

National Park Service
U.S. Department of the Interior
Mojave National Preserve
California



ENVIRONMENTAL ASSESSMENT
Abandoned Mine Lands Safety Installations
Multiple Mine Openings

Mojave National Preserve, California

February 2010

PUBLIC COMMENT

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Please address written comments to:

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ENVIRONMENTAL ASSESSMENT

Abandoned Mine Safety Installations
Multiple Mine Openings
Mojave National Preserve, California

SUMMARY

The National Park Service proposes implementing safety options at abandoned mine lands in Mojave National Preserve. The purpose of this project is to mitigate human and environmental hazards present at the Preserve.

The need for the proposed abandoned mine safety installations is related to safety hazards created by a large number of old and deteriorated abandoned open mine features. These types of hazards were recently documented in a report by the Office of the Inspector General (U.S. Office of the Inspector General 2008). To assure abandoned mine land sites are secured for visitor safety, each National Park Service region has been directed to identify and implement quick response measures for high-risk abandoned mine land features (National Park Service 2009b).

The purpose of the proposed project is to improve visitor and staff safety at Mojave while accommodating the use of abandoned mine land sites by wildlife (principally bats), minimize impacts on historic fabric and the visual character of the historic landscape, and minimize and offset potential adverse effects on natural resources using mitigation measures.

Two alternatives were analyzed for meeting these objectives:

1. Alternative A: the No Action alternative. The No Action alternative would consist of the continuation of existing management practices for abandoned mine land sites at Mojave National Preserve. Additional abandoned mine safety installations would not be implemented by the National Park Service and unsafe conditions would continue to exist at the site with unclosed mine openings.
2. Alternative B: Abandoned Mine Lands Safety Installations. The preferred alternative consists of closing multiple abandoned mine openings at Mojave. There are a variety of safety techniques that would be implemented either individually, or in combination under alternative B.

The effects on Preserve resources would be negligible to minor and none of the alternatives analyzed in this environmental assessment would result in major or unacceptable environmental impacts or impairment of Preserve resources or values.

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PURPOSE AND NEED FOR ACTION

PURPOSE AND NEED

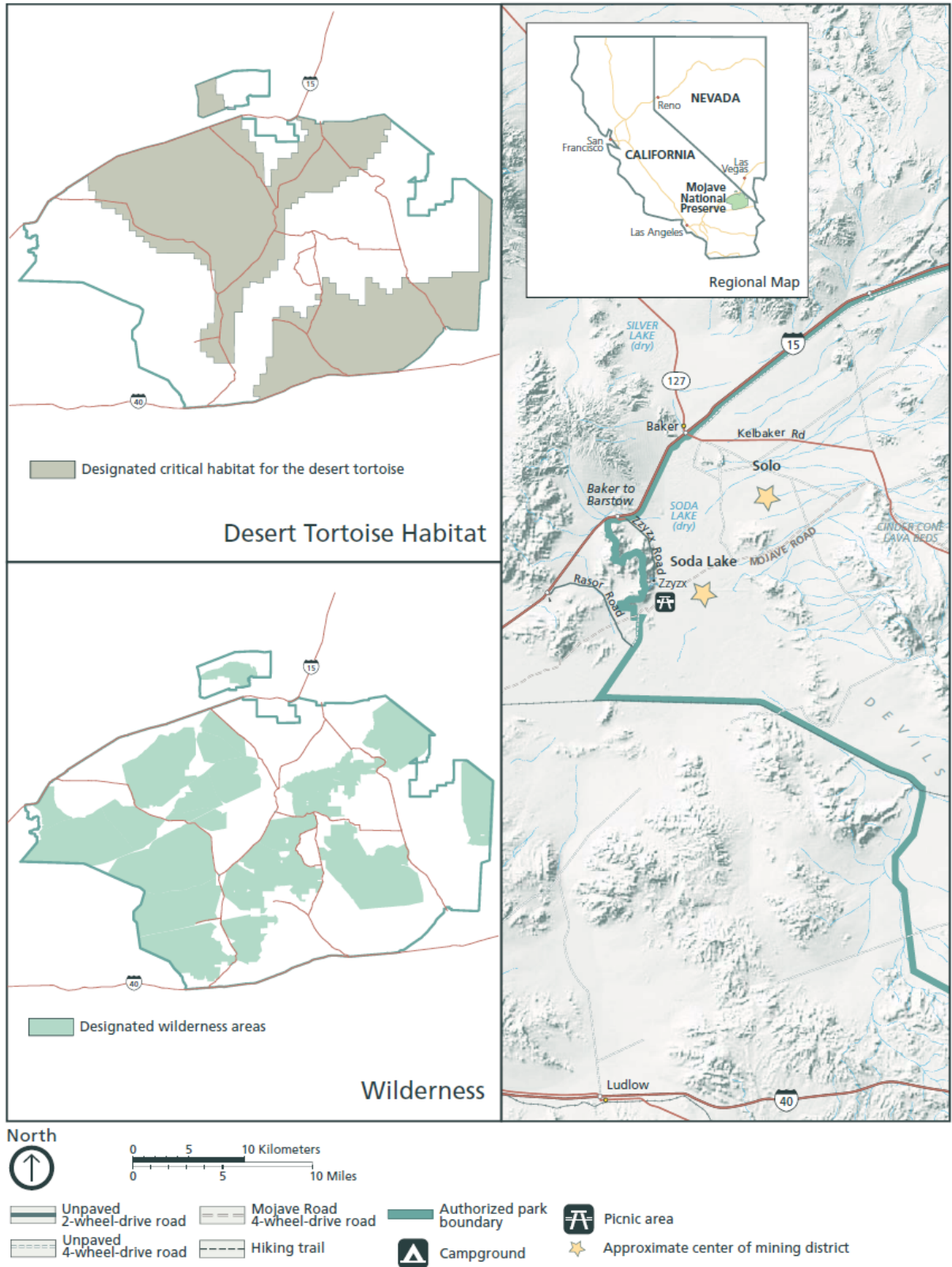
This environmental assessment has been prepared to assess mine safety options and environmental impacts to mitigate human and environmental hazards at abandoned mine lands in Mojave National Preserve (Mojave or Preserve) (figure 1). Abandoned mine lands are defined as any physical feature previously used for the extraction of minerals for which no responsible party can presently be identified (National Park Service 2009c). Abandoned mine land features include adits, drifts, glory holes, inclines, outcrops, portals, raises, shafts, stopes, sumps, tunnels, veins, winzes, prospect pits, cuts, and trenches. Figure 2 provides a glossary and illustrates these features.

This document has been prepared according to the guidance for “short-form” environmental assessments issued by the National Park Service Environmental Quality Division for projects funded under the American Recovery and Reinvestment Act of 2009 (National Park Service 2009a). The environmental assessment also meets the requirements of the National Environmental Policy Act of 1969 and implementing regulations, 40 CFR Parts 1500-1508, and the National Park Service Director’s Order # 12 and Handbook, Conservation Planning, Environmental Impact Analysis and Decision-making (National Park Service 2001 and 2009b, respectively).

PROPOSED ACTION AND OBJECTIVES

The purpose of the proposed project is to improve visitor and staff safety at Mojave while accommodating the use of abandoned mine land sites by wildlife (principally by bats), minimizing impacts on historic fabric and the visual character of extant cultural landscapes, and minimize and offset potential adverse effects on natural resources using mitigation measures. The objective is, simply, to minimize opportunity for human exposure to risk of hazardous mine conditions while providing for protection of natural and cultural resources, and minimizing potentially adverse effects on visitor experience.

Preventing human access to mine features can involve permanent closure of mine features, including non-reversible methods such as earthen backfill, blasting to collapse mine features, constructing rock and mortar walls into mine features, and re-contouring the landscape. The National Park Service, in consideration of wildlife and/or historic resources, can also employ less permanent measures, including reversible methods such as bat gates, cupolas, grates, nets, polyurethane foam plugs with a surface layer of earthen backfill, or fencing (chainlink or barbed). Closure methods that consider the needs of wildlife have been extensively researched (Sherwin et al. 2009; Vories and Throgmorton 2002) and the National Park Service will rely on closure techniques that have been developed to allow wildlife use for those mine openings where such methods are required.



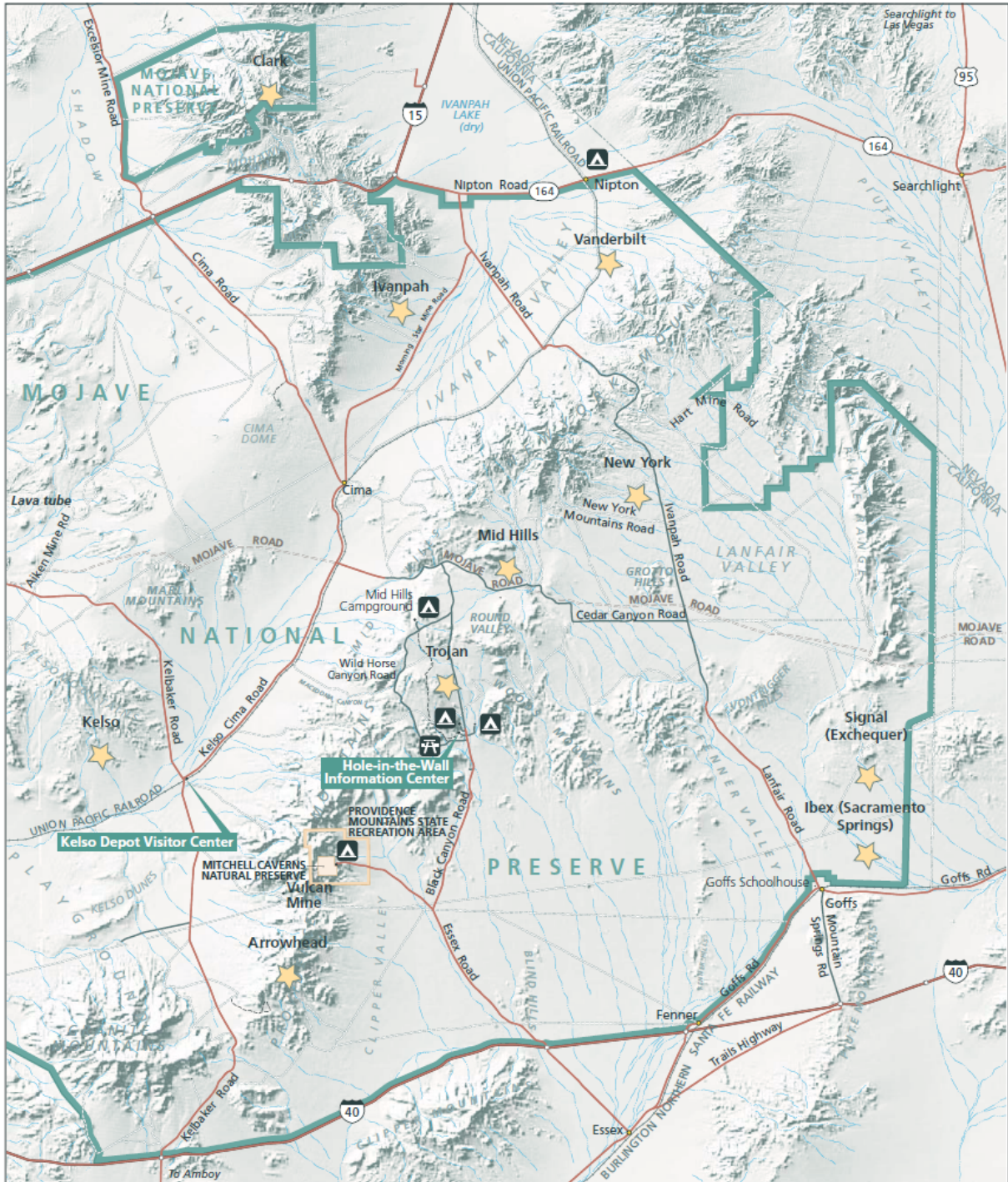


Figure 1. Park Map
Mojave National Preserve

United States Department of the Interior / National Park Service

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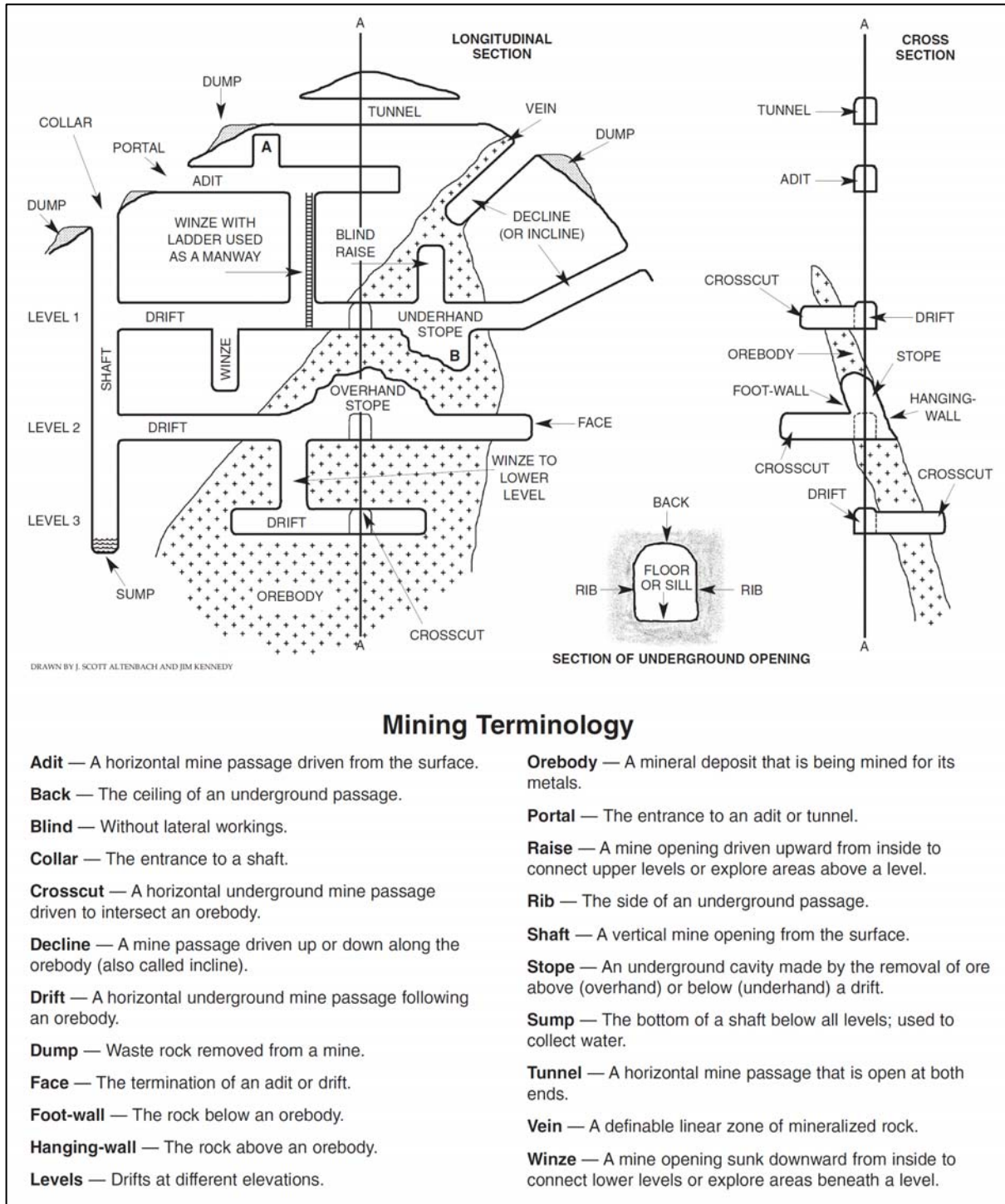


Figure 2. Typical types of mine openings and features
 (used with permission from Bat Conservation International - <http://www.batcon.org/>)

The objectives of the proposed multiple abandoned mine safety installations are as follows:

- **Protect visitors and preserve staff from abandoned mine safety hazards and minimize potentially adverse effects on visitor experience:** Properly designed safety structures protect visitors from unsafe conditions at abandoned mine land sites.
- **Protect natural resources from construction and operation of abandoned mine lands safety structures:** Wildlife, including federally and state-listed species, use mine openings as shelter and for nesting and denning.
- **Protect cultural resources from construction and operation of abandoned mine lands safety structures:** Abandoned mine land sites in the Preserve represent a remnant of the region's rich history and are popular destinations for visitors.
- **Maintain a good working relationship between the National Park Service and stakeholders and partners associated with Mojave:** A wide variety of stakeholders and partners are involved with abandoned mine lands at Mojave. In addressing abandoned mine lands safety issues, the overall objective of the National Park Service is to achieve good working relationships with various stakeholders and partners, and implement a balanced approach for resolving issues.

NEED FOR PROPOSED ACTION

The need for the proposed abandoned mine safety installations is related to safety hazards created by a large number of old and deteriorated abandoned open mine shafts, declines, and stopes, and horizontal openings such as adits and tunnels that exist in the Preserve. These types of hazards were recently documented in five National Parks and selected Bureau of Land Management areas in a report by the Office of the Inspector General (U.S. Office of the Inspector General 2008). The report concluded that because abandoned mine land sites in the West represent a remnant of the region's rich history, they are popular destinations for preserve visitors, and an associated safety risk is created. To assure abandoned mine land sites are secured for visitor safety, each National Park Service region is, therefore, directed to identify and implement quick response measures for high-risk abandoned mine land features (National Park Service 2009c). Parks were directed to identify those abandoned mine land features that pose a high risk for visitor safety, and to develop initial cost estimates for mitigation or safeguarding of those features. Parks were also directed to fulfill needed compliance responsibilities and implement plans for quick response measures (e.g., fences and warning signs) on a prioritized basis (National Park Service 2009c).

PURPOSE AND SIGNIFICANCE OF THE PRESERVE

The purpose and significance of Mojave National Preserve are important components of the basis for management decisions and planning. Decisions about the management of resources are generally measured against these factors to determine activities that may be acceptable in a unit.

DESCRIPTION OF PRESERVE

Mojave National Preserve (figure 1) is a relatively recent 1.6 million-acre unit of the National Park System, established by Congress on October 31, 1994, by the California Desert Protection Act. Mojave National Preserve is a vast expanse of desert land that represents a combination of Great Basin, Sonoran, and Mojave Desert ecosystems. This combination

allows a visitor to experience a wide variety of desert plant life in combinations that exist nowhere else in the United States in such proximity.

Located in southern California (figure 1), the desert area is a land of mountain ranges, sand dunes, great mesas, and extinct volcanoes. Mojave contains several diverse mountain ranges, the Kelso dune system, dry lake beds and evidence of volcanic activity (domes, lava flows, cinder cones). Plant and animal life complement the geological features. Mojave contains one of the finest Joshua tree forests in the world.

Of Mojave's 1.6 million acres, about 695,000 acres are designated wilderness.

PRESERVE PURPOSE

In addition to the overall purpose of parks as outlined in the National Park Service Organic Act, specific purposes may also be provided in each unit's establishing or enabling legislation. Certain activities may also be authorized that would otherwise be contrary to the Organic Act (i.e. hunting, grazing, mining, etc.). These activities are not legislative purposes of the unit, but rather exceptions made by Congress to recognize pre-existing rights or activities. In the case of Mojave National Preserve, for example, hunting is an activity not normally found in national park units. Where hunting is permitted in NPS units, the area is called a preserve rather than a park. Congress provides more specific direction for the new California desert parks and wilderness areas in section 2 (b)(1) of the California Desert Protection Act.

The specific purposes for Mojave National Preserve, as derived from the Organic Act and the California Desert Protection Act, can be summarized as follows:

- Preserve and protect the natural and scenic resources of the Mojave Desert, including transitional elements of the Sonoran and Great Basin deserts.
- Preserve and protect cultural resources representing human use associated with Native American cultures and westward expansion
- Provide opportunities for compatible outdoor recreation and promote understanding and appreciation of the California desert.

SIGNIFICANCE

Park significance statements tell why the park is special and deserves to be a part of the national park system. Statements of significance clearly define the importance of the park's resources as they relate to the park purpose. The following significance statements were developed for the Preserve in the recent General Management Plan/Environmental Impact Statement (National Park Service 2000) and serve as the basis for management actions:

- Mojave National Preserve protects an extensive variety of habitats, species, and landforms unique to the Mojave Desert and is the best place to experience this ecosystem.
- Mojave National Preserve contains outstanding scenic resources, rich in visual diversity containing a varied landscape of sand dunes, mountain ranges, dry lakebeds, lava flows, cinder cones, Joshua tree forests, and far-reaching vistas.
- The Joshua tree forest of Cima Dome and Shadow Valley is the largest and densest population of Joshua trees in the world.
- The Preserve is internationally known as a place to conduct desert research, and its lands are known for their geological features such as Cima Dome, the Cinder Cones, and the Kelso Dunes.

- Mojave is a naturally quiet desert environment with very dark night skies that offers visitors and researchers opportunities for natural quiet, solitude and star gazing with few human caused noise or light glare sources.
- The Mojave Desert has a long cultural history as a travel corridor across a harsh and foreboding desert, linking different areas in the Southwest. During the late 19th and early 20th centuries, railroads were constructed in this historic transportation corridor; more recently, modern interstate highways traverse the area.
- Mojave National Preserve protects many significant rock art sites that provide evidence of early Native American use of the Mojave Desert.
- Mojave National Preserve protects numerous historic sites from early mining, ranching, homesteading and railroading endeavors that serve as reminders of the bold and tough people that opened the harsh and forbidding western frontier.
- Historic Kelso Depot is associated with the early 20th century heyday of the great steam locomotives and the establishment of the final major rail crossings of the Mojave Desert. The Kelso Depot, built in 1924, is a rare surviving example of a combined depot, railroad restaurant, and employees' rooming house.

LIST OF ISSUES AND IMPACT TOPICS

Internal and external scoping comments were considered in the choice of impact topics and were used in the development and evaluation of alternatives discussed in this environmental assessment. Table 1 discusses the impact topics, the reasons for retaining the topic, and the relevant laws, regulations, and policies. The section located near the end of this document entitled Consultation and Coordination provides information on the organizations and agencies contacted during scoping, a summary of the public scoping efforts that helped identify relevant issues and impact.

Table 1 Impact Topics Retained for Further Evaluation and Relevant Laws, Regulations, and Policies		
Impact Topic	Reasons for Retaining Impact Topic	Relevant Laws, Regulations, and Policies
Public health and safety	Existing mine openings and structures pose a safety hazard for visitors. The proposed project would result in a long-term beneficial improvement in safety due to closing of mine openings and other improvements. However, this has the potential to adversely affect the experience of visitors who place a high value on directly observing mines. Therefore, this topic will be further analyzed in the environmental assessment.	National Park Service Management Policy 8.2.5, 2006

<p align="center">Table 1 continued Impact Topics Retained for Further Evaluation and Relevant Laws, Regulations, and Policies</p>		
Impact Topic	Reasons for Retaining Impact Topic	Relevant Laws, Regulations, and Policies
Visitor experience	There is a potential for construction and operation of closure structures to have beneficial and adverse effects on visitor use and experience, depending on the point of view and values of the visitor. Therefore, this topic will be further analyzed in the environmental assessment.	National Park Service Organic Act; National Park Service Management Policy 8.2, 2006
Special status species	Construction and operation of closure structures have a potential to affect state-listed bats and the desert tortoise by preventing access to mines that are currently used as habitat. Therefore, this topic will be further analyzed in the environmental assessment.	Endangered Species Act of 1973; National Park Service Management Policy 4.4.2.3, 2006; 40 Code of Federal Regulations 1500 (regulations for implementing the National Environmental Policy Act)
Wildlife	Construction and operation of closure structures have a potential to affect other, non-listed forms of wildlife by preventing access to mines that are currently used as habitat. Therefore, this topic will be further analyzed in the environmental assessment.	National Park Service Management Policies 2006: 4.4.2, 2006; Migratory Bird Treaty Act
Wilderness	Construction and operation of closure structures in wilderness areas is needed to improve human safety at AML sites that pre-date the designation of, but lie within, wilderness. Therefore, this topic will be further analyzed in the environmental assessment.	36 Code of Federal Regulations 62 (criteria for national natural landmarks); National Park Service Management Policy 2.3.1.9, 2006; Wilderness Act of 1964, National Park Service Management Policy 4.3.3, 2006; National Park Service Management Policy 6.0, 2006

IMPACT TOPICS DISMISSED FROM DETAILED ANALYSIS

Scoping issues or impact topics considered, but not evaluated further, are discussed below.

CULTURAL RESOURCES

A “Programmatic Agreement between the National Park Service (U.S. Department of the Interior) and the California State Historic Preservation Officer Regarding Mitigation of Physical Safety Hazards at Historic Abandoned Mineral Lands within the National Parks in California” was developed in anticipation of funding under the American Recovery and Reinvestment Act of 2009. It was signed by both parties on August 18, 2009 (appendix B). The purpose of this programmatic agreement is to establish a program for compliance with Section 106 of the National Historic Preservation Act and set forth a streamlined consultation process when agreed upon criteria are met and procedures are followed in the installation of physical safety mitigation treatments at abandoned mine lands sites. As part of the development of the programmatic agreement, the National Park Service has established guidelines, standards, and technical information applicable to the treatment of these physical hazards in ways that would, to the extent possible, minimize the impacts of such treatments on the historic fabric and historic character of abandoned mine lands features at these sites.

The Preserve would adhere to the programmatic agreement during implementation of this project and would treat all the mine structures as potentially eligible for listing on the National Register of Historic Places. The National Park Service would install only reversible closure treatments unless the unsafe condition of the feature is of such severity that a reversible option is not viable. The standard treatments described in Attachment A to the programmatic agreement, due to their non-permanent and reversible nature, are deemed to produce “No Adverse Effect” for purposes of the programmatic agreement. As soon as Preserve staff determines that a required alternative safety treatment would have an unavoidable and irreversible adverse effect on one or more historic properties, that portion of the project would be suspended and the Preserve would immediately enter into consultation with the State Historic Preservation Officer to identify other closure types that avoid, minimize, or mitigate the adverse effect. As a result of following the programmatic agreement and the mine closure types it proposes, the impact to cultural resources in Mojave National Preserve would be negligible to minor; they are discussed in detail below.

Archeological Resources

Prior to undertaking closure installations at any mine site, the Preserve would determine the Area of Potential Effects for the project and would consult its Archaeological Site Management Inventory System database to determine whether previously recorded sites are present within each area of potential effect. Previously recorded sites within the area of potential effect would be protected in place during construction through the use of exclusionary fencing or other measures. In areas of potential cultural sensitivity, archeological survey and site identification would take place prior to installations, and the protection measures outlined above would be implemented if archeological resources were located. The same procedure would be followed in cases of inadvertent discoveries of archeological resources – protection in place. As a result, impacts to archeological resources would be none to negligible. Because no impacts would be greater than minor, archeological resources were dismissed from further analysis.

Cultural Landscapes

Several mining landscapes have been identified within the Preserve. The abandoned mine lands safety techniques would impact mine sites in some cases by introducing new visible elements to the landscape, such as fences, or structures over shafts, or conversely, by burying some openings so they are no longer visible to visitors. The impact would be minimized by the use of materials that would blend into the mining landscape, such as non reflective metal and recessing closure installations into the shaft or adit where possible. Virtually all safety installation options would be reversible. All mine openings to be closed would be photo documented before and after the work is completed. The photographs would sufficiently illustrate the historic construction/engineering features and techniques of the treated portions of each site as well as provide an overview depicting its setting within the general landscape. Where permanent abandoned mine safety techniques are called for, representative mines would be closed by reversible means to convey the sense of the greater mining landscape. The project would result in minor impacts to cultural landscapes that would be mitigated by documentation and the closure techniques described above. Because greater than minor impacts would not occur, this topic is dismissed from further analysis.

Ethnographic Resources

Native American groups traditionally associated with the Preserve were consulted on May 20, 2009, regarding this project and agreed that the project would not affect traditional sites or resources and that the protections outlined in the programmatic agreement developed for

this project are adequate. Because the project would not impact ethnographic resources, this topic is dismissed from further analysis.

Historic Structures

Abandoned mine land safety techniques would be designed to avoid impacts to the historic fabric of the historic structures associated with the mine sites to the greatest extent possible and visual impacts to the historic character of the mine openings, such as entrance ways, doors, and wooden supports and collars would be minimized by recessing closure installations. In some cases, structural elements would be dismantled and then reconstructed after installations are complete. Where recessing is not possible, safety installations would be worked into and around historic structures so their visual presence is minimized to the extent possible. As a result, impacts would be negligible to minor depending on the safety technique chosen. Because there would be no impacts greater than minor, this topic is dismissed from further analysis.

Museum Objects

Objects related to mining operations can be found at most mine sites. These objects consist of equipment used in mining or personal objects used by the miners. The programmatic agreement developed with the California State Historic Preservation Officer requires the project to leave all potential museum objects in place where they are located and take care not to disturb them during closure installations at mine openings. Because potential museum objects would not be impacted or added to the Preserve collections at this time, there would be no impact to museum objects or collections. As a result, this topic is dismissed from further analysis.

FLOODPLAINS AND WETLANDS

Abandoned mine lands safety installations would not be conducted in floodplains or wetlands and would not affect the functions and values of floodplains and wetlands. This impact topic is, therefore, dismissed from further analysis.

GEOLOGIC RESOURCES

Impacts to geologic resources would be limited to anchoring of closure methods and minor shaping of bedrock limited primarily to the dimensions of each mine opening. The small geological area affected would result in negligible adverse effects on geological resources. This impact topic is, therefore, dismissed from further analysis.

PRIME AND UNIQUE FARMLANDS

No prime and unique farmlands are located within areas affected by the proposed abandoned mine safety installations and the proposed project would not affect prime and unique farmlands. This impact topic is, therefore, dismissed from further analysis.

SOUNDSCAPE

In accordance with *Management Policies 2006* (National Park Service 2006) and Director's Order 47: Soundscape Preservation and Noise Management (National Park Service 2000a), an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human sound. The proposed project would have negligible to minor short-term adverse impacts on soundscapes from construction equipment and vehicle noise, including the potential use of helicopters, to

transport equipment. These short-term activities would also affect visitor experience, special status species, wildlife, and wilderness. Potential impacts are described and evaluated under the visitor experience, special status species, wildlife, and wilderness impact topics, which have been retained for further analysis. Since short-term construction impacts on soundscapes are transitory and do not exceed a minor threshold, and the short-term construction noise impacts to wilderness, wildlife and visitor use and experience are described and evaluated under other impact topics, soundscapes was dismissed from further analysis as a separate impact topic.

INDIAN TRUST RESOURCES

Sacred sites are managed according to requirements of Executive Order 13007 and section 5.3.5.3.2 of *Management Policies 2006* (National Park Service 2006). The proposed project would not affect any sacred sites or Indian Trust Lands. This impact topic is, therefore, dismissed from further analysis.

AIR QUALITY

Emissions of particulates that could affect air quality, including visibility in the general vicinity of the Preserve, would temporarily increase during construction from the use of vehicles on and off paved roads, and from exhaust from gasoline- or diesel-powered vehicles and equipment. This equipment would also temporarily emit various air pollutants. However, a typical mine safety installation would take two to three days to complete. Because of the short-term, localized nature of the operation, mine safety installation activities would not affect the attainment status of the airshed that encompasses Mojave National Preserve and would not affect the airshed designation (e.g. the Class II designation under the prevention of significant deterioration program) at the Preserve. Because the adverse impacts described above would not exceed a minor threshold, this impact topic is dismissed from further analysis.

CLIMATE CHANGE

Activities associated with abandoned mine safety installations would have an incremental but negligible effect on climate change through the emission of additional carbon dioxide and other potential greenhouse gasses from construction activities and operations of gasoline- or diesel-powered vehicles. This impact topic is, therefore, dismissed from further analysis.

SOILS

The total footprint of the area of soil disturbed by the project (all components) would be limited primarily to the dimensions of each mine opening. Abandoned mine safety installations would have short-term, negligible adverse effects on soil during construction and operation. This impact topic is, therefore, dismissed from further analysis.

WATER RESOURCES

Aquatic resources are either absent or rare in areas that could be affected by abandoned mine lands safety installations. Soil disturbance and associated erosion of soil into adjacent dry or ephemeral-flow drainages during construction would result in short-term negligible adverse effects on water quality during wet weather (if that occurs). Mitigation measures described in more detail under alternative B would be employed to assure that potential associated effects on water quality and aquatic resources are avoided and minimized. This impact topic is, therefore, has been dismissed from further analysis.

VEGETATION – NATIVE PLANT COMMUNITIES

Construction would be almost completely limited to the mine opening or to a very limited area associated with structural improvements. Construction would not involve planting of non-native species of plants or otherwise cause the spread of these species through management of sources of backfill soil and other measures. The project would, therefore, have short-term, negligible adverse effects on vegetation-native plant communities. This impact topic is, therefore, has been dismissed from further analysis.

SOCIOECONOMICS

The proposed project would provide local contractors jobs to construct the abandoned mine safety installations as well as benefits through the local purchase of materials needed for the abandoned mine safety installations which would result in short-term, minor beneficial effects on the local economy in the vicinity of the Preserve. This impact topic is, therefore, has been dismissed from further analysis.

THE PRESERVE NATURAL LIGHTSCAPE (NIGHT SKY)

The project would be constructed during daytime hours and would have no adverse effects on natural lightscape quality. Similarly, the proposed safety installations would have no effects on natural lightscape (night sky). This impact topic is, therefore, dismissed from further analysis.

ENERGY CONSERVATION

The project would require a negligible amount of oil, gas, and electrical energy to construct the safety installations and new structural features. This impact topic is, therefore, dismissed from further analysis.

ENVIRONMENTAL JUSTICE

Impacts associated with closures would not disproportionately affect any minority or low-income population or community. This impact topic is, therefore, dismissed from further analysis.

PRESERVE OPERATIONS

The project would have a short-term, negligible effect on preserve operations during construction of the abandoned mine lands safety installations. The project would have a minor, long-term, beneficial effect on preserve operations by avoiding the need to respond to safety issues associated with mine opening incidents. This impact topic is, therefore, dismissed from further analysis.

ALTERNATIVES

DESCRIPTION OF ALTERNATIVES

The National Park Service identified and evaluated two alternatives for safety installations at abandoned mine land sites at Mojave.

Abandoned mine lands safety techniques are summarized in table 2. The information in table 2 is modified from *A Plan to Minimize the Impacts of Physical Safety Hazard Mitigation Treatments at Abandoned Historic Mines* (National Park Service no date). This and all other tables in this chapter are included at the end of this chapter.

Table 3 presents examples of typical mine openings and some of the factors that would be considered when determining what closure technique would be most appropriate. The table identifies most, but not all, possible combination closure techniques.

Table 4 presents a summary of the impacts associated with each of the impact topics for Abandoned mine lands safety closure techniques. Details of the analyses are presented in the Environmental Consequences section. Only adverse impacts are assigned an intensity threshold.

Table 5 presents a comparison of the environmental effects of Alternative A: No Action, and Alternative B: Abandoned Mine Lands Safety Installation, for each impact topic. The impact assessments summarized in table 5 are based on the detailed analyses that follow in the Environmental Consequences section. A determination of whether the alternative meets the purpose and need of the proposed action is also included in the last row of the table. Only adverse effects are assigned an impact intensity threshold. In cases where the effects of alternative B vary because of the different impacts associated with different closure techniques, the range of effects is presented.

ALTERNATIVE A: NO ACTION

The No Action alternative would consist of the continuation of existing management practices for abandoned mine land sites at Mojave. Additional abandoned mine safety installations would not be implemented by the National Park Service and unsafe conditions would continue to exist at sites with unclosed mine openings. Mine openings with existing safety installations would continue to exist and would continue to provide long-term safety improvements for visitors at those locations. Should the No Action alternative be selected, the National Park Service would respond to future needs and conditions associated with abandoned mine land sites without making major actions or changes in the present course.

ALTERNATIVE B: ABANDONED MINE SAFETY INSTALLATIONS

Alternative B is the NPS-preferred alternative because it offers the highest degree of resource protection for wildlife, special-status species, cultural resources, and wilderness, while improving public health and safety, which is the primary purpose of the project. Additionally, a safer environment would have a secondary benefit of reducing the need for emergency responses at AMLs as risks to human health and safety are diminished.

The preferred alternative consists of closing multiple abandoned mine openings in the Preserve. In addition, openings already closed would continue to exist in their present state, similar to the No Action alternative.

Appendix A provides photographs of the types of closure techniques that would be used and the types of mine openings that would be treated.

The abandoned mine lands safety techniques can be grouped based on their similar effects. These groups of closure techniques include:

- Grates
- Fencing
- Bat gates, culvert gates, and cupolas
- Cable mesh nets and screens
- Polyurethane foam closures covered with backfill
- Backfill alone
- Combination applications of above methods to treat complex situations

The number and types of closure techniques vary according to site circumstances. For a simple abandoned mine lands open feature situation, only one technique might be needed. For a complex site closure, several techniques may need to be combined. For example, a bat gate would be installed at a site consisting of an adit and known to be used by bats, whereas a simple metal grate would be used at a similar site not used by bats and so forth. Selection of closure techniques for specific openings would be based on a number of factors, including physical features and conditions of the opening, types of structures present, safety hazards, presence or absence of bats, use of the mine by other wildlife such as the desert tortoise, owls, or bighorn sheep, and the presence and condition of historic features. The objective is to select a set of techniques that eliminate basic safety hazards for visitors while simultaneously protecting historical resources, special status species, and other wildlife that use the mines.

The preferred alternative would provide a mechanism for closing abandoned mine openings in the Preserve over the long term using proven, accepted techniques. Closure of abandoned mine openings would mitigate basic safety hazards at mine sites while simultaneously protecting special status species and other forms of wildlife that utilize the mines, as well as historic cultural resources. Some of the abandoned mine safety installations would occur within designated wilderness in the Preserve (Big Horn, Teutonia, Oro Y Platta, and Gold Standard mines). Each abandoned mine land feature located in a wilderness area entails a minimum requirements analysis procedure. Mojave National Preserve utilizes the interagency Carhart Minimum Requirements Decision Guide (Appendix C). The “minimum tools” necessary for efficiently safeguarding these sites in the shortest period possible include, but are not limited to, motorized vehicles (e.g. trucks, helicopters), power saws and drills, welding equipment, and generators.

Proposed Mitigation Measures

During construction activities, mitigation measures would be included as part of the abandoned mine land safety process to ensure that adverse environmental effects would be either avoided or minimized. The most appropriate mitigation measures to be employed at a given site would be determined by an evaluation of site-specific physical and other factors. Measures would be selected based on judgments of what measures would be most effective in avoiding or minimizing impacts. In the arid to or semi-arid settings of most of the closure

sites, mitigation measures would focus on preventing and controlling soil erosion and vegetation loss or damage. These actions would protect water quality and any associated aquatic communities in situations where a surface water body occurs next to activities involving disturbance of soil and plant communities.

The following mitigation measures would typically be employed as appropriate to control soil erosion and vegetation loss and to configure the land surface to discourage soil erosion after closure activities are finished. Given the small size of treatment sites and typical closure activities, the following measures would be considered effective.

General Measures

- Construction limits would be delineated by the Preserve prior to any construction activity. Workers would be instructed to avoid conducting activities and disturbing areas beyond the construction limits.
- All tools, equipment, barricades, signs, surplus materials, demolition debris and rubbish would be removed from the project work limits upon project completion.
- Contractors would be required to properly maintain construction equipment and generators (i.e., mufflers) to minimize noise from use of the equipment.
- All equipment on the project would be maintained in a clean and well-functioning state to avoid or minimize contamination from automotive fluids. All equipment would be checked daily.
- Materials would be stored, used, and disposed of in a proper manner.
- A hazardous spill plan would be approved by the Preserve prior to construction. This plan would state what actions would be taken in the case of a spill, notification measures, and preventive measures to be implemented, such as the placement of vehicles and generators.

Soil Erosion and Vegetation Loss

- Wait until just before beginning construction to clear vegetation and to disturb the soil;
- Minimize the area of bare soil within the approved work zone as much as possible;
- Maintain a buffer of natural vegetation around the work area to slow runoff and trap sediments;
- Consider phasing construction to minimize the extent of disturbed soils;
- Use existing roads and trails to access closure locations to maximum extent practicable;
- Park vehicles and equipment and temporarily store materials on locations that are already devoid of vegetation and/or compacted from previous mine activities; and
- If vegetation disturbance cannot be avoided and conditions warrant, reseed the disturbed area with a mixture of native, self-sustaining native plant species in accordance with known, successful local techniques.
- Ensure the final land form is stable, minimizes soil erosion, and is hydrologically compatible with the surrounding area;
- Provide slope and land form stability by reducing slope angles;

Water Quality and Aquatic Community Protection (rare circumstances due to the arid and semi-arid conditions)

ALTERNATIVES

- Maintain a buffer zone between the construction activities and the edge of the water feature, a minimum separation distance of 100 feet is typically preferred;
- If rain is anticipated, install temporary silt fence between the construction activity and the water feature and remove the fence after the work is completed;
- In situations where a silt fence may not be adequate, create a temporary diversion or containment berm between the construction activity and the water feature to intercept and manage stormwater runoff; and
- Remove and reshape temporary containment berms once closure activities are completed.
- Restore any drainage channels that may have been altered by closure activities to pre-disturbance shape, size, capacity, stability, and contours.

Visitor Experience

- Provide interpretative or guided tours of safe mines to illustrate the facilities and techniques relied upon to mine mineral resources and to provide a sense of the conditions encountered by miners;
- Provide a permit system to allow qualified visitors to explore mine complexes on their own; and
- Minimize adverse visual experiences by using fences and other closure structures that are colored to resemble desert soils and vegetation, allowing gates and closure structures to weather to resemble of old mine structural features, and keeping closure structures hidden from view, low profile, and inconspicuous.
 - Minimize wilderness noise disturbance to the maximum extent possible.

Wildlife and Special Status Species

- Time closure or construction activities to avoid or take place outside reproductive or sensitive portions of species' life cycles;
- Use designs in gates, fences and other closure techniques that allow bat, owl, and desert tortoise access to mines that are occupied by these groups;
- Conduct bat and other wildlife surveys of openings to be closed before the closure is implemented to ensure that access is maintained and the closure technique produces minimal adverse effect; and
- For situations involving the desert tortoise and its critical habitat, use the conservation measures specified by the "Biological Opinion for Small Projects Affecting Desert Tortoise Habitat in the Mojave National Preserve, San Bernardino County, California (1-8-98-F-17)" (U.S. Fish and Wildlife Service 1998) (appendix B).

Wilderness

- Use the closure techniques identified as most appropriate by the Minimum Requirements Decision Guide to close mine openings;
- Restrict activities to a defined area around an abandoned mine opening site.
- Perform site restoration activities following safety installations to remove evidence of human activities and restore the natural conditions at the site to the extent possible. Use mitigation measures provided above under 'Soil Erosion and Vegetation Loss'

- Keep construction equipment and crews vehicles on existing roads and trails to the maximum extent possible; and
- Minimize wilderness access and vehicle trips into and out of the site to the maximum extent possible.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with the criteria outlined in NEPA and DO-12 an environmentally preferred alternative must be identified, which must meet the following criteria:

- Criterion 1: Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Criterion 2: Ensure for all Americans, safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- Criterion 3: Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- Criterion 4: Preserve important historic, cultural, and natural aspects of national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- Criterion 5: Achieve a balance between population and resource use that would permit high standards of living and wide sharing of life's amenities; and
- Criterion 6: Enhance the quality of renewable resources and approach the maximum attainable recycling of resources.

Alternative A does not protect visitors and preserve staff from abandoned mine safety hazards and minimize potentially adverse effects on visitor experience, so it fails to meet criteria 2, 3, and 5. Alternative A does not protect wildlife and special status species from becoming trapped in open shafts, so it fails to fully meet criteria 1 and 4. However, it does partially meet criterion 4 by preserving important historic and cultural aspects of national heritage, and maintain, wherever possible, an environment that supports a variety of individual choice. Due to the degree of disturbance and general lack of vegetation around most mine openings alternative A would not enhance the quality of renewable resources or approach the maximum attainable recycling of resources, so therefore, alternative A does not meet criterion 6.

Alternative B does protect visitors and preserve staff from abandoned mine safety hazards and minimizes potentially adverse effects on visitor experience, so it fully meets criteria 2, 3, and 5. Alternative B does protect wildlife and special status species from being trapped in open shafts, so it partially meets criteria 1 and 4. It does preserve important historic, cultural, and natural aspects of national heritage and maintains, wherever possible, an environment that supports diversity, but it does not allow the same variety of individual choice that alternative A does, so it only partially meets criterion 4. There would be no change to the amount of disturbance or increase of vegetation around most mine openings, therefore, alternative B would not enhance the quality of renewable resources or approach the maximum attainable recycling of resources (criterion 6) any better than alternative A. Because alternative B would ensure for all Americans safe surroundings, provide a greater opportunity for achieving a wide range of beneficial uses of the environment without risk of health or safety, achieve wilderness mitigation most expediently, and achieve a balance



between population and resource use that would permit high standards of living and wide sharing of life's amenities, alternative B is considered the environmentally preferred alternative.

ALTERNATIVES CONSIDERED BUT DISMISSED

The installation of bat gates at all mine openings was considered as one alternative to improve public health and safety at mine openings. However, the universal application of bat gates was determined not to be a good allocation of resources for a number of reasons. The reasons include that in some cases an inordinately large gate would be required and could be infeasible and/or costly; a bat gate may not be suitable because of site configuration constraints; and, some mines do not contain bats and the use of bat gates would be an unnecessary and excessive use of materials and funds. As a result of the inefficient use of resources that would occur with the installation of bat gates to close all openings, this alternative was dismissed from further consideration.

Additionally, the components of alternative B, consisting of a variety of abandoned mine land safety techniques, would be considered in relation to a specific mine opening in deciding the best method to be used. When the variables are evaluated, including bat and wildlife use, the presence of historic cultural resources, and the physical nature of the mine opening, some techniques would be dismissed because they do not provide adequate public safety and resource protection.

**Table 2
Procedures for Mitigating Physical Hazards at Abandoned Mine Land Sites**

Closure Technique	Description	Typical Closure Techniques
Metal grates	<p>Rigid metal frame enclosures used when bats are not present include horizontal and vertical grates. In some cases, grates may be combined with bat cupolas (see Bat Gates and Cupolas in this table). Horizontal and vertical grates can replace nets when systematic vandalism is probable or evident. Each device is individually tailored to fit the intended site. The devices can be constructed of several types of metal products, including square or rectangular steel tubing or round rod material. They would most often be constructed of angle iron, and infrequently combined with extruded expanded mesh construction as in the tops of bat cupolas.</p> <p>A grate over a shaft is shown in the photograph.</p>	
Fencing (permanent or temporary)	<p>Fencing has been commonly employed as an enclosure method in various Abandoned Mine Land management programs. Barbed wire, smooth wire, or chainlink fencing have been used to establish barriers to human entry, generally to mine shafts. History proves, however, that these devices are highly subject to vandalism, are difficult to maintain, and constitute less effective deterrents than rigid barriers. Fences can also draw unwanted attention and visitation to a site by increasing its visibility. Fences do prevent unintentional entry to a hazardous condition and constitute a physical barrier that must be defeated or negotiated by an intruder. Generally, fencing would be employed only in specific circumstances, such as adaptations for barn owls or where other techniques are unsuitable.</p>	

**Table 2
Procedures for Mitigating Physical Hazards at Abandoned Mine Land Sites (Continued)**



Closure Technique	Description	Typical Closure Techniques
<p>Bat gates and cupolas</p>	<p>Bat gates and cupolas are specially designed metal structures that allow bats access to a mine through slots of a specific width, typically between 5.75 and 6 inches. They are typically constructed of heavy-duty angle iron constituting an adaptation of the American Cave Conservation Association/Bat Conservation International, Inc. bat gate design (Vories and Throgmorton 2002). Strong recommendations from biologists, low materials cost, and relative ease of construction contributed to the selection and current incorporation of this design. One advantage of these closures is that bat gates and cupolas fitted with locking access panels guarantee future access to the mine features by biologists, geologists, and archaeologists.</p> <p>Bat gates and cupolas are often designed to include access openings for other species of animals such as barn owls and desert tortoises, if these species are known or suspected to inhabit a particular mine. In tortoise habitat, tortoise barriers would be included at those features where tortoises could be trapped, such as shafts and inclines/declines.</p> <p>In some cases, gates could be installed in culverts that would be placed within mine openings to enhance the physical integrity of mine openings that may be degrading.</p>	
<p>Cable mesh nets</p>	<p>Installation of safety cable nets was one of the earliest methods developed to close mine openings to visitors. The design concept allowed visitor appreciation of the feature, provided for air passage in the opening, and allowed small wildlife passage. Safety nets of various designs can be compatible with historic structures because they can be readily recessed or inset in the mine opening to allow more suitable rock drilling conditions and render the installation less visible.</p> <p>They are no longer widely used where wildlife need continued access to the mine openings and are no longer preferable for closures where bats are present as bats can have difficulty navigating through them. Cable mesh can also pull on structural elements that are loose or in bad condition and possibly hasten their deterioration. In tortoise habitat, tortoise barriers would be included at those features where tortoises could be trapped, such as shafts and inclines/declines.</p>	

Table 2
Procedures for Mitigating Physical Hazards at Abandoned Mine Land Sites (Continued)




Closure Technique	Description	Typical Closure Techniques
<p>Polyurethane foam plugs covered with backfill</p>	<p>Polyurethane foam plugs have closed mine sites in remote areas, sites with access restrictions, and sites that do not have sufficient backfill material. The plugs are typically installed a few feet below the collar of the shaft and a few feet are backfilled with soil or waste rock available near the site because the plug is subject to ultraviolet light degradation and vandalism, thus, it needs to be protected (Burghardt 1994). Polyurethane foam plugs have a considerable weight-bearing capacity. Polyurethane foam plugs are partially reversible closures because when necessary they can be removed; however, it is almost impossible to completely remove the foam, which adheres directly to the surrounding rock. If removal is attempted, some evidence of its use would always remain at the site. The photograph shows a shaft filled with foam and backfilled with local material.</p>	
<p>Back-filling alone</p>	<p>Back-filling may utilize either mechanical or manual earth-moving methods depending on the size of the mine or prospect and require that sufficient back-fill materials are present at the site (it is unlikely any material would be imported). A need for future maintenance of historic mining features may preclude back-filling as an appropriate closure method. If mechanized equipment is required, ingress, egress, and operation of earth moving equipment may result in unacceptable environmental impacts. In front-country situations well above the water table, back-filling may be an appropriate closure technique for trenches and prospects. The photograph shows an adit that was permanently closed using backfill.</p>	
<p>Combination applications of above methods to treat complex situations</p>	<p>Complex mine openings, including stopes, glory holes, and especially large openings, may require that combinations of closure techniques be employed to adequately protect visitors, allow wildlife access and provide safety. Photograph shows a combination of bat cupola, grate, and concrete base (in desert tortoise habitat, the base would serve as a tortoise barrier to prevent trapping).</p>	

Table 3 Typical Mine Opening Features with Factors Involved in Determining Mine Closure Techniques			
Typical Site Feature	Wildlife Use	Other Considerations	Closure Technique (see appendix A and table 2 for photographs of these techniques)
Shaft opening with sloping and unstable slopes	Bats	None	Horizontal gate on new concrete footing and small bat cupola
Unstable timbers in opening, adit	No	Historical features	Vertical gate
Ladder leading into shaft, collapsing edges	No	Historical features	Horizontal gate
Shaft	Bat and barn owl use	None	Fence with owl perches
Adit	Desert tortoise and bat use	None	Bat gate with tortoise entrance
Adit (20 ft.) with portal	Bats	Historic features with collapsing portal timbers	Repair/stabilize timbers & portal. May use culvert gate held in place with foam.
Adit (200 ft) stable portal	Bat maternity colony & bighorn sheep use	Historic feature. Known public use.	Install bat gate 10 feet in from the portal.
Shaft 50 ft, deep collapsing	None	No timbers. Eroded to 20 feet wide.	Foam plug and backfill.
Open stope 80 ft. by 10 ft, depth unknown.	Many bats	Near road	Install bat compatible grate over steel framework
Decline (with timbers)	Unknown	Historic, considerable public use	Stabilize timbers and install bat gate inside
Open trench with decline 30 ft down.	No	Historic, near road	Install expanded metal mesh on steel frame in the trench and over deep area.
Deep shaft with drifts at various levels.	Unknown	Historic water at 350 feet, opening in waste pile	Bat cupola on concrete footing
Decline 75 feet deep	Bobcat and pack rats, no bats	Historic, stable portal	Exclude bobcat and pack rats, install steel grate

Note: This table represents some, but not all, possible combinations for closing a mine opening

Closure Technique¹	Public Health and Safety	Visitor Experience²	Special - Status Species	Wildlife	Wilderness
Fencing	Long-term, beneficial	Long-term, minor and adverse	Negligible ³ to beneficial	Negligible to minor and adverse	Short-term, minor and adverse
Polyurethane Foam with Backfill ¹	Long-term, beneficial	Long-term, minor and adverse	Long-term, negligible ³ to minor adverse as well as long-term beneficial	Long-term, negligible and adverse	Short-term, minor and adverse
Bat Gates, Screens, Nets, Grates, or Cupolas	Long-term, beneficial	Long-term, minor and adverse	Long-term negligible ³ to minor and adverse as well as long-term beneficial	Short-term, negligible to minor, and adverse	Short-term, minor and adverse
Shallow Backfill	Long-term, Beneficial	Long-term, minor and adverse	Short-term, negligible ³ and adverse	Short-term, negligible and adverse	Short-term, minor and adverse
Combined Methods	Long-term, beneficial	Long-term, minor and adverse	Varies by opening	Varies by opening	Short-term, minor and adverse

Note: Additional details are provided in the respective environmental consequences section.

- (1) Only used at locations where bat, owl, or other wildlife uses of mine opening does not occur.
- (2) Adverse effect on visitors who place a high value on visiting mine sites. Beneficial effect associated with improved safety at closed mine sites. An intensity threshold (negligible, minor, moderate, major) is not applied to beneficial effects.
- (3) Equivalent to “may affect, but not likely to adversely affect” under Endangered Species Act Section 7 terms

Table 5 Comparison of the Alternatives		
Impact Topic	Alternative A, No Action	Alternative B, Abandoned Mine Safety Installations
Public Health and Safety	The No Action alternative would have a long-term, minor, adverse effect on visitor safety. Cumulative impacts would be long-term, minor and adverse.	Alternative B would have long-term, beneficial effects on public health and safety. Cumulative impacts would be long-term and beneficial.
Visitor Experience	The No Action alternative would have long-term, minor, adverse impacts on the experience of visitors. Cumulative impacts would be long-term, negligible, and adverse.	Alternative B would have minor adverse to beneficial impacts on visitor experience. Cumulative impacts would be long-term and beneficial.
Special Status Species	Desert Tortoise: The effects of alternative A would be long-term, minor, and adverse as well as long-term and beneficial. Cumulative would be long-term, negligible, and adverse as well as long-term and beneficial. State-Listed Bats: The impact of alternative A would be adverse, negligible to minor, and long term. Cumulative effects would be long-term, negligible, and adverse as well as long-term and beneficial.	Desert Tortoise and State-Listed Bats: The effects of additional abandoned mine safety installations on desert tortoises and bats would range from long-term, negligible, and adverse to long-term and beneficial. Cumulative effects would be negligible and adverse as well as beneficial.
Wildlife	Alternative A would have short- and long-term negligible to minor, adverse impacts on wildlife that currently utilize abandoned mines Cumulative effects would be short- and long-term, negligible and adverse, as well as long-term and beneficial.	The potential effects on wildlife would be long-term, negligible to minor, and adverse. Cumulative effects would range from short-term, negligible to minor, and adverse, to predominantly long-term and beneficial.
Wilderness	Alternative A allows long-term effects on wilderness to persist. Cumulative effects would be long-term.	Alternative B would have short and long-term, minor effects on wilderness. Disturbance from project work is transitory. Cumulative effects would be beneficial.
Meets Purpose and Need	No, alternative A would not meet the purpose and need because the public and staff safety would continue to be faced with safety risks at mine openings.	Yes, alternative B would meet the purpose and need because the closure of mine openings would eliminate the safety risks to visitors and staff at mine openings.

Note: Additional details are provided in the respective environmental consequences section.

(1) Equivalent to “may affect, but not likely to adversely affect” under Endangered Species Act Section 7 terms

AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

This section describes the characteristics of the affected environment that could be affected by the proposed abandoned mine safety installations and the estimated environmental effects of the closures. This analysis is presented for each of the impact topics listed in table 1.

The affected environment discussion is followed by Environmental Consequences, or the impact assessment. The assessment is limited to key aspects of existing conditions that relate to potential adverse effects or conditions that are of potential concern. In addition, only those aspects of the existing conditions that relate directly to the impact conclusion or form the basis for the impact conclusion are described.

A variety of different type of abandoned mine lands safety techniques would be applied to abandoned mine land sites, depending on individual mine features. Because there are many sites in the Preserve, this environmental assessment provides a programmatic assessment of potential environmental effects based on typical closure techniques that would be applied based on different combinations of features (e.g., adits with and without bats, vertical shafts with and without bats, and so forth). These were presented in table 3.

METHODS

The methods used to assess impacts of the abandoned mine lands safety techniques include:

- Impact intensity thresholds for each impact topic were defined and include negligible, minor, moderate, and major adverse impact definitions as well as a beneficial impact definition and terms of duration. Impact threshold definitions are provided for each of the five impact topics at the start of their respective Environmental Consequences section.
- Each alternative was evaluated for each impact topic using the threshold definitions to determine the intensity of effect. In the case of the multiple abandoned mine lands safety techniques associated with alternative B, the various individual closure techniques were evaluated. As a result, the determinations of effect for alternative B sometimes resulted in a range of effects for the same impact topic, as the impacts of one technique may differ from another. Only adverse impacts were assigned an intensity modifier; beneficial effects are characterized only as resulting in a positive impact.
- Table 4 presented a summary of the range of impact intensities associated with each closure technique for each impact topic. Detailed analyses are presented in the environmental consequences section for each impact topic. Table 5 summarized and compared the impacts of the alternatives, as well as noting how well each alternative met the project purpose and need.
- Impact analyses are programmatic in that they assess the impacts associated with “scenarios” that illustrate the range of closure approaches that would typically be used.
- When a combination of closure techniques are used, producing a range of impact intensities (for example, negligible to minor impact), the most severe (or highest) impact intensity is used for descriptive and evaluation purposes. This ensures a conservative evaluation.

CUMULATIVE IMPACT ANALYSIS METHOD

The environmental assessment also includes an assessment of cumulative impacts. The Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act require assessment of cumulative effects in the decision making process for federal projects.

Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative effects are considered for both the no action and the preferred action alternatives and are presented at the end of each impact topic discussion analysis.

Cumulative effects were determined by combining the qualitatively estimated effects of the alternatives with other past, present, and reasonably foreseeable future actions that are relevant to abandoned mine safety installations within the Preserve. The following is a summary of past, present, and reasonably foreseeable actions taking place at Mojave that would have a relationship to the proposed abandoned mine lands safety installations. The cumulative impact analyses in the environmental consequences section refer to the plans and projects described below as contributors to cumulative effects.

Other Restoration Projects

Several other restoration projects are being completed in the Preserve. The other restoration projects include the Prospect Site Investigation #139 restoration, restoration of the trenches at Seventeen Mile point, and AT&T cable route restoration. The Preserve has recontoured and revegetated Prospect Site Investigation #139, some trenches near Seventeen Mile Point, and an abandoned AT&T cable route/road.

Other Abandoned Mine Land Closures

Mine openings at several other mines already closed or in the process of being closed at Mojave include the Oro Fino mine, the Butcher Knife mine, the Paymaster, Gold Cycle, Death Valley, a Cinder Cones mine, and the Vulcan Mine. Closures include bat cupolas, polyurethane foam plugs, and fencing exclosures.

RESOURCE IMPAIRMENT

In addition to determining the environmental consequences of the no action and preferred alternatives, *Management Policies 2006* (National Park Service 2006) and Director's Order #12 (National Park Service 2001) require analysis of potential effects to determine if actions would impair resources in the Preserve.

An impact to any Preserve resource or value may, but does not necessarily, constitute impairment. An impact would more likely constitute impairment where it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the Preserve, or
- Key to the natural or cultural integrity of the Preserve or to opportunities for enjoyment of the Preserve, or
- Identified as a goal in the Preserve's general management plan or other relevant National Park Service planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of Preserve resources or values and it cannot be further mitigated" (National Park Service 2006).

The potential for impairment was estimated by qualitatively applying the three criteria listed above as required by National Park Service guidelines and policies (National Park Service 2001 and 2006). Professional judgment and available information on the baseline conditions and features of the

alternatives were relied upon to determine whether there would be resource impairment to the Preserves cultural or natural resources. Public health and safety and visitor experience are not considered Preserve resources and are therefore not analyzed for impairment.

UNACCEPTABLE IMPACTS

The impact threshold at which impairment occurs is not always readily apparent. Therefore, the National Park Service applies a standard that offers greater assurance that impairment will not occur. The National Park Service does this by avoiding impacts that it determines to be unacceptable. These are impacts that fall short of impairment, but are still not acceptable within a particular park's environment. Unlike impairment analysis, unacceptable impact determinations are made for all impact topics. For the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would:

- Be inconsistent with a park's purposes or values; or
- Impede the attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process; or
- Create an unsafe or unhealthful environment for visitors or employees; or
- Diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values; or
- Unreasonably interfere with park programs or activities; or
 - An appropriate use; or
 - The atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park; and
 - NPS concessioner or contractor operations or services.

PUBLIC HEALTH AND SAFETY

AFFECTED ENVIRONMENT

Abandoned mines pose a safety risk for the public on federal lands in the western United States, including the Preserve. This was documented in a recent Department of Interior Office of Inspector General's study at 45 locations on Bureau of Land Management land and in five national parks (including Mojave) in the region (U.S. Office of the Inspector General 2008). The overall conclusions were that:

Physical safety hazards continue to result in visitor injuries and deaths in these areas.

A total of 33 fatalities were recorded by the U.S. Mine Safety and Health Administration "between 1999 and 2007 on all public and private lands in the western United States."

At least 12 people were killed in accidents at abandoned mines and seven deaths occurred at six mine sites on these lands since 1984 (U.S. Office of the Inspector General 2008).

The conclusions presented in the Office of Inspector General's report (U.S. Office of the Inspector General 2008) for Mojave were as follows:

"Although several dangerous mine shafts in the area had been covered or fences had been installed, there were still many dangerous mine openings easily accessible to the public."

“At two sites, we found mine shafts on roads that were large enough to easily swallow entire vehicles. In both cases, there were no fences or signs to warn the public of the danger. At the Gold Cycle site in the Preserve, a ladder going into the mine provided easy access to the mine shaft. At the Johnny Shaft site, we observed the road led directly to a mine with a 400-foot deep shaft.”

At the Oro Fino site, “the entrance to the mine was collapsing, the roof was caving in, and dangerous shafts inside the mine created the risk of people falling. There was a dilapidated ladder in an open mine shaft at this site. There was vehicle access to the opening, and there were no signs warning the public of the dangers or fencing to prevent access.”

Mojave has no reported fatalities or injuries associated with mine openings (Woo 2009). Nonetheless, the hazards at mine openings are well documented and incidents likely go unreported (U.S. Office of the Inspector General 2008).

According to a 1997 visitor survey (University of Idaho 1997), 32% of visitors to Mojave visit ruins or abandoned mine sites (see section visitor experience section). This dropped to 18% in 2003 (University of Idaho 2004); however, visitation to abandoned mine sites is expected to increase significantly in the future as growth of populations and use of off-highway vehicles increases (U.S. Office of the Inspector General 2008).

Non-mine related aspects of safety in the Preserve were also analyzed recently by the University of Idaho in a visitor survey (University of Idaho 2003). The study concluded that while in the Preserve, most visitor groups (63%) felt “very safe,” 16% felt “safe,” and 6% felt “unsafe” or “very unsafe.” Visitors felt unsafe because of the following factors: “traveling at night without a cell phone, having no access to emergency help, fearful of armed park ranger, hunting season, a bike race took over the road, long winding roads, too many people, do not see any highway patrol, and other vehicles were going over the speed limit” (University of Idaho 2003).

ENVIRONMENTAL CONSEQUENCES

Impact Criteria and Thresholds

The following threshold definitions of impact intensity are used in the analysis of effects on Public Health and Safety:

Adverse Effects

Negligible: Overall public health and safety in the Preserve would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on public health and safety for typical visitor activities in the Preserve (considered to include the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites).

Minor: The effect would be detectable, but would not have an appreciable overall effect on public health and safety in the Preserve for typical visitor activities (considered to include the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites). If mitigation were needed, it would be relatively simple and likely successful.

Moderate: The effect would be readily apparent and would result in substantial, noticeable effects on public health and safety in the Preserve on a local scale for typical visitor activities (considered to include the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites). Changes in rates of accidents or injuries could be measured. Mitigation would probably be necessary and would likely be successful.

Major: The effects would be readily apparent and would result in substantial, noticeable effects on public health and safety in the Preserve and within the county around the Preserve. Effects could lead to changes in the rate of mortality. Extensive mitigation measures would be needed and their success would not be assured.

Beneficial Effect: Beneficial effects would reduce the potential for accidents and limit hazard exposure.

Short-term: Occurs only during project implementation.

Long-term: Occurs beyond the period of project implementation.

Impacts of Alternative A: No Action

Under the No Action alternative, unclosed mine openings would continue to create dangerous safety hazards because visitors would continue to have the opportunity to enter the mines. Visitors to these mines would continue to encounter open vertical shafts, crumbling adits and portals, and similar highly dangerous conditions. Mines with already closed openings would reduce the potential for accidents. Safety hazards for visitors to the Preserve would continue because the remaining mines would not have openings closed. Safety conditions for visitors engaging in activities other than visiting abandoned mines would also likely continue to be similar to existing conditions. Although, the likelihood of a mine opening-related accident may be relatively low and is restricted primarily to those visitors who enter mine openings, the consequences of such accidents pose a high risk from a health and safety perspective because of the magnitude of danger at mine openings, the remote location of most mine openings, and the risks associated with rescue. As a result, the No Action alternative would have a long-term, moderate adverse effect on visitor health and safety.

Cumulative Effects. The effects of past, present, and reasonably foreseeable future actions, including the projects identified in the section titled “Cumulative Impact Analysis Methods,” would not generally have any effects on public health and safety, except for other abandoned mine safety installations at other abandoned mine lands. Several other mine openings already closed or in the process of being closed at Mojave include the Oro Fino, Butcher Knife, Paymaster, Gold Cycle, Death Valley, Cinder Cones, and Vulcan mines. These closures have and will continue to have beneficial effects on public health and safety under the No Action alternative.

The other abandoned mine lands safety activities implemented in the past and expected to continue would have beneficial effects on health and safety. These other closures would continue under the No Action alternative. The impacts of the No Action alternative, which would not implement the large-scale closures proposed in alternative B, would combine with the effects of other plans and projects to result in an overall long-term, minor, adverse, cumulative effect.

Conclusions. Safety conditions for visitors engaging in activities other than visiting abandoned mines would also likely continue to be similar to existing conditions. The No Action alternative would have a long-term, minor, adverse effect on visitor safety.

Because no additional mine openings would be closed, the overall threat to visitor safety would continue to be similar to existing conditions, despite these other actions. When the beneficial impacts of the other plans and actions are combined with the long-term, moderate, adverse impacts under alternative A, there would be overall long-term, minor adverse cumulative impacts. Alternative A would contribute a slight adverse increment to overall cumulative impacts.

Impacts of Alternative B: Abandoned Mine Safety Installations

Under alternative B, mine openings in the Preserve would be closed using a variety of techniques tailored to each mine site, based on the previously described considerations.

Details of the individual techniques are presented in the alternatives section. The following is a summary of the estimated effects of each of the treatments on public health and safety.

Fencing. Temporary fencing could be employed at mine openings scheduled to be closed by one of the other various available closure techniques. Temporary fencing would protect visitors from entering dangerous openings such as shafts or adits. The fences would be removed once the final closure technique is applied. Temporary fencing would represent a short-term, beneficial effect because safety risks would be reduced.

Permanent fences would result in permanent closure of mine openings, which would reduce risks to human health and safety over the long term and represent a beneficial effect.

Other Closure Techniques. Other closure techniques would include bat gates, nets, screens, grates, and cupolas, polyurethane foam closures covered with backfill, backfill alone, and combination applications of the above methods to treat complex situations. All these measures would have similar beneficial effects on public health and safety in that they would result in permanent closure of mine openings and would reduce risks to human health and safety. Because all the other techniques accomplish the same basic objective they would all have similar effects on public health and safety. Closures would result in:

- Holes filled or barricaded that visitors might otherwise stumble into;
- Decayed timbers that are barricaded or replaced that might otherwise lead to visitor accidents if the timbers failed while visitors climbed on them; and
- Openings that are barricaded to prevent visitors from entering adits that might contain toxic gases or other hazards.

Alternative B would have a long-term, beneficial effect on public health and safety by reducing overall risks to human health and safety caused by the continued existence of openings in abandoned mines.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled “Cumulative Impact Analysis Method.” In particular, the Facilities Development Plan and previous abandoned mine safety installations would contribute to beneficial effects by improving NPS visitor protection and, in the case of previous safety installations, directly reducing safety risks at mine openings. Under alternative B, the closure of mine openings would result in a benefit to public health and safety because risks posed at mine openings would be decreased. The additional improvements to public health and safety associated with alternative B would add to overall safety in the Preserve and would grow over time as more mine openings are closed. Overall, the effects of alternative B, combined with the effects of other plans and actions, would have a beneficial cumulative effect because all of the actions would either directly or indirectly enhance public health and safety.

Conclusions. Alternative B would have a long-term, beneficial effect on public health and safety by reducing overall risks to human health and safety caused by the continued existence of open abandoned mine openings.

Overall, the effects of alternative B, combined with the effects of other plans and actions, would have a beneficial cumulative effect because all of the actions would either directly or indirectly enhance public health and safety. Alternative B would add a measureable beneficial increment to overall cumulative impacts.

VISITOR EXPERIENCE

AFFECTED ENVIRONMENT

Mojave provides a wide variety of experiences for visitors from all over the world. Visiting abandoned mine land sites is just one of many experience available in the Preserve. Its nearness to major population centers such as Los Angeles and Las Vegas, combined with major interstate highways, gives residents and visitors the opportunity for relatively easy access to many parts of the desert. Most of the landscape is open with broad vistas of relatively undeveloped land. The vastness of the landscape offers visitors an opportunity for seclusion and a sense of wilderness, even while in a vehicle. Early miners and ranchers developed roads that today offer visitors a chance to drive into many remote locations where informal camping traditionally occurred. There are several major sand dune systems. Hikers play on and explore the Kelso Dunes. There are many highly popular cultural sites such as abandoned mining districts. Mountain ranges, such as the New York and Providence Mountains, offer a contrast to the dry hot valleys, attracting many people in summer with cooler temperatures and forested areas. Volcanic cinder cones, lava flows, rock outcrops, and unique wildlife and vegetation are other elements that attract people. The land has many extremes and contrasts that people come to experience, such as the high summer temperatures. Most visitors come to the desert simply to see the outstanding scenery of this diverse landscape. Visitor use near the Big Horn, Teutonia, Oro Y Platta, and Gold Standard mines is infrequent but persistent.

A 1997 survey conducted by the University of Idaho (University of Idaho 1997) (table 6) reported the following participation levels by visitors to the Preserve for various types of activities:

Visitor Activity	Participation Level¹
Auto-touring/sightseeing	61
Nature study/hiking	49
Driving unpaved roads	51
Camping in developed campgrounds	22
Day hike	41
Visit ruins/historic sites	32
Driving through only	28
Dispersed camping	15
Hunting ²	Not available

(1) Percentages do not add up to 100% because visitors participate in more than one type of activity.

(2) Hunting was not included in the initial survey but is a considerable visitor activity during fall upland bird and deer hunts.

Visitors to the Preserve would have the ability to continue to participate in auto-touring / sightseeing, nature study / hiking, driving on unpaved roads, camping, hunting, and visiting ruins / historic sites. These are the most common types of visitor activities in the Preserve (National Park Service 2000). In 1997, of these activities, 61% of visitors participated in auto-touring / sightseeing and 32% participated in visiting ruins / historic sites (National Park Service 2000).

In a more recent 2003 study of visitor use, the University of Idaho (University of Idaho 2004) reported the following information regarding different types of visitor activities in the Preserve (figure 3):

- Among respondents of this survey, 48% of visitor groups said they were driving through a short cut between Southern California and Las Vegas without stopping.
- Of those who visited the Preserve, the most common activities were sightseeing (73%), driving paved roads (64%), and driving unpaved roads (43%).
- The least common activities were horseback riding and overnight backpacking (each 2%).
- “Other” activities included driving through, taking a cavern tour, studying geology of the area, photography, gathering burros, on the way to Joshua Tree National Park, using restrooms at Kelso, searching for owl/eagles, bird and reptile observation, getting away from civilization, and rock climbing.
- The participation levels for visiting mine ruins and historic sites in 2003 was 18%, a reduction of 14% over 1997 levels (figure 3).

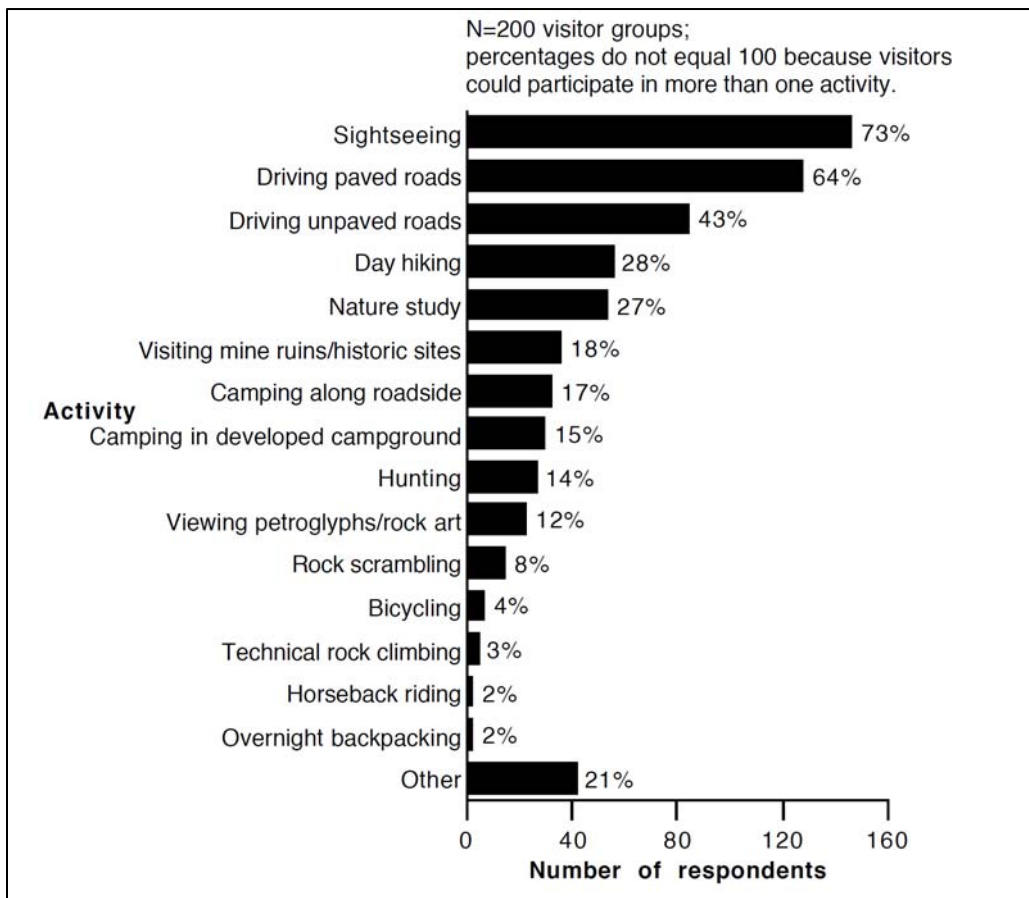


Figure 3. Visitor activities in Mojave in 2003 (University of Idaho 2004)

ENVIRONMENTAL CONSEQUENCES

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on visitor experience:

Adverse Effects

Negligible: Changes in visitor use and the quality or nature of the visitor experience would not occur as a result of abandoned mine lands safety installations. There would be no noticeable changes in visitor experience or in defined indicators of visitor satisfaction or behavior, which are considered to include the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites.

Minor: Changes in visitor experience as a result of abandoned mine safety installations would be small but detectable. Visitors could be aware of the effects but the changes would not appreciably alter important characteristics of the overall visitor experience or visitor satisfaction (considered to include the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites), or levels of use of preserve facilities.

Moderate: Some changes in important characteristics (considered to include the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites) of the overall preserve experience as a result of abandoned mine safety installations would be readily apparent, or the number of visitors engaging in an activity or in the use of areas within the Preserve would be substantially altered in comparison to historical trends. Most visitors would be aware of changes and many would be able to express an opinion regarding the difference. Visitor satisfaction would change as a result of the closure of mine openings.

Major: Changes in multiple important characteristics (considered to include the ability to view and explore abandoned mine sites, the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites) of the desired experience as a result of abandoned mine safety installations would be readily apparent. Visitors would be aware of the effects and would likely express a strong opinion about the changes. Participation in desired experiences or in Preserve visitation would be considerably altered and would result in substantial changes in the defined indicators of visitor satisfaction or behavior.

Beneficial Effects: Abandoned mine safety installations would have demonstrable beneficial effects on visitor experience, including, but not limited to a better understanding of the historical conditions and demands associated with mining, the ability to view and explore abandoned mine sites, to view and experience scenery and wildlife, and to experience solitude or quiet.

Short-term: Effects of abandoned mine safety installations on visitor enjoyment and recreational or educational opportunities would be associated with the construction period of the closure. The effect would end concurrent with or shortly after the end of the construction period.

Long-term: Effects of abandoned mine safety installations on visitor enjoyment and recreational or educational opportunities would be evident for a period exceeding five years.

Impacts of Alternative A: No Action

Visitors to the Preserve would have the ability to continue to participate in the most common types of visitor activities, including auto-touring / sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins / historic sites. In 1997, of these activities, 61% of visitors participated in auto-touring / sightseeing and 32% participated in visiting ruins / historic sites (NPS 2000).

Under the No Action alternative, visitors would continue to visit and explore abandoned mine land sites, both with and without closed openings, at Mojave. No additional abandoned mine safety installations would occur and existing closed mines would continue to exist in the Preserve. The number of visitors interested in seeing open mine sites would also increase as interest in these Preserve features increases (U.S. Office of the Inspector General 2008). Also, as interest in abandoned mine land sites increases in the future, visitor use of abandoned mine sites would be expected to rise (U.S. Office of the Inspector General 2008).

Continuing to allow access to unclosed openings in abandoned mine sites in the Preserve would have a variety of effects on visitor use and experience. The effects would depend on what value different visitors place on visiting open mine sites versus other types of experience available in the Preserve. Under No Action, mines that are already closed might continue to be viewed negatively by visitors who place a high value on entering and investigating unclosed mines without supervision. Visitors who place more value on participating in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting non-mining related ruins/historic sites would not be affected by the No Action alternative. Other visitors who are concerned with safety may choose not to go near the abandoned mines due to the abovementioned safety risk. Because the effects of closures on visitor experience vary depending on individual preferences, the effects would be long term, minor, and adverse

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled “Cumulative Impact Analysis Method.” The effects of past, present, and reasonably foreseeable actions would benefit visitor experience. The effects of the Facilities Development Plan would, in particular, have cumulative beneficial effects on visitor experience because NPS visitor protection would improve. Overall, cumulative effects from the past, current, and reasonably foreseeable future projects, when combined with the long-term, minor, adverse impacts of the No Action alternative, would result in long-term, negligible, adverse, cumulative effects on visitor experience.

Conclusions. Because some mine openings have already been closed the No Action alternative would have a long-term, minor, adverse effect on the experience of visitors who place a high value on the ability to have open access to these sites. Nonetheless, the majority of abandoned mine lands features remain a danger to human safety. The No Action alternative would not change this situation.

Because no additional mine openings would be closed, the overall visitor experience would continue to be similar to existing conditions. Overall, cumulative effects from the past, current, and reasonably foreseeable future projects, when combined with the long-term, minor, adverse impacts of the No Action alternative would result in long-term, negligible adverse cumulative effects. The No Action alternative would add a slight adverse increment to overall cumulative effects.

Impacts of Alternative B: Abandoned Mine Safety Installations

Closing abandoned mine openings in the Preserve would have a variety of effects on visitor use and experience, depending on the preferences and interests of the specific user group. Under the proposed action, the majority of mine and mining camp features in the Preserve would be left in place for visitors to enjoy and experience. There would be little or no change in the ability of visitors to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting non-mining related ruins/historic sites.

The proposed action would be limited to mine openings that are deemed to be unsafe and potentially dangerous by the National Park Service. Prior to implementation of a mine safety treatment, each mine would first be evaluated to determine the stability of the opening and overall condition, and where possible, would be left intact to facilitate visitor understanding of the features and historical

conditions. At selected sites, the structural integrity of historic structures would be preserved to enhance visitor understanding and appreciation of mine operations and working conditions. Interpretation regarding mines and abandoned mine safety installations and guided tours would be planned for some mine sites.

Under the proposed action, a variety of mine safety techniques would be applied to additional abandoned mine openings. The objective of implementing these measures would be to prevent or minimize visitor access to open shafts, unstable adits, or other dangerous features. The treatments applied at a specific site are intended to protect visitor safety while maintaining the cultural and physical integrity of the site. Considerations for selecting the preferred closure method at a given site include visitor safety risk, site geologic stability, method effectiveness, amount of public access and use, treatment cost, opening use by wildlife and bats, and existing strength and integrity of mine features such as timber framing, head frames and similar structures.

All the techniques would effectively prevent visitors from entering dangerous mine openings in different ways. Each type of closure technique would have the following additional types of effects on visitor experience:

Fencing. The physical appearance of a mine site would be changed by the presence of permanent or temporary fences, as compared with the original mine openings. Visitors could still view mine openings from a relatively close distance and would be able to view well into the depths of a mine opening, but would not be able to physically enter the feature. This would allow visitors to safely view and appreciate the historical values of the mines and surrounding mine camp or other historical features from a reasonably close distance. To minimize adverse visual effects on visitor experience caused by fencing, naturally colored fences and fence supports would be used that match the desert soil and vegetation, based on the location of the fence in relation to individual site features. Temporary and permanent fencing would have long-term, minor, adverse effects on visitor experience because these treatments would prevent some visitors from having full access to the sites. Visitors would be aware of the effects of the treatments, but the changes would not appreciably alter important characteristics of the overall visitor experience or visitor satisfaction. Visitors would still have the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites.

Bat Gates, Screens, Grates, and Cupolas. These structures would change the visitor experience by partially blocking or limiting the view into the opening. Placement of these types of structures outside an abandoned mine opening would also permanently alter the historical appearance of the feature. In situations where external frames or other structures are still intact, and where other features make it suitable, sunken bat gates would be employed. Visitors would still be able to view into the interior areas of the mine features by looking through the 5.75 to 6-inch openings in the bat gates, nets, or cupolas, however. These types of structures are highly visible to the public. This would allow the external historical appearance of a mine opening to be preserved and provide a safe viewing experience for visitors. Because the historical structures are retained rather than removed or hidden, the visitor would still experience the overall nature and character of the mine camp or mine site conditions. Even with closure structures in place, the visitor could still see and appreciate the miner's construction activities and techniques for mining minerals in the desert environment. In addition to these types of effects, bat gates, nets, and cupolas would allow visitors to learn about bat conservation, bat ecology, and management of bats. If a bat gate or cupola featured access openings for owls or desert tortoises, visitors would be provided with an opportunity to learn about and appreciate other protected species and wildlife that utilize mine openings and caves.

Grates and screens have a smaller mesh diameter than bat gates or cupolas and would further restrict the visitor's view into a mine opening. The effects on visitor experience would otherwise be similar to those resulting from bat gates. Horizontal and vertical grates would have long-term, minor, adverse effects on visitor experience in the Preserve because these treatments would prevent some

visitors from having full access to the sites. Visitors would be aware of the effects of the treatments, but the changes would not appreciably alter important characteristics of the overall visitor experience or visitor satisfaction in the Preserve. Visitors would still have the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites.

Bat gates, screens, nets, grates, and cupolas would have long-term, minor, adverse effects on visitor experience in the Preserve because these treatments would prevent visitors from full access to abandoned mine features. Visitors would be aware of the effects of the treatments, but the changes would not appreciably alter important characteristics of the overall visitor experience or visitor satisfaction in the Preserve. Visitors would still have the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites.

Polyurethane Foam with Backfill. Foam plugs are typically used in areas where there is a high safety risk. Application of this closure technique would result in complete filling of a mine opening with the foam and above that, several feet of dirt fill. This would permanently eliminate the visitor's view into the affected mine opening. Because the historical structures are hidden, the visitor would not be able to experience the overall nature and character of the mine opening. However, the visitor would still be able to appreciate the overall nature and character of the camp or mine site conditions. Polyurethane foam/backfill would have long-term, minor, adverse effects on visitor experience in the Preserve because these treatments would prevent some visitors from having full access to the sites. Visitors may be aware of the effects of the foam treatments, but the changes would not appreciably alter important characteristics of the overall visitor experience or visitor satisfaction in the Preserve. Visitors would still have the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites.

Backfill Alone. The effects of backfill of an abandoned mine lands feature on visitor experience would be similar to those resulting from foam plugs. Backfill would have long-term, minor, adverse effects on visitor experience in the Preserve because these treatments would prevent some visitors from having full access to the sites. Visitors may be aware of the effects of the backfill treatments, but the changes would not appreciably alter important characteristics of the overall visitor experience or visitor satisfaction in the Preserve. Visitors would still have the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites.

Combined Applications. These types of treatments would include using two or more methods to close a mine opening. Combined techniques could include, for example, using a horizontal gate with a bat cupola to close an open mine shaft while allowing bat use of the mine opening. Similar to bat gates and cupolas, combined closure structures are highly visible to the public and obviously modern changes that affect the physical appearance of the mining site. However, because the historical structures are retained rather than removed or hidden, the visitor can still experience the overall nature and character of the mining camp or mine site conditions. Similar to bat gates and cupolas, the visitor can still see and appreciate the miner's construction activities and techniques for mining minerals in the desert environment, even though some mine site features are affected by closure activities. Combined methods to treat complex situations would have long-term, minor, adverse effects on visitor experience in the Preserve because the combined treatments would prevent some visitors from having full access to the sites. Visitors would be aware of the effects of the combined treatments, but the changes would not appreciably alter important characteristics of the overall visitor experience or visitor satisfaction in the Preserve. Visitors would still have the ability to participate in auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting ruins/historic sites.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled “Cumulative Impact Analysis Method.” The effects of the Facilities Development Plan would, in particular, have cumulative beneficial effects on visitor experience because NPS visitor protection would improve. Mine-oriented Preserve visitors would experience minor, long-term adverse effects as a result of other abandoned mine land safety installations because mine access opportunities could be lost, similar to lost opportunities on other public lands.

Closing additional mine openings under alternative B would result in a long-term, beneficial effect on visitor experience for visitors who want additional mines to be closed for increased safety and to experience enhanced interpretive exhibits around mines. However, increased abandoned mine safety installations could result in a long-term, negligible adverse effect on visitor experience for visitors who do not want additional mines closed. The proposed interpretive actions and a mine access permit system would mitigate these adverse effects to some degree, although the long-term adverse effect would remain minor, especially for visitors used to having uncontrolled access to mines. The minor, long-term, adverse to beneficial range of impacts on visitor experience under alternative B would incrementally contribute to the effects of other plans and projects so that the overall cumulative impact would be long-term and beneficial.

Conclusions. In conclusion, the proposed action would restrict visitors from entering dangerous mine openings, but would allow the majority of visitors with a continued opportunity to enjoy other existing types of preserve activities, including auto-touring/sightseeing, nature study/hiking, driving on unpaved roads, camping, hunting, and visiting non-mining related ruins/historic sites. Because the majority of the existing historical features at abandoned mine sites would remain unchanged, the overall impact of mine closure activities are considered to result in a long-term, minor adverse impact on visitor experience in the Preserve. Potential adverse effects would be mitigated by the National Park Service by implementation of interpretive programs at sites that are safe and that have a wide variety of historical mine features and different types of mine closure techniques. The public would, therefore, have an opportunity to learn more about the history of these sites as well as the benefits provided by the various closure treatments to special status species and other forms of wildlife. The minor adverse to beneficial range of impacts on visitor experience under alternative B would incrementally contribute to the effects of other plans and projects so that the overall cumulative impact would be long-term and beneficial.

SPECIAL STATUS SPECIES

AFFECTED ENVIRONMENT

Several special status species of animals occur in the Preserve and have a potential to be affected by the alternatives. Table 7 summarizes information on special status species that potentially occur in abandoned mines or which have actually been observed by the National Park Service, and which are listed by the U.S. Fish and Wildlife Service as endangered, threatened, proposed, or candidate (U.S. Fish and Wildlife Service 2009 a, b) and by the California Department of Fish and Game as endangered, threatened, or species of special concern (State of California Department of Fish and Game 2009 a, b, and c). No listed plant species would be affected by the alternatives. Special Status Species of animals include the desert tortoise (*Gopherus agassizii*), and three species of state-listed bats. To avoid repetition between the section on Wildlife and the section on Special Status Species, however, the discussion of bats includes both listed (three species) and non-listed species (nine species) (table 7). No federally listed species of bats occur in the Preserve.

Desert Tortoise (*Gopherus agassizii*)

This species is listed as federally threatened by the U.S. Fish and Wildlife Service and as threatened by the State of California (National Park Service 2002; U.S. Fish and Wildlife Service 2008). Based on observations made by preserve staff, desert tortoises are known to use abandoned mine adits as habitat in Mojave. Vertical mine shafts also have a potential to trap tortoises (Weasma 2009).

A detailed assessment of the status, distribution, and other features of desert tortoise biology and conservation is included in this environmental assessment. This information is used in the impact analysis section to estimate the duration and intensity of effects of the alternatives on this species.

The range of the desert tortoise includes the Mojave and Sonoran deserts in southern California, Arizona, southern Nevada, the southwestern tip of Utah, and Sonora and northern Sinaloa, Mexico. The Mojave population of the desert tortoise primarily occupies valleys and bajadas characterized by scattered shrubs. The soil ranges from sand to sandy-gravel, though caliche soil, desert pavement, and rocky, boulder terrain are occasionally used (U.S. Fish and Wildlife Service 1994). Desert tortoises spend a large portion of the year underground to avoid extreme temperatures and, for younger tortoises, to avoid a variety of predators, such as coyotes, foxes, raptors, and ravens (Bureau of Land Management 1996). Tortoises generally are active during spring, early summer, and autumn when annual plants are most common and daily temperatures are tolerable. Additional activity occasionally occurs during warm weather in winter months and after summer rainstorms (Bureau of Land Management 1996).

Desert tortoise habitat has been destroyed, degraded, and fragmented as a result of urbanization, agricultural development, livestock grazing, mining, and roads. Removal of tortoises by humans for pets or for use as food or folk medicine is also a key factor in the decline of the desert tortoise population (U.S. Fish and Wildlife Service 1994). A respiratory disease is an additional cause of desert tortoise mortality and population decline, particularly in the western Mojave Desert (U.S. Fish and Wildlife Service 1994 and 2008).

In the Preserve, the desert tortoise is managed primarily according to areas of “critical habitat” and “recovery units” established by the U.S. Fish and Wildlife Service on a cooperative basis with the National Park Service and other agencies and organizations (U.S. Fish and Wildlife Service 2008). Critical habitat is defined as “specific, legally defined areas that are essential for the conservation of the desert tortoise, that support physical and biological features essential for desert tortoise survival, and that may require special management considerations or protection” (U.S. Fish and Wildlife Service 2008). Recovery units for the desert tortoise are special geographically identifiable units that are essential to the recovery of the entire listed population. The 1994 Recovery Plan identified six recovery units (based on the previously mentioned factors) for the desert tortoise: Upper Virgin River, Northeastern Mojave, Eastern Mojave, Eastern Colorado, Northern Colorado, and Western Mojave. The Preserve is located within the Eastern, Northern Colorado, and Northeastern recovery units. These six recovery units are provided protection under Sections 2(b)(c) and 3(15) of the Endangered Species Act.

Table 7 Special Status Species (and Non-Listed Bat Species) Potentially Occurring or Actually Observed At Abandoned Mine Sites in the Mojave National Preserve¹			
Common Name	Scientific Name	Federal Status ²	State Status ³
Group: Reptiles			
Desert tortoise	<i>Gopherus agassizii</i>	FT	ST
Group: Mammals			
California leaf-nosed bat	<i>Macrotus californicus</i>	-	SSC
Yuma myotis	<i>Myotis yumanensis</i> ¹	-	-
Long-eared myotis	<i>Myotis evotis</i>	-	-
Fringed myotis	<i>Myotis thysanodes</i> ¹	-	-
Long-legged myotis	<i>Myotis volans</i>	-	-
California myotis	<i>Myotis californicus</i> ¹	-	-
Small-footed myotis	<i>Myotis ciliolabrum</i> ¹	-	-
Western parastrelle/canyon bat	<i>Parastrellus hesperus</i> ¹	-	-
Big brown bat	<i>Eptesicus fuscus</i> ¹	-	-
Townsend's big-eared bat	<i>Corynorhinus townsendii</i> ¹	-	SSC
Pallid bat	<i>Antrozous pallidus</i> ¹	-	SSC
Mexican free-tailed bat	<i>Tadarida brasiliensis</i>	-	-

(1) Bat species observed by the National Park Service in surveys of abandoned mines (Brown 2009) or listed in the 2002 general management plan/environmental impact statement (National Park Service 2002).

(2) FT: Federal Threatened

(3) ST: State Threatened; SSC: A State of California Species of Special Concern

Three areas of critical habitat for the desert tortoise have been defined in Mojave National Preserve in the draft 1994 and revised draft 2008 recovery plans (U.S. Fish and Wildlife Service 1994 and 2008) (figure 1). The following is a description of the critical habitats for the desert tortoise in the Preserve (also refer to figure 1):

The northern area includes Ivanpah Valley, south of Nipton Road, including the areas north, west, and south of Cima Dome, extending up to Interstate 15. This area totals approximately 492,360 acres (769 square miles) and is located within the Eastern Mojave Recovery Unit.

The second area of the Preserve that contains desert tortoise critical habitat is the Fenner/Clipper Valley. This area contains 280,103 acres (438 square miles) of federal land. This habitat is also within the Eastern Mojave Recovery Unit. Private, state, and local agency lands were not considered in the general management plan recovery effort and are not considered part of the recovery effort unless the land is subsequently acquired by the adjacent managing agency.

Critical habitat also extends north of the Preserve onto Bureau of Land Management lands in the Shadow Valley area up to the southern slope of the Kingston Range and on adjoining Bureau of Land Management lands north of Nipton Road up to Ivanpah Dry Lake. There are also large areas of critical habitat to the south and east of the Fenner/Clipper valley area in California and Nevada.

The first two areas of critical habitat combined total about 772,463 acres (48%) of the Preserve designated as critical habitat for this species (U.S. Fish and Wildlife Service 1994). Figure 1 shows the overlapping relationship between desert tortoise critical areas and designated wilderness in the Preserve. Approximately 50% of the Preserve is designated wilderness, and approximately 50% is critical habitat for desert tortoises (National Park Service 2002).

The management goal of the recovery plan is full recovery and delisting of the desert tortoise following recovery of the Mojave population. The National Park Service manages for multiple species and protection of habitats for all native species. Desert tortoise management is directly linked with the management of grazing, burros, hunting, and camping (see those discussions for details) (National Park Service 2002).

Bats

This section summarizes information on all 12 species of listed and unlisted bats known to occur or which are estimated to potentially occur in mines in the Preserve. Two of the listed species of bats and six of the unlisted bats were observed in mines by bat biologists (Brown 2009) (table 7). The remaining four species of bats potentially occur in mines within the Preserve (table 7).

Mines are important to bats because their natural roosting habitats have been greatly reduced in the past 100 years as a result of loss of traditional roost trees, “human disturbance of caves, cave commercialization, deforestation, and urban and agricultural developments” (Tuttle and Taylor 1998).”

Bats have also lost traditional roosts in old tree hollows due to logging activities (Tuttle and Taylor 1998). Once a mine has been used by bats, they may also be so “instinctually committed to certain sites that they cannot change roosts in the time permitted by current rates of mine closure” (Tuttle and Taylor 1998).

It was recently shown that an increasing number of bat populations demonstrated a preference for using abandoned mine workings as roosting sites (National Park Service no date). Abandoned mines in the Preserve and elsewhere provide habitat less likely to be disturbed by light, noise, and predators and as such, provide usable roosting areas for bat populations otherwise displaced from their natural sites. Mines are also used for social encounters and eating of prey. Although some sites tend to be used as either hibernacula or maternity roosts, bats can use some mines, especially more complex mines, as both. Bats also use mines for hibernation and loss of any single one of these types of sites can affect a multistate region, eliminating many summer colonies of bats over thousands of square miles (Tuttle and Taylor 1998).

ENVIRONMENTAL CONSEQUENCES

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on Special Status Species:

Negligible: State- and federally listed species and their habitats would not be affected or the effects to an individual of a listed species or its critical habitat would be at or below the level of detection and would not be measurable or of perceptible consequence to the protected individual or its

population. Negligible effect would equate with a “no effect” determination in Endangered Species Act Section 7 terms.

Minor: The action would result in detectable effects to an individual (or individuals) of a federally or state-listed species or its critical habitat, but they would not be expected to result in substantial population fluctuations and would not be expected to have any measurable long-term effects on species, habitats, or natural processes sustaining them. Minor effects would equate with a “may affect/not likely to adversely affect” determination in Endangered Species Act Section 7 terms.

Moderate: An action would result in detectable effects on individuals or population of a federally or state listed species, its critical habitat, or the natural processes sustaining them. Key ecosystem processes may experience disruptions that may result in population or habitat condition fluctuations that would be outside the range of natural variation (but would return to natural conditions). Moderate level adverse effects would equate with a “may affect/likely to adversely affect/adversely modify critical habitat” determinations in Endangered Species Act Section 7 terms.

Major: Individuals or populations of a federally or state-listed species, its critical habitat, or the natural processes sustaining them, would be measurably affected. Key ecosystem processes might be permanently altered resulting in long-term changes in population numbers and permanently modifying critical habitat. Major adverse effects would equate with a “may affect/likely to adversely affect/adversely modify critical habitat” determinations in Endangered Species Act Section 7 terms.

Beneficial Effect: Beneficial effects are likely to protect or restore the abundance and distribution of special status species. This could occur through increased survival, reproduction, or availability of habitat or required resources.

Short-term (State Species and bats regardless of status): Effects last less than one year

Long-term (State Species and bats regardless of status): Effects last longer than one year

Impacts of Alternative A: No Action

Under the No Action alternative, the Preserve would continue to manage construction projects in the Preserve that could potentially affect desert tortoises according to the requirements of the “Biological Opinion for Small Projects Affecting Desert Tortoise Habitat in the Mojave National Preserve, San Bernardino County, California (1-8-98-F-17)” (U.S. Fish and Wildlife Service 1998).

The biological opinion was prepared by the U.S. Fish and Wildlife Service in response to a request by the National Park Service for formal consultation pursuant to the Endangered Species Act of 1973 (as amended). The biological opinion was prepared to address multiple “small” actions that the National Park Service was considering with potential to affect the desert tortoise in Mojave National Preserve. Small actions are defined as individual actions that disturb less than 2 acres of desert tortoise habitat (U.S. Fish and Wildlife Service 1998). Although the biological opinion was not prepared in association with alternative B, the actions proposed under alternative B would incorporate the protections and implement the conservation measures identified in the biological opinion. Small actions affecting desert tortoises include but are not limited to the following elements:

- Landing of a helicopter;
- Grading of a project area;
- Compacting of soil in the project area;
- Permanent fencing of the project site;
- Placement of a permanent structure;
- Use of explosives to create a working area;

- Feral burro removal on previously disturbed trapping sites;
- Normal cyclical existing maintenance projects such as road maintenance and repair, water line repair, etc.
- Special events with no more than 25 participants; and
- Scientific research other than those projects related to the desert tortoise.

The U.S. Fish and Wildlife biological opinion also specifies that the following conditions be met with regard to the loss of desert tortoise habitat in the Preserve:

- Total cumulative critical desert tortoise habitat loss would be limited to no more than 80 acres (0.005% of the total preserve acreage) within the Mojave Desert Preserve; and
- No more than 10 acres per year in critical desert tortoise habitat.
- The biological opinion concluded that the following types of impacts would occur as a result of these small actions:
 - The project site may be disturbed. That is, some vegetation may be crushed or removed or the site may be denuded by grading and/or compacting of soil.
 - The site may be removed from tortoise occupation by placement of a facility or by a fence excluding tortoise entry.
 - A tortoise could be killed or injured by crushing by a vehicle or other equipment operating at the site or accessing the site on a public road or a spur road.
 - A tortoise may be trapped or crushed in a burrow that has inadvertently collapsed.
 - A tortoise may be disturbed or injured by an explosive used in preparing the site.
 - Soil disturbance could lead to an invasion of exotic vegetation in areas that currently provide native forage and superior nutrition for tortoises.
 - Removal of feral burros has an overall beneficial effect on tortoises because it is very localized and is a limited type of action.
 - Maintenance actions such as dump site removal, fencing areas of hazardous materials, or erecting informational kiosks could promote the recovery of desert tortoises.

Additional details regarding incidental takings are provided in the U.S. Fish and Wildlife biological opinion (appendix B). The biological opinion also includes 15 terms and conditions that must meet the reasonable and prudent measures to avoid incidental take.

The impact of alternative A on bat populations would be adverse, negligible to minor, and long term, because of the potential for human presence and associated disturbance in open mines that are used by bats for roosting, hibernation, or as maternity colonies. Although human presence could occur during these sensitive portions of the life cycle, the low density and frequency of human use in the overall preserve, in comparison to the relatively large number of bat colony locations, would result in negligible to minor, long-term, adverse impacts to bats.

Based on adherence to the terms and conditions listed in the U.S. Fish and Wildlife biological opinion, as well as managing existing known mines with bat populations, alternative A would have negligible to minor adverse long-term effects on special status species. Tortoises would also continue to have access to adits and tunnels that are not closed permanently, which would have a beneficial

effect. This would equate with a “may affect, not likely to adversely affect” determination for the desert tortoise in Endangered Species Act Section 7 terms.

Cumulative Impacts. Details about the other plans and projects contributing to cumulative effects were presented in the section titled “Cumulative Impact Analysis Method.” Other plans and actions would continue to affect tortoises and bats, as management actions could potentially, although infrequently, disturb special status species. Such disturbances would have short-term, negligible adverse effects because activities would be limited in area affected, occur infrequently, and measures to protect the species would be used to avoid or minimize adverse effects. These effects would be characterized as “may affect, not likely to adversely affect” determinations for the desert tortoise in Endangered Species Act Section 7 terms. Some plans, including restoration plans, would contribute to long-term beneficial effects as habitat would be restored. Effects of the No Action alternative on the federally listed desert tortoise and state-listed bat species would be long-term and range from negligible adverse impacts to beneficial. The beneficial effect would be the result of closures accomplished under the abandoned mine land safety installations. No additional mine openings would be closed under the No Action alternative, thus the incremental contribution of alternative A to cumulative effects would be the negligible, short-term adverse effects associated with infrequent human disturbance in open mines that serve as habitat for special status species. Cumulatively, alternative A and the other plans and projects would have a few long-term, negligible and adverse effects, with most cumulative effects resulting in long-term benefits.

Conclusions. The No Action alternative would have no adverse effects on the desert tortoises because no additional abandoned mine safety installations would be installed. Tortoises would continue to have access to sites that are not closed permanently, resulting in a potential for tortoises to fall into and be trapped by vertical shafts. However, this is expected to occur infrequently and would, therefore, have a long-term, minor, adverse effect. Tortoises would also continue to have access to adits and tunnels that are not closed permanently, which would have a beneficial effect. The overall effect on the desert tortoise would be long-term, minor, and adverse as well as long-term and beneficial. This would equate with a “may affect/not likely to adversely affect” determination according to Endangered Species Act Section 7 terms.

The impact of alternative A on bat populations would be adverse, negligible to minor, and long term, because of the potential for human presence and associated disturbance in open mines that are used by bats for roosting, hibernation, or as maternity colonies.

Cumulative effects of the No Action alternative on the desert tortoise would be long-term, negligible, and adverse as well as long-term and beneficial. This would equate with a “may affect/not likely to adversely affect” determination according to Endangered Species Act Section 7 terms. Cumulative effects of the No Action alternative on bats would be long-term, negligible, and adverse as well as long-term and beneficial. The No Action alternative would add a negligible adverse increment to overall cumulative impacts.

Impacts of Alternative B: Abandoned Mine Safety Installations

Under alternative B, additional abandoned mine safety installations would be implemented in the Preserve. Details of the individual techniques are presented in the Alternatives section.

The analysis that follows is based on the overall assumption that the primary value of abandoned mines is the habitat provided inside the mines and that the terrestrial habitat in the immediate area outside the mine openings is typically highly disturbed. There is little or no existing vegetation that would be affected by any of the closure treatments at the openings, and soil at the mine opening sites has been disturbed, denuded of vegetation, and compacted by decades of use and visitation. Water is present in some shafts and adits, but this is not common (Weasma 2009).

As a result, use at the mine openings by special status species is limited primarily to bats. Desert tortoise use has also been observed at some mines, but typically, bats are the wildlife species that programmatically influence mine closure and mitigation efforts (Sherwin et al. 2009).

The types of effects on the desert tortoise were derived by matching the effects listed in the U.S. Fish and Wildlife biological opinion to the different types of closure techniques.

Fencing.

Desert Tortoise – Under alternative B, temporary and permanent fencing would be installed at selected mine openings in the Preserve to provide for improved visitor safety. During fence installation, desert tortoises could potentially be crushed or injured by vehicles bringing fencing material and construction equipment to a site, or such actions could crush tortoise burrows. It is expected that this would be an extremely rare event and within the specifications of the U.S. Fish and Wildlife biological opinion, however.

Temporary fencing is usually barbed wire and would still allow tortoises access to a shaft where they may become trapped. Permanent fencing (or in some cases narrow mesh temporary fencing) does not allow tortoises to pass through because it is constructed with a finer mesh that extends from the ground surface to a height of approximately 3 to 5 feet. This would prevent tortoises from falling into a shaft. In contrast, permanent fencing of other mine features such as adits or tunnels would prevent tortoises from accessing and utilizing these features. Surveys would be conducted by the National Park Service prior to fence installation to assure that tortoises are not utilizing these features.

In some cases, fence installation would also have beneficial effects on this species by preventing entrapment in vertical shafts, for example. The overall effects of all these actions on the desert tortoise would range from negligible to beneficial. This would equate with a “may affect/not likely to adversely affect” determination according to Endangered Species Act Section 7 terms.

Bats – Fencing does not restrict access of bats to mines. Fencing would, therefore, have no adverse effects on bats at mine openings in the process of being closed, or at existing mine openings where fencing is already installed.

Bat Gates, Screens, Nets, Grates, and Cupolas.

Desert Tortoise – Installation and maintenance of bat gates, screens, nets, grates, and cupolas would be managed under requirements of the U.S. Fish and Wildlife Service biological opinion, which would minimize all the above-referenced potentially long-term, minor, adverse effects on the desert tortoise, and assure use of structures with the maximum possibility of benefit to tortoises. Tortoise barriers would be included at those features where tortoises could be trapped, such as shafts and inclines/declines. The overall effects of installation and operation of bat gates, screens, grates, and cupolas would be long-term, minor adverse as well as long-term and beneficial. This would equate with a “may affect/not likely to adversely affect” determination according to Endangered Species Act Section 7 terms.

Bats – The impacts of mine closure methods on bats have been researched extensively (Sherwin et al. 2009; Vories and Throgmorton 2002) and the closure methods selected would rely on the findings of this research to minimize the effects of abandoned mine safety installations on bats and other wildlife. Each mine opening to be closed would be evaluated using the bat inventory data collected by the National Park Service and the most appropriate closure method would be selected to ensure this use is sustained with minimal adverse effects.

Potential adverse impacts on bats would be related to the selected closure technique, the number of bats using a particular opening, and whether the mine use is for roosting, hibernating, or maternity purposes. The type of structure selected would also determine the effects on bats. For example, grates and screens are fine mesh structures that do not allow passage of bats. The decision to install a

grate or screen is based on numerous factors, including use of the mine by bats. Before these types of structures are installed, the National Park Service would do a bat survey to determine if they use a particular mine. Grates and screens could be combined with other closure techniques (e.g., a grate atop a cupola) that allow bat access in the case of mines where bat use is substantial. This would minimize the possibility that the structures would adversely affect bats.

There could be short-term, adverse, impacts on bats (likely measured in terms of a few weeks at most) associated with construction of these types of closures. Impacts associated with construction of the closure would be offset by timing the actions to take place outside reproductive or sensitive portions of species' life cycles.

The exclusion of humans from mines following closure of openings would have a beneficial effect, as disturbance to roosting or hibernating bats would be eliminated. Beneficial effects for bats would also occur as a result of continuing access to the mine. Beneficial effects may include prevention of public use during maternity or hibernation times and potentially limiting the potential for introduction of White Nose Syndrome (a fungal disease) to any bats using a feature that has been closed with a bat-compatible closure. However, where data indicate potential presence of a particular species, the closure method selected could incorporate mitigation measures to accommodate the bat species. The extent of the beneficial effect on bats would depend on the level of dependency of each species on the habitat provided by mines.

As a result of selecting a closure method that would least affect bat access, the impact to bats from the installation of bat gates, screens, nets, grates, and cupolas would be long-term, negligible, and adverse as well as long-term and beneficial.

Polyurethane Foam Closures Covered With Backfill.

Desert Tortoise – The effects on the desert tortoise would be expected to be negligible because foam is typically used where use of an opening by the desert tortoise is scarce to non-existent. There would be no other adverse effects on the tortoise resulting from use of foam plugs. Foam plugs also have a beneficial effect on tortoises when vertical shafts are plugged because this prevents tortoises from falling and being trapped. The overall effect of these foam plugs on the desert tortoise would be negligible and adverse as well as beneficial. This would equate with a “may affect/not likely to adversely affect” determination according to Endangered Species Act Section 7 terms.

Bats – The adverse effect on bats from closing mine openings with foam plugs would be negligible to minor because foam is typically installed in areas where bats are absent have minimal use. However, in some cases, foam may be used where a limited number of bats are present because of overriding safety or engineering factors. Complete closure of some mine openings (i.e., without continued bat access) would occur only after bats are evacuated. The closure would be installed as soon as possible after bats were flushed from the mine to eliminate the potential for bats to return and to be trapped. The application of a foam plug closure would be determined by the availability of a nearby mine opening where displaced bats could relocate. Similarly, all openings to be sealed with foam would be surveyed for any wildlife and any species found would be removed prior to closing the opening. As a result, the adverse effects of foam plugging on bats and other species would range from negligible to minor and long-term.

Backfill Alone.

Desert Tortoise – Backfilling mine openings would be primarily used to treat shallow prospects or mine openings and to restore pre-construction contours around structures that have been stabilized. Such mine features and openings offer little suitable habitat for the desert tortoise. Relevant construction activities categories listed by the U.S. Fish and Wildlife biological opinion could include landing of a helicopter, soil compaction, and grading of an area. These activities would affect a limited area and would be short-term. As a result, backfilling would have short-term, negligible,

adverse effects on the desert tortoise. This would equate with a “may affect/not likely to adversely affect” determination according to Endangered Species Act Section 7 terms.

Bats – Backfilling mine openings would be primarily used to treat shallow prospects or mine openings. Such mine features and openings offer little suitable habitat for bats. These sites would also be restored to pre-construction contours around structures that have been stabilized. Post-construction backfilled areas are indistinguishable from the surrounding terrain and pre-construction conditions. As a result of all these factors, backfilling would have short-term, negligible, adverse effects on bats.

Combination Applications. Complex mine openings, including stopes, glory holes, and especially large openings, may require that combinations of closure techniques be employed to adequately restrict human access, close mine openings, and protect safety. The effects of combined techniques on desert tortoises and bats were evaluated by estimating the effects of each of the individual treatments and assigning an intensity of effect based on the method with the greatest impact. This ensures a conservative evaluation.

Desert Tortoise – The highest level intensity of any of the impacts of the previously described techniques was minor adverse. Tortoise barriers would be included at those features where tortoises could be trapped, such as shafts and inclines/declines. Combination closure techniques would also be implemented according to the requirements of the U.S. Fish and Wildlife biological opinion, which would avoid or minimize potentially adverse effects on the desert tortoise. This would equate with a “may affect/not likely to adversely affect” determination according to Endangered Species Act Section 7 terms.

Bats – The highest level intensity of any of the impacts of the previously described techniques was minor and adverse. This provides an estimate of the maximum potential effect of combined structures on bats.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled “Cumulative Impact Analysis Method.” The effects of the other plans and actions on special status species would primarily be associated with infrequent human presence and disturbance associated with management actions. These potential adverse effects would be negligible and short-term. Alternative B would incrementally add both negligible adverse and beneficial effects to these other actions. The negligible short-term adverse effects would be similar to the disturbance effects of the other plans and actions. However, the incremental beneficial contribution of alternative B from protecting roosting, hibernating and maternity sites from disturbance and keeping human activity out would outweigh the adverse impacts because abandoned mine safety installations with wildlife accommodations would eliminate human disturbance from mine habitats. These cumulative effects on the desert tortoise would be characterized as “may affect, not likely to adversely affect” determinations in Endangered Species Act Section 7 terms. Some plans, including restoration plans, would contribute to beneficial effects as habitat was restored. Cumulative effects of alternative B on the desert tortoise and state-listed bat species would range from long-term, negligible, and adverse, to beneficial, with the majority of cumulative effects long-term and beneficial.

Conclusions. The effects of additional abandoned mine safety installations on desert tortoises and bats would range from long-term, negligible, and adverse to long-term and beneficial. In Endangered Species Act Section 7 terms, the project may affect, but is not likely to adversely affect, the desert tortoise. A high priority would be given to determining the appropriate closure method in respect to special status species, along with the primary goal of protecting public health and safety. The mitigation measures incorporated in the abandoned mine safety installations for the desert tortoise and bats would ensure that these species would continue to have access to those mines.

While other plans and projects may affect the desert tortoise to various degrees, the abandoned mine safety installations would contribute negligible adverse cumulative effects on desert tortoises and bats. Regardless of the potential impacts to desert tortoises from other plans and projects, the cumulative impacts on the desert tortoise and state-listed bat species would not be greater than negligible and adverse, and there is a likely potential that the cumulative impact would be beneficial because in the long-term, mine habitats used by wildlife would no longer be subject to human intrusion.

WILDLIFE

AFFECTED ENVIRONMENT

In addition to species of special concern addressed in the special status species section, National Park Service surveys also report the presence of other types of wildlife at abandoned mine sites and inside mines. These include barn owls, Say's phoebes, speckled rattlesnakes, desert woodrats, deer mice, bobcats, and ring-tailed cats (Brown 2009). Less common but also present in abandoned mines are swallows, great horned and burrowing owls, spotted and striped skunks, bobcats, turkey vultures, coyotes, and badgers (Brown 2009). Bighorn sheep also occur in mines at Mojave (Weasma 2009).

Barn owls nest in abandoned mines. Nesting barn owls, among the more common species, demonstrate a preference for utilizing mine shafts in some parks (National Park Service no date).

Native populations of Nelson's bighorn sheep (*Ovis canadensis nelsoni*) are found in most of the mountainous terrain of the Preserve and are known to occur in abandoned mine sites, adits, and tunnels (Weasma 2009). Population estimates as of 1994 for this species were between 400 and 675 or more animals (National Park Service 2002). Mojave National Preserve provides substantial protected habitat for bighorn sheep and is also one of the few places in California where bighorn sheep hunting is allowed. Limited hunting of bighorn sheep began in 1987 (Bureau of Land Management 1988). A limited number of permits to hunt bighorn sheep are issued each year by the California Department of Fish & Game through a lottery system (National Park Service 2002).

ENVIRONMENTAL CONSEQUENCES

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on wildlife:

Adverse Effects

Negligible: Abandoned mine safety installations would have no perceptible or measurable impacts on wildlife species, including their habitats, the natural processes sustaining them, or the assemblage of species comprising their community.

Minor: Abandoned mine safety installations would have perceptible or measurable impacts to wildlife species, including their habitats, the natural processes sustaining them, or the assemblage of species comprising their community. However, the effects on wildlife would not have any substantial change on populations, communities, or ecosystems and would be within the range of natural variation.

Moderate: Abandoned mine safety installations would have perceptible or measurable impacts to wildlife species, including their habitats, the natural processes sustaining them, or the assemblage of species comprising their community. The effects could result in changes in survival rates of individuals, changes in quality or quantity of habitat, and/or relocation of individuals from or to

other habitats. Although there could be a temporary effect on populations, communities, or ecosystems, the changes would be within the range of natural variation.

Major: Abandoned mine safety installations would have substantial permanent impacts on wildlife species, including their habitats, the natural processes sustaining them, or the assemblage of species comprising their community. The effects could threaten the continued existence of a species' population within the Preserve. Changes in quality or quantity of habitat and/or relocation of individuals from or to other habitats could be irreversible. There could be a substantial effect on populations, communities, or ecosystems and the changes would be outside the range of natural variation.

Beneficial Effects: Abandoned mine safety installations would have positive effects on wildlife and wildlife habitat, including, but not limited to, metrics such as survival, reproduction rates, recruitment rates, or improvements in habitat or community conditions.

Short-term: The changes would have effects lasting less than one year or one breeding cycle.

Long-term: The changes would have effects lasting longer than one year or one breeding cycle

Impacts of Alternative A: No Action

Under the No Action alternative, no additional mine openings would be closed. Except for flight-based species, wildlife would continue to be at risk of falling into un-secured features and sustaining injury or death. This risk would result in short- and long-term negligible to minor adverse impacts, would affect individuals, but would not have impact overall wildlife populations.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled "Cumulative Impact Analysis Method." In particular, the Facilities Development Plan, Burro Removal Program, habitat restoration projects, and a wilderness management plan that is currently under development would contribute to beneficial effects by improving habitat and NPS management capabilities. There would be infrequent disturbance of wildlife associated with some of the other plans and actions, resulting in negligible short-term adverse impacts, but overall, the effects of other plans and actions would have a beneficial effect because the actions would either directly or indirectly enhance resources and habitat for wildlife. Other past, present, and reasonably foreseeable future actions, in addition to the impacts of the No Action alternative, would result in short-term, negligible, adverse and beneficial effects on wildlife.

Conclusions. Under the No Action alternative, no additional mine openings would be closed. However, due to the potential for individuals to become trapped or fall into unsecured features causing injury or mortality, the No Action alternative would result in short-term, and for individuals, long-term, negligible to minor, adverse impacts on wildlife

No additional mine openings would be closed under the No Action alternative. Other past, present, and reasonably foreseeable future actions, in addition to the impacts of the No Action alternative, would result in short-term, negligible, adverse and beneficial effects on wildlife. The No Action alternative would contribute a negligible increment to overall cumulative impacts.

Impacts of Alternative B: Abandoned Mine Safety Installations

Details of the individual abandoned mine lands safety techniques are presented in the Alternatives Section. The effects of these techniques on wildlife and their habitats are summarized in table 3.

There are few natural resources that support wildlife or wildlife habitat at the existing mine openings. There is little or no existing vegetation that would be affected by any of the closure treatments at the openings. Soil at the mine opening sites has been disturbed, denuded of vegetation,

and compacted by decades of use and visitation. Water is typically absent but is present in some shafts and adits.

As a result, wildlife use at the mine openings is limited primarily to small mammals and reptiles that could be potentially affected by the closures.

Closures can potentially restrict access to this habitat element. However, the closures have been designed to provide wildlife access where wildlife use is known to occur.

Fencing. Fencing constraints on wildlife access associated with fencing, particularly for bats and birds, are not as rigorous as closure methods that physically block or close an opening.

However, barn owls prefer to enter mine shaft entrances from a low approach angle (National Park Service no date) and barriers such as 8-foot-high chainlink fence presents obstacles to owl access. This can be addressed by installing horizontal perches at the highest fence level as well as lower perches near the shaft opening. This allows the owl to maintain a low approach angle to the shaft, land on the high perch, and move to the lower perch prior to entering the shaft.

Other fencing, permanent or temporary, could have variable lower heights (i.e., not extend to the ground, but be low enough to restrict human entry) or it could involve simple wire strands, which would allow wildlife to go under or through the fence. Typically, the fenced area around an opening encloses a small area in the immediate vicinity of the opening. Considering fence design mitigation measures that accommodate wildlife access and the small areas typically involved, the impacts of fencing mine openings on wildlife would be negligible to minor and adverse.

Bat Gates, Screens, Nets, Grates, and Cupolas. Bat gates, screens, nets, and grates can all be used to close mine openings where wildlife use is known or suspected to occur.

As a result of selecting a closure method that would least affect wildlife access, the impact to other wildlife from the installation of gates, nets, and grates would be short-term, negligible to minor and adverse.

There could be short-term impacts (likely measured in terms of a few weeks at most) associated with construction of the closure. Impacts associated with construction of the closure would be offset by timing the actions to take place outside reproductive or sensitive portions of species' life cycles. Beneficial effects for wildlife would also occur as a result of continuing access to the mine. Other wildlife, if present or suspect, would also be considered when deciding which closure method to use. However, where data indicate potential presence of a particular species, the closure method selected could incorporate mitigation measures to accommodate the species so adverse impacts would be negligible to minor and adverse.

Polyurethane Foam Closures Covered with Backfill. Use of foam would completely close the opening and typically be accompanied by earthen backfill to protect the foam from ultraviolet degradation and disguise its unnatural appearance, thus blocking access to a mine opening completely. The foam is entirely confined to the opening and installation is usually completed in one day.

Foam would be selected in most cases where wildlife use would be minimal and the procedure would not significantly impact the species present. If present, the affected species would be excluded before closure was installed. Foam may also be selected because the opening is very large and other closure types would be very expensive or be less safe to install. The decision to use foam would generally be based on the absence of wildlife, thus the impacts on wildlife, although long-term, would be negligible, because some regular species' use would be affected. The potential impact would be the loss of the mine opening as a future potential habitat. In the event of uncertainty of wildlife use of a mine opening, the use of any closure technique that would completely eliminate access would only be implemented following steps to ensure the absence of wildlife at the time of construction. Closure

actions would be taken following exclusion actions to evacuate wildlife. Closures would be implemented outside the breeding seasons of wildlife with potential to use the mine opening as another measure to ensure that no reproducing individuals were harmed. Implementing these approaches would result in long-term, negligible adverse effects on wildlife.

Backfill Alone. Backfilling mine openings would be primarily used to treat shallow prospects or mine openings and to restore pre-construction contours around structures that have been stabilized. Such mine features and openings offer little suitable habitat for other wildlife. Post-construction backfilled areas are indistinguishable from the surrounding terrain and pre-construction conditions. As a result, backfilling would have short-term, negligible, adverse effects on wildlife. There could also be some negligible and temporary disturbance associated with the presence of closure crews and equipment.

Combined Applications. Complex mine openings, including stopes, glory holes, and especially large openings, may require that a combination of closure techniques be employed to adequately restrict human access and protect safety. Combined treatments can be evaluated by assessing the effects of each individual treatment and assigning an intensity of effect based on the method that has the greatest impact. This ensures a conservative evaluation.

Cumulative Effects. The cumulative effects of alternative B would be similar to those described for alternative A, but the effects of both other plans and projects and alternative B would be incrementally greater both for the negligible to minor, short-term, adverse impacts and the long-term beneficial effects. The difference would be the result of the increased contribution of alternative B to the range of impacts (i.e., negligible adverse to beneficial). The intensity of effects would not be so substantially different that any threshold definitions would be exceeded because the mitigation measures to accommodate wildlife use of mine openings would offset disturbances associated with management activities. The overall cumulative effect of alternative B on wildlife would range from short-term, negligible to minor, and adverse, to predominantly long-term and beneficial.

Conclusions. The effects to wildlife of using the proposed closure techniques can be either beneficial or adverse depending on the opening characteristics, the wildlife species using the opening, and the method(s) selected to close or restrict visitor access to the opening. Considerations for protecting existing and potential future wildlife uses of an opening are given one of the highest priorities in deciding the most appropriate closure approach. These priorities and the evaluation process for deciding the best technique to employ at a site are described in the Alternatives section. The potential effects on wildlife would be long-term, negligible to minor, and adverse, with the greatest effect associated with permanently closing an opening used by owls for roosting, security cover, or reproductive purposes.

The overall cumulative effect of alternative B on wildlife would range from short-term, negligible to minor and adverse, to predominantly long-term and beneficial.

WILDERNESS

AFFECTED ENVIRONMENT

The California Desert Protection Act of 1994 designated wilderness in the establishment of Mojave National Preserve (figure 1) (National Park Service 2002). After boundary adjustments as mandated in the Act, the final Mojave Wilderness totals 806,000 acres. The Wilderness Act of 1964 further prescribes the purpose of the wilderness-designated lands. The purpose is to preserve lands in their natural condition “for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness.” The Wilderness Act defines

wilderness as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain, . . . an area of undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions. . . .” (National Park Service 2002).

The extensive wilderness and backcountry areas in Mojave provide opportunities for primitive recreational activities as well as for solitude. The absence of motorized/mechanized activities in wilderness, the grand vistas, and the limited visitation enable the hiking and backpacking visitor to enjoy a truly unique desert experience. As a result of the wilderness designation as delineated by Congress, some mines may fall within wilderness boundaries while others, although surrounded by wilderness, may not. Mine openings that occur within wilderness include, but are not limited to the following; the Oro y Platta Mine, the Teutonia Mine, the Big Horn Mine, and the Gold Standard Mine.

The Wilderness Act at 16 *United States Code* 1133(c) states that “except as necessary to meet minimum requirements for the administration of the area for the purposes of this Act (including measures required in emergencies involving the health and safety of persons within the area) there shall be no temporary road, no use of motor vehicles, motorized equipment, or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation...” The “minimum requirement” exception can never be used to allow a commercial enterprise or a permanent road in a wilderness area. A backcountry patrol station, fire lookout, a radio repeater, a helicopter rescue of an injured person, or a chainsaw may all be permitted in a wilderness only if such use is determined through a documented decision process, such as the National Environmental Policy Act, to be the “minimum requirement for the administration of the area” for wilderness purposes. This environmental assessment, which includes a draft minimum requirements analysis, provides for public review of this documented decision process.

Congress incorporated into the 1964 Wilderness Act several “special provisions,” or exceptions. Closing of abandoned mines would fall under the exemption to the special provision entitled “To meet the minimum requirements for the administration or area, including emergencies involving health/safety of persons (Section 4c of the Wilderness Act). Because of the general prohibition of mechanized or motorized equipment in wilderness, each abandoned mine feature located in a wilderness area needs to be evaluated by minimum tool analysis procedure following the Minimum Requirements Decision Guide. Appendix C includes analyses for each proposed and any future safety installations at abandoned mine lands in Mojave National Preserve.

ENVIRONMENTAL CONSEQUENCES

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on wilderness:

Adverse Effects

Negligible: Impacts of the action would have no discernible effect on wilderness character. Wilderness would remain untrammelled and free from modern human control or manipulation, natural conditions would prevail, wilderness would remain undeveloped and retain its primeval character and influence, and wilderness would provide outstanding opportunities for solitude or primitive conditions. The forces of nature would primarily affect the wilderness zone.

Minor: Abandoned mine safety installations would have perceptible or measurable impacts resulting in small changes to existing natural conditions. There would be a small effect on the untrammelled and undeveloped qualities of wilderness character, including a small presence of modern human activity and manipulation within limited areas of the wilderness zone. The wilderness area would generally appear to have been affected primarily by the forces of nature. Opportunities for solitude

and primitive conditions would change slightly, but most of the zone would continue to provide opportunities for solitude or primitive conditions.

Moderate: Abandoned mine safety installations would have perceptible or measurable impacts resulting in intermediate changes to existing natural conditions. There would be an intermediate effect on the untrammelled and undeveloped qualities of wilderness character, including an intermediate presence of modern human activity and manipulation within limited areas of the wilderness zone. It would be apparent that natural conditions within the zone are affected by the action. Opportunities for solitude and primitive conditions would change substantially, but over a relatively small area and most of the zone would continue to provide opportunities for solitude or primitive conditions for the majority of the time.

Major: Abandoned mine safety installations would have substantial permanent impacts resulting in large changes to existing natural conditions. There would be a large effect on the untrammelled and undeveloped qualities of wilderness character, including a large presence of modern human activity and manipulation throughout a large portion of the wilderness zone. It would be apparent that natural conditions are substantially affected by the action. Opportunities for solitude and primitive conditions would change by a large amount, affecting the ability of a large portion of the zone to have a wilderness character for much of the time.

Beneficial Effect: Actions taken would enhance opportunities for solitude and primitive recreational activities and experiences. Evidence of human activities or remnants of past mining developments may be removed, returning the wilderness zone to a more natural condition.

Short-term - Recovers in less than one year.

Long-term - Takes more than one year to recover.

Impacts of Alternative A: No Action

Under the No Action alternative, no additional abandoned mine safety installations would occur. The Preserve would continue to manage wilderness according to *Management Policies 2006* (National Park Service 2006), the requirements of the California Desert Protection Act of 1994, and the Wilderness Act of 1964.

Visitors would continue to be allowed access to abandoned mines in and adjacent to wilderness areas.

Under the No Action alternative, wilderness would continue to be protected according to current laws, regulations, and management policies described previously. Alternative A would have long-term beneficial effects on wilderness in the Preserve because natural conditions would predominate, minimal human-made noise would occur, the primeval character and influence of wilderness would be only slightly affected, and outstanding opportunities for solitude or a primitive and unconfined type of recreation would prevail.

However, under Alternative A, No Action, the risk to human health and safety would continue to be minor but associated with serious injury or death. If one or more people would be injured or die at an abandoned mine lands feature in or adjacent to wilderness, wilderness character would be adversely impacted by the use of mechanized or motorized equipment necessary in emergency search and rescue operations. The potential for such an incident is low but unceasing; it is a question of when, not if, such an incident would occur in Mojave National Preserve. The impact would be short-term, minor, and adverse.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled "Cumulative Impact Analysis Method." The primary source of cumulative effects to wilderness would be improved human safety for visitors and park staff alike.

Overall, these cumulative impacts, when combined with the effects of alternative A on wilderness, would result in short-term, negligible, adverse impacts on wilderness. Alternative A would contribute a negligible adverse increment to overall cumulative impacts.

Conclusions. Under the No Action alternative, no additional mine openings would be closed in the Preserve. Visitors would continue to be allowed access to abandoned mines in and adjacent to wilderness areas. Wilderness would continue to be protected according to current laws, regulations, and management policies. Alternative A would have long-term beneficial effects on wilderness in the Preserve because natural conditions would predominate; minimal human-made noise would occur; the primeval character and the influence of wilderness would be only slightly affected; and outstanding opportunities for solitude or a primitive and unconfined type of recreation would prevail. Alternative A would contribute a negligible adverse increment to overall cumulative impacts.

Impacts of Alternative B: Abandoned Mine Safety Installations

Under Alternative B, additional mine openings would be closed in the Preserve and some of these could be located entirely within wilderness areas. Existing roads would provide the primary access to mine opening sites in designated wilderness areas. Some safety installations would be associated with roads surrounded by or adjacent to wilderness. In some cases, abandoned mine sites would be within the wilderness boundary but may be located close to these roads. In these instances, motorized vehicle access to mines in the wilderness areas would, therefore, be possible without actually entering wilderness.

Limited use of helicopters may occur for sites that are difficult to access and not near backcountry roads. For safety installations mine opening sites inside wilderness, vehicle and helicopter use would be minimized to the maximum extent feasible and would be guided by the analytical results of completing the Minimum Requirements Decision Guide procedure employed by the National Park Service in these situations (Appendix C). This procedure is intended to identify the minimum mechanical tools required to accomplish activities within the wilderness. Assessment of several alternative approaches may be required. Appendix C provides a sample that illustrates the scope and nature of the minimum tool analysis. In practice, the park would complete the analysis before conducting mechanical activities in the wilderness for specific locations. The analysis would be posted to the park's Planning Environment, and Public Comment project management database website for public review and comment.

When necessary and appropriate, vehicle and helicopter activities would still follow minimum impact practices while in the wilderness, such as minimizing the number of vehicles allowed in the wilderness, staying on existing trails or remnant road tracks, minimizing vehicle trips into and out of the site; restricting activities to defined areas around the rescue site; minimizing vegetation and soil disturbances; and using helicopter access as appropriate. Site restoration activities would be completed after the activities were completed to remove evidence of human activities as much as practical.

Because of the relatively small size of the areas potentially affected by vehicle and helicopter use; the short time typically spent at the mine opening to install safety features (typically 1 to 5 days); and use of the mitigation measure described above, the adverse impacts on wilderness would be short-term and minor. Should the need arise for an emergency rescue associated with construction of mine safety installations within wilderness areas, there would be short-term, minor adverse effects due to emergency vehicle and rescue crews needed to execute a rescue.

The impacts of various closure techniques would not vary substantially between the methods used. The potential adverse impacts on wilderness areas would be minimized by the use of the Minimum Requirements Decision Guide procedure employed by the National Park Service in these situations (appendix C). The National Park Service will, therefore, continue to manage wilderness areas with the maximum statutory protection allowed – to preserve their wilderness character and to gather

information on their use and enjoyment as wilderness, which includes the proposed exceptions to general prohibition of mechanized or motorized equipment in wilderness. The overall short-term adverse effect of alternative B on wilderness would be minor and adverse.

Cumulative Impacts. Details about the other plans and projects contributing to cumulative effects were presented in the section titled “Cumulative Impact Analysis Method.” The occasional intrusive effects associated with other plans and actions, including other safety installations on abandoned mine lands, would potentially have short-term, negligible, adverse effects, but in the long-term, wilderness values and resources would benefit from these plans and actions. The effects of alternative B on wilderness, namely short-term, minor and adverse, would have a relatively small incremental effect in combination with the long-term beneficial effects of other plans and actions, resulting in overall beneficial cumulative effects. As a result, the overall long-term cumulative effects of alternative B and other plans and actions would be beneficial.

Conclusions. Under alternative B, mine openings would be closed in the Preserve, and some of these could be located entirely within wilderness areas. Short-term, adverse effects on wilderness would be minor as a result of disturbance associated with vehicles (trucks and/or helicopters) and equipment used during construction of the closures. The long-term, adverse effect of alternative B on wilderness would be minor once the closures were installed and conditions in the vicinity of the closure returned to their wilderness character. The overall long-term cumulative effects of alternative B and other plans and actions would be beneficial.

CONCLUSIONS

The impact analysis identifies less than major impacts for all Preserve cultural or natural resources and values analyzed in this environmental assessment for both Alternative A: No Action, and Alternative B: Abandoned Mine Safety Installations. For the reasons described in the impact analysis, neither alternative would result in impairment of Preserve resources.

Because the previously described impacts (1) are consistent with Mojave’s purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the Preserve, and (5) do not unreasonably interfere with preserve programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on natural or cultural resources and values under either Alternative A: No Action or Alternative B: Abandoned Mine Lands Safety Installations

CONSULTATION AND COORDINATION

LIST OF PERSONS, ORGANIZATIONS AND AGENCIES CONTACTED

Scoping includes early input from any interested agency or any agency with jurisdiction by law or expertise. The NPS consulted with federal and state agencies responsible to protect and manage our natural and cultural resources. Initial responses are summarized below. NPS consultation letters and agency responses are included as Appendix B of this document.

A programmatic between the National Park Service and the California SHPO regarding mitigation of physical safety hazards at historic abandoned mineral lands within the national parks in California was developed in anticipation of funding under the American Recovery and Reinvestment Act. It was signed by both parties on August 18, 2009, and is included as appendix B to the environmental assessment.

The actions proposed in the environmental assessment would incorporate the protections and implement the conservation measures identified in the biological opinion prepared to address multiple “small” actions (defined as individual actions that disturb less than 2 acres of desert tortoise habitat, which was received from the U.S. Fish and Wildlife Service in 1998. The U.S. Fish and Wildlife Service would also be sent a copy of the environmental assessment for review.

The following is a list of individuals and organizations contacted as part of the consultation and coordination for this environmental assessment.

Federal Agencies

Department of Defense

- U.S. Marine Corps
- U.S. Army
- U.S. Air Force

Department of the Interior

- Bureau of Land Management, California Desert District
- National Park Service, Death Valley National Park
- National Park Service, Joshua Tree National Park
- National Park Service, Lake Mead National Recreational Area
- National Park Service, Pacific West Region

Elected Officials

- U.S. Senator Dianne Feinstein, California
- U. S. Senator Barbara Boxer, California
- U. S. Senator Harry Reid, Nevada
- The Honorable Jerry Lewis, 41st Congressional District

Native American Tribes

- San Manuel Band of Mission Indians
- The Morongo Band of Mission Indians
- Fort Mohave Indian Tribe
- Chemehuevi Indian Tribe

State Agencies

- California Travel and Tourism Commission
- California State University, Desert Studies Center
- Barstow Community College, Barstow, California
- Mojave Desert Air Quality District, Victorville, California

Local Agencies

City of Barstow, CA, Parks and Recreation Department
City of Barstow, CA, Chamber of Commerce
City of Barstow, CA, Contract Administrator
Orange County, CA, Government Relations
San Bernardino County, CA, Association of Governments
City of Los Angeles, CA
City of Ridgecrest, CA
City of Riverside, CA

Organizations & Media

American Discovery Trail Society
Barstow Rodeo Stampede
Daily News
Desert Dispatch, Barstow, CA
The Desert Sun, Palm Springs, CA
Dos Costas Communication
Inland Newspapers
Inland Newspapers
Institute for Continuing Education and Research
Journal Broadcast Group
KMIR 6 TV, Palm Desert, CA
Kunamundo – KUNA TV, Palm Springs
L. A. Times
Las Vegas Sun
National Parks and Conservation Association
Needles Desert Star
Press-Enterprise, Riverside, CA
Review Journal
San Bernardino County Sun
San Gabriel Valley News
Soppeland Commercial Real Estate
The Sun Runner
Old Spanish Trail Association
The Student Conservation Association
Victorville Daily Press

SUMMARY OF PUBLIC SCOPING EFFORTS

Staff of the Preserve and resource professionals of the National Park Service Denver Service Center team initiated internal scoping in a project review meeting in September 2009. On October 6-7, 2009, preserve and DSC team staff conducted an onsite survey and discussed issues and options.

A press release (appendix B) initiating public scoping and describing the proposed action was issued by email on October 28, 2009 and sent to local, regional, and national newspapers, radio and television stations along with approximately 120 agencies, individuals, businesses, and interest groups on the Preserves' mailing list. Comments were solicited until the scoping period ended November 28, 2009.

Three written responses from private individuals were received during the scoping period. One individual expressed concern about impacts to wildlife, specifically bats and the desert tortoise. Two individuals expressed concern about the preservation of mine features. These concerns were incorporated into the issues and impact topics discussions.

LIST OF PREPARERS

The following individuals were responsible for preparation of this environmental assessment:

National Park Service

Name	Title	Location
Bob Bryson	Abandoned Mine Lands Regional Coordinator	Pacific West Regional Office
Ted Weasma	NPS Geologist	Mojave National Preserve
Danette Woo	Environmental Compliance Specialist	Mojave National Preserve
Linda Slater	Chief of Interpretation	Mojave National Preserve
David Nichols	Archaeologist	Mojave National Preserve
Neal Darby	Wildlife Biologist	Mojave National Preserve
Margo Muhl Davis	Environmental Compliance/Cultural Resource Specialist	Denver Service Center
Ginger Molitor	Project Manager, Environmental Compliance Specialist	Denver Service Center

Parsons

Name	Title	Education	Experience
Steve Bach	Project scientist/task leader	B.S. Biology, M.S. Botany, Ph.D., Botany. Responsible for preparing the first draft of the environmental assessment	36 years
Don Kellett	Project scientist	B.S., Wildlife Biology. Task Manager and author of selected sections.	20 years
Sherrie Keenan	Senior technical writer/editor	B.A. Journalism. Responsible for document editing and quality control.	35 years
Alexa Miles	Senior scientist	B.A., Environmental Studies and M.S., Landscape Architecture; LEED AP. Responsible for document preparation and graphics.	5 years
Bruce Snyder	Project manager	B.S., Biology, and M.S., Wildlife Biology. Responsible for overall project management and technical support in regulatory compliance and site restoration.	40 years

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