow model for the Sierra Nevada." In Proceedings of the ninth Pacific climate workshop, edited by K.T. Redmond and V.L. Tharp. 141-52.

Chambers, C. L., M. J. Herder, W. M. Masters and D. Vleck. 2006. "Movement areas for spotted bats (Euderma maculatum), northern Arizona." Bat Research News 47: 94.

Cisneros, R., A. Byternowicz, D. Schweizer, S. Zhong, S. Traina, T. Procter and D. Bennett. 2010. "Ozone, nitric oxide and ammonia air pollution unhealthy for people and ecosystems in the southern Sierra Nevada, California." Environmental Pollution 158: 3261-3271.

Clow, D. W. and K. R. Collum. 1986. "Geology of the volcanic rocks at Devils Postpile, California." Journal of Natural Sciences 1: 18-21.

Cook, R. R., and P. Lineback. 2008. Sierra Nevada Network data management plan. Natural Resource Report NPS/NRPC/NRR—2008/070. National Park Service, Fort Collins, Colorado.

Cousens, B. 1996. "Magmatic evolution of quaternary mafic magmas at Long Valley Caldera and the Devils Postpile, California: Effects of crustal contamination on lightospheric mantle-derived magmas." Journal of Geophysical Research 101(B12): 27, 673-689.

Craven, P. 2009. "Devils Postpile National Monument visitor safety program." Prepared for Devils Postpile National Monument, National Park Service, Mammoth Lakes, CA.

Crozier, L. 2003. "Winter warming facilitates range expansion: Cold tolerance of the butterfly Atalopedes campestris." Oecologia 135(4): 8pp.

Cui, Y., E. Mahoney, and T. Herbowicz. 2013. Economic benefits to local communities from national park visitation, 2011. Natural Resource Report NPS/NRSS/EQD/NRTR—2013/631. National Park Service, Fort Collins, Colorado.

Dahlgren, R.A., J.L. Boettinger, G.L. Huntington, and R.G. Amundson. 1997. "Soil development along an elevational transect in the western Sierra Nevada, California." Geoderma 78(3–4): 207-236.

Dalrymple, G. B. 1964. "Potassium-argon dates of three Pleistocene interglacial basalt flows from the Sierra Nevada, California." Geologic Society of America Bulletin 75(8): 753-758.

Denn, M. and D. Shorrok. 2009. "Devils Postpile National Monument Wetland Inventory and Assessment." Prepared for Devils Postpile National Monument, National Park Service, Mammoth Lakes, CA.

Etzel, Ken, PRBO. 2012. DEPO Bird Monitoring Results from the 2009-2011 Point Counts , Ken Etzel.

Forister, M. L., A. C. McCall, N. J. Sanders, J. A. Fordyce, J. H. Thorne, J. O'Brien, D. P. Waetjen and A. M. Shapiro. 2010. "Compounded effects of climate change and habitat alteration shift patterns of butterfly diversity." Proceedings of the National Academy of Sciences 107(5): 2088-2092.

Formichella, C., K. Fristrup, D. Joyce, E. Lynch and E. Pilcher. 2007. Devils Postpile National Monument acoustic monitoring report 2005 & 2006. National Park Service, Natural Sounds Program, Fort Collins, CO.

Goldhammer, J. G., M. Statheropoulos and M. Andreae. 2009. "Impacts of vegetation fire emissions on the environment, human health, and security: a global perspective." In Wildland Fires and Air Pollution, Development in Environmental Science 8, edited by A. Byternowicz, M. Arbaugh, A. Riebau and C. Andersen, pp. 3-36. Elsevier, Amsterdam.

Graber, D. M. 1996. "Chapter 25. Status of terrestrial vertebrates." In Sierra Nevada Ecosystem Project: Final Report to Congress, Vol. II, Assessments and Scientific Basis for Management Options, edited by Centers for Water and Wildland Resources, pp. 709-734. University of California, Centers for Water and Wildland Resources, Davis, CA.

Graham, J. 2009. Devils Postpile National Monument Geologic Resources Inventory Report. National Park Service, Denver, CO. Natural Resources Report NPS/NRPC/GRD/NRR -- 2009/160.

Green, G. A., H. L. Bombay, M. L. Morrison. 2003. "Conservation assessment of the willow flycatcher in the Sierra Nevada." Accessed online at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5357607.pdf

Grindrod, P. and B, J, Walton. n.d. "Cooper's Hawk." Accessed online at http://www.blm.gov/ca/pdfs/cdd_pdfs/coha.pdf

Grinnell, J. and T. I. Storer. 1924. Animal Life in the Yosemite: An account of the mammals, birds, reptiles, and amphibians in a cross-section of the Sierra Nevada, University of California Press, Berkeley.

Grossenbacher, K. A. and S. M. McDuffie. 1995. "Conductive cooling of lava: columnar joint diameter and stria width as functions of cooling rate and thermal gradient." Journal of Volcanology and Geothermal Research 69(1-2): 95-103.

Halterman, M. D. and S. A. Laymon. 1999. "The effects of brown-headed cowbird parasitism on neotropical migrants in Yosemite National Park." Kern River Research Center, Weldon, California.

Halterman, M. D. and S. A. Laymon. 2000. "The effects of Brown-headed Cowbird parasitism on neotropical migrants in Sequoia and Kings Canyon National Parks." Kern River Research Center, Weldon, California.

Hansen, A., R. Knight, J. Marzluff, S. Powell, K. Brown, P. Gude, and K. Jones. 2005. "Effects of exurban development on biodiversity: patterns, mechanisms, and research needs." Ecological Applications 15(6): 1893-1905.

Hayhoe, K., D. Cayan, C. B. Field, P. C. Frumhoff, E. P. Maurer, N. L. Miller, S. C. Moser, S. H. Schneider, K. N. Cahill, E. E. Cleland, L. Dale, R. Drapek, R. M. Hanemann, L. S. Kalkstein, J. Lenihan, C. K. Lunch, R. P. Neilson, S. C. Sheridan and J. H. Verville. 2004. "Emissions pathways, climate change, and impacts on California." Proceedings of the National Academy of Sciences 101(34): 12422-12427.

Hejl, S. J. 1994. "Human induced changes in bird populations in coniferous forests in western North America during the past 100 years." Studies in Avian Biology 15: 232-246.

Hildreth, W., and Fierstein, J., 2014, Eruptive history of Mammoth Mountain and its mafic periphery, California: USGS Professional Paper; 250 ms. pp., 43 Figures, 3 Tables; Appendices; geologic map scale 1:24,000.

Hilimire, K., J. C. Nesmith, A. C. Caprio, and R. Milne. 2013. "Field Note: Attributes of windthrown trees in a Sierra Nevada mixed-conifer forest." Western Journal of Applied Forestry, 28(2), 85-88 and at https://irma.nps.gov/App/Reference/DownloadDigitalFile?code=471059&file=Hilimire_etal_2013_DEPO_Windthrow.pdf.

Holmquist, J.G and J. Schmidt-Gengenbach. 2005. Inventory of Invertebrate Fauna in Devils Postpile National Monument. Report submitted to Sierra Nevada Network Inventory and Monitoring Program, Three Rivers, CA.

Huber, N. K. and W. W. Eckhardt. 2001. The Story of Devils Postpile: A land of volcanic fire, glacial ice, and an ancient river. The Sequoia Natural History Association, Three Rivers, CA.

Huber, N.K., and Rinehart, C.D., 1965, Geologic map of the Devils Postpile Quadrangle, Sierra Nevada, California: USGS Map GQ-437; scale 1:62,500.

Hull, K. L. and M. R. Hale. 1993. "Post-Fire Archeological Survey of Devils Postpile, Madera County, California." Dames and Moore, Chico, California.

IPCC. 2007. "Climate Change 2007: The Physical Science Basis." Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Intergovernmental Panel on Climate Change, Bangkok, Thailand.

Johnson, Christopher E. 2013. "Nature and History on the Sierra Crest: Devils Postpile and the Mammoth Lakes Sierra." National Park Service, Pacific West Regional Office - Seattle, WA.

Kattlemann, R. 1996. "Hydrology and Water Resources." In Sierra Nevada Ecosystem Project: Final report to Congress, vol. III. University of California, Centers for Water and Wildland Resources. Davis, CA.

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. National Park Service, Fort Collins, Colorado.

Kuhn, B.A., and T. Whitaker. 2013. Natural resource condition assessment for Devils Postpile National Monument. DRAFT. Natural Resource Technical Report NPS/2013/NRTR—2013/XXX. National Park Service, Fort Collins, Colorado.

Kunkel, K.E., L.E. Stevens, S.E. Stevens, L. Sun, E. Janssen, D. Wuebbles, K.T. Redmond, and J.G. Dobson. 2013. Regional Climate Trends and Scenarios for the U.S. National Climate Assessment. Part 5. Climate of the Southwest U.S. National Oceanic and Atmospheric Administration Technical Report NESDIS 142-5. Washington, D.C.

Lafayettee H. Bunnell, "Discovery of the Yosemite and the Indian War of 1851, (1892) Robert Eccelston, Mairposa Indian War 1957.

Lambeck, R. J. 1997. "Focal species: a multi-species umbrella for nature conservation." Conservation Biology 11(4): 849-856.

Landers, D. H., S. Simonich, D. Jaffe, L. Geiser, D. H. Campbell, A. Schwindt, C. Schreck, M. Kent, W. Hafner, H. E. Taylor, K. Hageman, S. Usenko, L. Ackerman, J. Schrlau, N. Rose, T. Blett and M. M. Erway. 2008. The fate, transport, and ecological impacts of airborne contaminants in western National Parks (USA). U.S. Environmental Protection Agency, Office of Research and Development, NHEERL, Western Ecology Division, Corvallis, OR. EPA/600/R-07/138.

Landres, P., C. Barns, J. G. Dennis, T. Devine, P. Geissler, C. S. McCasland, L. Merigliano, J. Seastrand, R. Swain. 2008. Keeping it wild: an interagency strategy to monitor trends in wilderness character across the National Wilderness Preservation System. Gen. Tech. Rep. RMRS-GTR-212. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 77 pp.

LeConte, J. N. 1912. "The Devil's Postpile". Sierra Club Bulletin, (8):170-173.

LeConte, J.N. Letter to President Wm. H. Taft, March 29, 1911. Berkeley Water Resources Library, Walter Huber Papers.

Liu, Y., J. Stanturf and S. Goodrick. 2010. "Trends in global wildfire potential in a changing climate." Forest Ecology and Management 259(4): 685-697.

Mahood, G., J. Ring, S. Manganelli and M. McWilliams. 2010. "New 40Ar/39Ar ages reveal contemporaneous mafic and silicic eruptions during the past 160,000 years at Mammoth Mountain and Long Valley caldera, California." Geological Society of America Bulletin 122(3-4): 396.

Manni, M. F., & Cooperative Park Studies Unit (Moscow, Idaho). 2007. "Devils Postpile National Monument visitor study: Summer 2006." Moscow, Idaho: Social Science Program, National Park Service, U.S. Dept. of the Interior.

Martin, M. 2011. "Floodplain assessment of developed area at Devils Postpile National Monument." Memo to Devils Postpile National Monument Superintendent. Water Resources Division, National Park Service, Depart. of the Interior. Fort Collins, CO.

Meehan, T. D. and T. L. George. 2003. "Short-term effects of moderate- to high-severity wildfire on a disturbance-dependent flycatcher in northwest California." Auk 120(4): 1102-1113.

Millar, C. I. 2012. "Geologic, climatic, and vegetation history of California." In The Jepson Manual: Vascular Plants of California. 2nd Edition. University of California Press. pp. 49-67. , http://www.fs.fed.us/psw/publications/millar/psw_2012_millar003.pdf

Millar, C. I. 2005. Late Holocene forest dynamics, volcanism, and climate change at Whitewing Mountain and San Joaquin Ridge, Mono County, Sierra Nevada, CA, USA

Millar, C. I. 1996. "Tertiary vegetation history." In Sierra Nevada ecosystem project: final report to congress. Vol. 2: 71-122.

Miller, N. L. 2003. "California Climate Change, Hydrologic Response, and Flood Forecasting." International Expert Meeting on Urban Flood Management, World Trade Center Rotterdam, the Netherlands. 1-11.

Moritz, C., J. L. Patton, C. J. Conroy, A. Leache, A. Rush and S. R. Beissinger. 2011. "A resurvey of the Grinnell-Storer vertebrate transect through Yosemite National Park, California." National Park Service, Fort Collins, CO. Natural Resource Technical Report NPS/SIEN/NRTR--2011/439.

Moritz, C., J. L. Patton, C. J. Conroy, J. L. Parra, G. C. White and S. R. Beissinger. 2008. "Impact of a century of climate change on small-mammal communities in Yosemite National Park, USA." Science 322(5899): 261-264.

Mount, J. 1997. California Rivers and Streams. University of California Press. Berkeley, CA.

Moyle, P.B. 1996. "Status of Fish and Fisheries." In Sierra Nevada Ecosystem Project: Final report to Congress, vol. III. University of California, Centers for Water and Wildland Resources. Davis, CA.

Murdock, E., B. Itami, H. Gimblett. 2012. "Devils Postpile National Monument visitor behavior model and travel simulation." Prepared for Devils Postpile National Monument, National Park Service, Mammoth Lakes, CA.

Mutch, L. S., M. G. Rose, A. M. Heard, R. R. Cook and G. L. Entsminger. 2008. Sierra Nevada Network Vital Signs Monitoring Plan. DOI National Park Service, Fort Collins, CO. Natural Resources Report NPS/SIEN/NRR-2008/072.

National Park Service. 1998. "Baseline Water Quality Data Inventory and Analysis, Devils Postpile National Monument."

National Park Service. 2009. "Riverbank stability analysis for the Upper Middle Fork of the San Joaquin River north of Devils Postpile National Monument." Unpublished data, Devils Postpile National Monument. National Park Service, Dept. of the Interior.

National Park Service. 2010a. "Devils Postpile National Monument Scope of Collection Statement."

National Park Service. 2010b. Climate Change Response Program. http://www.nature.nps.gov/climatechange (last accessed 9/14/2010).

National Park Service. 2010c. Devils Postpile National Monument Climate Action Plan. http://www.nps.gov/climate-friendlyparks/parks/DEPO.html (last accessed 5/21/2014).

National Park Service. 2011. "Devils Postpile National Monument Long Range Interpretive Plan."

National Park Service. 2013a. Integrated Resource Management Applications. Accessed online at https://irma.nps.gov/App/Portal/Home

Pak, J. B., E. M. Meek, C. L. Horne III, J. H. Owji, K. L. Terrell, M. R. Vinciguerra. 2011. "Devils Postpile National Monument housing needs assessment and certification." DRAFT. Prepared for Devils Postpile National Monument, National Park Service, Mammoth Lakes, CA.

Pechony, O. and D. T. Shindell. 2010. "Driving forces of global wildfires over the past millennium and the forthcoming century." Proceedings of the National Academy of Sciences 107(45): 19167.

Pettebone, D., B. Meldrum, T. Newburger, J. Roche and B. Woiderski. 2010. "Devils Postpile National Monument Visitor Use Assessment." DRAFT. Yosemite National Park, National Park Service, El Portal, CA.

Pierson, E. D. and W. E. Rainey. 2002. "Preliminary surveys for bat species at Devils Postpile National Monument." National Park Service.

Pierson, E. D. and W. E. Rainey. 2009. "Bat inventory for Sequoia-Kings Canyon National Parks and Devils Postpile National Monument."

Rabe, M., M. Siders, C. Miller and T. Snow. 1998. "Long foraging distance for a spotted bat (Euderma maculatum) in northern Arizona." The Southwestern Naturalist 43(2): 266-269.

RHJV (Riparian Habitat Joint Venture). 2004. The riparian bird conservation plan: a strategy for reversing the decline of riparian associated birds in California. California Partners in Flight. Accessed online at http://www.prbo.org/calpif/pdfs/riparian_v-2.pdf.

Richardson, T. W. and. S. Moss. 2010. "Bird Monitoring at Devils Postpile National Monument - Results from the 2009 Field Season." PRBO Conservation Science, Petaluma, California. PRBO Contribution #1729.

Root, T. L., J. T. Price, K. R. Hall, S. H. Schneider, C. Rosenzweig and J. A. Pounds. 2003. "Fingerprints of global warming on wild animals and plants." Nature 421: 57-60.

Rosenzweig, C. and P. Neofotis. 2013. Detection and attribution of anthropogenic climate change impacts. WIREs Climate Change 2013, 4:121-150. doi:10.1002/wcc.209.

Schlesinger, M. D, P. N. Manley, and M. Holyoak. 2008. "Distinguishing stressors acting on land bird communities in an urbanizing environment." Ecology 89(8): 2302-2314.

Shuford, W. D. and T. Gardali. 2008. California bird species of special concern: A ranked assessment of species, subspecies, and distrinct populations of birds of immediate conservation concern in California. Western Field Ornithologists and California Department of Fish and Game, Camarillo & Sacramento, California.

Siegel, R. B, R. L. Wilkerson, J. F. Saracco, and Z. L. Steel. 2011. "Elevation ranges of birds on the Sierra Nevada's west slope." Western Birds 42:2-26.

Siegel, R. B. and R. L. Wilkerson. 2004. Landbird inventory for Devils Postpile National Monument. Final Report. IBP Contribution No. 239. The Institute for Bird Populations, Point Reyes Station, California.

Siegel, R. B. and R. L. Wilkerson. 2005. "Short- and long-term effects of stand-replacing fire on a Sierra Nevada bird community. Final report for the 2004 field season." The Institute for Bird Populations, Point Reyes Station, California.

Siegel, R. B., R. L. Wilkerson and M. Goldin Rose. 2010. Bird monitoring protocol for national parks in the Sierra Nevada Network. National Park Service, Fort Collins, CO. Natural Resource Report NPS/SIEN/NRR -- 2010/231.

Sierra Nevada Ecosystem Project. 1996. Sierra Nevada Ecosystem Project, Final Report to Congress, Vol. I, Assessment Summaries and Management Strategies, edited by D. C. Erman. University of California, Davis, Centers for Water and Wildland Resources, Davis, CA.

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. National Park Service, Fort Collins, Colorado.

Steel, Z. L., M. L. Bond, R. B. Siegel, and P. Pyle. 2012b. Avifauna of Sierra Nevada Network Parks: Assessing distribution, abundance, stressors, and conservation opportunities for 145 bird species (Appendix A – species accounts). Natural Resource Report NPS/SIEN/NRR—2012/506.A. National Park Service, Fort Collins, Colorado.

Stynes, D. J. 2011. Economic benefits to local communities from national park visitation and payroll, 2010. Natural Resource Report NPS/NRSS/EQD/NRR—2011/481. National Park Service, Fort Collins, Colorado.

Tingley, M. W., W. B. Monahan, S. R. Beissinger, and C. Moritz. 2009. "Birds track their Grinnellian niche through a century of climate change." PNAS 106:19,637–19,643.

Toramaru, A., and T. Matsumoto. 2004. "Columnar joint morphology and cooling rate: A starch-water mixture experiment." Journal of Geophysical Research 109(B2): 2205-2214.

U.S. Department of Agriculture, Natural Resources Conservation Service. 1995. Soil Survey of Inyo National Forest Area, Western Part, California.

U.S. Environmental Protection Agency. 2001. Functions and Values of Wetlands. U.S. Environmental Protection Agency. EPA 843-F-01-002c.

United States Forest Service (USFS). 2006. "Draft Environmental Impact Statement for Inyo National Forest Commercial Pack Station and Pack Stock Outfitter/Guide Permit Issuance, Mono and Inyo Counties, CA."

United States Forest Service (USFS). 2008. "Mammoth Lakes Welcome Center Interpretive Plan." Prepared by P.M. Custer for Inyo National Forest.

United States Forest Service (USFS). 2008. "Pacific Southwest Region Regional Forester's Sensitive Species List." USDA Forest Service, Pacific Southwest Region Sensitive Animal Species by Forest. 2007. Accessed online at http://www.fs.fed.us/r5/projects/sensitive-species/

USFWS (United States Fish and Wildlife Service). 2002. Birds of conservation concern 2002. Division of Migratory Bird Management, Arlington, Virginia. 99 pp. Accessed online at: http://migratorybirds.fws.gov/reports/bcc2002.pdf.

USGS. 2001. "North American Breeding Bird Survey." Accessed online at https://www.pwrc.usgs.gov/bbs.

Vanasse Hangen Brustlin, Inc. 2007. "Reds Meadow Valley/Devils Postpile National Monument Case Study."

Vezeau, S. L., J. Roche, B. Woiderski, D. Pettebone, T. Newburger, B. Meldrum, and C. Leslie. 2011. "Devils Postpile National Monument 2010 Visitor Use Monitoring Assessment". National Park Service.

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 increases western U.S. forest wildfire activity." Science 313: 940-943.

Wheeler, S. S., C. M. Barker, Y. Fang, M. V. Armijos, B. D. Carroll, S. Husted, W. O. Johnson, and W. K. Reisen. 2009. "Differential impact of West Nile virus on California birds." The Condor 111(1): 1-20.

Zielinski, W. 2004. "The status and conservation of mesocarnivores in the Sierra Nevada." In Sierra Nevada Science Symposium, pp. 185-193. USDA Forest Service, Kings Beach, CA. Gen. Tech. Rep. PSW-GTR 193.

Zielinski, W.J., R. L. True, F. V. Schlexer, L. A. Campbell and C. Carroll. 2005. "Historical and contemporary distributions of carnivores in forests of the Sierra Nevada, California, USA. " Journal of Biogeography 32:1385–1407

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