

## Chapter Three: Alternatives







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## Alternatives for the management of Lava Beds National Monument

### Introduction

The National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality regulations that implement NEPA require the development of alternatives in a draft general management plan in order to fully explore a range of ideas, methods, and concepts for managing a national park unit. It must be possible to implement all alternatives considered. In addition, regulations require that the draft general management plan identify a “preferred alternative” before the draft plan and environmental assessment is released for public review. The preferred alternative is the alternative that the NPS believes would best accomplish its goals, based on the analyses conducted.

This *Draft General Management Plan and Environmental Assessment* presents three alternatives for future management of Lava Beds National Monument. Alternative A, the No-Action Alternative, presents a continuation of current management direction and is included as a baseline for comparing the consequences of implementing each alternative. The action alternatives are alternative B, Expanding Learning and Resource Preservation through Collaboration (the preferred alternative) and alternative C, Diversified Recreation.

These three 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 Lava Beds National Monument.

### Formulation of the Alternatives

The planning team, comprised of staff from the monument and the NPS Pacific West Region, developed four preliminary management alternatives (including

the “no action” alternative) in the summer of 2007. The action alternatives centered on three themes; expanded resource preservation and restoration (preliminary alternative B), providing diversified recreation opportunities (preliminary alternative C), and expanded education and interpretation (preliminary alternative D). Each alternative was evaluated to ensure consistency with the monument’s purpose and significance, the desired future conditions, and current laws, regulations, and policies. These preliminary alternatives were presented for public review in winter 2008.

In spring 2008, the planning team incorporated ideas generated from stakeholder meetings and public comment letters submitted to the planning team during the winter of 2008. Overall, GMP actions that the public was most supportive of included preserving the monument’s resources and character, and enhancing educational opportunities, interpretive programs, and exhibits. Many of the public comments on the preliminary alternatives that were received indicated a preference for a blending of the themes captured in the alternatives into one or more alternatives that contain a reasonable complement of environmental preservation, research, visitor access, and visitor opportunities.

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 Lava Beds National Monument.



Early Visitors at Petroglyph Point, CalLibrary Photo

## Alternative Components

Each alternative must meet the program standards for the major elements of a GMP, including:

- An overall **management concept** statement generally describes the guiding philosophy or overall direction for each alternative. The concept highlights the alternative's overall character in terms of emphasis on particular kinds of resource conditions and associated visitor experiences.
- **Management of specific areas.** Area-specific desired conditions are described for various locations throughout the monument, including the desired resource conditions, associated visitor experience opportunities, and the appropriate kinds and levels of management, development, and access. This plan describes area specific desired conditions for the Cave Loop Road area, Petroglyph Point, and the campground.
- **Management zoning** is the method used by the NPS to identify and describe the appropriate variety of resource conditions and visitor experiences to be achieved and maintained in the different areas of a park. Zoning is generally a two-step process: (1) identify a set of potentially appropriate management zones and define what activities or conditions are appropriate for each zone (see table 2: Management Zones), and (2) allocate those zones to geographic locations throughout the park unit. The geographic locations are conveyed on alternative zoning maps. The alternative zoning maps determine where recommended management actions are appropriate (see alternative zoning maps, pp. 58-60 and pp. 72-74). For example, what areas of the monument would be appropriate for new visitor serving facilities such as a picnic area?
- **User capacity** defines the types and levels of visitor and other public use that can be accommodated while sustaining the desired resource conditions, social conditions and visitor experiences that complement the purpose of the monument. The premise behind user capacity management approaches is that with any use on public lands comes some level of impact that must be accepted; therefore it is the responsibility of the public land management agency to decide what level of impact is acceptable and what actions are needed to keep impacts within acceptable limits.
- **Potential Boundary Adjustments.** GMPs are required to take a comprehensive look at concerns about adjacent land uses, implications for management of lands within the authorized boundary, and potential for boundary adjustments.
- **Management actions** describe the changes in management direction or strategies that the monument would consider to achieve the vision described in the alternative concept. Because some management directions would be implemented regardless of alternative, Table 3 describes those management directions that are "common to all alternatives."
- **Projected Implementation Costs.** NPS policies require general management plans to include estimates of annual recurring costs ("annual operating costs") and of one-time capital costs for facility rehabilitation, new construction, or management projects. Costs of alternatives may vary significantly in recurring needs such as staffing, operations, and maintenance, as well as one-time projects such as facilities, transportation projects, research, and resource rehabilitation.



Alternatives workshop, NPS Photo

The Preferred Alternative was chosen by comparing costs against the relative advantages of each alternative to preservation and restoration, research opportunities, and engagement of a broader public through more interpretation, education, and new visitor opportunities.



Public meeting, NPS Photo



Mushpot Cave, NPS Photo

The preferred alternative proposed includes a blend of the strengths and advantages of themes included in preliminary alternatives B and D. Several actions from alternative C were also incorporated.

The alternatives presented seek to balance resource protection with new visitor opportunities and were developed to be functional and viable. The revised alternative B (the preferred alternative) would maximize resource protection and visitor opportunities by restoring habitat, expanding research opportunities, offering new educational and interpretive opportunities, expanding wilderness opportunities, constructing new trails, and providing a limited number of new visitor service facilities. Alternative C maximizes visitor recreational opportunities by providing more facilities and recreational programs for visitors.

Each alternative has a somewhat different concept, which is primarily defined in terms of different management zones and how they are applied geographically. These differences are displayed on zoning maps for each of the action alternatives. Each alternative also varies in the management prescriptions, or actions, for various resource topics that the monument would initiate in order to achieve the desired conditions. See the opposite page for a detailed description of the alternative components.

The alternatives focus on which resource conditions and what visitor uses and experiences should exist within the monument rather than on details of how these conditions and experiences should be achieved. Thus, the alternatives do not include many details about

resource or visitor use management. More detailed plans or studies would be required before most conditions proposed in the alternatives are achieved. The implementation of any alternative also depends on future funding and environmental compliance. This plan does not guarantee that funding will be forthcoming. The plan establishes a vision of the future that would guide day-to-day and year-to-year management of the monument, but full implementation could take many years.

## Identification of the Preferred Alternative

The development of a preferred alternative involves evaluating the alternatives with the use of an objective analysis process called “choosing by advantages” or “CBA.” Through this process, the planning team identifies and compares the relative advantages of each alternative according to a set of factors. The factors were chosen based on issues and goals identified for the GMP and public comments. The alternatives were evaluated based on the degree to which each alternative accomplishes the following factors:

- Preserves and/or restores significant ecological systems, cultural resources and monument collections
- Provides a range of high quality experiences through interpretive, educational, and recreational opportunities
- Increases scientific knowledge and understanding of monument resources
- Preserves the monument’s undeveloped character (unobtrusive and low-profile) and wilderness values
- Improves operational efficiency and sustainability

The planning team evaluated the relationships between the advantages and costs of each alternative according to the factors listed above. This information was used to combine the best attributes of the initial preliminary alternatives into the preferred alternative (alternative B). This alternative gives the National Park Service the greatest overall benefits for each point listed above for the most reasonable cost.



## Potential for Boundary Adjustments

The National Park and Recreation Act of 1978 requires general management plans to address whether boundary modifications should be made to park units. Since the 1930s the NPS has looked at a number of different alternatives with respect to expanding Lava Beds National Monument boundaries for the purpose of resource preservation and visitor use. The monument's 1944 Master Plan recommended adding Petroglyph Point and large areas south of the monument including the Black Lava Flow and Big Glass Mountain. In 1951, President Harry Truman issued a presidential proclamation adding Petroglyph Point and Mammoth Crater to the monument. To accommodate a road along the north boundary, Congress authorized the addition of several hundred acres in the October 1974 appropriations bill. The recommended Black Lava Flow and the Big Glass Mountain additions were never implemented. In 2010, additional lands were added to Petroglyph Point.

The action alternatives in this GMP do not propose any boundary adjustments. However, the monument will focus on working primarily with the U.S. Forest Service in the management of significant resources that are associated with the monument, such as lava tube systems that start on U.S. Forest Service lands and cross into the monument. There are also significant holdings of private timberland (approximately 2,500 acres) located along the southern boundary of the monument. Depending on how they are managed, activities on these lands could be detrimental to the resources of the monument. Rather than expanding the monument boundary, efforts would instead be directed to assist the Modoc National Forest in acquiring the timberland.

## Overview of Management Zones

Management zones apply to different areas of a park unit and consist of descriptions of the desired conditions for resources and visitor experiences in those different areas. Together, they identify the widest range of potential resource conditions, visitor experiences, and facilities for the park unit that fall within the scope of the park unit's purpose, significance, and special mandates. Four management zones were identified

for Lava Beds National Monument: administrative, developed, interpretive backcountry, and backcountry.

In formulating the two action alternatives, the management zones were placed in different locations or configurations on a map of the monument according to the overall concept of each alternative (see alternative zoning maps, pp. 76-78 and pp. 89-91).

The four management zones identified for Lava Beds National Monument are presented in Table 2. Visitor experiences, resource conditions, and appropriate activities and facilities are described for each management zone. Desired conditions that are common to all of the management zones are described below.



### COMMON TO ALL ZONES

#### CAVES

Lava Beds National Monument offers a variety of experiences but the primary recreational activity is cave exploration. The monument recognizes that caves are non-renewable resources, and every effort will be made to provide resources and staff to preserve and protect cave resources in as natural a setting as possible regardless of surface zoning. The monument's cave management plan would outline specific resource management prescriptions for caves.

#### ETHNOGRAPHIC RESOURCES

In all zones, ethnographic resources are identified. Consultation of the tribes would be undertaken to address issues related to ethnographic resources.

**TABLE 2: MANAGEMENT ZONES**

<b>MANAGEMENT ZONES</b>			
<b>BACKCOUNTRY ZONE</b>	<b>INTERPRETIVE BACKCOUNTRY ZONE</b>	<b>DEVELOPED ZONE</b>	<b>ADMINISTRATIVE ZONE</b>
<b>ZONE CONCEPTS</b>			
The backcountry zone would emphasize the preservation of natural and cultural resources and offer outstanding opportunities for solitude and primitive recreation. Recreational opportunities would be primarily unstructured, with many opportunities for adventure. This zone would include legislated wilderness areas and others areas managed as wilderness.	The interpretive backcountry zone would emphasize the preservation of natural and cultural resources and offer opportunities for solitude and primitive recreation, but the sights and sounds of people would be evident in limited areas. Resources could be modified for essential visitor needs such as trails and interpretive media, as well as operational needs in a way that harmonizes with the natural and cultural environment.	The developed zone would support developed visitor use areas that feature convenient access and support services. Education and interpretive facilities and services would be fully accommodated. This zone would serve as a primary entry into other zones.	The purpose of the administrative zone would be to support the day-to-day management and administration of the monument. These areas would generally be closed to the public.
<b>DESIRED NATURAL RESOURCE CONDITIONS</b>			
<p>Natural resources would be managed with concern for fundamental ecological processes as well as individual species and features.</p> <p>Sage and grassland communities would be maintained in a healthy and stable condition. The Ponderosa pine community would be restored using appropriate management techniques.</p> <p>Nonnative plant management would be focused on eradication.</p> <p>The monument would provide adequate habitat for wildlife, including populations of bats, birds, and sensitive species such as sage grouse.</p> <p>Wildland fire use would be the principal vegetation management tool in this area.</p> <p>Surface geological features would be maintained in their natural condition.</p>	<p>Natural resources would be managed for the same desired conditions as the Backcountry Zone. However, the monument would allow greater visitor access while maintaining and improving the natural and geological setting.</p> <p>Sage and grassland communities would be maintained in a healthy and stable condition. The Ponderosa pine community would be restored using appropriate management techniques.</p> <p>Nonnative plant management would be focused on eradication.</p> <p>The monument would provide adequate habitat for wildlife, including populations of bats, birds, and sensitive species such as sage grouse.</p> <p>Wildland fire use would be emphasized, but managed to accommodate visitor needs and address safety concerns.</p>	<p>Visitor facilities such as structures, trails, parking areas, picnic areas, informational signs, and drinking fountains would be sited in areas that are already disturbed or in areas without sensitive resources.</p> <p>New visitor facilities would be designed to minimize any negative impacts on natural resources.</p> <p>Sage and grassland communities would be maintained in a healthy and stable condition. The Ponderosa pine community is restored using appropriate management techniques.</p> <p>Nonnative plant management would be focused on eradication or containment.</p> <p>The monument would provide adequate habitat for wildlife, including populations of bats, birds, and sensitive species such as sage grouse.</p>	<p>Natural resources would be managed with concern for fundamental ecological processes as well as individual species and features. Monument operations would have a minimal impact on the protection of native vegetation and wildlife</p> <p>New administrative facilities would be sited in areas that are already disturbed or in areas without sensitive resources.</p> <p>Sage and grassland communities would be maintained in a healthy and stable condition. The Ponderosa pine community would be restored using appropriate management techniques.</p> <p>The monument would provide adequate habitat for wildlife, including populations of bats, birds, and sensitive species such as sage grouse.</p>

MANAGEMENT ZONES			
BACKCOUNTRY ZONE	INTERPRETIVE BACKCOUNTRY ZONE	DEVELOPED ZONE	ADMINISTRATIVE ZONE
DESIRED NATURAL RESOURCE CONDITIONS (CONTINUED)			
	<p>Surface geological features would be maintained in their natural condition, managed to prevent degradation, or restored where feasible.</p> <p>Area closures to protect sensitive species would be utilized.</p>	<p>Surface geological features would be maintained in their natural condition, managed to prevent degradation, or restored where feasible.</p> <p>Area closures to protect sensitive species would be utilized.</p> <p>Natural resources collections would be housed in this zone.</p>	<p>Surface geological features would be maintained in their natural condition, managed to prevent degradation, or restored where feasible.</p> <p>The visibility of administrative structures and features from other zones would be minimized.</p> <p>Natural resources collections would be housed in this zone.</p>
DESIRED CULTURAL RESOURCE CONDITIONS			
<p>Cultural resources would be recognized as an integral component of the wilderness resource.</p> <p>Historic properties would be managed using the Secretary of the Interior's Standards for documentation, preservation, conservation, and research.</p> <p>Known sites, ruins/structures and features would be fully described for management, research, and interpretation.</p> <p>Past human uses of the land would be researched and understood.</p>	<p>The monument would balance greater visitor use and interpretation with the preservation of sites, buildings, features, and rock art.</p> <p>Historic properties would be managed using the Secretary of the Interior's Standards for documentation, preservation, conservation, and data recovery.</p> <p>Known sites, ruins, structures and features would be fully described for management, research, and interpretation.</p> <p>Past human uses of the land would be researched and understood.</p> <p>Appropriate information concerning human ecology and history would be provided for visitors through formal and self-guided tours.</p>	<p>The monument would actively preserve and maintain resources in this zone to address anticipated visitor impacts.</p> <p>Historic properties would be managed using the Secretary of the Interior's Standards for documentation, preservation, conservation, and data recovery.</p> <p>Known sites, ruins/structures and features would be fully described for management, research, and interpretation.</p> <p>Past human uses of the land would be researched and understood.</p> <p>Historic structures and buildings would be appropriately adapted for continued use.</p> <p>Historic properties are integral to the educational program and would be actively used for interpretation.</p>	<p>Visitor access would not be encouraged or provided.</p> <p>Historic properties would be managed using the Secretary of the Interior's Standards for documentation, preservation, conservation, and data recovery.</p> <p>Known sites, ruins/structures and features would be fully described for management, research, and interpretation.</p> <p>Past human uses of the land would be researched and understood.</p> <p>Historic buildings would be appropriately adapted for continued use.</p> <p>At risk properties would be monitored and threats would be mitigated.</p> <p>Collections would be cared for by providing appropriate environmental controls and by adhering to access and handling protocols.</p>



## MANAGEMENT ZONES

BACKCOUNTRY ZONE	INTERPRETIVE BACKCOUNTRY ZONE	DEVELOPED ZONE	ADMINISTRATIVE ZONE
<b>DESIRED CULTURAL RESOURCE CONDITIONS (CONTINUED)</b>			
		<p>Sensitive resources may be documented and salvaged if threatened by use.</p> <p>Archeological sites would be stabilized.</p>	<p>Archives would be fully catalogued and copies would be made available for appropriate research and interpretation.</p>
<b>DESIRED VISITOR OPPORTUNITY RESOURCE CONDITIONS</b>			
<p>Visitors would have the opportunity to experience solitude, adventure, and escape in the monument's unique volcanic landscape.</p> <p>Visitors would experience natural scenery, dark night sky, natural quiet, and the natural qualities of this environment.</p> <p>Visitors would have a self-directed, generally unfacilitated experience involving some level of risk and physical challenge.</p> <p>Interpretive opportunities would be available for pre-planning the visitor experience.</p> <p>Wilderness areas provide an opportunity and obligation for self-sufficiency.</p> <p>Visitor activities within the backcountry zone would require a moderate to extended time commitment.</p> <p>Special programs could be conducted in the backcountry zone.</p>	<p>Visitors would experience the environment with some interpretive features.</p> <p>Visitors would have some opportunities to experience natural scenery, dark night sky, and natural quiet.</p> <p>Visitors would have some ranger guided activities and interpretive opportunities would be provided.</p> <p>Some pre-planning may be required for visitation.</p> <p>Visitor opportunities would require some amount of self-reliance.</p> <p>Visitor activities within the interpretive backcountry zone would require a moderate time commitment.</p> <p>Visitors would have light to moderate contact with other visitors and monument staff.</p>	<p>Visitors would experience a wide variety of both personal and non-personal interpretive opportunities.</p> <p>Aside from caves, most visitor attractions and interpretive features would be accessible to most or all visitor populations.</p> <p>The monument would provide opportunities for more in-depth interpretation.</p> <p>Numerous ranger guided activities would be provided, especially in the summer season.</p> <p>There would be a high potential for contact with other visitors, monument staff, and administrative activities</p> <p>Little or no pre-planning would be required for visitation to most areas.</p> <p>Minimal risk and physical challenge would be required for visitors in the developed zone.</p> <p>Visitor activities within the developed zone would require a short to moderate time commitment.</p> <p>Wheeled conveyances and leashed pets are allowed on roads and designated trails.</p> <p>Monument staff would allow controlled access to collections</p>	<p>Monument staff would allow controlled access to collections and research materials on a case-by-case basis.</p>

MANAGEMENT ZONES			
BACKCOUNTRY ZONE	INTERPRETIVE BACKCOUNTRY ZONE	DEVELOPED ZONE	ADMINISTRATIVE ZONE
DESIRED VISITOR OPPORTUNITY RESOURCE CONDITIONS (CONTINUED)			
		and research materials on a case-by-case basis.	
DESIRED FACILITIES RESOURCE CONDITIONS			
<p>Facilities in the backcountry zone could include primitive trails, minimal trail signs, primitive campsites, unobtrusive administrative markers, and temporary resource monitoring equipment.</p> <p>Telecommunications facilities would not be permitted in the backcountry zone.</p>	<p>Only non-motorized transportation would be permitted, with the exception of motorized administrative access where necessary.</p> <p>With the exception of the existing fire lookout facility, no other buildings would be permitted in the interpretive backcountry zone.</p> <p>Development would primarily consist of trails, administrative roads, trail signs (including interpretive signs), and markers.</p> <p>Small scale telecommunications facilities may be allowed for administrative purposes if designed and sited to minimize impacts.</p> <p>Resource monitoring equipment would be permitted.</p>	<p>The developed zone would contain most visitor facilities. Facilities could include paved and unpaved roads, parking areas, buildings, visitor use support structures, utilities, picnic areas, campground area, interpretive media, pullouts, overlooks, and trail-heads.</p> <p>Telecommunications facilities may be allowed to support monument operations if designed and sited to minimize impacts.</p> <p>Resource monitoring equipment would be permitted.</p> <p>New development would minimize visitor impacts and emphasize high quality design aesthetics and sustainability.</p>	<p>Facilities in the administrative zone could include employee housing, administrative offices, maintenance shops and storage, roads, parking, signage, utilities, fire and emergency operations centers.</p> <p>Telecommunications facilities may be allowed to support monument operations if designed and sited to impacts.</p> <p>Sustainability and energy efficiency would be a component of facility management.</p> <p>Resource monitoring equipment would be permitted.</p> <p>New development would emphasize high quality design, aesthetics, and sustainability.</p>
DESIRED CAVE RESOURCE CONDITIONS			
<p>The backcountry zone would emphasize cave preservation. Visitor access would not be encouraged.</p> <p>Information would be limited to cave safety and conservation messages (no specific information on cave locations would be provided).</p> <p>Seasonal cave closures may occur to protect sensitive resources.</p>	<p>The interpretive backcountry zone would provide moderate levels of visitor access to selected caves.</p> <p>Cave exploration would require a high degree of self-reliance and responsibility.</p> <p>Caves would be more intensely managed through monitoring of visitor use and restoration efforts.</p>	<p>The developed zone would provide higher levels of visitor access to selected caves.</p> <p>Caves would be more intensely managed through monitoring of visitor use and restoration efforts.</p> <p>More directed interpretation, including designated corridors for accessing caves, and ranger guided tours would be provided for Class 1 caves.</p>	<p>Access to caves would not be encouraged.</p> <p>Caves would be more intensely managed through monitoring of visitor use and restoration efforts.</p> <p>Impacts to caves from administrative facilities and infrastructure would be minimized.</p>

MANAGEMENT ZONES			
BACKCOUNTRY ZONE	INTERPRETIVE BACKCOUNTRY ZONE	DEVELOPED ZONE	ADMINISTRATIVE ZONE
DESIRED CAVE RESOURCE CONDITIONS (CONTINUED)			
A high level of self-reliance and responsibility would be required to explore caves in the backcountry zone.	<p>Directed interpretation for Class 1 caves in this zone would be provided.*</p> <p>Seasonal cave closures may occur to protect sensitive resources.</p> <p>Caves would be generally more impacted in this zone and could require intense management.</p>	Seasonal cave closures may occur to protect sensitive resources.	<p>Seasonal cave closures may occur to protect sensitive resources.</p> <p>Caves would be generally more impacted in this zone and require intense management.</p>
DESIRED DARK NIGHT SKY RESOURCE CONDITIONS			
<p>Dark night skies and natural lightscapes would be integral to the visitor experience in this zone.</p> <p>Nocturnal lightscapes would be preserved and restored to the extent possible.</p> <p>No permanent outdoor lighting would be allowed except as needed for emergency response, critical natural resource goals, or emergency communications.</p>	Same as backcountry zone.	<p>Dark night skies and natural lightscapes would enhance the visitor experience in this zone.</p> <p>Some lighting would be appropriate on powered facilities and in heavy use areas where health and safety are of concern.</p> <p>No lighting would be placed in areas that impact the backcountry and interpretive backcountry zones.</p> <p>Lighting developments would preserve the monument's International Dark Night Skies Park status while protecting nocturnal wildlife.</p> <p>New proposed lights would be in compliance with NPS procedures to assure the protection of dark sky resources.</p>	Same as the developed zone. However, no lighting would be permitted in the Crescent storage area.

\* Class 1 caves contain developments that make the cave accessible and relatively safe for the average visitor. These developments must include a trail sign that identifies the cave, a nearby parking area, a path to the cave, and trails within the cave that define routes. Normal visitation to class 1 caves must not threaten sensitive or fragile cave resources. Class 1 caves are not located within designated wilderness or backcountry areas.



MANAGEMENT ZONES			
BACKCOUNTRY ZONE	INTERPRETIVE BACKCOUNTRY ZONE	DEVELOPED ZONE	ADMINISTRATIVE ZONE
DESIRED SOUNDSCAPE RESOURCE CONDITIONS			
<p>The major focus of management within this zone would be the complete protection, maintenance, and restoration of the natural soundscape resource in a condition unimpaired by non-natural noise sources.</p> <p>To the fullest extent possible natural soundscapes would be protected as intrinsic elements of this zone to ensure a wilderness/ backcountry experience for visitors and protect natural resources.</p>	<p>The monument would preserve natural soundscapes in a condition unimpaired by inappropriate or excessive noise sources. Vehicle traffic noise along monument roads would be the primary impact in this zone.</p> <p>The monument would take every effort necessary to limit excessive noise from operational activities, such as vehicle and tool use, etc.</p> <p>Natural soundscapes are managed to provide a high-quality visitor experience and protect biological resources and processes that rely on sound (i.e., intra-species communication, courtship, predation and predator avoidance, and effective use of habitat).</p>	<p>Areas developed for visitor use in this zone would maintain natural soundscapes to the highest extent possible.</p> <p>Disruptions from recreational uses are managed to provide a high-quality visitor experience and protect biological resources and processes that rely on sound.</p>	<p>Natural soundscapes would be protected to the fullest extent possible.</p> <p>Sounds associated with powered vehicles and other equipment needed to manage developed and administrative areas would occur in this zone.</p> <p>Disruptions from maintenance activities are managed to minimize impacts to visitor experiences and protect biological resources and processes that rely on sound.</p>

## Description of the Alternatives

The following section describes the range of alternatives considered in this general management plan. Before the detailed description of each alternative, an overview of specific general management plan actions that are common to all alternatives are described. For each alternative described, a narrative provides an overall vision for the alternative. This narrative is followed by a table of management actions specific to that alternative and a description of costs.

### ACTIONS COMMON TO ALL OF THE ALTERNATIVES

The following table summarizes the management direction, or actions, that would apply to all the alternatives, including alternative A, the no action alternative.



California Poppies, NPS Photo

TABLE 3: ACTIONS COMMON TO ALL ALTERNATIVES

ACTIONS COMMON TO ALL ALTERNATIVES	
GEOLOGIC PROCESSES AND FEATURES	<ul style="list-style-type: none"> <li>The monument would continue to maintain and restore the integrity of existing geologic resources and assess the impacts of natural processes and human-related events on geologic resources.</li> <li>The monument would continue to work with the U.S. Geological Survey and other partners to conduct geologic research, inventories and monitoring, and to identify, address, and monitor geologic hazards.</li> <li>Sensitive caves (such as Fern Cave and Crystal Ice Cave) would be operated in a manner that preserves the resources while allowing for limited visitor use.</li> <li>The monument would complete a revised cave management plan. The cave management plan would establish guidelines for long term management strategies and set resource condition goals for the monument's caves.</li> </ul>
VIEWSHEDS/VISUAL QUALITY	<ul style="list-style-type: none"> <li>The monument would continue to work with the California Environmental Protection Agency and other partners, to preserve its Class I air quality within and around its borders.</li> <li>The monument would continue to monitor air quality to gain a better understanding of ambient air quality conditions and the sensitivity of monument resources to air pollution.</li> </ul>
DARK NIGHT SKIES	<ul style="list-style-type: none"> <li>The monument would seek recognition as an International Dark Sky Preserve.</li> </ul>
ECOLOGICAL COMMUNITIES	<ul style="list-style-type: none"> <li>Wildlife is recognized as an integral part of monument wilderness areas and contributes significantly to overall biodiversity. Wilderness areas would continue to function as a key component in maintaining indigenous species.</li> <li>Habitat would be managed to support a diverse range of native wildlife species and give the public high-quality opportunities for wildlife-based recreation.</li> <li>Habitat for migratory birds, including forage, water, cover, structure, and security would be available to support healthy populations of resident and migrant species.</li> <li>The monument would continue to protect cave environments, ecosystems, and habitat.</li> </ul>
FIRE MANAGEMENT	<ul style="list-style-type: none"> <li>Fire is recognized as one of the most important tools for the maintenance and restoration of plant communities within and outside of the Monument. All operational, planning and implementation steps are taken in a manner to assure the preservation of natural and cultural resources. Fires are managed for resource benefit through multiple means, including wildfire (unplanned ignitions) and the use of prescribed fire (planned ignitions).</li> <li>Desired future conditions are developed within a vegetation management plan (draft 2010), adaptive management is applied in response to non-native plants, and additional research is conducted to understand fire effects on vegetation communities.</li> <li>Fire on the landscape is a continually developing science and management effort evolving annually with new research information/findings and fire policy.</li> </ul>

## ACTIONS COMMON TO ALL ALTERNATIVES

WILDERNESS	<ul style="list-style-type: none"> <li>• Designated Wilderness would be managed in accordance with the 2006 Wilderness Stewardship Plan and future updates. Lava Beds Wilderness would remain an area characterized by an essentially unmodified natural environment: Interaction between users would be very low; evidence of other users would be minimal; motorized use within the area would not be permitted.</li> <li>• No major wilderness expansion legislation would be pursued. Legislation has been proposed for minor adjustments to the wilderness boundary as outlined in the 2006 Wilderness Stewardship Plan. The proposed adjustments would correct errors from the original legislation by drawing the wilderness boundary around features that are incompatible with wilderness values (e.g. road segments, a portion of the campground amphitheater). Such changes are minor and would not add or remove acres from the 28,460 acres of legislated wilderness designated for the monument in PL 92-493.</li> <li>• Cultural and historic sites are recognized as an integral component of the wilderness resource. Past human uses of the land are understood. Values of cultural resource sites are preserved.</li> <li>• Lava Beds provides opportunities for public use, enjoyment, and understanding of the wilderness, through experiences that depend upon a wilderness setting. The monument would continue to provide outstanding opportunities for solitude or a primitive and unconfined setting. Wilderness dependent research would be encouraged.</li> <li>• The Schonchin Lava Tubes Research Natural Area, a 134 acre plot of land set aside for research would continue to be maintained by allowing natural physical and biological processes to prevail without human intervention.</li> </ul>
CULTURAL RESOURCES	<ul style="list-style-type: none"> <li>• The monument would continue efforts to document cultural resources and consider additional nominations to the National Register of Historic Places for historic buildings and structures, cultural landscapes, and archeological sites.</li> <li>• The monument would complete a survey of all monument lands for cultural resources.</li> </ul>
ARCHEOLOGY	<ul style="list-style-type: none"> <li>• The Modoc Lava Beds Archeological District would be managed for preservation, interpretation, and research.</li> <li>• With the recent addition of a cultural resource position to the monument staff, the monument would continue to improve management of archeological resources through day to day coordination with interested parties.</li> <li>• The identification and interpretation of archeological sites would be conducted so as to not compromise the security of the resources.</li> </ul>
ETHNOGRAPHIC RESOURCES	<ul style="list-style-type: none"> <li>• The monument would continue to preserve and maintain contact with The Klamath Tribes, organizers of the annual Modoc Gathering, and with individual Modocs regarding traditional cultural interests.</li> <li>• The monument would formalize use of ethnographic resources. For example, an agreement or special permit with tribes for collection and use.</li> <li>• The monument would compile baseline information on ethnographic resources.</li> </ul>
HISTORIC STRUCTURES	<ul style="list-style-type: none"> <li>• The monument would continue to preserve and maintain its historic structures.</li> </ul>
CULTURAL LANDSCAPES	<ul style="list-style-type: none"> <li>• The monument would continue preservation of the Modoc War Historic District cultural landscape. Prescribed burns and other treatments would continue to be used to restore the historic landscape and control the spread of invasive species.</li> <li>• Preservation and maintenance of buildings, structures, and landscape features associated with the Public Works Administration and Civilian Conservation Corps development would continue.</li> <li>• Mission 66 era infrastructure would be evaluated for national register eligibility.</li> </ul>



## ACTIONS COMMON TO ALL ALTERNATIVES

MUSEUM COLLECTIONS	<ul style="list-style-type: none"> <li>• Monument staff would continue to locate and document museum collections housed at other facilities and identify, process, document, and duplicate monument records and archives, and make these available for staff and public use.</li> <li>• Within the monument, environmental controls for current collections space would be improved.</li> <li>• The monument would develop documentation for all specimens in the natural and cultural resource collections. Specific efforts to preserve historic management/administrative records would be implemented, specifically the preservation of records that cover the period of park management (1925-current). Specific steps to continue the protection of administrative records would be implemented through continued collection management efforts.</li> </ul>
INTERPRETATION AND EDUCATION	<ul style="list-style-type: none"> <li>• The monument would complete a long range interpretive plan that would provide specific guidance for defining interpretive themes and desired visitor experience opportunities. The plan would define the interpretive, outreach, and educational services that would meet the needs and preferences of the widest variety of visitors, students, and community members while preserving resources.</li> <li>• Coordination with new cultural resources staff would improve cultural resource interpretation.</li> <li>• Monument interpretive staff would continue to meet the curriculum goals of a wide range of students in both Oregon and California.</li> <li>• Monument interpretive staff would remain engaged in community events, and recruit employees from local communities and colleges to further enhance ties to local and regional communities.</li> <li>• An emphasis placed on interpreting specific prescient topics such as climate change and utilizing new technologies in interpretation would continue as they evolve at a national level.</li> </ul>
ROADS, TRAILS, AND TRAILHEADS	<ul style="list-style-type: none"> <li>• If the condition of Forest Service Route 10 is not improved and remains in poor condition, visitors would be directed to access the monument from the more heavily traveled and paved northern routes.</li> <li>• The suitability of potential new trail locations would be evaluated through a trail management plan.</li> </ul>
FACILITIES (MAIN PARK UNIT)	<ul style="list-style-type: none"> <li>• Facilities would be managed to protect dark night skies, soundscapes, viewsheds, and wildlife preservation, and to prevent nonnative plant dispersal.</li> <li>• New facilities would not be built over or degrade geologic features and cave resources.</li> <li>• Best available technologies would be used to reduce impacts on wildlife species. For example, the replacement of windows in current facilities with new non-collision technology would be incorporated as the science develops to prevent birds from colliding with structures.</li> <li>• New alternative/solar energy conversion efforts on facilities would be implemented in a manner to protect the monument's natural and cultural resources.</li> <li>• The research center would continue to be used for research and educational purposes by the monument and its partners.</li> </ul>
BOUNDARY ADJUSTMENTS	<ul style="list-style-type: none"> <li>• The monument would focus on working with partners and sister agencies to manage significant resources that extend beyond the monument boundaries, primarily lava tube systems that cross onto National Forest lands.</li> </ul>
RESEARCH	<ul style="list-style-type: none"> <li>• A resource stewardship strategy would be completed for Lava Beds.</li> <li>• The monument would identify and prioritize scientific research needs. The following are examples of some of these needs: <ul style="list-style-type: none"> <li>• Caves – impacts of visitors on cave formations and cave fauna/flora.</li> <li>• Fire –nonnative plant response to fire regimes on large inter-agency landscape level.</li> <li>• Archeology –Modoc War, obsidian sites, and other topics that provide further insight into human occupation on the landscape.</li> <li>• Wildlife – avian use in northern monument lands and mammal presence within low elevation sagebrush communities.</li> <li>• Vegetation –conducting long-term research on low elevation plant communities to understand all parameters of juniper establishment, etc.</li> </ul> </li> </ul>

## ACTIONS COMMON TO ALL ALTERNATIVES

PARK OPERATIONS	<ul style="list-style-type: none"> <li>The monument would continue to practice environmental stewardship and implement best management practices.</li> <li>The monument would seek ways to reduce its carbon footprint and apply best ecological practices.</li> </ul>
PETROGLYPH POINT	<ul style="list-style-type: none"> <li>The monument would conduct a conservation assessment/site plan of Petroglyph Point that would include collecting baseline data on birds, mammals, rare species, and cultural resources.</li> <li>The monument would study/research causes of petroglyph erosion and develop a suitable plan for implementing protection measures.</li> </ul>
CAVE LOOP	<ul style="list-style-type: none"> <li>The monument would continue to implement seasonal closures of Cave Loop caves to protect resources.</li> <li>The monument would complete a cave management plan that further describes the management of cave resources.</li> </ul>

## Alternative A: The No Action Alternative

The “no action” alternative provides a baseline for evaluating changes and impacts in the other alternatives. In the no action alternative, the National Park Service would continue to manage Lava Beds National Monument as described in the 1996 General Management Plan. There would be no major change in the management of the monument.

The key components of alternative A are as follows:

- Existing facilities would be maintained.
- The natural resource program would continue to focus on inventorying and monitoring, resource protection, preservation, mitigation, and applied research efforts.
- The cultural resource program would continue to focus on protecting archeological resources, historic buildings and structures, and cultural landscapes. Cultural resources would be protected unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. The monument would continue to work with regional and other park cultural resource professionals to manage archeological and museum collection resources. Monitoring of cultural resources would continue through cooperative efforts with the fire program and regional archeological program.

- Limited education programs would be provided for school groups and visitors.
- The existing monument boundary and designated wilderness boundaries would be maintained.
- The monument would continue current coordination with the U.S. Forest Service, the U.S. Fish and Wildlife Service, the Klamath Tribes, universities and researchers, primarily for resource stewardship, interpretive, and administrative purposes.

### MANAGEMENT OF SPECIFIC AREAS

#### *Petroglyph Point Unit*

The Petroglyph Point Unit would remain in its current condition. The visitor experience at this unit is not of high quality. The chain-link fence erected in front of the west-side rock art would continue to obstruct visibility of the petroglyphs and make photography difficult. The proximity of the unpaved road would continue to cloud the site with dust from passing traffic and the absence of shade on the site would continue to make even brief visits during the summer uncomfortable. Although there is a vault toilet, no potable water is available. While an orientation bulletin board, several wayside exhibits, and a trail guide enhance visitor understanding, personal contact with a ranger would be rare. The petroglyphs would remain vulnerable to vandalism because of the “abandoned” appearance of the area and the distance from monument headquarters.

### *Cave Loop Road*

Cave exploration would continue to be the dominant attraction for visitors at Lava Beds National Monument. Most cave exploration takes place along the “Cave Loop Road” located near the visitor center. The Cave Loop Road provides vehicle and trail access to a number of caves with different configurations and resource attractions. Primary access to caves would be via existing vehicle pull-outs along the loop road. Although some ranger guided tours and contact with roving volunteers would exist in summer, most visitors’ caving experience would remain self guided.

### *Campground*

Indian Well campground would continue to provide visitors the opportunity to camp within the monument year round. The monument would maintain the campground in its current condition with flush toilets and sink facilities, but without hookups or additional accommodations for recreational vehicles (RVs).

### **MANAGEMENT ZONING**

In alternative A, NPS managers would continue to follow the management zoning scheme described

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

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*Miner's Lettuce, NPS Photo*

in the 1996 general management plan. Most of the monument would remain within an overlapping natural/historic zone, with substantial portions further overlapped by a wilderness subzone (which includes designated wilderness areas) and an eagle habitat management subzone. Major visitor facilities such as the existing visitor center, trailheads, overlooks, campgrounds, picnic areas, and parking lots would be in the developed zone.

### **USER CAPACITY**

In this alternative NPS managers would continue to manage visitation as they have in the past, relying on approved plans. The monument staff would continue to respond to user capacity issues on a case by case basis, with facility capacity largely

setting the monument’s user capacity. No major new initiatives would be pursued to manage visitors and a monument-wide user capacity approach (i.e., monitoring indicators and standards) would not be established.

### **BOUNDARY ADJUSTMENTS**

No new boundary adjustments would be pursued in alternative A.



*Skull Cave entrance, Photo by Adrian Fernandez*



**TABLE 4: MANAGEMENT ACTIONS FOR ALTERNATIVE A**

<b>MANAGEMENT ACTIONS FOR ALTERNATIVE A</b>	
<b>NATURAL RESOURCES</b>	
<b>GEOLOGIC PROCESSES AND FEATURES</b>	The management of caves would continue based on the classification system identified in the Cave Management Plan.
<b>VIEWSHEDS/VISUAL QUALITY</b>	<i>See Actions Common to all Alternatives</i>
<b>DARK NIGHT SKIES</b>	<i>See Actions Common to all Alternatives</i>
<b>ECOLOGICAL COMMUNITIES</b>	<p>The monument's primary vegetation management objectives would be to: (1) maintain or re-establish native communities and; (2) eradicate exotic species which are interfering with native species propagation.</p> <p>Special status species (those listed by U.S. Fish and Wildlife Service and/or the California Department of Fish and Game) would remain at viable population levels.</p> <p>Native restoration would continue to be inhibited by nonnative species that have become entrenched in the monument's native plant communities.</p> <p>Habitat for two of 14 sensitive bat species would be protected to maintain sustainable population levels.</p>
<b>FIRE MANAGEMENT</b>	<p>The Lava Beds fire management program would continue to include the use of suppression, prescribed fire (planned ignitions), and wildfire (unplanned ignitions).</p> <p>Prescribed fire (planned ignitions) would be used to manage the ecosystem, maintain fire as a natural process in the biotic communities of the monument, create or maintain a variety of fuel breaks to prevent the spread of wildfire or prescribed fire, and to maintain the historic scene in historical areas of the monument. On a landscape level, the gradual re-introduction of fire into the ecosystem has been accomplished. There are still small areas of the monument that would need the first application of fire (initial entry) to be accomplished.</p> <p>Wildfire (unplanned ignitions) use would continue to be an integral component of the fire management program. In 2005, over 33,000 acres were identified for wildfire use. The monument would continue to expand this acreage through coordination with sister agencies and as plant communities return to a natural cycle of fire use, allowing for broader wildfire use across the landscape. This would be accomplished through continued implementation of the fire management plan and through improved coordination with partners and sister agencies that border the monument.</p>
<b>WILDERNESS</b>	<i>See Actions Common to all Alternatives</i>
<b>CULTURAL RESOURCES</b>	
<b>ARCHAEOLOGY</b>	<i>See Actions Common to all Alternatives</i>
<b>ETHNOGRAPHIC RESOURCES</b>	<i>See Actions Common to all Alternatives</i>
<b>HISTORIC STRUCTURES</b>	<p>The monument would continue to work on the establishment of baseline inventories for historic structures and cultural landscapes (national register or national register eligible).</p> <p>Properties listed on the National Register of Historic Places associated with the Modoc War Historic District would continue to be preserved and primarily used for interpretation.</p> <p>Civilian Conservation Corps facilities within the monument would continue to be used for visitor and/or administrative uses.</p>

## MANAGEMENT ACTIONS FOR ALTERNATIVE A

<b>CULTURAL LANDSCAPES</b>	<p>The monument would continue preservation and maintenance of the Modoc War Historic District cultural landscape. Prescribed burns and other treatments would continue to be used to restore the historic landscape to 19th century battle conditions and to control the spread of invasive species.</p> <p>The cultural landscape inventory and determination of eligibility of Civilian Conservation Corps and Mission 66 structures, buildings, and landscape features for the National Register of Historic Places would be completed.</p>
<b>MUSEUM COLLECTIONS</b>	<p>Cultural resource collections would continue to be housed at the visitor center while natural collections would continue to be housed in a storage building at monument headquarters.</p> <p>Curatorial duties would continue to be a collateral duty position of the Chief of Resources. The Crater Lake National Park curator would continue to provide assistance to the monument.</p> <p>A new monument cultural resource specialist would take on collections duties. Continued efforts to preserve collections would focus on upgrading the cooling/heating system in the visitor center and maintaining the natural collections storage building.</p>
<b>VISITOR EXPERIENCE</b>	
<b>RECREATION</b>	<p>Visitors are directed to other locations for experiences and facilities not provided at the monument such as, mountain biking trails, RV camping with hookups, activities for pets, firewood collection, showers, motels, and food services.</p> <p>The monument would make incremental improvements to improve visitor accessibility (ADA compliance) as facilities and interpretive media are renovated and replaced.</p>
<b>INTERPRETATION</b>	<p>The monument would continue to provide a variety of high-quality non-personal services such as museum exhibits, wayside exhibits, website content, maps, brochures, and a monument introductory film.</p> <p>Interpretive staff coordination between the monument, the U.S. Fish and Wildlife Service, and the U.S. Forest Service would continue at current levels.</p> <p>The education program at the monument would continue to provide limited, curriculum-based education programs both in the monument and in surrounding classrooms during the school year for mid-level grades only.</p>
<b>EDUCATION AND OUTREACH</b>	<p>The monument would continue to provide high-quality personal services. Demand for more formal interpretive programming on weekends and during peak visitation periods would sometimes remain unmet.</p>
<b>FACILITIES AND OPERATIONS</b>	
<b>VISITOR CENTER</b>	<p>The existing visitor center facilities would remain and continue to be maintained.</p>
<b>RESEARCH CENTER</b>	<p>The existing research center facilities would remain and continue to be maintained.</p>
<b>ROADS</b>	<p>The monument would maintain its paved roads and improve adjacent sidewalks and parking areas to fully meet federal and state accessibility standards.</p> <p>Although a project to realign and pave the portion of Medicine Lake Road (Forest Service Road 49) within the monument has been partially designed, design work would continue to be postponed due to a National Park Service policy prohibiting adding additional paved road infrastructure. The U.S. Forest Service plan to pave and improve the currently unpaved segments of the Medicine Lake Road would also continue to be postponed due to a lack of funding.</p> <p>Unpaved administrative roads would continue to be maintained in their current conditions.</p>

## MANAGEMENT ACTIONS FOR ALTERNATIVE A

TRAILS AND TRAILHEADS	<p>The monument would continue to maintain its current hiking trails.</p> <p>The monument would continue to manage trails according to the classification system in the 2006 Wilderness Stewardship Plan according to designated use levels.</p> <p>The monument would realign and adjust trails as necessary to reduce impacts where needed.</p>
BOUNDARY ADJUSTMENTS	See <i>Actions Common to all Alternatives</i>
PARTNERSHIPS AND REGIONAL COOPERATION	<p>Monument staff would continue to engage in a limited amount of in-monument and community outreach activities including attending local meetings and special events.</p> <p>The monument would continue to coordinate fire management and law enforcement activities with local and federal agencies.</p> <p>The monument would continue to coordinate with tribes on interpretive efforts, ethnographic uses, and compliance issues.</p>
RESEARCH	<p>Existing cooperative efforts with partners and universities would continue.</p> <p>Cooperative bat research with the Bureau of Land Management would continue.</p> <p>The monument would continue current fire research.</p>
COMMERCIAL SERVICES	<p>The Lava Beds Natural History Association would continue to function as a cooperating association for the monument.</p> <p>The monument would continue to authorize the concession contract for visitor convenience items which is currently held by the Lava Beds Natural History Association.</p> <p>The monument would continue to provide authorizations to a few small scale tour operators.</p>
PARK OPERATIONS AND SUSTAINABILITY	<p>The monument would make incremental improvements in energy conservation and sustainability by implementing energy conservation and alternate energy generation efforts.</p> <p>The monument would continue to implement the existing Environmental Stewardship Plan.</p>
SAFETY AND LAW ENFORCEMENT	<p>Law enforcement would continue with current levels of staffing.</p> <p>Monument staff would continue to depend on electronic systems to protect sensitive resources.</p>
STAFFING	Staffing would be expected to remain at current levels.
AREA-SPECIFIC ACTIONS	
PETROGLYPH POINT	Facilities at Petroglyph Point would be limited to the existing restroom, waysides, parking pull-outs and trails. The existing unpaved road would continue to provide access to and traverse the site. A small parking pull-out would remain to view the Coppock Flag on the eastern end of the site.
CAVE LOOP ROAD	<p>The Cave Loop Road and cave access trails would remain. Occasional seasonal closures of individual caves to protect sensitive resources (e.g. bat colonies) would occur.</p> <p>Cave Loop Road would remain closed to motor vehicles after dark.</p>
CAMPGROUND	<p>The campground would continue to provide opportunities for tent and RV camping and for large groups at one group site.</p> <p>Restoration of vegetation in the campground would continue. The monument would continue to plant trees to replace the loss/mortality of the juniper/pine woodlands and establish vegetation islands between campsites to improve camper privacy.</p>



## ESTIMATED COSTS

Cost estimates for alternative A are identified below in Table 5. The costs shown here are not for budgetary purposes; they are only intended to show a very general relative comparison of costs between the alternatives. A discussion of the development of the costs and a comparison between the alternatives is included after the description of the alternatives.

The 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 will be forthcoming. Full implementation of the actions in the approved general management plan could be many years in the future.

### *Annual Operating Costs*

The monument's annual operating budget for fiscal year 2008 (FY 2008) was \$1,701,000.

### *Staffing*

Alternative A assumes that current staffing levels would be maintained at 22.3 full-time positions (one full time equivalent (FTE) is one person working 40 hours per week for one year, or the equivalent). In addition to the 22.3 FTE, the fire program has six positions that are not funded out of the monument's base operating budget. The FTE number indicates base-funded staff only, not volunteer positions or positions funded by partners. FTE salaries and benefits are included in the annual operating costs.

### *One-Time Capital Costs*

Alternative A would continue the current level of facilities. No major capital improvement projects would be planned under alternative A. Improvements to monument facilities would include deferred maintenance and rehabilitation projects.

TABLE 5: SUMMARY OF COSTS FOR ALTERNATIVE A

SUMMARY OF COSTS FOR ALTERNATIVE A	
ANNUAL OPERATING COSTS	
Monument Operations	\$1,701,000
<b>Total Annual Operating Costs</b>	<b>\$1,701,000</b>



Recreational cave exploration, NPS Photo

## Alternative B: Expanding Learning and Resource Preservation through Collaboration (Preferred Alternative)

### MANAGEMENT CONCEPT

Under this alternative Lava Beds National Monument would promote and strengthen resource protection and restoration through stewardship, research, education, and inter-agency cooperation. The monument would strive to engage a broader public through more interpretation, education, and new visitor facilities.

### VISITOR EXPERIENCE

The visitor experience at Lava Beds National Monument would be focused on interpretation for a greater diversity of visitors. The monument would reach out to new audiences by expanding interpretive, educational, and recreational opportunities at the monument. Information and programs on new interpretive topics (e.g., new resource management programs) would be offered. More extensive interpretation on existing topics would also be offered. The monument would employ new technologies for interpretation and education (e.g. virtual cave tours, podcasts for audio tours). More collections would be put on display at the visitor center.

Partnerships with schools, tribes, gateway communities and others would be fostered to provide new opportunities for education. School groups and volunteers would have opportunities to participate in monument research programs. Workshops and interpretive programs about monument resources would be offered both within and outside of the monument at sites related to park significance (Modoc War battlefields, lava tubes, and portions of the Medicine Lake Volcano).

Expanded recreational opportunities at Lava Beds would include new hiking opportunities and improved day use areas. New hiking trails would primarily include short interpretive loop trails. The NPS would collaborate with the U.S. Forest Service to develop longer trail connections and provide opportunities for appropriate

winter sports activities such as cross-country skiing or snowshoeing. More accessible trails would be provided to accommodate users of varying abilities. Several day use areas would be redesigned to better accommodate families and larger groups.



Petroglyph, NPS Photo

### FACILITIES

A limited number of new facilities would be provided to accommodate expanded educational programs, recreational opportunities and research efforts while ensuring that Lava Beds National Monument retains its relatively undeveloped and rustic character. The monument would minimize the intrusion of its existing buildings on monument views through visual screening, applying muted paint colors, installing less reflective roofing materials and minimizing lighting requirements.

Where possible, duplicative and unneeded facilities would be removed and revegetated to reduce the overall facility footprint on the monument and to reduce long-term maintenance obligations.

To better accommodate new educational and research programs, the monument would construct a small addition to the current visitor center to provide classrooms, several offices, and more collections space. The monument would also explore expanding the research center laboratory area to accommodate new research opportunities.

The monument would explore additional office space as efficiently as possible through consideration of leasing in local communities, and co-locating with other agencies before considering new construction or enlarging existing buildings.

## NATURAL RESOURCES

### *Habitat Restoration*

The NPS would work towards actively restoring native ecological communities throughout the monument. This may include restoring threatened, endangered, and extirpated species (e.g. sage grouse, desert bighorn sheep). To achieve these goals, the monument would actively work with adjoining land management agencies towards restoration.

### *Research and Technical Assistance for Lava Tube Caves*

The monument would expand the geologic research program to function as a center for research and technical assistance focused on lava tube caves. The program would emphasize monitoring, restoration of impacted geologic features and caves and providing assistance to other volcanic parks and sister agencies through planning, surveying, research and information sharing.

## CULTURAL RESOURCES

Lava Beds National Monument would function as a center for cultural resource research and learning. The monument would expand research to address a range of regional cultural resources related to the Klamath Basin, including increased efforts to collect local oral histories. Use of the Research Center for cultural resource research and workshops would occur in coordination with the education program. New research and battle forensics would enhance interpretation and knowledge of the Modoc War sites. A wider range of cultural and historical educational programming and interpretive materials would be developed.

## SUSTAINABLE PARK OPERATIONS

The monument would make a comprehensive effort to reduce the total energy used to operate the monument. This would be accomplished through changes in monument operations and the use of new sustainable technologies for electricity, heating and motor vehicle fuel consumption. The monument would also strive to generate enough electrical energy on-site through alternative means such as photovoltaic panels or windmills to supply the monument's electrical consumption. The NPS would work to reduce visitor reliance on automo-

biles within the monument by providing additional trail linkages and encouraging bicycling on roads.

## MANAGEMENT OF SPECIFIC AREAS

### *Petroglyph Point Unit*

A new visitor day use area with an educational focus would be constructed at Petroglyph Point. The current road would be realigned southward around the petroglyphs and the existing chain link fence would be replaced with a more attractive barrier that protects the petroglyphs and allows for wildlife movement and photography. A new wildlife (raptor) viewing area, parking areas, seasonally staffed ranger contact station, small picnic area and outdoor education area would be provided as well as accessible trails connecting the new facilities with the petroglyphs.

### *Cave Loop Road*

The monument would provide more interpretive media for Cave Loop caves to improve the visitor experience (e.g. individual cave guide brochures for trails on the loop), promote responsible caving practices, and increase awareness about the preservation needs of cave resources. Increased monitoring of cave resources would occur to preserve non-renewable features.

To encourage visitors to use other modes of travel other than their cars, the monument would provide a separate pedestrian trail between the visitor center and the caves, and encourage bicycle use through amenities such as bike racks. One or two vault toilets would be installed on the loop to reduce human waste issues in caves.

### *Campground*

The monument would explore various ways to improve the visitor experience in the campground for all types of campers (tent, RV users, and large groups). The campground would retain its current character without providing RV hook-ups. Such services would continue to be provided outside of the monument at local RV campgrounds. To encourage longer stays coin operated and limited time shower buildings would be considered for the campground.



Caving tour guide, NPS Photo



## MANAGEMENT ZONING

The zoning maps on pp. 58-60 show how Lava Beds National Monument would be zoned in alternative B. (The management zones are described near the end of the “Introduction to the Alternatives” section.) In alternative B, the majority of the monument would be included in the backcountry and interpretive backcountry zones. Existing circulation patterns in the monument would be maintained; therefore, all primary roads are included in the developed zone. The developed zone would also include existing visitor facilities such as overlooks, pullouts, the visitor center, the campground, and new facilities at Petroglyph Point. The administrative zone would include the monument headquarters and housing area at Indian Well, and the maintenance area near Crescent Butte.

## USER CAPACITY

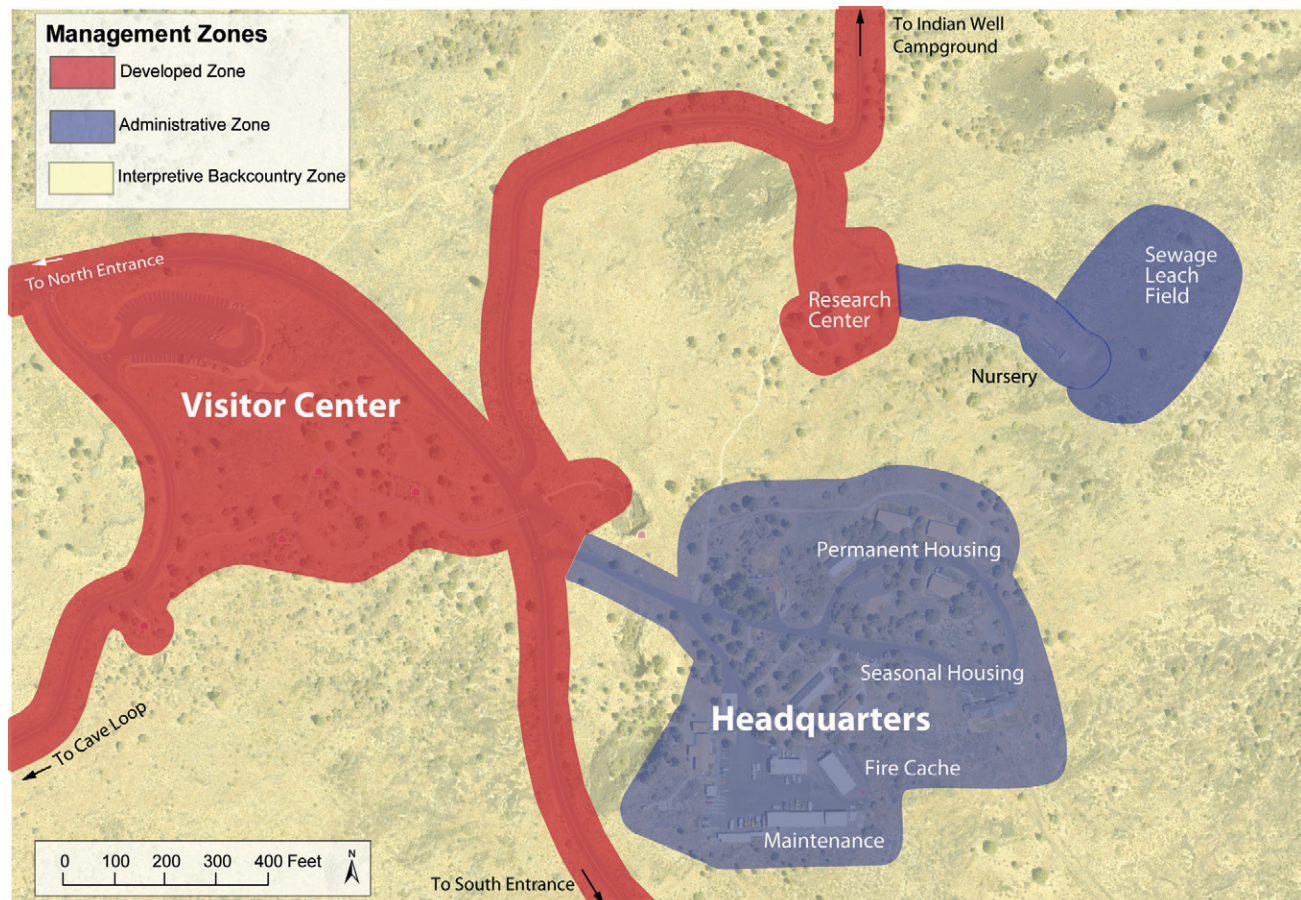
As described in the user capacity section later in this chapter, monument staff would monitor social and resource indicators, evaluate current conditions against standards, and take appropriate steps to ensure the

monument’s user capacity is not exceeded (See table 12 for the user capacity indicators, standards, and management and monitoring strategies that would be followed under this alternative).

## BOUNDARY ADJUSTMENTS

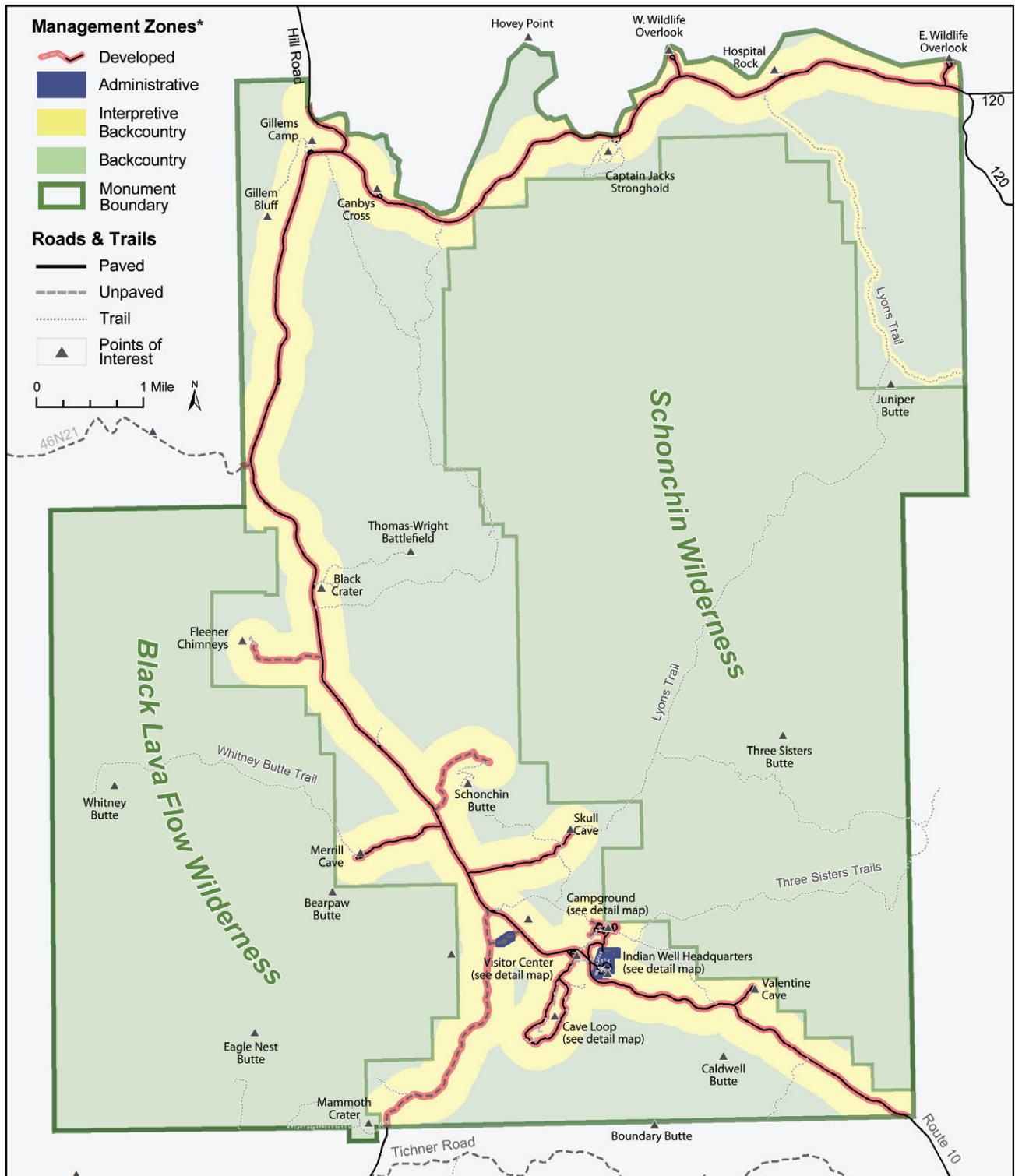
The monument would focus on working primarily with the U.S. Forest Service in the management of significant resources that are associated with the monument, such as lava tubes that start on Modoc National Forest lands and cross into the monument. There are also significant holdings of private timberland (approximately 2,500 acres) along the southern boundary of the monument which depending upon how the lands are managed could be detrimental to the resources of the monument. Rather than expanding the monument boundary, efforts would instead be directed to assist the Modoc National Forest in acquiring the timberland.

**MAP 3: ALTERNATIVE B - INDIAN WELL HEADQUARTERS AND VISITOR CENTER**



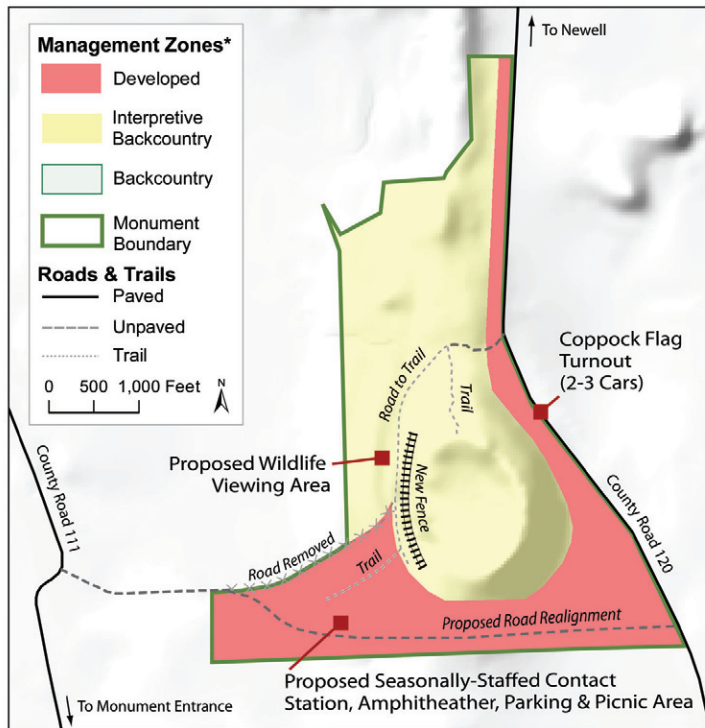


MAP 4: ALTERNATIVE B ZONING - MAIN MONUMENT



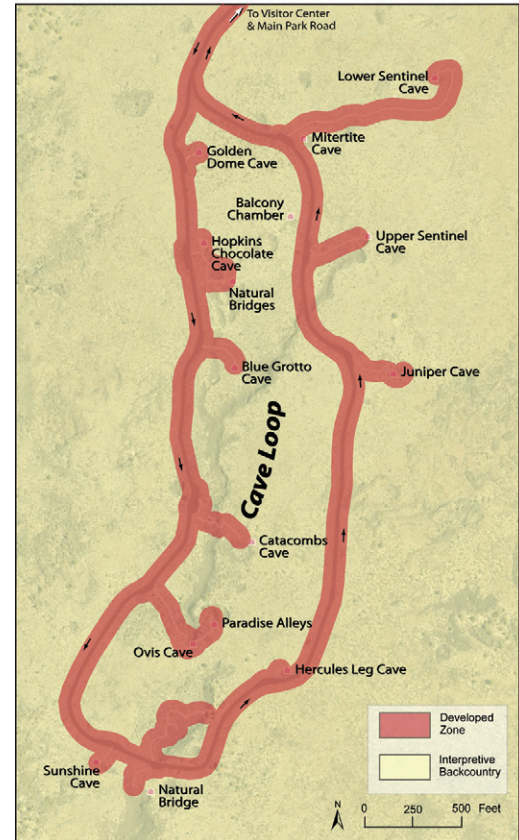
\*See management zones table for a description of the conditions and activities that are appropriate to each mangement zone.

MAP 5: ALTERNATIVE B - PETROGLYPH POINT

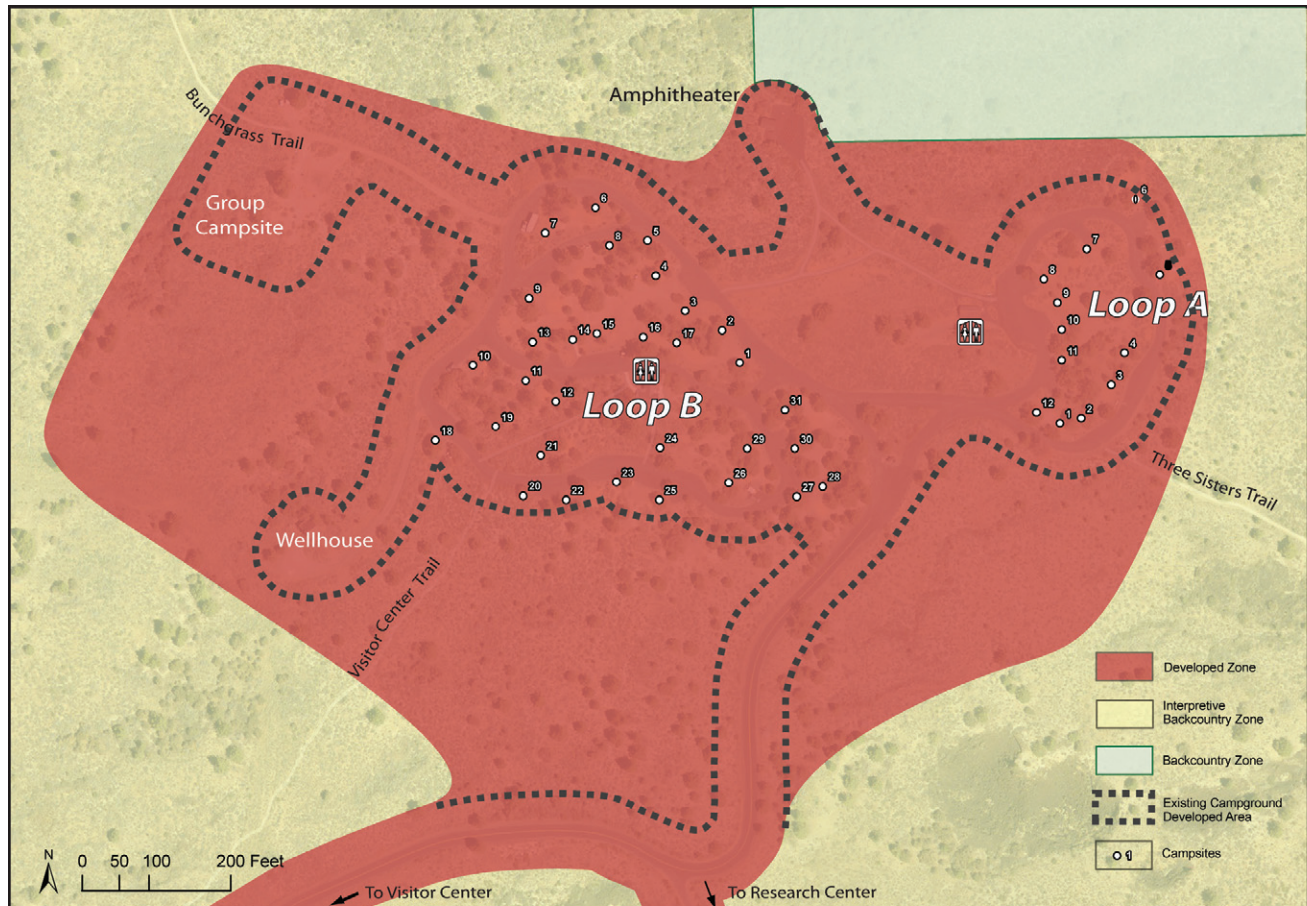


\*See management zones table for a description of the conditions and activities that are appropriate to each management zone.

MAP 6: ALTERNATIVE B - CAVE LOOP



MAP 7: ALTERNATIVE B - CAMPGROUND LOOP





**TABLE 6: MANAGEMENT ACTIONS FOR ALTERNATIVE B**

<b>MANAGEMENT ACTIONS FOR ALTERNATIVE B</b>	
<b>NATURAL RESOURCES</b>	
<b>GEOLOGIC PROCESSES AND FEATURES</b>	<p>An expanded geologic research program would make Lava Beds National Monument a center for research and technical assistance focused on lava tube caves. Program components would include:</p> <ul style="list-style-type: none"> <li>• Restoration of impacted geologic features and caves.</li> <li>• Assistance to other volcanic and cave parks through management planning, cave surveys, research, and information sharing.</li> <li>• Establishment of a comprehensive monitoring program for geologic resources throughout the monument.</li> <li>• Working with sister parks, partners, and agencies toward the regional preservation of volcanic and cave resources. Coordinated regional management of volcanic resources would focus on developing research projects, acquiring funding for preservation of resources, analyzing visitor use on a regional scale and taking steps to mitigate impacts across land management agency boundaries.</li> </ul> <p>Caves would receive a higher level of management through monitoring, restoration, and management plans.</p>
<b>VIEWSHEDS/VISUAL QUALITY</b>	<p>The intrusion of existing buildings on views throughout the monument would be reduced through screening, muted paint colors, less reflective roofing materials, and minimizing lighting.</p> <p>The monument would work to maintain high quality viewsheds within the monument.</p> <p>The monument would place overhead utility lines underground at Petroglyph Point and cooperate with the Fish and Wildlife Service to place overhead utility lines north of the monument underground.</p>
<b>DARK NIGHT SKIES</b>	<p>Greater emphasis would be placed on community outreach to preserve and restore dark night skies. Efforts would be taken to reduce light impacts on the wilderness areas of the monument, primarily from Klamath Falls and the Tule Lake Basin.</p>
<b>ECOLOGICAL COMMUNITIES</b>	<p>The monument would expand comprehensive restoration efforts for native vegetation and habitat.</p> <p>The monument would increase inter-agency coordination for restoration of native habitat along the monument boundaries and coordinate with adjacent land and wildlife management agencies to restore threatened and endangered species such as the sage grouse and bighorn sheep.</p> <p>Habitat for all 14 sensitive bat species would be protected to maintain sustainable population levels.</p> <p>The monument would take steps to monitor and mitigate, where possible, the pressures of climate change on native vegetation, wildlife, cave resources, and habitat.</p>

## MANAGEMENT ACTIONS FOR ALTERNATIVE B

<b>FIRE MANAGEMENT</b>	<p>The monument would continue to implement the current fire management program including the use of suppression, wildfire (unplanned ignitions) and prescribed fire (planned ignitions).</p> <p>The monument would take steps to monitor the effects of climate change and adapt fire management.</p> <p>Fire research would emphasize coordination with local agency managers to begin to understand large landscape level nonnative plant impacts. Research would become the most important means to understand how fire can be used on the landscape while limiting the current spread of nonnative species with the goal of ecosystem maintenance and restoration. Special efforts would be taken to acquire research funding to focus on controlling the spread of nonnative plants across agency boundary lines.</p> <p>The monument would coordinate with the U.S. Fish and Wildlife Service, the U.S. Forest Service, and private landowners to promote fire ecology/research and the use of wildfire (unplanned ignitions) across property lines. Efforts would be taken to coordinate across political boundaries when looking at fire on the landscape. The practice of aggressively fighting fires along borders would be coordinated and assessed for benefits.</p>
<b>WILDERNESS</b>	<p>New opportunities to experience wilderness areas would be provided through additional outreach and education programs.</p> <p>The monument would explore additional trail opportunities in wilderness areas.</p>
<b>CULTURAL RESOURCES</b>	
<b>ARCHEOLOGY</b>	<p>The monument would establish the cultural context of its archeological sites through analysis of existing archeological collections, research on site distribution of types, and documentation of newly discovered sites.</p> <p>The monument would expand public interpretation of archeology in collaboration with tribes, universities, and cultural resource professionals and identify selected sites that are appropriate for expanded visitor interpretation.</p>
<b>ETHNOGRAPHIC RESOURCES</b>	<p>Modoc War fortification preservation and rehabilitation would be facilitated by conservation studies.</p> <p>The monument would expand research of cultural landscapes for treatment and public interpretation.</p> <p>Opportunities for interpretation of additional Modoc War and Civilian Conservation Corps sites inside and outside of the monument would be developed.</p>
<b>HISTORIC STRUCTURES</b>	<p>Additional interpretive and educational programming and materials would be developed about the 20th century historic structures and human history within the monument.</p>
<b>CULTURAL LANDSCAPES</b>	<p>Modoc War fortification preservation and rehabilitation would be facilitated by conservation studies.</p> <p>The monument would expand research of cultural landscapes for treatment and public interpretation.</p> <p>Opportunities for interpretation of additional Modoc War and Civilian Conservation Corps sites inside and outside of the monument would be developed.</p>



## MANAGEMENT ACTIONS FOR ALTERNATIVE B

<b>MUSEUM COLLECTIONS</b>	<p>Research on current collections would be conducted. A broader understanding of cultural collections would be pursued to promote further understanding of the thousands of items within the collections. Photo documentation of all collections, or a percentage of the collections, would be completed to provide for electronic access by researchers. Images would be posted in a manner to provide understanding while still protecting this non-renewable resource. (e.g. electronic museum tours or new/rotating displays in the visitor center).</p> <p>The monument would replicate objects and photos for hands-on educational use and programming.</p> <p>The monument would implement additional collections management through increased staffing, coordination, and research.</p> <p>Collections storage facilities would be improved and expanded where feasible. The research center would be assessed for potential laboratory space enhancement.</p> <p>The monument would explore new collections management opportunities with nearby parks in the Klamath network.</p>
<b>VISITOR EXPERIENCE</b>	
<b>RECREATION</b>	<p>The NPS would collaborate with the U.S. Forest Service on new recreational opportunities such as trail connections and cross-country skiing near the monument's southern boundary.</p> <p>An improved virtual cave experience would be provided.</p> <p>Several day use areas for large groups would be considered at various monument sites.</p> <p>The site of the former West Wildlife Overlook would be used as an educational area (within or less than the existing developed footprint).</p> <p>Primitive backcountry campsites would be developed.</p> <p>The monument would work to reduce reliance on automobiles by providing additional trail linkages and encouraging bicycling on roads.</p>



Crystal Cave tour, NPS Photo

## MANAGEMENT ACTIONS FOR ALTERNATIVE B

### INTERPRETATION AND EDUCATION

The visitor experience would primarily be focused on learning and education for a wide diversity of monument visitors.

#### **INTERPRETATION:**

The monument would significantly increase the use of new technologies and media to improve the connection of visitors to monument resources.

The monument would display more collections through rotating exhibits.

New exhibits would be provided at the visitor center.

The monument would expand use of its oral history collection for historical interpretation and education.

The monument would provide an increased number of guided cave tours.

The monument would explore expanded interpretation both within and outside the monument on topics related to park purpose and significance such as:

- Archeology
- Astronomy/dark night skies
- Cave ecology
- Natural and cultural resources research and management initiatives, including fire ecology and management, restoration ecology, and non-native species

Collaborative efforts to expand interpretation would include:

- working with The Klamath Tribes to interpret history and pre-history,
- coordination between resource management and interpretive staff to provide opportunities for visitors to learn about park research,
- collaborating with the U.S. Fish and Wildlife Service to expand the interpretation of refuges and provide tours, and
- identifying opportunities for the interpretation of additional Modoc War and Civilian Conservation Corps sites outside of the monument.

#### **EDUCATION AND OUTREACH:**

More in-depth visitor education opportunities would be provided (such as guided tours, workshops and educational programs) throughout the monument and at related sites throughout the region.

The monument would expand formalized relationships with local and regional schools and collaborate with regional parks on expanded outreach and education.

The visitor center would be expanded to accommodate educational programs and provide more opportunities for teachers, students, and the general public.

The research center would be expanded to include more laboratory space to provide more opportunities for researchers, students, and the general public to participate in research activities at the monument.

Opportunities would be provided for public involvement in research and restoration activities. For example:

- The monument would develop a program for high school and university level students to participate/assist in monument research.
- Public archeology programs and archeology workshops would be conducted.

## MANAGEMENT ACTIONS FOR ALTERNATIVE B

### FACILITIES AND OPERATIONS

VISITOR CENTER	The visitor center would be expanded to accommodate educational programs and provide more opportunities for teachers, students, and the general public.
RESEARCH CENTER	The research center would be expanded to include more laboratory space to provide more opportunities for researchers, students, and the general public to participate in research activities at the monument.
ROADS	<p>If Forest Service Route 10 continues to receive inadequate or no funding for project work and remains in poor condition, the NPS would encourage visitors to enter and exit the monument via Medicine Lake Road and the paved and better maintained northern routes.</p> <p>The 1.8 mile segment of Lyons Trail between the main road gate and Fern Cave trailhead would be maintained as a primitive two track road limited to official vehicles. The 2.0 mile segment between the trailhead and the east boundary would also be maintained for official vehicle use, primarily for the treatment of wildland fire fuels.</p> <p>Natural processes would reclaim the remainder of Lyons and Powerline roadbeds.</p> <p>The monument would improve maintenance of the unpaved Medicine Lake Road, within the monument, to reduce summer season wash boarding.</p> <p>The East and West Wildlife Overlooks and roads are removed and revegetated restoring ecological communities on the monument's northern border. A portion of the West Wildlife Overlook road would be retained as an unpaved road and maintained for special events.</p> <p>The monument would encourage bicycle use on roads. Bicycle facilities would be provided at appropriate locations.</p>
TRAILS AND TRAILHEADS	<p>The monument would explore making accessibility improvements to Captain Jacks Stronghold, Gillems Camp, Hospital Rock, and Petroglyph Point trails so that they are accessible to all visitors.</p> <p>The monument would provide more trail opportunities with an emphasis on traditional interpretive methods (such as printed trail guides) or new technologies (such as podcasts). For example, a geology interpretive trail would be constructed at one of three sites in the northern portion of the monument (Gillems Bluff, Thomas Wright Battlefield, or Fleener Chimneys).</p> <p>Additional trail opportunities would be provided in wilderness areas.</p> <p>The monument would explore providing trail loops/connections to national forest lands and refuges, including Gillems Bluff.</p> <p>The monument would create better trail/pedestrian connections between visitor areas. This action could include connecting Schonchin Butte to Symbol Bridge trail, and connecting the campground to Valentine Cave.</p> <p>The monument would remove unnecessary established and social trails. This action would require coordination with other agencies and organizations.</p>
BOUNDARY ADJUSTMENTS	The current boundary would be maintained. The monument would work with the U.S. Forest Service protect resources outside of the monument related to park purpose and significance, and to acquire or trade private timberlands along monument boundary.

## MANAGEMENT ACTIONS FOR ALTERNATIVE B

<b>PARTNERSHIPS AND REGIONAL COOPERATION</b>	<p>The monument would initiate increased interagency cooperation for resource protection and restoration including:</p> <ul style="list-style-type: none"> <li>• cooperation with U.S. Fish and Wildlife Service efforts to establish wetlands on lands along northern edge of the monument and provide coordinated interpretation such as guided tours along the wildlife tour route, and</li> <li>• cooperation with the U.S. Forest Service on land management in areas south and east of the monument.</li> </ul> <p>Increased tribal involvement would be emphasized (e.g. NPS employment, and interpretation and education programs).</p> <p>Partners would have a greater role in research, restoration, education, and monitoring.</p> <p>The monument would expand relationships with gateway communities to provide signage and interpretation.</p> <p>The monument would participate in a larger number of community events.</p> <p>Community outreach programs would increase (e.g. dark night skies program).</p> <p>For sites outside the monument that are related to park purpose and significance, new partnerships/agreements with schools, affiliated tribes, surrounding agencies, and gateway communities would be developed to provide new educational and interpretive opportunities.</p>
<b>RESEARCH</b>	<p>Research activity would remain the primary use of the research center.</p> <p>The research center would be expanded for greater use by researchers, teachers, and the general public.</p> <p>The monument would involve high school and college students in science and research projects.</p> <p>The monument would establish formal relationships with colleges and universities to encourage more research in the monument.</p> <p>Informal opportunities would be provided for visitors to learn about various monument research and management activities.</p> <p>The monument would initiate a citizen-scientist program, possibly in partnership with other agencies (e.g. citizen science program to monitor pika populations).</p> <p>The monument would become a center for cultural resource research and learning. Research publications would be provided and the monument would enter into new research partnerships. Research efforts to address a range of regional cultural resource issues related to the Klamath Basin would be expanded.</p> <p>Through research, the monument would investigate the impacts of climate change on cultural resources, as well as past human responses to climate change.</p> <p>The monument would increase efforts to collect local oral histories.</p> <p>Use of the research center for cultural resource research and workshops would occur in coordination with the education program.</p> <p>The monument would conduct additional research to better understand the full context of all topics related to the Modoc War. This could include surveys, fortification studies, and battle-field reviews.</p>



## MANAGEMENT ACTIONS FOR ALTERNATIVE B

<b>COMMERCIAL SERVICES</b>	<p>The Lava Beds Natural History Association would continue to function as a cooperating association for the monument.</p> <p>Limited seasonal food and drink service in the vicinity of the visitor center would be assessed for commercial feasibility.</p> <p>The monument would consider allowing commercial interpretive tours consistent with the general management plan and NPS service-wide policies.</p> <p>The monument would continue to authorize the concession contract for visitor convenience items which is currently held by the Lava Beds Natural History Association.</p>
<b>PARK OPERATIONS AND SUSTAINABILITY</b>	<p>The monument would strive to reduce as much energy use as possible, including offsetting total electrical use, by generating electricity using alternative sources such as installing grid tied photovoltaic panels and bird/bat safe wind turbines. The monument would also explore using the best available, energy saving vehicle technology for monument operations (e.g. plug in hybrids).</p> <p>The monument would consider leasing or co-locating with other agencies outside the monument before considering new construction or modification of existing buildings inside of the monument for new office space.</p> <p>The monument would retrofit facilities with sustainable materials/building methods where appropriate.</p> <p>Pedestrian trail linkages between visitor areas would be provided in order to encourage visitors to not use their automobiles for short trips within the monument.</p> <p>The monument would pursue an NPS “climate-friendly park” designation.</p>
<b>SAFETY AND LAW ENFORCEMENT</b>	<p>More safety and preparedness information would be provided for visitors.</p>
<b>STAFFING</b>  <small>*Terms used</small> <b>Permanent Staff:</b> An appointment or hire to a federal position that has no time limit established with it  <b>Term Staff:</b> Nonpermanent appointment expected to last longer than one year, but less than four years	<p>Additional staffing would include:</p> <ul style="list-style-type: none"> <li>• 1 Shared/Partner: (Science Advisor that could be located at partner university)</li> <li>• 5 Permanent* Staff: (1 education specialist, 1 resource management specialist, 1 law enforcement, 2 maintenance)</li> <li>• 2 Term* Staff: (1 interpreter, 1 physical science tech)</li> <li>• 8 Part-time/Seasonal Staff: (4 interpreters, 4 resource management techs)</li> </ul>

## MANAGEMENT ACTIONS FOR ALTERNATIVE B

### AREA-SPECIFIC ACTIONS

<b>PETROGLYPH POINT</b>	<p>New visitor facilities would include a parking area, wildlife (raptor) viewing area, seasonal visitor contact station, outdoor education area and a visitor day use area that accommodates families and school groups, picnic tables, shade structures, and toilets. Accessible trails would connect these facilities to the petroglyphs.</p> <p>The fence would be replaced with a new protective structure to improve viewing and allow for wildlife movement.</p> <p>The road through Petroglyph Point would be realigned to the south and remain unpaved. The existing road would be removed and revegetated.</p> <p>On-site seasonal staffing would provide expanded educational and interpretative services as well as visitor orientation to the entire monument.</p> <p>The monument would interpret other resources in addition to rock art (e.g. geology, wildlife, vegetation, astronomy, homesteading).</p> <p>The monument would conduct research and monitoring on sensitive species potentially impacted by visitor use.</p> <p>The monument would seek to improve protection efforts at Petroglyph Point by increasing ranger presence, improving facilities, and implementing remote sensing technologies.</p> <p>The monument would replace the existing inadequate parking pullout and improve visitor access to the Coppock flag site.</p>
<b>CAVE LOOP ROAD</b>	<p>Social trails would be removed and restored.</p> <p>More rangers would be present at peak times to educate visitors about minimum impact caving.</p> <p>Increased monitoring of cave resources would occur to preserve non-renewable features.</p> <p>The monument would provide more in-depth information and educational materials for caves on the cave loop (e.g. cave guides).</p> <p>In order to encourage visitors to use modes of travel other than their cars, the monument would provide a separate pedestrian trail between the visitor center and the caves, and encourage bicycle use through installing bike racks.</p> <p>One or two vault toilets would be installed on the loop to reduce human waste issues in caves.</p>
<b>CAMPGROUND</b>	<p>The monument would explore various ways to improve the visitor experience in the campground for all types of campers (tent, recreational vehicle (RV) users, and large groups), using techniques such as separation and screening. The campground would retain its current character without providing RV hook-ups. Such services would continue to be provided outside of the monument at local RV campgrounds.</p> <p>To encourage longer visitor stays, one or two new shower buildings would be evaluated for addition to the campground.</p>

## ESTIMATED COSTS

Cost estimates for alternative B are identified below in Table 7. The cost estimates, in 2008 dollars, are not for budgetary purposes; they are only intended to show a very general relative comparison of costs between the alternatives. A discussion of the development of the costs and a comparison between the alternatives is included after the description of the alternatives.

The 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 will be forthcoming. Full implementation of the actions in the approved General Management Plan could be many years in the future.

### *One-Time Capital Costs*

Alternative B would consist of the improvements to facilities and structures described previously in the alternative. The estimated one-time capital cost in 2008 dollars is approximately \$9,100,000. One-time capital costs include trails, interpretive facilities and services, road improvements, facility improvements, changes to monument operations to reduce energy use, collection of oral histories, and habitat improvements.

### *Staffing Requirements*

Implementation of alternative B would require additional staffing to support new interpretive and educational programming, increased research and restoration efforts, and additional maintenance needs. Three full-time staff and four seasonal staff would be added to the Resource Protection and Visitor Services Division. An education specialist would be needed to provide greater outreach to schools, to implement new educational programs, and to serve as a liaison with the resource management staff to incorporate new research into interpretive materials and programming. A full-time interpreter would be needed to develop programs and materials for new interpretive topics. Four seasonal interpreters would conduct new guided tours and assist in implementing expanded interpretive efforts within the main monument, at Petroglyph Point, and at surrounding sites related to the monument's purpose. One additional visitor protection position would be needed to ensure protection of sensitive resources through increased roving and visitor contacts.

New research programs and increased restoration efforts proposed in alternative B would require two new full-time staff positions, one part-time science

advisor position, and four new seasonal positions in the Resource Management Division. A resource management specialist and one physical science tech would assist in the implementation of new restoration projects and research programs. A full performance physical scientist would be required for enhanced cave management and restoration activities. A new science advisor position, which could be shared with a partner university, would be needed to facilitate proposed new research efforts and partnership activities with local universities. Four new seasonal resource management technicians would be required for implementing specific restoration projects.

The Maintenance Division would require two new full-time positions to maintain the new facilities at Petroglyph Point, new trails, and to oversee and maintain new sustainable technologies that would be installed to achieve the monument's goal for reducing its carbon footprint.

### *Five Full-time Permanent Staff Positions*

- One education specialist
- One resource management specialist
- One visitor protection (law enforcement position)
- Two maintenance positions

### *Two Term Staff Positions*

- One interpreter
- One physical science tech

### *One Shared/Partner Position*

- One science advisor (possibly located at a partner university)

### *Additional part-time/seasonal staff positions under Alternative B*

- Four interpreters
- Four resource management technicians

### *Annual Operating Costs*

This alternative would be implemented with the current staffing levels plus 7.5 full-time equivalent staff (FTEs) for research, resource protection, maintenance, and interpretation (One FTE is one person working 40 hours per week for one year, or the equivalent) and eight seasonal staff for interpretation and resource management. The addition of these positions would add approximately \$737,000 to the operating base for Alternative B. Additional administrative costs for potential leasing of new office space would be \$18,000.

The monument estimates that it would have additional annual cost savings of \$35,000 upon installation of new energy-saving technologies for monument operations. The total annual operating costs for alternative B would be approximately \$2,500,000 per year (in 2008 dollars).



Bat Butte, NPS Photo

TABLE 7: SUMMARY OF COSTS FOR ALTERNATIVE B

SUMMARY OF COSTS FOR ALTERNATIVE B	
ANNUAL OPERATING COSTS	
Existing Monument Operations	\$1,701,000
Additional Staff (7.5 FTE (8) Seasonal/Part-time	\$737,000
Oral Histories	\$15,000
Habitat Restoration	\$60,000
Law Enforcement	\$4,200
Medicine Lake Road Maintenance Improvements	\$5,000
Annual Savings from On-site Renewable Energy	\$-35,000
Leased Office Space	\$18,000
<b>Total Annual Operating Costs</b>	<b>\$2,505,200</b>
ONE-TIME CAPITAL COSTS	
Campground Improvements	\$1,400,000
Cave Loop Improvements (Trail and road improvement, vault toilets)	\$121,000
Collections Exhibits	\$130,000
Day Use Areas	\$20,000
Educational and Interpretive Materials	\$166,000
Habitat Restoration	\$50,000
Modoc War Historic Landscape Restoration	\$80,000
Petroglyph Point Improvements <ul style="list-style-type: none"> <li>• Protective Fence (\$72,000)</li> <li>• Trails (\$100,000)</li> <li>• Picnic Area with Shade Structures (\$100,000)</li> <li>• Parking (\$500,000)</li> <li>• Contact Station (\$800,000)</li> <li>• Vault Toilets (\$80,000)</li> <li>• Outdoor Education Area (\$100,000)</li> <li>• Road Realignment/Unpaved (\$700,000)</li> <li>• Wildlife Viewing Area (\$25,000)</li> </ul>	\$2,477,000
Research Laboratory Expansion	\$60,000
Sustainable Park Operations (new energy systems)	\$2,010,000
Trails	\$973,000
Underground Utility Lines	\$600,000
Visitor Center Expansion (2 classrooms, office space)	\$1,012,000
<b>Total One-Time Capital Costs</b>	<b>\$9,099,000</b>

\*All costs in FY08 dollars