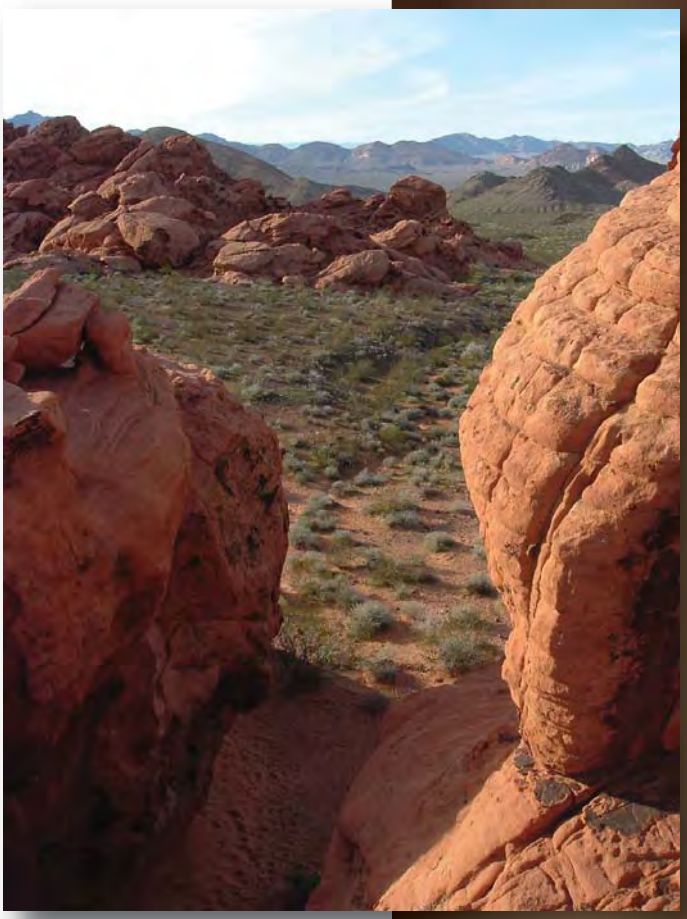

Chapter Five:
ENVIRONMENTAL CONSEQUENCES

METHODOLOGY FOR ASSESSING IMPACTS

Potential impacts (direct, indirect, and cumulative effects) are described in terms of type, context (are the effects site-specific, local, or even regional?), duration (are the effects short-term (less than one year), long-term (greater than one year), or permanent?) and intensity (is the degree or severity of effects negligible, minor, moderate, or major). Because definitions of intensity (negligible, minor, moderate, or major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this environmental assessment.

This environmental assessment generally analyzes several actions, such as installation of signs and the closure of some approved roads. Other actions noted in the alternatives, such as the establishment of new access points and the designation of routes, are generally identified, but specific design details and site-specific locations have not been identified. If and when proposed site-specific developments or other actions are ready for implementation following the approval of the wilderness management plan, appropriate detailed environmental and cultural compliance documentation would be prepared. This compliance would be in accordance with the National Environmental Policy Act of 1969 and the National Historic Preservation Act of 1966, both as amended, and would meet requirements to identify and analyze each possible impact for the resources affected.

Cumulative Impacts: The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 *et seq*.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts 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 impacts are considered for all alternatives, including the no-action alternative.

Cumulative impacts were determined by combining the impacts of the alternatives with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects for the wilderness areas at Lake Mead National Recreation Area and adjacent BLM lands, and, if applicable, the surrounding region. (For more details on these projects, see the Cumulative Impact Analysis section.)

Impacts to Cultural Resources and §06 of the National Historic Preservation Act: In this environmental assessment impacts to cultural resources are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality (CEQ) that implement the National Environmental Policy Act (NEPA). These impact analyses are intended, however, to comply with the requirements of both NEPA and §106 of the National Historic Preservation Act (NHPA). In accordance with the Advisory Council on Historic Preservation's regulations implementing §106 of the NHPA (36 CFR Part 800, *Protection of Historic Properties*), impacts to cultural resources were also identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected, national register eligible or national registerlisted cultural resources; and (4) considering ways to avoid, minimize or mitigate adverse effects.

Under the Advisory Council's regulations, a determination of either *adverse effect* or *no adverse effect* must also be made for affected national register-listed or national register-eligible cultural resources. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the national register, e.g. diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance or be cumulative (36 CFR 800.5, *Assessment of Adverse Effects*). A determination of *no adverse effect* means there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the national register.

CEQ regulations and the National Park Service's *Conservation Planning, Environmental Impact Analysis and Decision Making* (NPS Director's Order #12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by §106 is similarly reduced. Cultural resources are non-renewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under §106 may be mitigated, the effect remains adverse.

A §106 summary is included in the impact analysis sections. The §106 summary is an assessment of the effect of the undertaking (implementation of the alternative) on national register-eligible or national register-listed cultural resources only, based upon the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations.

NATURAL RESOURCES – SOILS

Definitions of Intensity Levels

Negligible: The action would result in a change in soil, but the change would be at the lowest level of detection, or not measurable.

Minor Adverse impact – The action would result in a detectable change, but the change would be slight and local. There could be changes in a soil's profile in a relatively small area, but the change would not increase the potential for erosion.

Moderate Adverse impact – The action would result in a clearly detectable change in a soil. There could be a loss or alteration of the topsoil in a small area, or the potential for erosion to remove small quantities of additional soil would increase.

Major Adverse impact – The action would result in the permanent loss or alteration of soils in a relatively large area, or there would be a strong likelihood for erosion to remove large quantities of additional soil as a result of the action.

NATURAL RESOURCES – VEGETATION AND WILDLIFE

Definitions of Intensity Levels

Negligible: The action might result in a change in vegetation or wildlife, but the change would not be measureable or would be at the lowest level of detection.

Minor Adverse impact – The action might result in a detectable change, but the change would be slight and have a local effect on a population. This could include changes in the abundance or distribution of individuals in a local area, but not changes that would affect

the viability of local populations. Changes to local ecological processes would be minimal.

Moderate Adverse impact – The action would result in a clearly detectable change in a population and could have an appreciable effect. This could include changes in the abundance or distribution of local populations, but not changes that would affect the viability of regional populations. Changes to local ecological processes would be of limited extent.

Major Adverse impact – The action would be severely adverse or exceptionally beneficial to a population. The effects would be substantial and highly noticeable, and they could result in widespread change and be permanent. This could include changes in the abundance or distribution of a local or regional population to the extent that the population would not be likely to recover (adverse) or return to a sustainable level (beneficial). Important ecological processes would be altered, and "landscape-level" (regional) changes would be expected.

NATURAL RESOURCES – THREATENED AND ENDANGERED SPECIES

Definitions of Intensity Levels

Negligible: Impacts on state or federally listed plant and wildlife species would not be observable or measurable and would be well within the range of natural variability.

Minor Adverse impact – Impacts on species or their habitat would be detectable, but still within the range of natural variability both spatially and temporally. No interference with feeding, reproductive, or other activities affecting population viability would result from the impacts. Sufficient functional habitat would remain to support viable populations.

Moderate Adverse impact – Impacts on activities necessary for survival, and on species habitats, can be expected on an occasional basis, but are not anticipated to threaten potential or continued existence of the species in the park. Changes to population characteristics could be outside the natural range of variability spatially or temporally but would not be anticipated to result in loss of population viability.

Major Adverse impact – Impacts on state or federally-listed plant and wildlife species or their habitats would be detectable, outside of the natural range of variability both spatially and temporally, and would be anticipated to result in loss of viability at the population level.

NATURAL RESOURCES – NATURAL SOUNDSCAPES

Definitions of Intensity Levels

Negligible – Noise is either not detectable, or detectable only for brief periods of time. Most detectable noises do not induce physiological or behavioral responses in humans or wildlife.

Minor Adverse impact – Noise is detectable for a small fraction of the time. Noise induces physiological or behavioral responses in humans or wildlife, but these responses are brief and within the range of natural variation in these parameters.

Moderate Adverse impact – Noise is detectable for a substantial fraction of the time at low levels, or is present at high levels for short durations. Noise induces physiological or behavioral responses in humans or wildlife that may be of extended duration, but can be accommodated without measurable risk of diminished biological function.

Major Adverse impact – Noise appreciably masks other sounds for a substantial fraction of the time, or regularly exceeds high levels. Noise induces physiological or behavioral responses in humans or wildlife that are of extended duration, but may present measurable risk of diminished biological function.

WILDERNESS CHARACTER

Definitions of Intensity Levels

Negligible: Effects on opportunities for solitude or primitive and unconfined recreation would be confined to a small, localized area; any changes would not be perceived (or would be barely perceived) by most visitors. Also, any effects on the degree of development and the prevalence of natural conditions would be confined to a relatively small, localized area and would be barely perceived by most visitors.

Minor Adverse impact – Effects on opportunities for solitude or primitive and unconfined recreation would be slightly beneficial or adverse and confined to a limited area of a wilderness area; changes would be perceived by some visitors. Also, effects on the degree of development and the prevalence of natural conditions would be apparent and confined to a limited area of a wilderness area and would be perceived by some visitors; natural conditions would continue to predominate.

Moderate Adverse impact – Effects on opportunities for solitude or primitive and unconfined recreation would be apparent in one or more wilderness areas; changes would be apparent to many visitors. Also, effects on the degree of development and the prevalence of natural conditions would be readily apparent in one or more wilderness areas; natural conditions would predominate overall; some changes in wilderness character would be apparent to many visitors.

Major Adverse impact – Effects on opportunities for solitude or primitive and unconfined recreation would be obvious in one or more wilderness areas; changes would be obvious to most visitors. Also, effects on the degree of development and the prevalence of natural conditions would be substantial in one or more wilderness areas; some changes in wilderness character would be obvious to most visitors.

CULTURAL RESOURCES – ARCHEOLOGICAL RESOURCES

Definitions of Intensity Levels

Negligible: Impact is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for §106 would be *no adverse effect*.

Minor Adverse impact — disturbance of a site(s) results in little, if any, loss of integrity. The determination of effect for §106 would be *no adverse effect*.

Moderate Adverse impact — disturbance of a site(s) results in loss of integrity. The determination of effect for §106 would be *adverse effect*. A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.

Major Adverse impact — disturbance of a site(s) results in loss of integrity. The determination of effect for §106 would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).

CULTURAL RESOURCES – ETHNOGRAPHIC RESOURCES

Definitions of Intensity Levels

Negligible: Impact(s) would be barely perceptible and would neither alter resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group's body of

practices and beliefs. The determination of effect on Traditional Cultural Properties (ethnographic resources eligible to be listed in the national register) for §106 would be *no adverse effect*.

Minor Adverse impact — impact(s) would be slight but noticeable but would neither appreciably alter resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs. The determination of effect on Traditional Cultural Properties (ethnographic resources eligible to be listed in the National Register) for §106 would be *no adverse effect*.

Moderate Adverse impact — impact(s) would be apparent and would alter resource conditions. Something would interfere with traditional access, site preservation, or the relationship between the resource and the affiliated group's practices and beliefs, even though the group's practices and beliefs would survive. The determination of effect on Traditional Cultural Properties (ethnographic resources eligible to be listed in the national register) for §106 would be *adverse effect*.

Major Adverse impact — impact(s) would alter resource conditions. Something would block or greatly affect traditional access, site preservation, or the relationship between the resource and the affiliated group's body of practices and beliefs, to the extent that the survival of a group's practices and/or beliefs would be jeopardized. The determination of effect on Traditional Cultural Properties (ethnographic resources eligible to be listed in the National Register) for §106 would be *adverse effect*.

VISITOR USE AND EXPERIENCE

Definitions of Intensity Levels

Negligible: The changes in visitor use and experience would be below or at the lowest level of detection. The visitor would not likely be aware of the effects.
Minor: Changes in visitor use and/or experience would be slight but detectable, but would not appreciable diminish or enhance critical characteristics of the visitor experience. There would be no noticeable change in visitor use and experience or in any defined indicators of visitor satisfaction or behavior – either positively or negatively.

Moderate: A few critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be altered. The visitor would be aware of the effects and would likely be able to express an opinion about the changes. Visitor satisfaction would begin to either decline or increase as a direct result of the effect

Major: Multiple critical characteristics of the desired visitor experience would change and/or the number of participants engaged in an activity would be greatly reduced or increased. The visitor would be aware of the effects associated with implementation of the alternative and would likely express a strong opinion about the change. Visitor satisfaction would markedly decline or increase.

IMPAIRMENT OF RESOURCES ON NPS LANDS

In addition to determining the environmental consequences of implementing the alternatives, NPS *Management Policies 2006* §1.4 requires analysis of potential effects to determine whether the alternatives would impair Lake Mead National Recreation Area's resources and values. (Note: This NPS requirement does not apply to the Bureau of Land Management and its lands in the wilderness areas.)

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on resources and values. However, the laws give the National Park Service the management discretion to allow impacts on resources and values when necessary and appropriate to fulfill the purposes of the area, as long as the impact does not constitute an unacceptable impact or impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within a unit, that discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of resources and values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS *Management Policies 2006,* §1.4.5). An impact on any resource or value may constitute impairment. An impact would be more likely to constitute impairment if it results in a moderate or major adverse affect on a resource or value whose conservation is

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the area;
- key to the natural or cultural integrity of the area or to opportunities for enjoyment of the area; or
- identified as a goal in the area's general management plan or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the area, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park.

A determination on impairment is made in the conclusion section for each natural and cultural impact topic related to the national recreation area's resources and values. An evaluation of impairment is not required for topics related to visitor use and experience (unless the impact is resource based). If it is determined that an action or actions would have a moderate to major adverse effect, an explanation is presented of why this would not constitute impairment. Impacts of only negligible or minor intensity would—by definition—not result in impairment. The impairment analysis for each of the impact topics has determined that none of the alternatives presented in this plan would result in impairment of national recreation area resources and values.

UNACCEPTABLE IMPACTS TO RESOURCES ON NPS LANDS

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 by avoiding unacceptable impacts. These are impacts that fall short of impairment, but are still not acceptable within a particular national park unit's environment. NPS managers must not allow uses that would cause unacceptable impacts; they must evaluate existing or proposed uses and determine whether the associated impacts on national park unit resources and values are acceptable. Virtually every form of human activity that takes place within a national park unit has some degree of effect on resources or values, but that does not mean the impact is unacceptable or that a particular use must be disallowed. Therefore, for the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would

- be inconsistent with a national park unit's purposes or values, or
- impede the attainment of a national park unit's desired future conditions for natural and cultural resources as identified through the national park unit'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 national park unit resources or values, or
- unreasonably interfere with any of the following:
    - NPS programs or activities
    - an appropriate use;
    - the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the national park unit
    - NPS concessioner or contractor operations or services

In accordance with NPS *Management Policies 2006*, NPS managers must not allow uses that would cause unacceptable impacts to national park unit resources. To determine if unacceptable impact could occur to the resources and values of Lake Mead National Recreation Area, the impacts of the alternatives in this wilderness management plan were evaluated based on the previously identified criteria. A determination on unacceptable impacts is made in the conclusion statement for all topics carried forward in this chapter.

CUMULATIVE IMPACT ANALYSIS

Cumulative impacts are described in the Council on Environmental Quality's regulation 1508.7 as follows:

Cumulative impacts are the impacts that result from incremental impacts of the action when added to other past, present, and reasonably foreseeable action, regardless of what agency (federal or nonfederal) or person undertakes such other action. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over time.

To determine potential cumulative impacts, past, present, and potential future actions and projects within and surrounding the Nevada side of Lake Mead National Recreation Area were identified. The area considered covers about 25 miles in radius in Clark County, and includes the communities of Boulder City, Henderson, Overton, and Las Vegas, Nevada. The actions and projects addressed are listed below.

These activities were evaluated in conjunction with the impacts of each alternative to determine if they would result in any cumulative impacts on a particular natural, cultural, or socioeconomic resource, or on visitor use. Because most of these actions are in the early planning stages, the qualitative evaluation of cumulative impacts was based on a general description of the projects.

ACTIONS AND PROJECTS INSIDE THE WILDERNESS AREAS

Independent of this wilderness management plan, prescribed burning, thinning, and herbicide spraying would continue in the effort to control the spread of nonnative species. The national recreation area's exotic plant management plan is currently in development. This plan will address nonnative plant control, including actions in the wilderness areas. The national recreation area's *Fire Management Plan* (2004b) will continue to provide direction consistent with the wilderness management plan to protect native species and vegetation.

An air tour management plan for Lake Mead National Recreation Area is in the process of being developed. This plan will provide direction on air tours that fly over the national recreation area, and thus will affect the natural soundscapes in the wilderness areas.

ACTIONS AND PROJECTS OUTSIDE THE WILDERNESS AREAS

Planning efforts are underway for the development of two new airports near the national recreation area, within Clark County. These airports would be located in Mesquite, which is about 20 miles from the national recreation area, and in Ivanpah Valley, which is about 30 miles from the national recreation area. The Mesquite airport project is a general aviation airport. The Ivanpah Valley airport, called the Southern Nevada Supplemental Airport, will be a major commercial airport for the region. A number of the commercial flights from the existing McCarran International Airport will be switching to the new airport. It is expected that some flightpaths from these airports would pass over the wilderness areas.

OTHER EXTERNAL EVENTS: CLIMATE CHANGE

Climate change could affect both use of the wilderness areas and resources. Climate change is expected to affect vegetative and wildlife composition and may increase fire danger. Some nonnative species may expand into the wilderness areas, while native species

may decline or disappear. Warmer temperatures could also affect visitor use seasons. Some of these impacts could combine with the effects of the actions proposed in the alternatives, thus creating cumulative impacts.

The impacts of climate change on the wilderness areas are not expected to differ among the alternatives, and the lack of qualitative information about climate change effects adds to the difficulty of predicting how these impacts will be realized in the wilderness areas. For example, wildlife habitat in the wilderness areas may be more or less impacted by wildland fire frequency and intensity. Therefore, the potential effects of this dynamic climate on wilderness resources were included in "Chapter 4, Affected Environment," but will not be analyzed in detail with respect to each alternative because of the uncertainty and variability of outcomes.

IMPACTS ON NATURAL RESOURCES

ALTERNATIVE A – NO ACTION

Soils

Analysis. In alternative A, no soils would be altered due to development because no development of new facilities is included in alternative A.

Soils in the wilderness areas would likely continue to be compacted and eroded by hikers and illegal off-highway vehicle users, particularly at road pull-offs near the wilderness areas and along existing user-created, unofficial routes. Areas that would likely continue experiencing noticeable soil impacts from off-highway vehicle use include Black Canyon and Eldorado. In some areas, new user-created, unofficial routes may be created from visitation, particularly in areas with traditionally higher visitor numbers such as those with certain points of interest (e.g., Boy Scout Canyon, Spirit Mountain). In this alternative, there would continue to be no limits on the size of groups entering the wilderness areas; this would likely continue to contribute to soil compaction and erosion in some areas. In sloped areas, unofficial routes would result in increased soil erosion from stormwater runoff. These long-term, adverse impacts would likely be minor to moderate and limited in extent.

Fragile cryptogamic soil crust exists in the Pinto Valley Wilderness. Adverse impacts to these soil crusts could be minor to moderate, long-term, and localized due to the continued use and creation of unofficial routes under alternative A.

Cumulative Effects. Soils in parts of the wilderness areas have been altered by past occupation by burros, cattle grazing, and the development of user-created travel routes. These past uses of the wilderness areas led to the establishment of unofficial trails, increased soil compaction and soil erodibility, and decreased cryptogamic soil crust density. The loss and alteration of soils due to past land uses and future external actions such as exotic plant management, vegetation restoration, and fire management would likely result in a long-term, negligible to minor, adverse impact on area soils. When the potential minor effects from visitor use in the wilderness areas in alternative A are added to the past and future impacts external to the wilderness areas, there would be a long-term, minor to moderate, adverse cumulative impact on area soils. However, the actions in alternative A would contribute a very small increment to the overall cumulative impact.

Conclusion. Some soils would be compacted, eroded, and lost, and soil properties would be altered due to visitor use in localized areas such as along trails, in washes, and at particular points of interest such as at Boy Scout Canyon and Spirit Mountain. These adverse impacts on soils and cryptogamic soil crust would likely be minor to moderate, highly localized, and long term.

When the impacts inside the wilderness areas are added to past and foreseeable future impacts from land uses and increased visitation, there would be the potential for a long-term, minor to moderate, adverse cumulative impact on area soils—although the actions in alternative A would add a very small increment to this overall impact. No impairment to the national recreation area's lands, resources, and values would result from soil impacts in this alternative and none of the impacts would be considered unacceptable.

Vegetation

Analysis. No impacts on native vegetation would occur due to development or improvement of facilities, because alternative A does not include such actions.

Under alternative A, visitor access to the wilderness areas would continue to be dispersed with no officially designated trails or routes. Illegal off-highway vehicle use would also likely continue to be a problem with no additional signs posted on the boundaries of some wilderness areas, such as Black Canyon and Eldorado. These uses would potentially result in trampling, crushing, and other damage to native vegetation in localized areas. Visitor use levels in the wilderness areas in the future may lead to vegetation loss due to the formation of user-created, unofficial routes in or near popular use areas and from vehicles parking off roadways as visitors seek access to the wilderness areas. Also, there would continue to be no limits on the size of groups entering the wilderness areas. As a result, more native vegetation might be adversely affected in local areas. These impacts could affect the presence and distribution of some native plants in localized areas in the wilderness areas. Thus, under alternative A, visitor use would likely continue to have a long-term, negligible to minor, adverse impact on native vegetation in localized areas.

Where consistent with existing regulations, the collection of native vegetative resources on BLM portions of the jointly managed wilderness areas (Ireteba Peaks, Eldorado, and Spirit Mountain) would continue under this alternative. Overall, the impacts of resource collection on BLM portions of the wilderness areas would be long-term, localized and negligible, resulting in minimal changes to native vegetation.

Cumulative Effects. Vegetation in many parts of the wilderness areas has been altered by past occupation by burros, cattle grazing, development of user-created travel routes, and the spread of nonnative plants, resulting in a long-term, moderate to major, adverse effect on native vegetation. The loss and alteration of vegetation due to future external actions would likely result in a long-term, negligible to minor, adverse impact on area vegetation from potential future wildland fires. On the other hand, vegetation restoration efforts would continue, likely focusing on noticeably disturbed areas (from visitor use, poaching and other illegal uses, and the spread of nonnative species). This would likely have a long-term, beneficial effect on vegetation in localized areas.

As noted in the "Affected Environment," the spread of nonnative plants is a problem in the areas. Nonnative species have been spreading in different locations due to past visitor activities and through natural sources like wind and birds. In addition, even with education efforts, some nonnative plants such as tamarisk, Russian olive, Russian knapweed, and salt cedar could be introduced or spread by visitors in the wilderness areas. It is difficult to determine the impact of these nonnative species on native vegetation due to the uncertainties about the type of species that might be introduced in the future, and the locations and frequencies of introductions. In spite of monitoring and weed control efforts, the adverse effect of the introduction and spread of nonnative species is unknown, but could range from minor to major and be long term in duration.

When the potential negligible to minor, adverse effects to vegetation in alternative A are added to the past moderate to major impacts; the future negligible to minor, adverse impacts external to the wilderness areas; and the beneficial impacts of restoration of disturbed areas, the result would be a long-term, moderate to major, adverse cumulative impact on area vegetation. However, alternative A would contribute a very small increment to the overall cumulative impact on the wilderness areas' native vegetation.

Conclusion. Some impacts would occur due to visitor use in the formation of user-created, unofficial trails, and illegal off-highway vehicle use. These adverse impacts would likely be localized, minor to moderate, and long-term in extent. Nonnative plants would likely continue to spread in the wilderness areas, resulting in unknown, long-term, adverse impacts on native vegetation. However, continuing efforts to control

nonnative species would likely have a long-term, beneficial impact in local areas.

When the impacts inside the wilderness areas are added to past and foreseeable future impacts from past land uses and increased visitation, as well as the beneficial impacts of restoration of disturbed areas, there would be the potential for a moderate to major, long-term, adverse cumulative impact on area vegetation. However, the actions in alternative A would add a very small increment to this overall impact. None of the vegetation impacts resulting under this alternative would be considered unacceptable or sufficient to result in an impairment of the national recreation area's lands, resources, and values.

Terrestrial Wildlife

Analysis. Few actions in this alternative would affect the wilderness areas' wildlife populations or habitats. Wildlife populations and habitats have already been altered by the presence of visitors and NPS and BLM employees. There would continue to be no limits on the size of groups entering the wilderness areas. Animals sensitive to human activities already avoid these areas when people are present. Wildlife that occupy these areas of concentrated use, such as various reptiles, birds, and small mammals, are mostly adapted to the presence of people and would not be noticeably affected by the actions being taken in alternative A.

Although some desert bighorn sheep would continue to be taken by hunters in the wilderness areas, with population levels being monitored by state and federal biologists, the adverse effect would be expected to be negligible and long term.

Some animals would probably continue to be attracted to food offered by visitors or to areas where food and trash receptacles are present, such as at parking areas and trailheads; these areas are located outside of the wilderness areas. Overall, the adverse impacts of visitor use on wildlife populations in alternative A would be localized and negligible, resulting in no measurable changes to wildlife populations and habitats.

Where consistent with existing regulations, the collection of wildlife resources, other than game species, on BLM portions of the jointly managed wilderness areas (Ireteba Peaks, Eldorado and Spirit Mountain) would continue under this alternative. Overall, the long-term, adverse impacts of resource collection on BLM portions of the wilderness areas would be localized and negligible.

In this alternative, pets, including dogs, would still be allowed in the wilderness areas. Dogs would not be expected to go into the wilderness areas on a frequent basis; however, they could occasionally intimidate and harass wildlife, such as desert bighorn sheep, resulting in long-term, localized and negligible, adverse impacts on terrestrial wildlife.

Cumulative Effects. Terrestrial wildlife in parts of the wilderness areas have been altered by hunting and the presence of visitors and NPS and BLM employees in localized areas. In the past, wild horses and burros have been removed from some of the areas, which extirpated or reduced populations of these species to very low numbers in the wilderness areas. On the other hand, past and continuing efforts to prevent the spread of nonnative vegetation species, restore native vegetation, and restore riparian areas would result in long-term, beneficial impact on some wildlife populations, such as birds and small mammals. When the potential minor effects from visitor use in the wilderness areas in alternative A are added to the past and future impacts external to the wilderness areas, there would be a long-term, minor to moderate, adverse cumulative impact on terrestrial wildlife populations in the wilderness areas. However, the actions in alternative A would contribute a very small increment to the overall impact.

Conclusion. Some wildlife habits and movements may be altered due to increased visitor use in localized areas such as in pull-

offs outside the wilderness areas, along popular routes, and at points of interest. Long-term, negligible, adverse impacts would continue to occur in localized areas due to visitor use. In addition, some bighorn sheep would continue to be taken by hunters; however, their population levels will be monitored by state and federal biologists. This adverse effect would be negligible and long term.

When the beneficial and adverse impacts of alternative A are added to the impacts that have occurred and are likely to occur in the future in the wilderness areas, there would be a long-term, minor to moderate, adverse cumulative impact on wildlife populations and habitats. However, the actions in alternative A would contribute only a small beneficial increment and a very small adverse increment to this impact. None of the wildlife impacts resulting from alternative A would be considered unacceptable or would constitute an impairment to the national recreation area's lands, resources and values.

Threatened and Endangered Species

Analysis. No impacts on state and federal threatened and endangered species and critical habitat would occur due to development or improvement of facilities, because alternative A does not include such actions. No actions or visitor use in the alternative would be expected to affect the spotted bat and peregrine falcon populations and habitats in the wilderness areas because alternative A does not include actions that would remove or damage the wide-ranging habitat of the spotted bat and peregrine falcon.

Under alternative A—even with ongoing education efforts—a few visitors may, on rare occasions, harass tortoises when they see them. However, continued dispersed visitor use of the wilderness areas would be expected to result in a long-term, negligible adverse effect on desert tortoises in the wilderness areas. Likewise, use by hikers might result in the trampling of a few state-listed Las Vegas bear poppy, threecorner milkvetch, and sticky buckwheat, but this use is expected to have a negligible, long-term, adverse effect on the populations in the areas.

Visitor use in the wilderness areas in the future may lead to the loss of some threatened and endangered species' habitat, due to the formation of user-created, unofficial routes near popular use areas, and illegal off-highway vehicle use. These continued visitor actions could limit vegetation growth through soil compaction and the removal of vegetation and food sources. As a result, these species might be adversely affected in local areas. These impacts could affect communities in the wilderness areas. Thus, visitor use would likely have a long-term, minor to moderate, adverse impact on the wilderness areas' threatened and endangered species in localized areas.

Cumulative Effects. Threatened and endangered species critical habitat in parts of the wilderness areas has been altered by past occupation by burros, user-created trails, and illegal off-highway vehicle use. Illegal off-highway vehicle use is expected to continue in several wilderness areas, such as Black Canyon and Eldorado, likely modifying and degrading desert tortoise habitat and resulting in the harassment or even loss of some tortoises, and the loss of some state-listed Las Vegas bear poppy, threecorner milkvetch, and sticky buckwheat. The loss and alteration of habitat due to future external actions that include the increased potential for wildfires in Spirit Mountain would likely result in a minor to moderate, long-term, adverse impact on area threatened and endangered species. External actions that have resulted in the loss of desert tortoise habitat and populations include urbanization, proliferation of roads, off-highway activity, grazing, habitat invasion by nonnative species, increased frequency of wildfires, placement of landfills and other waste disposal facilities, vandalism and collection of tortoises, disease, environmental contaminants, predation by ravens and other species, and global climate change, among other factors (USFWS 2008).

On the other hand, continuing habitat restoration efforts in the wilderness areas would help protect tortoise habitat under alternative A, which would be a long-term, beneficial impact on the wilderness areas' desert tortoise, as well as other state-listed species and related critical habitat.

When the potential adverse effects from increased visitation in the wilderness areas in alternative A are added to past actions and illegal off-highway vehicle use and future impacts external to the wilderness areas, there would be a long-term, minor to moderate, adverse cumulative impact on desert tortoise and state threatened and endangered species in the wilderness areas. However, alternative A would contribute a very small increment to the overall cumulative impact.

Conclusion. A few individual state-listed Las Vegas bear poppy, threecorner milkvetch, and sticky buckwheat may be lost or damaged due to visitor use in the future in localized areas, and rarely some desert tortoise may be harassed by visitors, but this would be expected to have a negligible to minor, long-term, adverse effect on these populations. The alternative would not affect the integrity, distribution, or presence of state and federal threatened and endangered species in the wilderness areas. Overall, alternative A may affect, but would not be likely to adversely affect, the desert tortoise.

When the beneficial and adverse impacts of alternative A are added to the impacts that have occurred and are likely to occur in the wilderness areas and adjacent lands, there would be the potential for a long-term, minor to moderate, adverse cumulative impact on the desert tortoise and the areas' state-listed threatened and endangered species populations and habitats. However, alternative A would contribute a very small increment to this overall cumulative impact. No impairment to the national recreation area's lands, resources, and values would result from threatened and endangered species impacts in this alternative, and none of these impacts would be considered unacceptable.

Natural Soundscape

Analysis. No impacts on natural soundscapes would occur due to development or improvement of facilities, because alternative A does not include such actions.

The potential for increased visitor use, no limits on size of groups entering the wilderness areas, and increased noise due to people's voices, would have long-term, negligible to minor, adverse impacts on the wilderness areas' natural soundscapes in localized areas (e.g., attraction areas such as Boy Scout Canyon, Hamblin Peak, and Grapevine Canyon) during the fall and spring under this alternative.

Cumulative Effects. The natural soundscapes in the wilderness areas would likely continue to be impacted by aircraft overflights, continued illegal off-highway vehicle use, and restoration activities in localized areas. Also, in some of the wilderness areas, boating traffic can be heard from Lake Mead and Lake Mohave, resulting in negligible to minor, long-term, adverse impacts in the areas' natural soundscapes. There are planning efforts currently underway to develop two more local airports; the overflights that would occur from the addition of these airports would have a moderate to major, long-term, adverse impact on the natural soundscape in the wilderness areas. When the effects of visitor use in alternative A are added to the impacts from overflights, boat traffic, and management activities in the areas, there could be a moderate to major, long-term, adverse cumulative impact on the natural soundscapes in some of the wilderness areas. However, alternative A would add a very small increment to the overall adverse cumulative impact.

Conclusion. Some long-term, minor to moderate, adverse impacts to soundscapes would occur due to visitor use in localized areas such as at parking areas, along popular routes and at points of interest, such as Boy

Scout Canyon and Hamblin Peak, illegal off-highway vehicle use, and boating traffic on Lake Mead and Lake Mohave.

When the impacts inside the wilderness areas resulting from alternative A are added to past and foreseeable future impacts from uses and activities outside the wilderness areas (primarily overflights from the addition of two new airports), there would be the potential for a long-term, moderate to major adverse cumulative impact on the areas' natural soundscapes—although the actions in alternative A would add a very small increment to this overall cumulative impact. None of the noise impacts resulting from alternative A would be sufficient to result in impairment to the wilderness areas' lands, resources, and values, and none of these impacts would be considered unacceptable.

ALTERNATIVE B – PREFERRED ALTERNATIVE

Soils

Analysis. Previous uses of the wilderness areas, such as cattle grazing and mining, as well as the presence of feral burros, led to the establishment of unofficial trails, increased soil compaction and erodibility, and in some areas decreased cryptogamic soil crust density.

In alternative B, some soils would be lost or substantially altered in local areas where ground disturbance would occur due to the creation and use of official designated trails and routes. While the development of officially designated routes would occur in areas that have already been disturbed by people, the adverse impact on soils from route development would likely be minor to moderate and long term in localized areas.

The new routes developed as part of alternative B (e.g., the Pinto Valley hiker/horse route and theWhite Rock Mine route) would be built with erosion control measures. Also, under this alternative, three roads would be reduced in width and converted to either horse and pack animal routes or hiking routes; the native vegetation in these areas would be restored. These actions would have long-term, beneficial impacts on soils.

Visitors would be encouraged to stay on the designated routes. However, as in alternative A, soils in some of the wilderness areas would likely continue to be compacted and eroded by hikers at some points of interest such as Boy Scout Canyon. In sloped areas, user-created, unofficial routes would result in increased soil erosion from stormwater runoff. These long-term, adverse impacts would likely be negligible to minor and localized in extent. The creation of unofficial routes and illegal off-highway vehicle use would remove top soil and cause compaction, resulting in localized minor to moderate, long-term, adverse impacts to the national recreation area's soils.

The creation of new access points and the installation of information signs and kiosks would also occur in areas that have been previously disturbed and are outside of the wilderness boundary. Additional top soil would be removed or compacted due to these actions, thus these actions would have a minor to moderate, adverse, long-term, and localized impact on soils in these areas. Also, in this alternative, the development and use of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would remove or compact top soil adjacent to the wilderness area, resulting in a localized, minor to moderate, long-term, adverse impact to the soils adjacent to the Jimbilnan Wilderness.

In alternative B, the Lower Grapevine Canyon Road adjacent to the Spirit Mountain Wilderness would be closed for resource protection, resulting in a long-term, beneficial impact on soils adjacent to the wilderness area. The development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would reduce the removal and compaction of soils caused by visitors camping within the wilderness area, as they would now camp in

the newly designated camping area adjacent to the wilderness area. This would result in a long-term, beneficial impact on soils within the Jimbilnan Wilderness boundary.

This alternative would also provide visitors the opportunity for dispersed overnight camping in Spirit Mountain. This random dispersed use would also result in the removal of top soil and cause soil compaction, resulting in negligible to minor, long-term, and localized adverse impacts to the soils in this area.

In alternative B, efforts to remove user-created unofficial routes and restore the land would help reduce erosion, compared to present conditions, and would result in a long-term, beneficial impact on soils. This alternative also allows for the restoration of the wilderness character at Tule Springs in the Ireteba Peaks Wilderness, resulting in long-term, beneficial impacts to the soils in this area.

Instituting and monitoring user capacity indicators and standards should also help ensure that an unacceptable increase in the number of user-created trails (and resulting in increased soil erosion) does not occur in the wilderness areas. Also, limiting group sizes to no more than 12 people per group would reduce the potential for the development of user-created trails and soil erosion. Compared to the no action alternative, this alternative would result in a long-term, beneficial impact on wilderness area soils.

The installation of informational signs and kiosks would also likely have a long-term, beneficial impact on area soils by educating visitors about the wilderness areas and the principles of Leave No Trace outdoor ethics.

Cumulative Effects. Soils in parts of the wilderness areas have been altered by past occupation by burros, cattle grazing, and the development of user-created trails. These past uses of the wilderness areas led to the establishment of unofficial trails, increased soil compaction and erodibility, and decreased cryptogamic soil crust density. The loss and alteration of soils due to past land uses and future external actions, such as exotic plant management, vegetation restoration, and fire management, would likely result in negligible to minor, long-term, adverse impacts on area soils. When these past and future impacts are added to the potential adverse and beneficial effects of alternative B, there would be a long-term, minor to moderate, adverse cumulative impact on area soils. However, the actions in alternative B would contribute a very small increment to the overall impact.

Conclusion. Some soils would be eroded and lost and some soil properties would be altered. This would be due to the creation of designated routes and from visitor use in localized areas, such as along routes, in washes, and at specific points of interest. Overall, these adverse impacts would likely be minor to moderate and long term in extent. On the other hand, establishing and monitoring user capacity indicators and standards should help prevent the development of new user-created trails and resulting soil erosion, compaction or loss; this would have a long-term, beneficial impact.

When the impacts of alternative B are added to other impacts from past and foreseeable future actions, there would be the potential for a long-term, minor to moderate, adverse cumulative impact on area soils—although the actions in alternative B would add a very small increment to this overall cumulative impact. No impairment to the wilderness areas' lands, resources, and values would result from soil impacts in this alternative and none of these impacts would be considered unacceptable.

Vegetation

Analysis. Vegetation in most portions of the wilderness areas would not be affected by alternative B.

In alternative B, some vegetation would be lost or substantially altered in local areas where ground disturbance would occur due to the creation and use of official designated routes

(e.g., the Pinto Valley hiker/horse route and the White Rock Mine route). The development of officially designated routes would occur in previously disturbed areas where native vegetation has already been substantially altered. Given the previous vegetation disturbance and the use of appropriate mitigation measures (e.g., revegetating disturbed areas and taking steps to avoid the spread of nonnative plants), the long-term, adverse effects on native vegetation from the development of official routes would be negligible to minor in localized areas.

The removal of user-created unofficial routes in several of the wilderness areas, the restoration of vegetation in disturbed areas, and the removal of nonnative invasive species, such as tamarisk at spring sites would have long-term, beneficial impacts. Under this alternative, three roads would be reduced in width and converted to either horse and pack animal routes or hiking routes; the native vegetation in these areas would be restored. These actions would have long-term, beneficial impacts on the national recreation area's vegetation.

In alternative B, new access points would be established in various locations outside and adjacent to the wilderness boundary, resulting in localized, negligible to minor, adverse, long-term impacts to vegetation due to the loss of vegetation from the construction of these new access points. Although the installation of information signs and kiosks would occur in previously disturbed areas, some vegetation could be lost, trampled, or damaged during construction, resulting in negligible, adverse, and long-term impacts in localized areas. Also in this alternative, the development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would remove or degrade vegetation adjacent to the wilderness area, resulting in a negligible to minor, long-term, localized, adverse impact to the vegetation adjacent to the Jimbilnan Wilderness.

The development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would reduce the removal of and damage to vegetation from visitors camping within the wilderness area, as they would now camp in the newly designated camping area adjacent to the wilderness area. This would result in a long-term, beneficial impact on vegetation in the wilderness area. Also in this alternative, the Lower Grapevine Canyon Road adjacent to the Spirit Mountain Wilderness would be closed for resource protection, resulting in long-term, beneficial impact on vegetation adjacent to the Spirit Mountain Wilderness.

This alternative would allow dispersed camping in the Spirit Mountain Wilderness, which could have negligible, long-term, localized adverse effects on native vegetation from visitors trampling, removing, or damaging the vegetation. None of these impacts would affect the overall integrity, distribution, or presence of native plant communities in the wilderness areas. Thus, visitor use would likely have a long-term, negligible to minor, adverse impact on the wilderness areas' native vegetation in local areas.

In alternative B, most wilderness area visitors would be encouraged to stay on newly developed designated routes and would not affect native vegetation. More native vegetation might be adversely affected in local areas due to people wandering off the routes and trampling or removing native vegetation, and due to people developing user-created trails and using off-highway vehicles where it is illegal to do so. None of these impacts would affect the overall integrity, distribution, or presence of native plant communities in the wilderness areas. Thus, visitor use would likely have a long-term, negligible to minor, adverse impact on the wilderness areas' native vegetation in local areas.

The spread of nonnative plants, such as tamarisk, Russian olive, Russian knapweed, and salt cedar, due to visitor use would likely continue to be a problem in the wilderness

areas in alternative B. Opportunities for greater access and visitor use in the wilderness areas would increase the potential for the spread of nonnative species, which would replace native plant communities. Continued use of mitigation measures should help contain the spread of some nonnative species in limited areas. Even with these measures and visitor education efforts, some nonnative plants might be introduced or spread by visitors (as well as by the wind and other animal species) in the wilderness areas. Thus, pockets of nonnative species would continue to be present during the life of this plan. It is difficult to determine the impact this would have to native species, due to uncertainties about the type of species that might be introduced and the locations and frequencies of such introductions. However, it is expected that even with continuing monitoring and weed control efforts, the impacts would result in localized, negligible to minor, long-term, adverse impacts.

Alternative B would prohibit resource collection in all wilderness areas, resulting in a long-term beneficial impact on vegetation.

In this alternative, the wilderness character would be restored at Tule Springs in the Ireteba Peaks Wilderness, resulting in long-term, beneficial impacts to vegetation.

The establishment and monitoring of user capacity indicators and standards in this alternative would help prevent the spread of additional user-created unofficial routes, and thus prevent the loss and disturbance of vegetation in the wilderness areas from trampling or removal by visitors. Also in this alternative, limiting group sizes to no more than 12 people per group would reduce the potential for the disturbance of vegetation, particularly in popular areas like Pinto Valley. This would have a long-term, beneficial impact on native vegetation in localized areas.

Alternative B would implement the Volunteer Wilderness Stewardship Program to aid in the management of the wilderness areas. Volunteer wilderness stewards would be trained to monitor cultural and natural resources and visitor use in the areas. This program would result in an overall long-term, beneficial impact to the wilderness areas' natural resources, as volunteers would assist park staff in monitoring efforts that the park staff may not be able to provide on their own. This program would also provide important and timely feedback on resource conditions to park staff so they can implement mitigation measures before the impacts have a greater effect on the resources.

The installation of informational signs and kiosks would also likely have a long-term, beneficial impact on area vegetation by educating visitors about the wilderness areas and the principles of Leave No Trace outdoor ethics.

Cumulative Effects. Vegetation in many parts of the wilderness areas have been altered by past occupation by burros, cattle grazing, the development of user-created trails, and the spread of nonnative plants, resulting in a long-term, moderate to major, adverse effect to native vegetation. The loss and alteration of vegetation due to future external actions such as possible future wildland fires would likely result in a negligible to minor, long-term, adverse cumulative impact on the areas' native vegetation. On the other hand, vegetation restoration efforts would continue, likely focusing on noticeably disturbed areas (from visitor use, poaching and other illegal uses, and the spread of nonnative species). This would have a long-term, beneficial effect on vegetation in localized areas.

New route development would likely result in the loss of some native vegetation, though designated routes would be placed, as much as possible, in previously disturbed areas. Other planning efforts, either already in place or in the process of being developed, would result in beneficial impacts to the restoration and protection of native vegetation. The actions in alternative B would add mostly long-term, beneficial and small long-term, adverse effects to this overall impact.

As noted in the "Affected Environment," the spread of nonnative plants is a problem in the wilderness areas. Nonnative species have been spreading in different locations due to past visitor activities and natural sources like wind and birds. In addition, even with education efforts, some nonnative plants such as tamarisk, Russian olive, Russian knapweed, and salt cedar could be introduced or spread by visitors in the wilderness areas. It is difficult to determine the impact of these nonnative species on native vegetation due to the uncertainties about the type of species that might be introduced in the future, and the locations and frequencies of introductions. In spite of monitoring and weed control efforts, the adverse effect of the introduction and spread of nonnative species is unknown, but could range from minor to major and be long term in duration.

When the potential negligible to minor, adverse effects of alternative B are added to the past moderate to major impacts; the future negligible to minor, adverse impacts external to the wilderness areas; and the beneficial impacts of restoration of disturbed areas, there would be a long-term, minor to moderate, adverse cumulative impact on area vegetation. However, alternative B would contribute a very small increment to the overall cumulative impact on the wilderness areas' native vegetation.

Conclusion. Some long-term, negligible to minor, adverse impacts would occur in local areas due to the development of proposed new, designated routes and from visitor use. The existence and spread of nonnative plants would continue to have a negligible to minor, long-term, adverse impact on native vegetation. However, efforts to restore native vegetation, remove tamarisk and user-created trails, and establish and monitor user capacity indicators and standards would likely have long-term, beneficial impacts on native vegetation in localized areas.
When the effects of alternative B are added to the effects of other past, present and foreseeable future actions, there would be a negligible to minor, long-term, adverse cumulative impact on native vegetation. The actions in alternative B would add both small long-term, beneficial and small long-term, adverse increments to this overall cumulative impact. None of the vegetation impacts that would occur in alternative B would be sufficient to result in an impairment of the national recreation area's lands, resources and values, and none of these impacts would be considered unacceptable.

Terrestrial Wildlife

Analysis. In alternative B, human use in the wilderness areas would be concentrated on official routes, in washes, and at particular points of interest such as Boy Scout Canyon. Animals sensitive to human activities already avoid these areas when people are present. Wildlife that occupy these areas of concentrated use, such as various reptiles, birds, and small mammals, are mostly adapted to the presence of people and would not be noticeably affected by the actions in alternative B.

In this alternative, some wildlife may be displaced or habitat may be damaged in local areas where disturbance would occur due to the creation and use of official designated routes. The development of officially designated routes would occur in areas that have already been disturbed by people. Given the previous wildlife and habitat disturbances, the long-term, adverse effects on wildlife and habitat from the development and use of official routes would be negligible to minor in localized areas.

Efforts to restore native vegetation communities would occur in alternative B, expanding habitat for wildlife, and resulting in a long-term, beneficial impact on wildlife populations in the wilderness areas. Likewise, the closure of unofficial user-created trails and the restoration of these areas would result in a reduction of wildlife displacement due to the reduction of human use, and would increase the availability of habitat for wildlife that are sensitive to the presence of people, resulting in long-term, beneficial impacts to native wildlife and habitat.

In alternative B, three roads would be reduced in width and converted to horse and pack animal routes or hiking routes; the native vegetation in these areas would be restored, increasing habitat for native wildlife populations. These actions would have long-term, beneficial impacts on the area's wildlife.

In this alternative, new access points would be established at various locations outside and adjacent to the wilderness boundary. This would result in localized, negligible to minor, adverse, short-term impacts on wildlife due to the loss of habitat or the displacement of wildlife from noise and the presence of humans during the construction of these new access points. The presence of humans at these new access points after construction will have localized, negligible to minor, adverse, long-term impacts on wildlife. Although the installation of information signs and kiosks would occur in previously disturbed areas, some habitat would be lost or damaged during construction, resulting in negligible, adverse, and long-term impacts in localized areas.

Also in this alternative, the development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would result in lost or damaged habitat and wildlife displacement in areas adjacent to the wilderness area. These actions would result in a negligible to minor, long-term, localized, adverse impact to the wildlife and habitat adjacent to the Jimbilnan Wilderness.

The development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would reduce the displacement of wildlife and damage to habitat from visitors camping within the wilderness area, as visitors would now camp in the newly designated camping area adjacent to the Jimbilnan Wilderness boundary. This would result in a long-term, beneficial impact on wildlife and habitat within the Jimbilnan Wilderness. Also in this alternative, the Lower Grapevine Canyon Road adjacent to the Spirit Mountain Wilderness would be closed for resource protection, resulting in long-term, beneficial impacts on wildlife and habitat adjacent to the Spirit Mountain Wilderness.

Dispersed camping would be allowed in the Spirit Mountain Wilderness, which could have localized, negligible, long-term, adverse effects on wildlife and habitat from visitors displacing wildlife or damaging their habitat.

As in all of the alternatives, some animals such as desert tortoise and various reptiles would continue to occasionally be injured or killed by illegal off-highway vehicle use or be displaced by visitors creating unofficial routes through wildlife habitat. Some animals such as birds, mice, squirrels, and rabbits would probably continue to be attracted to food being offered by visitors. The overall adverse effects on wildlife from visitor activities in alternative B would be the same as those in alternative A: long-term, localized and negligible, resulting in no measurable changes to the wilderness areas' wildlife populations.

Alternative B would prohibit resource collection in all wilderness areas, resulting in a long-term beneficial impact on terrestrial wildlife in the wilderness areas.

In this alternative, the wilderness character would be restored at Tule Springs in the Ireteba Peaks Wilderness, resulting in long-term, beneficial impacts to the wildlife and habitat in this area.

In this alternative, limiting group sizes to no more than 12 people per group would reduce human use and the potential for groups to disturb wildlife. This would result in long-term beneficial impacts to the wildlife and habitat.

Alternative B would implement the Volunteer Wilderness Stewardship Program to aid in the management of the wilderness areas. Volunteer wilderness stewards would be trained to monitor cultural and natural resources and visitor use in the areas. This program would result in an overall long-term, beneficial impact to the wilderness areas' natural resources, as the volunteers would

assist park staff in monitoring efforts that the park staff may not be able to provide on their own. This program would also provide important and timely feedback on resource conditions to park staff so they can implement mitigation measures before the impacts have a greater effect on the resources.

The installation of informational signs and kiosks would also likely have a long-term, beneficial impact on area wildlife and habitat by educating visitors about the wilderness areas and the principles of Leave No Trace outdoor ethics.

The prohibition of pets, including dogs, in the wilderness areas would keep dogs from intimidating and harassing wildlife, including desert bighorn sheep and desert tortoise. This would have a long-term, beneficial impact on terrestrial wildlife.

Cumulative Effects. Terrestrial wildlife in parts of the wilderness areas have been altered by hunting and the presence of visitors and NPS and BLM employees in localized areas. In the past, wild horses and burros have been removed from some of the areas, which extirpated these populations or reduced them to very low numbers in the wilderness areas. The alteration of wildlife habits and movements due to future external actions would likely result in long-term, negligible to minor, adverse impacts on native wildlife. On the other hand, past and continuing efforts to prevent the spread of nonnative vegetation species, restore native vegetation, and restore riparian areas would result in long-term, beneficial impacts on some wildlife populations, such as birds and small mammals. When the potential minor effects from visitor use in the wilderness areas in alternative B are added to the past and future impacts external to the wilderness areas, there would be a long-term, negligible to minor, adverse cumulative impact on terrestrial wildlife populations. However, the actions in alternative B would contribute a very small increment to the overall impact.

Conclusion. Long-term, negligible, adverse impacts would continue to occur in localized areas due to visitor use of the wilderness areas. There would also be long-term, beneficial impacts on some wildlife populations due to vegetation restoration efforts and the closure and restoration of roads and unofficial user-created trails in the wilderness areas.

When the beneficial and adverse impacts of alternative B are added to the impacts that have occurred in the wilderness areas, there would be a long-term, negligible to minor, adverse cumulative impact on the areas' wildlife populations and habitats. However, the actions in alternative B would contribute only a small long-term, beneficial increment and a very small long-term, adverse increment to this impact. None of the wildlife impacts resulting from alternative B would be expected to constitute an impairment of the wilderness areas' lands, resources, or values, and none would be considered unacceptable.

Threatened and Endangered Species

Analysis. In alternative B, human use in the wilderness areas would be concentrated on official routes, in washes, and at particular points of interest. Spotted bat and peregrine falcon populations and habitats in the wilderness areas are not expected to be affected by any actions in this alternative, as no construction or other activities will take place in their habitats.

Under alternative B—even with ongoing education efforts—a few visitors may very occasionally harass tortoises when they see them. However, in general, continued dispersed visitor use of the wilderness areas would be expected to result in a negligible, long-term, adverse effect on desert tortoises. Likewise, visitation by hikers might result in the trampling of a few state-listed Las Vegas bear poppy, threecorner milkvetch, and sticky buckwheat, but this use is expected to have a long-term, negligible, adverse effect on the populations in the areas.

In alternative B, some desert tortoises or other threatened and endangered species may be

displaced or habitat may be damaged in local areas where disturbance would occur due to the creation and use of official designated routes. The development and use of officially designated routes would occur in areas that have already been disturbed by people; this development and use would have a negligible to minor, long-term, localized, adverse impact on the national recreation area's desert tortoises or other threatened and endangered species and habitat.

Under this alternative, three roads would be reduced in width and converted to horse and pack animal routes or hiking routes; the native vegetation in these areas would be restored, increasing possible habitat for desert tortoise or other threatened and endangered species. These actions would have long-term, beneficial impacts on the desert tortoise and other threatened and endangered species and habitat.

Development of new access points and the installation of information signs and kiosks would occur in areas that are not considered critical habitat, have already been disturbed, and are located outside of and adjacent to the wilderness boundary. The adverse impact on desert tortoise or other threatened and endangered species populations and habitats in these areas from the construction of parking areas, signs, and kiosks would be short-term and negligible.

Also in this alternative, the development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would displace desert tortoise or other threatened and endangered species or damage habitat adjacent to the wilderness area. This would result in a localized, negligible to minor, long-term, adverse impact to desert tortoise or other threatened and endangered species and their habitat. Dispersed camping will be allowed in the Spirit Mountain Wilderness, which could have negligible, long-term, and localized adverse effects on desert tortoise or other threatened and endangered species and their habitat through species displacement or damage to their habitat from visitor use.

The development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would reduce the displacement of desert tortoise or other threatened and endangered species and the damage to habitat from visitors camping within the wilderness area. This would result in a long-term, beneficial impact on desert tortoise or other threatened and endangered species in the wilderness area.

Also in this alternative, the Lower Grapevine Canyon Road adjacent to the Spirit Mountain Wilderness would be closed for resource protection, resulting in a long-term, beneficial impact to desert tortoise or other threatened and endangered species and habitat.

As in all of the alternatives, some animals such as the desert tortoise or other threatened and endangered species would continue to occasionally be injured or killed by illegal off-highway vehicle use or be displaced from visitors creating unofficial routes through the species' habitat. The overall adverse effects on threatened and endangered species from visitor activities in alternative B would be localized, negligible to minor, and long term.

In alternative B, the wilderness character would be restored at Tule Springs in the Ireteba Peaks Wilderness, resulting in long-term, beneficial impacts to desert tortoises or other threatened and endangered species and habitat in this area.

Alternative B would implement the Volunteer Wilderness Stewardship Program to aid in the management of the wilderness areas. Volunteer wilderness stewards would be trained to monitor cultural and natural resources and visitor use in the areas. This program would result in overall long-term, beneficial impacts to the wilderness areas' natural resources, as volunteers would assist park staff in monitoring efforts that the park staff may not be able to provide on their own. This program would also provide important

and timely feedback on resource conditions to park staff so they can implement mitigation measures before the impacts have a greater effect on the resources.

The installation of informational signs and kiosks would also likely have a long-term, beneficial impact on the desert tortoise or other threatened and endangered species and habitat by educating visitors about the wilderness areas and the principles of Leave No Trace outdoor ethics.

Cumulative Effects. Threatened and endangered species' critical habitat in parts of the wilderness areas has been altered by the past occupation by burros, the development of user-created trails, and illegal off-highway vehicle use. Until illegal off-highway vehicle use is eliminated in several wilderness areas, such as Black Canyon and Eldorado, this use will likely modify and degrade desert tortoise habitat and result in the harassment or even loss of some tortoises, as well as the loss of some state-listed Las Vegas bear poppy, threecorner milkvetch, and sticky buckwheat

The loss and alteration of habitat due to future external actions, including possible wildfires in Spirit Mountain, would likely result in a long-term, negligible to minor, adverse impact on area threatened and endangered species. External actions that have resulted in the loss of desert tortoise habitat and populations include urbanization, proliferation of roads, off-highway activity, grazing, habitat invasion by nonnative species, increased frequency of wildfires, placement of landfills and other waste disposal facilities, vandalism and collection of tortoises, disease, presence of environmental contaminants, predation by ravens and other species, and global climate change, among other factors (USFWS 2008).

On the other hand, continuing habitat restoration efforts in the wilderness areas would help protect tortoise habitat under alternative B, which would result in a long-term, beneficial impact on desert tortoise, as well as other state-listed species and related critical habitat.

When the potential adverse effects from visitor use in the wilderness areas in alternative B are added to past actions, illegal off-highway vehicle use, and future impacts external to the wilderness areas, there would be a long-term, negligible to minor, adverse cumulative impact on desert tortoise and other state threatened and endangered species in the wilderness areas. However, alternative B would contribute a very small increment to the overall cumulative impact.

Conclusion. Long-term, negligible, adverse impacts would continue to occur in localized areas due to visitor use of the wilderness areas. There would also be long-term, beneficial impacts on some threatened and endangered species populations due to vegetation restoration efforts, tortoise fencing, and the closure and restoration of unofficial user-created trails in the wilderness areas.

When the beneficial and adverse impacts of alternative B are added to the impacts that have occurred in the wilderness areas, there would be a long-term, negligible to minor, adverse cumulative impact on the areas' threatened and endangered species populations and habitats. However, the actions in alternative B would contribute only a small long-term, beneficial increment and a very small long-term, adverse increment to this impact. None of the threatened and endangered species impacts resulting from alternative B would be expected to constitute an impairment of the wilderness areas' lands, resources, or values. None of these impacts would be considered to be unacceptable.

Natural Soundscape

Analysis. The natural soundscape in most portions of the wilderness areas would not be affected by the actions taken in alternative B.

Alternative B would allow for the development of new official designated routes, which would confine users and concentrate user noise to these routes. This could result in increased disruption of the natural soundscape along the official designated routes, as visitors would be

encouraged to stay on these routes with other visitors rather than to seek individual routes through the development of user-created unofficial trails. This would result in a negligible to minor, long-term, adverse impact on the natural soundscape in the wilderness areas.

The closure of unofficial user-created trails would result in more concentrated areas of visitor use, thus containing visitor noise to the newly designated official routes, resulting in long-term, beneficial impacts to the natural soundscape.

Under this alternative, three roads would be reduced in width and converted to horse and pack animal routes or hiking routes; this would eliminate illegal off-highway vehicle use and restore the natural soundscape in these areas. These actions would have long-term, beneficial impacts on the natural soundscape.

Development of new access points and the installation of information signs and kiosks would occur in areas that are located outside of and adjacent to the wilderness boundary. The adverse impact on the natural soundscape in these areas from the construction of parking areas, signs, and kiosks would be short term and negligible.

Also in this alternative, the development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would concentrate visitor noise adjacent to the wilderness area, resulting in a localized, negligible to minor, long-term, adverse impact to the area's natural soundscape outside of the wilderness area.

The development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would better protect the natural soundscape within the wilderness area, as visitors would camp outside of the Jimbilnan Wilderness boundary, thus resulting in a long-term, beneficial impact on the natural soundscape within the wilderness area.

Also in this alternative, the Lower Grapevine Canyon Road adjacent to the Spirit Mountain Wilderness would be closed for resource protection, resulting in a long-term, beneficial impact on natural soundscapes due to the elimination of illegal off-highway or other vehicle use.

Monitoring sounds within the wilderness areas and from aircraft overflights would continue under alternative B; this may provide information regarding the impacts on the natural soundscapes, which could result in the development of management actions to mitigate these impacts. Instituting and monitoring user capacity indicators and standards should help ensure that an unacceptable increase in disruption of the natural soundscape due to visitors does not occur in the wilderness areas. Establishing limits on group sizes, especially in areas of high use and at points of interest, and eliminating illegal off-highway vehicle use would result in long-term, beneficial impacts in the areas' natural soundscapes.

The installation of informational signs and kiosks would also likely have a long-term, beneficial impact on area natural soundscapes by educating visitors about the wilderness areas and the principles of Leave No Trace outdoor ethics.

Cumulative Effects. The natural soundscapes in the wilderness areas would likely continue to be impacted by aircraft overflights, illegal off-highway vehicle use, and restoration activities in localized areas. Also, in some of the wilderness areas, boating traffic can be heard from Lake Mead and Lake Mohave, resulting in long-term, negligible to minor, adverse impacts in the areas' natural soundscapes. There are planning efforts currently underway to develop two more local airports, and the overflights that would occur from the addition of these airports would have a long-term, moderate to major, adverse cumulative impact on the natural soundscape in the wilderness areas. When the effects of alternative B are added to the impacts from overflights, boat traffic, and management

activities in the areas, there potentially could be a moderate to major, long-term, adverse cumulative impact on the natural soundscapes in some of the wilderness areas. However, alternative B would add a very small increment to the overall adverse cumulative impact.

Conclusion. Some natural soundscapes would be degraded due to visitor use in localized areas such as along routes, in washes, in high use areas such as at Boy Scout Canyon, and in some wilderness areas where boating traffic on Lake Mead and Lake Mohave can be heard. These adverse impacts would likely be negligible to minor and long term in extent.

When the impacts inside the wilderness areas are added to past and foreseeable future impacts from visitor use and the addition of two airports outside the wilderness boundary, there would be a long-term, moderate to major, adverse cumulative impact on the areas' natural soundscapes—although the actions in alternative B would add a very small increment to this overall impact. Continuing efforts to monitor and establish a baseline for natural soundscapes in the wilderness areas, and the development and implementation of mitigation measures would result in a long-term, beneficial impact on the natural soundscapes. Instituting and monitoring user capacity indicators and standards that would address group sizes, illegal off-highway vehicle use, and general noise disturbances would also result in long-term, beneficial impacts on the natural soundscape in the wilderness areas.

When the beneficial and adverse impacts of alternative B are added to the impacts that have occurred and external future actions that might affect the wilderness areas, there would be a long-term, moderate to major, adverse cumulative impact on the areas' natural soundscapes. No impairment to the national recreation area's lands, resources, and values would result from natural soundscape impacts in this alternative. None of these impacts would be considered unacceptable.

ALTERNATIVE C

Soils

Analysis. Previous uses of the wilderness areas, such as cattle grazing and mining, as well as the presence of feral burros led to the establishment of unofficial trails, increased soil compaction and erodibility, and in some areas decreased cryptogamic soil crust density.

In alternative C, some soils would be lost or substantially altered in local areas where ground disturbance would occur due to the creation and use of official designated routes. The development of officially designated trails would occur in areas that have already been disturbed by people and would have a negligible, long-term, localized, adverse impact on the national recreation area's soils.

The new formal routes developed as part of alternative C would be built with erosion control measures. Under this alternative, three roads would be reduced in width and converted to either horse and pack animal routes or hiking routes; the native vegetation in these areas would be restored. These actions would have long-term, beneficial impacts on soils.

Visitors would be encouraged to stay on the designated routes; however, as in alternative A, soils in some of the wilderness areas would likely continue to be compacted and eroded by hikers at some points of interest, such as Boy Scout Canyon. In sloped areas, user-created, unofficial routes would result in increased soil erosion from stormwater runoff. These long-term, adverse impacts would likely be negligible to minor and localized in extent. The creation of unofficial routes and illegal off-highway vehicle use would remove top soil and cause compaction, resulting in minor to moderate, long-term, and localized adverse impacts to the area's soils.

The creation of new access points and the installation of information signs and kiosks would also occur in areas that have been

previously disturbed and are outside of the wilderness boundary. Additional top soil would be removed or compacted due to these actions; these actions would have a minor to moderate, adverse, long-term, and localized impact on soils in these areas. Also in this alternative, the development and use of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would remove or compact top soil adjacent to the wilderness area, resulting in a minor to moderate, long-term and localized, adverse impact to the soils adjacent to the Jimbilnan Wilderness.

In alternative C, the Lower Grapevine Canyon Road adjacent to the Spirit Mountain Wilderness would be closed for resource protection, resulting in a long-term, beneficial impact on soils adjacent to the wilderness area. The development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would reduce the removal and compaction of soils caused by visitors camping within the wilderness area, as they would now camp in the newly designated camping area adjacent to the Jimbilnan Wilderness. This would result in a long-term, beneficial impact on soils within the Jimbilnan Wilderness.

Alternative C would also provide visitors only day use opportunities in the Spirit Mountain Wilderness. Compared to alternative B, this would result in long-term, beneficial impacts; however, overall, soil erosion, removal, or compaction would still be caused by visitor use on the newly designated trails and routes, resulting in negligible to minor, long-term, and localized, adverse impacts to the soils in this area.

In alternative C, efforts to remove and restore user-created unofficial routes would help reduce erosion, compared to present conditions, and would result in a long-term, beneficial impact on soils. This alternative also allows for the restoration of the wilderness character at Tule Springs in the Ireteba Peaks Wilderness, resulting in long-term, beneficial impacts to the soils in this area.

Alternative C would move the trail register from the summit of Spirit Mountain to the access point. This could result in long-term, beneficial impacts to the soils of the Spirit Mountain Wilderness by allowing visitors to access the trail register from outside the wilderness area rather than by hiking up to the summit, which could remove top soil and cause soil compaction or erosion.

Instituting and monitoring user capacity indicators and standards should also help ensure that an unacceptable increase in the number of user-created trails (and resulting increased soil erosion) does not occur in the wilderness areas. In addition, limiting group sizes to no more than 12 people per group would reduce the potential for the development of user-created trails and soil erosion. Compared to the no action alternative, this alternative would result in a long-term, beneficial impact on wilderness area soils.

The installation of informational signs and kiosks would also likely have a long-term, beneficial impact on national recreation area soils by educating visitors about the wilderness areas and the principles of Leave No Trace outdoor ethics.

Cumulative Effects. Soils in parts of the wilderness areas have been altered by past occupation by burros, cattle grazing, and the development of user-created trails. These past uses of the wilderness areas led to the establishment of unofficial trails, increased soil compaction and erodibility, and decreased cryptogamic soil crust density. The loss and alteration of soils due to past land uses and future external actions such as exotic plant management, vegetation restoration, and fire management, would likely result in negligible to minor, long-term, adverse impacts on area soils. When these past and future impacts are added to the potential adverse and beneficial effects of alternative C, there would be a long-term, minor to moderate, adverse cumulative impact on area soils. However, the actions in alternative C

would contribute a very small increment to the overall impact.

Conclusion. Some soils would be eroded and lost and some soil properties would be altered. This would be due to the creation of designated routes and from visitor use in localized areas, such as along routes, in washes, and at specific points of interest. Overall, these adverse impacts would likely be minor to moderate and long term in extent. On the other hand, establishing and monitoring user capacity indicators and standards should help prevent the development of new user-created trails and resulting soil erosion, compaction or loss; this would have a long-term, beneficial impact.

When the impacts of alternative C are added to other impacts from past and foreseeable future actions, there would be the potential for a long-term, minor to moderate, adverse cumulative impact on area soils—although the actions in alternative C would add a very small increment to this overall cumulative impact. No impairment to the national recreation area's lands, resources, and values would result from soil impacts in this alternative and none of these impacts would be considered unacceptable.

Vegetation

Analysis. As in alternatives A and B, vegetation in most portions of the wilderness areas would not be affected by alternative C.

In alternative C, some vegetation would be lost or substantially altered in local areas where ground disturbance would occur due to the creation and use of official designated routes. The development of officially designated trails would occur in previously disturbed areas where native vegetation has already been substantially altered. Given the previous vegetation disturbance and the use of appropriate mitigation measures (e.g., revegetating disturbed areas and taking steps to avoid the spread of nonnative plants), the long-term, adverse effects on native vegetation from the development of official routes would be negligible to minor in localized areas.

The removal of user-created unofficial routes in several of the wilderness areas, the restoration of vegetation in disturbed areas, and the removal of nonnative invasive species, such as tamarisk at spring sites, would have long-term, beneficial impacts. Under this alternative, three roads would be reduced in width and converted to either horse and pack animal routes or hiking routes; the native vegetation in these areas would be restored. These actions would have long-term, beneficial impacts on the national recreation area's vegetation.

In alternative C, new access points would be created in various locations outside and adjacent to the wilderness boundary, resulting in localized, negligible to minor, adverse, long-term impacts to vegetation due to the loss of vegetation from the construction of these new access points. Although the installation of information signs and kiosks would occur in previously disturbed areas, some vegetation could be lost, trampled, or damaged during construction, resulting in negligible, adverse, and long-term impacts in localized areas. Also in this alternative, the development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would remove or degrade vegetation adjacent to the wilderness area, resulting in a negligible to minor, long-term, and localized, adverse impact to the vegetation adjacent to the Jimbilnan Wilderness.

The development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would reduce the removal of and damage to vegetation from visitors camping within the wilderness area, as they would now camp in the newly designated camping area adjacent to the wilderness area. This would result in a long-term, beneficial impact on vegetation in the wilderness area. Also in this alternative, the Nevada Telephone Cove Road adjacent to the Spirit Mountain Wilderness would be closed for resource

protection, resulting in a long-term, beneficial impact on vegetation adjacent to the Spirit Mountain Wilderness.

In alternative C, most wilderness area visitors would be encouraged to stay on newly developed designated routes and would not affect native vegetation. More native vegetation might be adversely affected in local areas due to people wandering off the routes and trampling or removing native vegetation, the development of user-created trails, and the illegal use of off-highway vehicles. None of these impacts would affect the overall integrity, distribution, or presence of native plant communities in the wilderness areas. Thus, visitor use would likely have a long-term, negligible to minor, adverse impact on the wilderness areas' native vegetation in local areas.

Alternative C would also provide visitors only day use opportunities in the Spirit Mountain Wilderness. Compared to alternative A, this would result in long-term, beneficial impacts; however, overall, vegetation could still be trampled or removed by visitor use, resulting in negligible to minor, long-term, localized, adverse impacts to the soils in this area.

The spread of nonnative plants, such as tamarisk, Russian olive, Russian knapweed, and salt cedar, due to visitor use would likely continue to be a problem in the wilderness areas in alternative C. Opportunities for greater access and visitor use in the wilderness areas would increase the potential for the spread of nonnative species, which would replace native plant communities. Continued use of mitigation measures should help contain the spread of some nonnative species in limited areas. Even with these measures and visitor education efforts, some nonnative plants might be introduced or spread by visitors (as well as by the wind and other animal species) in the wilderness areas. Thus, pockets of nonnative species would continue to be present during the life of this plan. It is difficult to determine the impact this would have on native species, due to uncertainties about the type of species that might be introduced and the locations and frequencies of such introductions. However, it is expected that even with continuing monitoring and weed control efforts, the impacts would result in negligible to minor, long-term, localized, adverse impacts.

Alternative C would prohibit resource collection in all wilderness areas, resulting in a long-term, beneficial impact on vegetation.

In this alternative, the wilderness character would be restored at Tule Springs in the Ireteba Peaks Wilderness, resulting in long-term, beneficial impacts to vegetation.

Alternative C would move the trail register from the summit of Spirit Mountain to the access point. This could result in long-term, beneficial impacts to the vegetation on Spirit Mountain by allowing visitors to access the trail register from outside the wilderness area rather than by hiking up to the summit, which could damage vegetation through trampling or removal.

The establishment and monitoring of user capacity indicators and standards in this alternative would help prevent the spread of additional user-created unofficial routes, and thus prevent the loss and disturbance of vegetation from trampling or removal by visitors. particularly in popular areas like Pinto Valley. This would have a long-term, beneficial impact on native vegetation in localized areas.

Alternative C would implement the Volunteer Wilderness Stewardship Program to aid in the management of the wilderness areas. Volunteer wilderness stewards would be trained to monitor cultural and natural resources and visitor use in the areas. This program would result in an overall long-term, beneficial impact to the wilderness areas' natural resources, as volunteers would assist park staff in monitoring efforts that the park staff may not be able to provide on their own. This program would also provide important and timely feedback on resource conditions to park staff so they can implement mitigation

measures before the impacts have a greater effect on the resources.

The installation of informational signs and kiosks also would likely have a long-term, beneficial impact on national recreation area vegetation by educating visitors about the wilderness areas and the principles of Leave No Trace outdoor ethics.

Cumulative Effects. Vegetation in many parts of the wilderness areas has been altered by past occupation by burros, cattle grazing, the development of user-created trails, and the spread of nonnative plants, resulting in a moderate to major, adverse effect to native vegetation. The loss and alteration of vegetation due to future external actions, such as possible future wildland fires, would likely result in a negligible to minor, long-term, adverse cumulative impact on the areas' native vegetation. On the other hand, vegetation restoration efforts would continue, likely focusing on noticeably disturbed areas (from visitor use, poaching and other illegal uses, and the spread of nonnative species). This would have a long-term, beneficial effect on vegetation in localized areas.

New route development would likely result in the loss of some native vegetation, though designated routes would be placed, as much as possible, in previously disturbed areas. Other planning efforts either already in place or in the process of being developed would result in long-term, beneficial impacts to the restoration and protection of native vegetation. The actions in alternative C would add mostly long-term, beneficial and small long-term, adverse effects to the cumulative impact.

As noted in the "Affected Environment," the spread of nonnative plants is a problem in the wilderness areas. Nonnative species have been spreading in different locations due to past visitor activities and natural sources like wind and birds. In addition, even with education efforts, some nonnative plants such as tamarisk, Russian olive, Russian knapweed, and salt cedar could be introduced or spread by visitors in the wilderness areas. It is difficult to determine the impact of these nonnative species on native vegetation due to the uncertainties about the type of species that might be introduced in the future, and the locations and frequencies of introductions. In spite of monitoring and weed control efforts, the adverse effect of the introduction and spread of nonnative species is unknown, but could range from minor to major and be long-term in duration.

When the potential negligible to minor, adverse effects of alternative C are added to the past moderate to major impacts; future negligible to minor, adverse impacts external to the wilderness areas; and the beneficial impacts of restoration of disturbed areas, there would be a long-term, minor to moderate, adverse cumulative impact on area vegetation. However, alternative C would contribute a very small increment to the overall cumulative impact on the wilderness areas' native vegetation.

Conclusion. Some long-term, negligible to minor, adverse impacts would occur in local areas due to the development of proposed new, designated routes and from visitor use. The existence and spread of nonnative plants would continue to have a negligible to minor, long-term, adverse impact on native vegetation. However, efforts to restore native vegetation, remove tamarisk and user-created trails, and establish and monitor user capacity indicators and standards would likely have long-term, beneficial impacts on native vegetation in localized areas.

When the effects of alternative C are added to the effects of other past, present, and foreseeable future actions, there would be a negligible to minor, long-term, adverse cumulative impact on native vegetation. The actions in alternative C would add both small beneficial and small adverse increments to this overall cumulative impact. None of the vegetation impacts that would occur in alternative C would be sufficient to result in an impairment of the national recreation area's lands, resources and values, and none of

these impacts would be considered unacceptable.

Terrestrial Wildlife

Analysis. In alternative C, human use in the wilderness areas would be concentrated on official routes, in washes, and at particular points of interest such as Boy Scout Canyon. Animals sensitive to human activities already avoid these areas when people are present. Wildlife that occupy these areas of concentrated use, such as various reptiles, birds, and small mammals are mostly adapted to the presence of people and would not be noticeably affected by the actions in alternative C.

In this alternative, some wildlife may be displaced or habitat may be damaged in local areas where disturbance would occur due to the creation and use of official designated routes. The development of officially designated routes would occur in areas that have already been disturbed by people. Given the previous wildlife and habitat disturbances, the long-term, adverse effects on wildlife and habitat from the development and use of official routes would be negligible to minor in localized areas.

Efforts to restore native vegetation communities would occur in alternative C, expanding habitat for wildlife and resulting in a long-term, beneficial impact on wildlife populations in the wilderness areas. Likewise, the closure of unofficial user-created trails and the restoration of these areas would result in a reduction of human use, and would increase the availability of habitat for wildlife that are sensitive to the presence of people, resulting in long-term, beneficial impacts to native wildlife and habitat.

In alternative C, three roads would be reduced in width and converted to horse and pack animal routes or hiking routes; the native vegetation in these areas would be restored, increasing habitat for native wildlife populations. These actions would have long-term, beneficial impacts on the area's wildlife.

In this alternative, new access points would be created at various locations outside and adjacent to the wilderness boundary. This would result in localized, negligible to minor, adverse, short-term impacts on wildlife due to the loss of habitat or the displacement of wildlife from noise and the presence of humans during construction of these new access points. The presence of humans at these new access points after construction will have localized, negligible to minor, adverse, long-term impacts on wildlife. Although the installation of information signs and kiosks would occur in previously disturbed areas, some habitat would be lost or damaged during construction, resulting in negligible, adverse, and long-term impacts in localized areas.

Also in this alternative, the development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would result in lost or damaged habitat and wildlife displacement in areas adjacent to the wilderness area. These actions would result in a negligible to minor, long-term, localized, adverse impact to the wildlife and habitat adjacent to the Jimbilnan Wilderness.

The development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would reduce the displacement of wildlife and the damage to habitat from visitors camping within the wilderness area, as visitors would now camp in the newly designated camping area adjacent to the Jimbilnan Wilderness boundary. This would result in a long-term, beneficial impact on wildlife and habitat within the Jimbilnan Wilderness. Also in this alternative, the Nevada Telephone Cove Road adjacent to the Spirit Mountain Wilderness would be closed for resource protection, resulting in long-term, beneficial impacts on wildlife and habitat adjacent to the Spirit Mountain Wilderness.

As in all of the alternatives, some animals such as desert tortoise and various reptiles would continue to occasionally be injured or killed by illegal off-highway vehicle use or be

displaced by visitors creating unofficial routes through wildlife habitat. Some animals, such as birds, mice, squirrels, and rabbits, would probably continue to be attracted to food being offered by visitors. The overall adverse effects on wildlife from visitor activities in alternative C would be the same as those in alternative A: long term, localized and negligible, resulting in no measurable changes to the wilderness areas' wildlife populations.

Alternative C would also provide visitors only day use opportunities in the Spirit Mountain Wilderness. Compared to alternative A, this would result in long-term, beneficial impacts; however, overall, wildlife and habitat could still be adversely affected by visitor use, resulting in negligible to minor, long-term, localized, adverse impacts to the wildlife and habitat in this area.

Alternative C would prohibit resource collection in al lthe wilderness areas, resulting in a beneficial, long-term impact on terrestrial wildlife in the wilderness areas.

In this alternative, the wilderness character would be restored at Tule Springs in the Ireteba Peaks Wilderness, resulting in long-term, beneficial impacts to the wildlife and habitat in this area.

Alternative C would move the trail register from the summit of Spirit Mountain to the access point. This could result in long-term, beneficial impacts to the wildlife and habitat on Spirit Mountain by allowing visitors to access the trail register from outside the wilderness area rather than by hiking up to the summit, which could have adverse impacts on wildlife and habitat in the Spirit Mountain Wilderness.

In this alternative, limiting group sizes to no more than 12 people per group would reduce human use and the potential for groups disturbing wildlife. This would result in long-term, beneficial impacts to the wildlife and habitat.

This alternative would implement the Volunteer Wilderness Stewardship Program to aid in the management of the wilderness areas. Volunteer wilderness stewards would be trained to monitor cultural and natural resources and visitor use in the areas. This program would result in an overall long-term, beneficial impact to the wilderness areas' natural resources, as volunteers would assist park staff in monitoring efforts the park staff may not be able to provide on their own. This program would also provide important and timely feedback on resource conditions to park staff so they can implement mitigation measures before the impacts have a greater effect on the resources.

The installation of informational signs and kiosks would also likely have a long-term, beneficial impact on national recreation area wildlife and habitat by educating visitors about the wilderness areas and the principles of Leave No Trace outdoor ethics.

The prohibition of pets, including dogs, in the wilderness areas would keep dogs from intimidating and harassing wildlife, including desert bighorn sheep and desert tortoise. This would have a long-term, beneficial impact on terrestrial wildlife.

Cumulative Effects. Terrestrial wildlife in parts of the wilderness areas have been altered by hunting and the presence of visitors and NPS and BLM employees in localized areas. In the past, wild horses and burros have been removed from some of the areas, which extirpated or reduced populations of these species to very low numbers in the wilderness areas. The alteration of wildlife habits and movements due to future external actions such as future wildland fires would likely result in long-term, negligible to minor, adverse impacts on native wildlife. On the other hand, past and continuing efforts to prevent the spread of nonnative vegetation species, restore native vegetation, and restore riparian areas would result in long-term, beneficial impacts on some wildlife populations, such as birds and small mammals. When the potential minor effects

from visitor use in the wilderness areas in alternative C are added to the past and future impacts external to the wilderness areas, there would be a long-term, negligible to minor, adverse cumulative impact on terrestrial wildlife populations. However, the actions in alternative C would contribute a very small increment to the overall impact.

Conclusion. Long-term, negligible, adverse impacts would continue to occur in localized areas due to visitor use of the wilderness areas. There would also be long-term, beneficial impacts on some wildlife populations due to vegetation restoration efforts and the closure and restoration of roads and unofficial user-created trails in the wilderness areas.

When the beneficial and adverse impacts of alternative C are added to the impacts that have occurred in the wilderness areas, there would be a long-term, negligible to minor, adverse cumulative impact on the areas' wildlife populations and habitats. However, the actions in alternative C would contribute only a small long-term, beneficial increment and a very small long-term, adverse increment to this impact. None of the wildlife impacts resulting from alternative C would be expected to constitute an impairment of the wilderness areas' lands, resources, or values, and none would be considered unacceptable.

Threatened and Endangered Species

Analysis. In alternative C, human activity in the wilderness areas would be concentrated on official routes, in washes, and at particular points of interest. No actions in the alternative would be expected to affect the spotted bat and peregrine falcon populations and habitats in the wilderness areas.

Under alternative C—even with ongoing education efforts—a few visitors may rarely harass tortoises when they see them. However, in general, even if use levels slightly increase, continued dispersed visitor use of the wilderness areas would be expected to result in a long-term, negligible, adverse effect on desert tortoises in the wilderness areas. Likewise, increased visitation by hikers might result in the trampling of a few state listed Las Vegas bear poppy, threecorner milkvetch, and sticky buckwheat, but this is expected to have a long-term, negligible adverse effect on the populations in the areas.

In alternative C, some desert tortoises or other threatened and endangered species may be displaced or habitat may be damaged in local areas where disturbance would occur due to the creation and use of official designated routes. The development of officially designated routes would occur in areas that are not considered critical habitat or routes, and have already been disturbed by people; this would have a negligible, long-term, and localized adverse impact on the wilderness areas' desert tortoises or other threatened and endangered species and habitat. Given the previous disturbances to these species and their habitat, the long-term, adverse effects on the desert tortoise or other threatened and endangered species and habitat from the development and use of official routes and routes would be negligible to minor in localized areas.

Efforts to restore native vegetation communities would occur in alternative C. This effort could expand habitat for the desert tortoise or other threatened and endangered species and would have a long-term, beneficial impact on these species populations found in the wilderness areas. Likewise, the closure of unofficial user-created trails and the restoration of these areas would result in a reduction in human use, resulting in a reduction in species displacement. A reduction in human use would increase the availability of habitat for the desert tortoise or the threatened and endangered species that are sensitive to the presence of people, resulting in long-term, beneficial impacts to desert tortoise or other threatened and endangered species and habitat.

Under this alternative, three roads would be reduced in width and converted to horse and pack animal routes or hiking routes, and the native vegetation in these areas would be restored, increasing possible habitat for desert

tortoise or other threatened and endangered species. These actions would have long-term, beneficial impacts on the desert tortoise and other threatened and endangered species and habitat.

Development of new access points and the installation of information signs and kiosks would occur in areas that are not considered critical habitat, that have already been disturbed, and are located outside the wilderness boundary. The adverse impact on desert tortoise or other threatened and endangered species populations and habitats in these areas from the construction of parking areas, signs, and kiosks would be short term and negligible.

Also in this alternative, the development of a designated camping area along Boathouse Cove Road, adjacent to the Jimbilnan Wilderness, would displace desert tortoise or other threatened and endangered species or damage habitat adjacent to the wilderness area; this would result in a negligible to minor, long-term, localized adverse impact to the wilderness areas' desert tortoise or other threatened and endangered species and their habitat.

However, the development of such a designated camping area would reduce the displacement of desert tortoise or other threatened and endangered species and the damage to habitat from visitors camping within the wilderness area; this would result in a long-term, beneficial impact to desert tortoise or other threatened and endangered species.
Also in this alternative, the Lower Grapevine Canyon Road (Approved Road 13) adjacent to the Spirit Mountain Wilderness would be closed for resource protection, resulting in a long-term, beneficial impact to the desert tortoise or other threatened and endangered species and habitat.

As in all of the alternatives, some animals such as the desert tortoise or other threatened and endangered species would continue to occasionally be injured or killed by illegal off-highway vehicle use or become displaced from visitors creating unofficial routes through desert tortoise or other threatened and endangered species habitat. The overall adverse effects to threatened and endangered species from visitor activities in alternative C would be localized and negligible to minor.

Alternative C would also provide visitors only day use opportunities in the Spirit Mountain Wilderness. Compared to alternative B, this would result in long-term, beneficial impacts; however, overall, the desert tortoise or other threatened and endangered species and habitat could still be adversely affected by visitor use, resulting in negligible to minor, long-term, and localized adverse impacts to these species and habitat in this area.

In alternative C, the wilderness character would be restored at Tule Springs in the Ireteba Peaks Wilderness, resulting in long-term, beneficial impacts to the desert tortoise or other threatened and endangered species and habitat in this area.

Alternative C would move the trail register from the summit of Spirit Mountain to the access point. This could result in long-term, beneficial impacts to the desert tortoise or other threatened and endangered species and habitat in Spirit Mountain Wilderness area by allowing visitors to access the trail register from outside the wilderness rather than by hiking up to the summit.

Alternative C would implement the Volunteer Wilderness Stewardship Program to aid in the management of the wilderness areas. Volunteer wilderness stewards would be trained to monitor cultural and natural resources and visitor use in the areas. This program would result in an overall long-term, beneficial impact to the wilderness areas' natural resources, as it would assist park staff in monitoring efforts that the staff may not be able to provide on its own. This program would also provide important and timely feedback on resource conditions to park staff so they can implement mitigation measures

before the impacts have a greater effect on the resources.

The installation of informational signs and kiosks would also likely have a long-term, beneficial impact on wilderness area desert tortoise or other threatened and endangered species and habitat by educating visitors about the wilderness areas and the principles of Leave No Trace outdoor ethics.

Cumulative Effects. Threatened and endangered species' critical habitat in parts of the wilderness areas has been altered by past occupation by burros, development of user-created trails, and illegal off-highway vehicle use. Illegal off-highway vehicle use is expected to continue in several wilderness areas, such as Black Canyon and Eldorado, likely modifying and degrading desert tortoise habitat and resulting in the harassment or even loss of some tortoises, as well as the loss of some state-listed Las Vegas bear poppy, threecorner milkvetch, and sticky buckwheat. The loss and alteration of habitat due to future external actions including possible wildfires in the Spirit Mountain Wilderness would likely result in a long-term, negligible to minor, adverse impact on threatened and endangered species. External actions that have resulted in the loss of desert tortoise habitat and populations include urbanization, proliferation of roads, off-highway activity, grazing, habitat invasion by nonnative species, increased frequency of wildfires, placement of landfills and other waste disposal facilities, vandalism and collection of tortoises, disease, presence of environmental contaminants, predation by ravens and other species, and global climate change, among other factors (USFWS 2008).

On the other hand, continuing habitat restoration efforts in the wilderness areas would help protect tortoise habitat under alternative C, which would be a long-term, beneficial impact on the wilderness areas' desert tortoise as well as other state-listed species. When the potential adverse effects from increased visitation in the wilderness areas in alternative C are added to past actions, continuing illegal off-highway vehicle use, and future impacts external to the wilderness areas, there would be a long-term, negligible to minor, adverse cumulative impact on desert tortoise and other state threatened and endangered species in the wilderness areas. However, alternative C would contribute a very small increment to the overall cumulative impact.

Conclusion. Alternative C would have both adverse and beneficial impacts on the wilderness areas' threatened and endangered species populations and habitats. Most of these species populations and habitats in the wilderness areas would not change as a result of the actions in this alternative. No actions would affect areas known to be important for breeding, nesting, or foraging, or as key migration routes. No actions would interfere with feeding, reproduction, or other activities necessary for the survival of threatened and endangered species. Long-term, negligible, adverse impacts would continue to occur in localized areas due to continuing and increased visitor use of the wilderness areas. There also would be long-term, beneficial impacts on some threatened and endangered species populations due to vegetation restoration efforts, tortoise fencing, and the closure and restoration of unofficial user-created trails in the wilderness areas.

When the beneficial and adverse impacts of alternative C are added to the impacts that have occurred in the wilderness areas, there would be a long-term, negligible to minor, adverse cumulative impact on the areas' threatened and endangered species populations and habitats. However, the actions in alternative C would contribute only a small long-term, beneficial increment and a very small long-term, adverse increment to this impact. None of the threatened and endangered species impacts resulting from alternative C would be expected to constitute an impairment of the wilderness areas' lands, resources, or values. None of these impacts would be considered unacceptable.

Natural Soundscape

Analysis. The natural soundscapes in most portions of the wilderness areas would not be affected by the implementation of alternative C. The potential for increased visitor use and some continued illegal off-highway vehicle use would have negligible to minor, adverse impacts on the wilderness areas' natural soundscapes under this alternative. Also, in some of the wilderness areas, boating traffic can be heard from Lake Mead and Lake Mohave, resulting in negligible to minor, adverse impacts on the areas' natural soundscapes.

Alternative C would allow for the development of new official designated routes which would confine users and user noise to the official routes. This could result in increased disruption of the natural soundscape along those routes, as visitors would be encouraged to stay on the designated routes with other visitors rather than to seek individual routes through the development of user-created unofficial trails. This would result in a negligible to minor, short-term, adverse impact on the natural soundscape in the wilderness areas.

Efforts to restore native vegetation communities would occur in alternative B and may provide a buffer to noise that might occur within the wilderness areas. This effort would result in a long-term, beneficial impact on the natural soundscape in the wilderness areas. Likewise, the closure of unofficial user-created trails would result in more concentrated areas of visitor use, thus containing visitor noise to the newly designated official routes; this would result in long-term beneficial impacts to the natural soundscape.

Under this alternative, three roads would be reduced in width and converted to horse and pack animal routes or hiking route, cutting off illegal off-highway vehicle use and restoring the natural soundscape in these areas. These actions would have long-term, beneficial impacts on the wilderness areas' natural soundscape.

Development of new access points and the installation of information signs and kiosks would occur in areas that are located outside of the wilderness. The adverse impact on the natural soundscape in these areas from the construction of parking areas, signs, and kiosks would be short-term and negligible.

Also in this alternative, the development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would concentrate visitor noise adjacent to the wilderness area, resulting in a negligible to minor, long-term, and localized adverse impact to the wilderness areas' natural soundscape.

In this alternative, the development of a designated camping area along Boathouse Cove Road adjacent to the Jimbilnan Wilderness would better protect the natural soundscape within the wilderness area, as visitors would camp outside of the Jimbilnan Wilderness, thus resulting in a long-term beneficial impact on the natural soundscape.

Also in this alternative, the Lower Grapevine Canyon Road (Approved R 13) adjacent to the Spirit Mountain Wilderness would be closed for resource protection, resulting in long-term, beneficial impact on natural soundscapes from reduced illegal off-highway or other vehicle use.

The development of new routes in this alternative would concentrate visitor noise on these new routes, which could disrupt opportunities for solitude depending on the amount of use and distance between users on these routes. This would result in negligible to minor, short-term, adverse effects in localized areas on the natural soundscape from the development and use of official trails and routes.

Alternative C would also provide visitors only day use opportunities in the Spirit Mountain Wilderness. Compared to alternative B, this would result in long-term, beneficial impacts; however, overall, the natural soundscape

could still be degraded by visitor use, resulting in negligible to minor, short-term, and localized adverse impacts to the natural soundscape in this area.

Alternative C would move the trail register from the summit of Spirit Mountain to the access point. This could result in long-term, beneficial impacts to the natural soundscape in the Spirit Mountain Wilderness by allowing visitors to access the trail register from outside the wilderness area rather than by hiking up to the summit, which could have an adverse effect on the natural soundscape.

Monitoring sounds within the wilderness areas and from aircraft overflights would continue under alternative C; this may provide information regarding the impacts on the natural soundscapes that could be used to develop management actions to mitigate these impacts. Instituting and monitoring user capacity indicators and standards should help ensure that an unacceptable increase in disruption of the natural soundscape due to visitors does not occur in the wilderness areas. Limiting group size, especially in areas of high use and at points of interest, and reducing the occurrences of illegal off-highway vehicle use would result in long-term, beneficial impacts in the areas' natural soundscapes.

The installation of informational signs and kiosks also would likely have a long-term, beneficial impact on wilderness area natural soundscapes by educating visitors about the wilderness areas and the principles of Leave No Trace outdoor ethics.

Cumulative Effects. The natural soundscapes in the wilderness areas would likely continue to be impacted by aircraft overflights, continued illegal off-highway vehicle use, and restoration activities in localized areas. Also, in some of the wilderness areas, boating traffic can be heard from Lake Mead and Lake Mohave, resulting in negligible to minor, adverse impacts in the areas' natural soundscapes. There are planning efforts currently underway to develop two more local airports, and the overflights that would occur from the addition of these airports would have a moderate to major, adverse cumulative impact on the natural soundscape in the wilderness areas. When the effects of increased visitation in alternative C are added to the impacts from overflights, boat traffic, and management activities in the areas, there potentially could be a moderate to major, long-term cumulative impact on the natural soundscapes in some of the wilderness areas. However, alternative C would add a very small increment to the overall adverse cumulative impact.

Conclusion. Most of the wilderness areas' soundscapes would not be affected by the actions in alternative C. However, some natural soundscapes would be degraded due to increased visitor use in localized areas such as along routes, in washes, in high use areas such as Boy Scout Canyon, and in some wilderness areas where boating traffic on nearby lakes can be heard. These adverse impacts would likely be minor and short-term in extent. When the impacts inside the wilderness areas are added to past and foreseeable future impacts from increased visitation and the addition of two airports outside the wilderness boundary, there would be the potential for a long-term, moderate to major, adverse cumulative impact on the areas' natural soundscapes—although the actions in alternative C would add a very small increment to this overall impact.

Continuing efforts to monitor and establish a baseline for natural soundscapes in the wilderness areas, and developing and implementing mitigation measures would result in a negligible to minor, short-term, beneficial impact on the natural soundscapes in the wilderness areas. Also, instituting and monitoring user capacity indicators and standards that address group sizes, illegal off-highway vehicle use, and general noise disturbances would result in minor to moderate, beneficial impact on the natural soundscape in the wilderness areas. When the beneficial and adverse impacts of alternative C are added to the impacts that have occurred and external future actions that might affect

the wilderness areas, there would be a long-term, moderate to major, adverse cumulative impact on the areas' natural soundscapes. No impairment to the wilderness areas' lands, resources, and values would result from natural soundscape impacts in this alternative. None of these impacts would be considered unacceptable.

IMPACTS ON WILDERNESS CHARACTER

ALTERNATIVE A – NO ACTION

Apparent Naturalness

Under the no-action alternative, the wilderness areas would continue to appear natural. Old roads and other disturbances still existing from before wilderness designation would continue to be naturally obliterated. There would be no development such as marked routes or signs in the eight wilderness areas under this alternative. There would be no change to apparent naturalness resulting from this alternative.

Undeveloped

In this alternative, the wilderness areas would continue to be undeveloped. No new permanent improvements or human occupation would occur that would change the character of the area.

Untrammeled

The vast majority of the wilderness areas would remain untrammeled in this alternative. There would continue to be little to no notable NPS presence (in the form of regulations, infrastructure, management activity, or personnel) in the eight areas, with the exception of occasional ranger-led walks or infrequent backcountry ranger patrols. Activities that are nonconforming but allowed, such as wildfire suppression, exotic species control, and other resource management activities, would continue to occur and have a trammeling effect. This alternative would result in a continuation of some adverse effects from nonconforming uses, but would not result in any new impacts to the untrammeled nature of the wilderness areas.

Opportunities for Solitude

Nothing in this alternative would affect the outstanding opportunities for solitude currently available in the wilderness areas. The amount of visitor use would continue to be limited by 1) natural limitations of travel in the rugged backcountry, 2) the inhospitable summer climate, and 3) the existing lack of visitor amenities. In this alternative, these conditions would continue relatively unchanged. As a result, visitor numbers in the wilderness areas (outside of Grapevine Canyon and the Redstone interpretive trail) would continue to be quite low. There would be no effect on opportunities for solitude from implementing this alternative.

Opportunities for Primitive, Unconfined Recreation

Visitors would continue to have unrestricted access to and within the wilderness areas and to have opportunities for primitive (non-mechanized) activities such as hiking, backpacking, wildlife watching, photography, and canyoneering. Almost unlimited opportunities for primitive, unconfined recreation would continue. The beneficial effect of having ample opportunities for primitive, unconfined recreation would continue and there would be no new effect on these opportunities as a result of implementing the no-action alternative.

Cumulative Effects

Land development related to the fast-growing population of the Southern Nevada region is quickly reducing the availability of the once open and seemingly empty desert areas in the region. Areas with wilderness designations are legally protected from development in perpetuity. The remaining naturalness and untrammeled character of these undeveloped areas is likely to increase in importance as the surrounding lands are taken over by commercial, industrial, and residential expansion. These protected natural areas provide a long-term beneficial impact that can be described in tangible and intangible terms.

Opportunities for people to find solitude and to enjoy primitive, unconfined recreation can be found in the eighteen designated wilderness areas in Clark County managed by the BLM, the Forest Service, and the National Park Service, including the eight wilderness areas considered in this plan. Opportunities and locations for wilderness experiences are numerous in the region – a long-term beneficial impact for residents and visitors.

The no-action alternative would have no contribution to the effects of other past, present, and future actions and so there would be no cumulative effects on wilderness character.

Conclusion

Implementing the no-action alternative would have no effect on wilderness character, including apparent naturalness, undeveloped character, opportunities for solitude, or primitive and unconfined recreation. No impairment to wilderness character would result from alternative A, and none of the impacts would be considered unacceptable. Because this alternative would have no impact, there would be no project-related cumulative effects.

ALTERNATIVE B – PREFERRED ALTERNATIVE

Apparent Naturalness

Under the preferred alternative, the wilderness areas would continue to appear to most visitors as largely natural. One old road in Pinto Valley would be converted to a route, while other roads and disturbance remaining from before wilderness designation would continue to be naturally obliterated. Access points would be formalized and information and interpretation signs or kiosks would be installed; however, these would be outside the wilderness boundaries and so would not affect the naturalness within. There would be a marked route to the top of Hamblin Peak in Pinto Valley that would reduce the impact of visitor-created trails, resulting in a negligible, beneficial impact. There would be no such marked route on Spirit Mountain and so the network of visitor-created trails currently marring the sides of the peak would continue.

A slight increase in NPS presence in the form of additional infrastructure, management activity, and personnel (staff or volunteers) in five of the eight areas would result in long-term, negligible, adverse impacts.

Under this alternative, there would be no development or change in management of three wilderness areas—Jimbilnan, Ireteba Peaks, and Nellis Wash. Existing apparent naturalness would be preserved in these three areas.

Efforts would be made to improve naturalness; these efforts would include the restoration of Tule Springs, the removal of climbing bolts in Bridge Canyon, and the closing of three roads to vehicles and conversion of the roads to routes (two in Spirit Mountain and one in Bridge Canyon). Implementing the user capacity strategy described in the alternatives chapter of this plan would involve monitoring resources to determine if unacceptable impacts are occurring from visitor use as defined in the user capacity section of this plan. If so, actions would be taken to address the cause of the impacts. These efforts would have long-term, minor, beneficial impacts on naturalness in the planning area.

Overall, the long-term impacts to apparent naturalness would be negligible to minor and beneficial.

Undeveloped

In this alternative, the wilderness areas would continue to be undeveloped. No new permanent improvements or human occupation would occur that would change the character of the area. Thus, alternative B would have no effect on the undeveloped character of the areas.

Untrammeled

The vast majority of wilderness would remain untrammeled in this alternative. Activities that are nonconforming but allowed, such as wildfire suppression, exotic species control, environmental restoration, and other resource management actions, would occur and have a trammeling effect. Since these activities would most likely continue at the same level as in the no-action alternative, there would be no new impact from this alternative.

Opportunities for Solitude

This alternative would potentially affect the opportunities for solitude in the wilderness areas. Opportunities for solitude would continue to be somewhat less at the more popular destinations such as Hamblin Peak, Boy Scout Canyon, Spirit Mountain, Redstone, and Grapevine Canyon. The level of visitor use would most likely increase in the five wilderness areas that receive improved access and information. This increased use would be concentrated at access points and on marked routes to destinations, which could adversely affect some visitors' wilderness experience. This is not anticipated to be a concern except for a few busy weekends per year, and there would be ample opportunities for solitude outside of these concentration points. Implementing the user capacity strategy described in the alternatives chapter of this plan would involve monitoring the level of visitor use to determine if unacceptable impacts, such as crowding, are occurring. If so, actions such as limiting or dispersing use would be taken to reduce the level of effect. Thus, the adverse impacts would be long term but negligible.

Visitor numbers in the Jimbilnan, Ireteba Peaks, and Nellis Wash wilderness areas would continue to be quite low, preserving outstanding opportunities for solitude.

Opportunities for Primitive, Unconfined Recreation

Although encouraged to use designated access points and marked routes, visitors would have generally unrestricted access to and within the wilderness areas for primitive (non-mechanized) activities such as hiking, backpacking, wildlife watching, photography, and canyoneering. Horse use would be allowed on some routes. Hunting would still be allowed according to state regulations. Exceptional opportunities for primitive and unconfined recreation would be available under this alternative, resulting in long-term, negligible, beneficial impacts.

Cumulative Effects

Land development related to the fast-growing population of the Southern Nevada region is quickly reducing the availability of the once open and seemingly empty desert areas in the region. Areas with wilderness designations are legally protected from development in perpetuity. The remaining naturalness of these undeveloped areas is likely to increase in importance as the surrounding lands are taken over by commercial, industrial, and residential expansion. These protected natural areas provide long-term, beneficial impacts that can be described in tangible and intangible terms.

Opportunities for people to find solitude and enjoy primitive, unconfined recreation can be found in the twenty-two designated wilderness areas in Clark County managed by BLM, the Forest Service, and the National Park Service, including the eight wilderness areas considered in this plan. Opportunities and locations for wilderness experiences are numerous in the region—resulting in a long-term, beneficial impact for residents and visitors.

Alternative B would have a slight beneficial contribution to the overall beneficial effects of other past, present, and future actions resulting in cumulative effects on wilderness character that would be minor and beneficial.

Conclusion

Implementing alternative B would not affect the undeveloped character of the wilderness areas; it would have long-term, negligible to minor, beneficial impacts to naturalness; a long-term ,negligible, adverse impact to

untrammeled character; long-term, negligible, adverse impacts to opportunities for solitude; and long-term, negligible, beneficial impacts to primitive and unconfined recreation. None of these impacts would result in impairment of park resources and values, including wilderness character, and none of the impacts would be considered unacceptable. Cumulative effects on wilderness character would be minor and beneficial.

ALTERNATIVE C

Apparent Naturalness

Under alternative C, the wilderness areas would continue to appear to most visitors as largely natural. One old road in Pinto Valley would be converted to a route, while other roads and disturbances remaining from before wilderness designation would be naturally or actively obliterated. Several access points would be formalized and information and interpretation signs or kiosks would be installed (more than in alternative B), but these would be placed outside the wilderness boundaries and so would not affect the naturalness within. One or two routes on Hamblin Peak in Pinto Valley and two routes to the top of Spirit Mountain would be marked to reduce the impact of visitor-created trails, resulting in a negligible, beneficial impact.

Efforts would be made to improve naturalness; these efforts would include the restoration of Tule Springs, the removal of climbing bolts in Bridge Canyon, and the closing of three roads to vehicles and conversion of the roads to routes (two in Spirit Mountain and one in Bridge Canyon). Implementing the user capacity strategy described in the alternatives chapter of this plan would involve monitoring resources to determine if unacceptable impacts are occurring from visitor use. If so, actions would be taken to address the cause of the impacts. These efforts would have long-term, minor, beneficial impacts on naturalness in the planning area.

A slight increase in NPS presence in the form of additional infrastructure, management activity, and personnel (staff or volunteers) in the eight areas would result in a long-term, negligible, adverse impact to apparent naturalness.

Overall, the long-term impacts to apparent naturalness would be negligible and beneficial.

Undeveloped

In this alternative, the wilderness areas would continue to be undeveloped. No new permanent improvements or human occupation would occur that would change the character of the area. Thus, alternative C would have no effect on the undeveloped character of the wilderness areas.

Untrammeled

While the majority of wilderness would remain untrammeled in this alternative, Activities that are nonconforming but allowed, such as wildfire suppression, exotic species control, environmental restoration, and other resource management actions, would occur and have a trammeling effect. Since these activities would most likely continue at the same level as in the no-action alternative, there would be no impact.

Opportunities for Solitude

This alternative would affect the opportunities for solitude in the wilderness areas. Opportunities for solitude would continue to be somewhat less at the more popular destinations such as Hamblin Peak, Boy Scout Canyon, Spirit Mountain, Redstone, and Grapevine Canyon. Implementing this alternative would most likely increase the level of use over current levels in all wilderness areas due to the increased access and information. This increased use would be concentrated at access points and on marked routes to destinations, which could adversely impact visitors' opportunities for solitude. Use levels at concentration points would vary by time of year and day of the week and opportunities for solitude would be available away from these concentration points.

Implementing the user capacity strategy described in the alternatives chapter of this plan would involve monitoring the level of visitor use to determine if unacceptable impacts, such as crowding, are occurring. If so, actions would be taken to reduce the cause of the impacts. The impacts of this alternative would be long term, minor, and adverse.

Opportunities for Primitive, Unconfined Recreation

Under this alternative, visitors could participate in primitive (non-mechanized) activities such as hiking, backpacking, wildlife watching, photography, and canyoneering without having to obtain permits. Hunting would continue to be allowed and regulated by the state. Horse use would be allowed on some routes.

Increased information and access would improve opportunities for primitive and unconfined recreation under this alternative, resulting in a long-term, negligible to minor, beneficial impact. With the additional designated access points and designated routes, visitors may feel restricted to these areas and inhibited from venturing into other areas of the wildernesses. This may cause a long-term, negligible, adverse impact for some visitors.

Cumulative Effects

Land development related to the fast-growing population of the Southern Nevada region is quickly reducing the availability of the once open and seemingly empty desert areas in the region. Areas with wilderness designations are legally protected from development in perpetuity. The remaining naturalness of these undeveloped areas is likely to increase in importance as the surrounding lands are taken over by commercial, industrial, and residential expansion. These protected natural areas provide long-term tangible and intangible beneficial impacts.

Opportunities for people to find solitude and enjoy primitive, unconfined recreation can be found in the eighteen designated wilderness areas in Clark County managed by the BLM, the Forest Service, and the National Park Service, including the eight wilderness areas considered in this plan. Opportunities and locations for wilderness experiences are numerous in the region – resulting in a long-term, beneficial impact to residents and visitors.

Alternative C would have a modest beneficial contribution to the overall beneficial effects of other past, present, and future actions and so cumulative effects on wilderness character would be minor and beneficial.

Conclusion

Implementing alternative C would not affect the undeveloped character of the wilderness areas; it would have long-term, negligible, beneficial impacts to naturalness; a long-term, negligible, adverse impact to untrammeled character; long-term, minor, adverse impacts to opportunities for solitude; and long-term, negligible, beneficial and adverse impacts to primitive and unconfined recreation. None of these impacts would result in impairment of park resources and values, including wilderness character, and none of the impacts would be considered unacceptable. Cumulative effects on wilderness character would be minor and beneficial.

IMPACTS ON CULTURAL RESOURCES

ALTERNATIVE A – NO ACTION

Archeological Resources

Visitation levels would remain unchanged but visitation could impact archeological sites. Archeological sites adjacent to or easily accessible from visitor use areas or routes would continue to be vulnerable to inadvertent damage and vandalism, resulting in a loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence. Continued ranger patrols and an emphasis on visitor education regarding the significance and fragility of such resources and how visitors can reduce their impacts to them, would discourage vandalism and inadvertent impacts and minimize adverse impacts. Any adverse impacts could be mitigated through stabilization of the sites and the elimination of user-created trails to disturbed or vulnerable sites. Implementation of the no action alternative would result in negligible to minor, long-term or permanent adverse impacts to archeological resources.

No archeological resources would be altered due to development since no development of new facilities is included in alternative A. Cultural resource management would continue without change under alternative A. The survey of archeological and historic resources would continue, along with the protection of historic structures according to existing NPS guidelines and standards. Under alternative A, visitor access to the wilderness areas would continue to be dispersed with no officially designated routes, and illegal off-highway vehicle use possibly would continue with no additional signage posted on the wilderness boundary, potentially resulting in adverse impacts to archeological sites.

Archeological site monitoring would continue as in the past with an emphasis on the prevention of deterioration and the maintenance of sites in good condition. Sites eligible for listing or currently listed in the National Register of Historic Places would continue to be preserved and stabilized in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995).

Cumulative Effects. Archeological sites could be disturbed, exposed, or otherwise impacted by human activity represented at current use levels. It is likely that the no-action alternative would not contribute to the effects of other past, present, and future actions and so there would be no discernable cumulative effects on archeological resources.

Conclusion. In alternative A, there would be some long-term indirect negligible to minor adverse impacts on the wilderness areas' archeological sites as current practices continue and visitation remains light. There would be no unacceptable impacts to archeological resources under alternative A, and none of the impacts would result in impairment of the national recreation area's resources. There would be no adverse effect under section 106 of the National Historic Preservation Act for archeological sites in the various wilderness areas.

Ethnographic Resources

Affiliated American Indian tribes have expressed their discomfort with the presence of visitors at Spirit Mountain. Native Americans desiring privacy for religious activities would be disrupted occasionally by the presence of hikers at Spirit Mountain. Impacts to ethnographic resources currently come from continued and possible increasing visitation. The presence of visitors at a traditional cultural property potentially alters traditional use and practice. At the present time, impacts are currently negligible to minor; however, with increased visitation the impact, especially in the vicinity of Spirit

Mountain, could be long term and moderately adverse.

Ethnographic resources would be protected by existing laws and policies, including the American Indian Religious Freedom Act, the Native American Graves Protection Act, §110 (sacred sites) of the National Historic Preservation Act, Executive Order 13007, and NPS *Management Policies 2006*, and thus would not likely be adversely affected under alternative A.

Cumulative Effects. No past, ongoing, or reasonably foreseeable future actions by others would be expected to combine with the actions proposed in the no action alternative to have a cumulative impact on ethnographic resources.

Conclusion. Alternative A would have some adverse impacts on the wilderness areas' only traditional cultural property, Spirit Mountain—located in the Spirit Mountain Wilderness. Continued use of the area without instituting some controls on visitor use through the establishment of designated trailheads and signs may result in continuing negligible to minor adverse impacts as visitation remains light. There would be no unacceptable impacts to ethnographic resources under alternative A, and none of the impacts would result in impairment of the national recreation area's resources. A negligible to minor adverse impact would constitute no adverse effect under §106. However, if a moderate adverse impact is noted, the determination of effect on this national register-listed property for §106 requirements would be an adverse effect.

ALTERNATIVE B – PREFERRED ALTERNATIVE

Alternatives B and C would both implement the Volunteer Wilderness Stewardship Program to aid in the management of the wilderness areas. Volunteer wilderness stewards would be trained to monitor cultural and natural resources and visitor use in the areas. This program would result in an overall beneficial impact to the wilderness areas' cultural resources, as it would assist park staff by having stewards focus on monitoring efforts that park staff may not be able to provide on their own. This program would also provide important and timely feedback on resource conditions to park staff so they can implement mitigation measures before the impacts have a greater effect on the resources.

Archeological Resources

Archeological site monitoring would continue as in the past with an emphasis on the prevention of deterioration and the maintenance of sites in good condition. Sites eligible for listing or currently listed in the National Register of Historic Places would continue to be preserved and stabilized in accordance with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (1995). The impacts described below would be true for all wilderness areas under alternative B.

As appropriate, archeological surveys and/or monitoring would precede any ground disturbance, and any archeological resources located near or in areas where new access points, parking areas, and trailheads would be established would be avoided. Ground disturbance would be limited to areas void of archeological sites. The creation of new access points, including trailheads and parking areas, and the installation of information kiosks would also occur outside of the wilderness boundary or in areas that have been previously disturbed. No adverse effects would be anticipated.

Instituting and monitoring user capacity indicators and standards would help ensure that an unacceptable increase in disturbance levels, as defined by the Southern Nevada Agency Partnership (SNAP) Cultural Site Program, and in the number of incidences of graffiti on rock art and other archeological sites does not occur in the wilderness areas. Compared to the no-action alternative, this alternative would result in beneficial impacts

to archeological resources through better monitoring and condition assessment.

Providing visitors information about the significance and fragility of archeological resources, and how visitors can reduce impacts to them, would discourage vandalism and inadvertent impacts and minimize adverse impacts. Any adverse impacts would be negligible to minor and permanent.

In alternative B, where new wilderness access points are established, there likely would be an increase in visitor use; however, there would be a related reduction in the potential for visitors accessing the wilderness area from random points near archeological sites that might be impacted. Directing visitor entry to designated locations that have been cleared for use would lessen the potential for visitor impacts to archeological sites adjacent to or easily accessible from visitor use areas or routes. Any adverse impacts would be negligible to minor and permanent.

Cumulative Effects. Increased visitation resulting from growing populations in adjacent areas in conjunction with actions proposed in alternative B could lead to increased disturbance of archeological sites through the direction of use to formalized trailheads.

Conclusion. Overall, there would be a potential negligible to minor adverse impact from actions proposed in alternative B. Most of the wilderness areas' archeological resources would not be affected by the actions in alternative B. With the creation of designated routes and increased visitor use in localized areas such as along routes, in washes, and at specific points of interest, there may be some minor adverse impacts to archeological sites from trampling or vandalism. Overall, these adverse impacts would likely be minor, although permanent. On the other hand, establishing and monitoring user capacity indicators and standards should help prevent any moderate adverse impacts to archeological sites and instead, could have a beneficial impact through increased preservation and monitoring. There would be no unacceptable impacts to archeological resources under alternative B. None of the impacts would be sufficient to result in impairment of the national recreation area's resources. Under §106, the determination of effect would be no adverse effect for the negligible to minor impacts.

Because alternative B would have no adverse effects, it would not contribute to the adverse cumulative effects described above.

Ethnographic Resources

Ethnographic resources in the wilderness areas would not be altered by alternative B; however, with increased visitation there may be some negligible to minor adverse impacts that would not impact its listing in the national register. Ethnographic resources would be protected by existing laws and policies, including the American Indian Religious Freedom Act, the Native American Graves Protection Act, §110 (sacred sites) of the National Historic Preservation Act, Executive Order 13007, and NPS *Management Policies 2006*, and thus would not likely be adversely affected under alternative B.

The only traditional cultural property within any of the wilderness areas covered by this environmental assessment is located within the Spirit Mountain Wilderness. The popularity of hiking on Spirit Mountain is likely to increase in the future. In this alternative, only day use would be permitted, and two designated routes up Spirit Mountain would be established and maintained. Existing user-created trails to the summit would be removed and the landscape restored. These activities and the related increased visitor use would cause potential negligible to minor long term adverse impacts under alternative B.

As with other wilderness areas, informational signs and kiosks would be placed in various locations such as at trailheads, access points, and parking areas outside of the wilderness boundary to educate users about the wilderness area and Leave No Trace outdoor ethics. Visitors would increase their

understanding and appreciation for ethnographic resources in the wilderness area. This would help minimize adverse impacts from visitor use, resulting in overall beneficial impacts on this ethnographic resource.

Cumulative Effects. Increased visitor use in wilderness areas have had and would continue to have minor long-term adverse cumulative impacts on ethnographic resources. The negligible to minor long-term adverse impacts of alternative B, in combination with the minor to moderate cumulative adverse impacts of increasing visitation would result in potentially moderate adverse cumulative impacts.

Conclusion. Alternative B would have some negligible to minor long-term adverse impacts on the wilderness areas' only traditional cultural property, Spirit Mountain, located in the Spirit Mountain Wilderness. A negligible to minor adverse impact would be considered a no adverse effect under §106. However, if a moderate adverse impact is noted, the determination of effect on this national register – listed property for §106 would be an adverse effect. Implementation of alternative B would result in negligible to minor, long-term adverse effects to ethnographic resources. There would be no unacceptable impacts to ethnographic resources under alternative B. None of the impacts would result in impairment of the national recreation area's resources. The determination of effect for §106 requirements would be no adverse effect.

ALTERNATIVE C

Alternatives B and C would both implement the Volunteer Wilderness Stewardship Program to aid in the management of the wilderness areas. Volunteer wilderness stewards will be trained to monitor cultural and natural resources and visitor use in the areas. This program would result in an overall beneficial impact to the wilderness areas' cultural resources, as it would assist park staff by having stewards focus on monitoring efforts that park staff may not be able to provide on their own. This program would also provide important and timely feedback on resource conditions to park staff so they can implement mitigation measures before the impacts have a greater effect on the resources.

Archeological Resources

Archeological site monitoring would continue as in the past with an emphasis on the prevention of deterioration and the maintenance of sites in good condition. Sites eligible for listing or currently listed in the National Register of Historic Places would continue to be preserved and stabilized in accordance with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (1995). The impacts described below would be true for all wilderness areas under alternative C.

As appropriate, archeological surveys and/or monitoring would precede any ground disturbance, and any archeological resources located near or in areas where new access points, parking areas, and trailheads would be established would be avoided. Ground disturbance would be limited to areas void of archeological sites. The creation of new access points, including trailheads, and parking areas, and the installation of information kiosks would occur outside of the wilderness boundary or in areas that have been previously disturbed or would be located outside of the wilderness boundary. No adverse effects would be anticipated.

Instituting and monitoring user capacity indicators and standards would help ensure that an unacceptable increase in disturbance levels, as defined by the Southern Nevada Agency Partnership (SNAP) Cultural Site Program, and in the number of incidences of graffiti on rock art and other archeological sites does not occur in the wilderness areas. Compared to the no action alternative, this alternative would result in beneficial impacts to archeological sites through better monitoring and condition assessment.

Providing visitors information about the significance and fragility of archeological resources, and how visitors can reduce impacts to them, would discourage vandalism and inadvertent impacts and minimize adverse impacts. Any adverse impacts would be negligible to minor and permanent.
In alternative C, where new wilderness access points are established, there likely would be an increase in visitor use; however, there would be a related reduction in the potential for visitors accessing the wilderness area from random points near archeological sites that might be impacted. Directing visitors to entry sites that had been cleared for use would lessen the potential for visitor impacts to archeological sites adjacent to or easily accessible from visitor use areas or routes. Any adverse impacts would be negligible to minor and permanent.

Cumulative Effects. Increased visitation resulting from growing populations in adjacent areas in conjunction with actions proposed in alternative B could lead to increased disturbance of archeological sites through the direction of use to formalized trailheads.

Conclusion. The creation of designated routes and increased visitor use in localized areas such as along routes, in washes, and at specific points of interest, would create some negligible to minor adverse impacts to archeological sites due to trampling or vandalism; however, most of these impacts would likely be avoidable. If they occur, these adverse impacts likely would be negligible to minor, although long term. Additionally, establishing and monitoring user capacity indicators and standards should help prevent any moderate adverse impacts to archeological sites and instead could have a moderate beneficial impact through increased preservation and monitoring. There would be no unacceptable impacts to archeological resources under alternative C. None of the impacts would result in impairment of the national recreation area's resources. Under §106, the determination of effect would be no adverse effect for the negligible to minor impacts.

Ethnographic Resources

Ethnographic resources would be protected by existing laws and policies, including the American Indian Religious Freedom Act, the Native American Graves Protection Act, §110 (sacred sites) of the National Historic Preservation Act, Executive Order 13007, and NPS *Management Policies 2006*, and thus would not likely be adversely affected under alternative C.

The only traditional cultural property within any of the wilderness areas covered by this environmental assessment is located within the Spirit Mountain Wilderness. The popularity of hiking on Spirit Mountain is likely to increase in the future. In this alternative, only day use would continue to be permitted, and two designated routes up Spirit Mountain would be established and maintained. Existing user-created routes to the summit would be removed and the landscape restored. These activities and the related increased visitor use would cause potential negligible to minor long term adverse impacts under alternative C.

As with other wilderness areas, informational signs and kiosks would be placed in various locations such as at trailheads, access points, and parking areas outside of the wilderness boundary to educate users about the wilderness area and Leave No Trace outdoor ethics. This would help minimize adverse impacts from visitor use, resulting in overall beneficial impacts on this ethnographic resource.

Cumulative Effects. Increased visitor use in wilderness areas have had and would continue to have minor long-term adverse cumulative impacts on ethnographic resources. The negligible to minor long-term adverse impacts of alternative C, in combination with the minor to moderate cumulative adverse impacts of increasing visitation would result in potentially moderate adverse cumulative impacts.

Conclusion. Alternative C would have some adverse negligible to minor long-term impacts on the wilderness areas' only traditional cultural property, Spirit Mountain—located in the Spirit Mountain Wilderness. A negligible to minor adverse impact would be a no adverse effect under §106. However, if a moderate adverse impact is noted, the determination of effect on this national register – listed property for §106 would be an adverse effect. It is likely that directed use in the Spirit Mountain Wilderness would serve to keep impacts in the negligible to minor range. Implementation of alternative C would result in negligible to minor, long-term adverse effects to ethnographic resources. There would be no unacceptable impacts to ethnographic resources under alternative C. None of the impacts would result in impairment of the national recreation area's resources. The determination of effect for §106 requirements would be no adverse effect.

IMPACTS ON VISITOR USE AND EXPERIENCE

ALTERNATIVE A – NO ACTION

Analysis

Use of the wilderness areas generally would continue to be limited by 1) natural limitations of travel in the rugged backcountry, 2) the inhospitable summer climate, and 3) the existing lack of development such as marked routes and trailheads. In this alternative, these conditions would continue relatively unchanged and little effort would be expended by the agencies on orienting, informing, or educating the public about the wilderness areas. As a result, visitor numbers in the wilderness areas (outside of Grapevine Canyon) would continue to be quite low.

Visitors would continue to have unrestricted access to the wilderness areas and have opportunities for nonmotorized activities such as hiking, backpacking, nature study, photography, canyoneering, hunting, and attending occasional ranger-led walks under this alternative. There would also continue to be no restrictions on group size or the taking of pets in the wilderness areas. This alternative would result in a continuation of current long-term, minor, beneficial impacts on visitor experience.

The wildernesses' rugged nature and lack of formally marked trails or access points would continue to inhibit use by some visitors. Those visitors who enter the wilderness with a lack of information and navigation skills could have negative experiences when they are unable to reach their intended destination or get lost in these areas; this would result in a continuing short-term, minor to moderate, adverse impact for some visitors' quality of experience.

On the other hand, visitors who enter these areas fully prepared (e.g., map, compass, GPS, survival gear) may have a great wilderness experience because of the lack of managerial presence. Almost unlimited opportunities for solitude and primitive, unconfined recreation would continue—creating a long-term minor beneficial impact.

Cumulative Effects

The fast-growing population of the southern Nevada region and related development pressures are recognized by local, regional, state, and federal entities as major concerns affecting the region's environmental, economic, and community values.

Regardless of growth issues, there are many opportunities for people to participate in outdoor recreation in southern Nevada. In addition to Lake Mead National Recreation area, there is the Red Rock Canyon National Conservation Area just west of Las Vegas, Mount Charleston in Humboldt-Toiyabe National Forest within an hour's drive, and thousands of acres of open public land managed by the Bureau of Land Management (BLM). There are ten designated wilderness areas in Clark County managed by the BLM and the Forest Service, in addition to the eight wilderness areas considered in this plan. Thus, opportunities and locations for outdoor recreation and wilderness experiences are numerous in the region—creating a long-term, beneficial impact for residents and visitors.

Hiking has remained one of the most popular outdoor activities. Participation in hiking is relatively stable with close to a third of Americans aged 16 and older participating in the activity. In Nevada, just over 50% of the population participated in a trail-related activity in 2007 (Outdoor Industry Foundation 2007), so the presence of opportunities for outdoor recreation, specifically hiking, creates a long-term beneficial impact for residents and visitors. However, overall trends in outdoor recreation indicate that the number of people recreating in the outdoors has been relatively flat since

1997 (Outdoor Industry Foundation 2006). The visitation numbers for Lake Mead National Recreation Area have declined since 1995.

The no-action alternative would have no new contribution to the effects of other past, present, and future actions, so there would be no cumulative effects on visitor use and experience.

Conclusion

Implementing the no-action alternative would result in the continuation of adverse and beneficial impacts to visitor use of the wilderness areas. This alternative would not change how visitors use the areas and would have no effect on the number of visitors; therefore, this alternative would have no new impact on visitor use or experience. Because this alternative would have no impact, there would be no project-related cumulative impact.

ALTERNATIVE B – PREFERRED ALTERNATIVE

Analysis

Alternative B would provide improved opportunities for visitors to access most of the wilderness areas when compared to alternative A. Additional developments such as marked routes, trailheads, and signs at a few locations in Pinto Valley, Black Canyon, Eldorado, Spirit Mountain, and Bridge Canyon wilderness areas would allow easier access for persons with all levels of wilderness experience. Orientation information provided at visitor contact stations and on-site kiosks would allow visitors to choose the type of wilderness experience that meets their skill set and time constraints. This would result in a long-term, minor, beneficial impact to the visitor experience. These actions also would likely increase the number of visitors and concentrate visitor use at access points and designated routes, which could adversely affect some visitors' wilderness experience. However, this is not expected to be a concern except for during a few busy weekends per year, and there would be many opportunities for solitude outside of these areas of concentrated use. Thus, the adverse impacts of these actions would be long term but negligible.

Visitors would have somewhat improved access to five of the wilderness areas and have opportunities for appropriate nonmotorized activities such as hiking, backpacking, nature study, photography, canyoneering, hunting, and occasional ranger-led walks under this alternative. A route in Pinto Valley would be maintained for horseback or pack stock use to provide opportunities for this type of visitor use.

Under this alternative, there would be a maximum group size limit imposed to provide quality visitor experiences and resource protection. Implementing the user capacity strategy described in the alternatives chapter of this plan would involve monitoring the level of visitor use to determine if unacceptable impacts, such as crowding, are occurring. If so, actions—such as limiting or dispersing use—would be taken to reduce the level of effect. This would result in a beneficial impact to visitor experience because it would prevent crowding at destination points that might occur under the no-action alternative. On the other hand, such actions would result in an adverse impact on visitors who might have to change their plans. Because the need for such actions is not expected to occur very often, the level of impact (both beneficial and adverse) is expected to be negligible.

For resource protection reasons, there would be a prohibition on taking pets into wilderness; this would result in long-term, negligible adverse impacts on some visitors.

Under the preferred alternative, no actions would be taken to improve access into Jimbilnan, Ireteba Peaks, and Nellis Wash wildernesses. Thus, visitor use in these areas would most likely remain quite low, and outstanding opportunities for solitude would be maintained as in alternative A. This would

continue a long-term, beneficial impact for those visitors seeking this type of experience.

Cumulative Effects

The fast-growing population of the Southern Nevada region and related development pressures are recognized by local, regional, state, and federal entities as major concerns affecting the region's environmental, economic, and community values. Areas that are designated as wilderness are legally protected from development in perpetuity. These undeveloped areas are likely to increase in importance as the surrounding lands are taken over by commercial, industrial, and residential expansion. The beneficial impact or value of wilderness can be measured in experiential, scientific, and spiritual terms.

There are many opportunities for people to participate in outdoor recreation in southern Nevada. In addition to Lake Mead National Recreation Area, there is Red Rock Canyon National Conservation Area just west of Las Vegas, Mount Charleston in Humboldt-Toiyabe National Forest within an hour's drive, and thousands of acres of open public land managed by the Bureau of Land Management (BLM). There are ten designated wilderness areas in Clark County managed by the BLM and the Forest Service, in addition to the eight wilderness areas considered in this plan. Opportunities and locations for outdoor recreation and wilderness experiences are numerous in the region—creating a long-term, beneficial impact for residents and visitors.

Hiking has remained one of the most popular outdoor activities. Participation in hiking is relatively stable with close to a third of Americans aged 16 and older participating in the activity. In Nevada, just over 50% of the population participated in a trail-related activity in 2007 (Outdoor Industry Foundation 2007), so the presence of opportunities for outdoor recreation, specifically hiking, results in a long-term, minor to moderate, beneficial impact for residents and visitors. However, overall trends in outdoor recreation indicate that the number of people recreating in the outdoors has been relatively flat since 1997 (Outdoor Industry Foundation 2006). The visitation numbers for Lake Mead National Recreation Area have been declining since 1995.

Alternative B would have a slight beneficial contribution to the overall beneficial effects of other past, present, and future actions, so cumulative effects on visitor use and experience would be minor to moderate and beneficial.

Conclusion

Implementing the preferred alternative would change how visitors use the areas and could increase the number of visitors, which would have a long-term, negligible to minor beneficial impact and a long-term, negligible adverse impact on visitor use or experience. The overall cumulative effects associated with this alternative would be minor to moderate and beneficial.

ALTERNATIVE C

Analysis

Alternative C would provide more opportunities for visitors to access the wilderness areas when compared to alternatives A or B. Additional development such as marked routes, trailheads, and signs would be placed in several locations throughout all the wilderness areas. This would allow easier access to persons with all levels of wilderness experience. Orientation information provided at visitor contact stations and on-site kiosks would allow visitors to choose the type of wilderness experience that meets their skill set and time restraints. This would result in a long-term, minor, beneficial impact to visitor experience.

The addition of these developments would likely increase visitation, and use would be more concentrated at access points and designated routes which could adversely impact some visitors' wilderness experience and opportunities for solitude. This relative crowding likely would not occur most days of the

year and there would be many opportunities for solitude away from these concentrated areas. Thus, the adverse impacts of these actions would be long term and negligible to minor.

Visitors would have greatly improved access to the wilderness areas and would have opportunities for appropriate nonmotorized activities such as hiking, backpacking, nature study, photography, canyoneering, hunting, and occasional ranger-led walks under this alternative. A route in Pinto Valley would be maintained for horseback and pack stock use to provide opportunities for this type of visitor.

Under this alternative, there would be a maximum group size limit imposed to provide quality visitor experiences and resource protection. Implementing the user capacity strategy described in the "Management Alternatives" section of this plan would involve monitoring the level of visitor use to determine if unacceptable impacts, such as crowding, are occurring. If so, actions—such as limiting or dispersing use—would be taken to reduce the level of effect. Such actions would result in a beneficial impact to visitor experience because they would prevent crowding at destination points that might occur under the no-action alternative. On the other hand, such actions would create an adverse impact on visitors who might have to change their plans. Because the need for such action is not expected to occur very often, the level of impact (both beneficial and adverse) is expected to be negligible.

For resource protection reasons, there would be a prohibition on taking pets into a wilderness, which would result in long-term, negligible adverse impacts on some visitors.

Cumulative Effects

The fast-growing population of the southern Nevada region and related development pressures are being recognized by local, regional, state, and federal entities as major concerns affecting the region's environmental, economic, and community values. Areas with wilderness designations are legally protected from development in perpetuity. These undeveloped areas are likely to increase in importance as the surrounding lands are taken over by commercial, industrial, and residential expansion. The beneficial impact or value of wilderness can be measured in experiential, scientific, and spiritual terms.

There are many opportunities for people to participate in outdoor recreation in southern Nevada. In addition to Lake Mead National Recreation Area, there is Red Rock Canyon National Conservation Area just west of Las Vegas, Mount Charleston in Humboldt-Toiyabe National Forest within an hour's drive, and thousands of acres of open public land managed by the Bureau of Land Management (BLM). There are several designated wilderness areas in Clark County managed by BLM and the Forest Service in addition to the eight wilderness areas considered in this plan. Opportunities and locations for outdoor recreation and wilderness experiences are numerous in the region—resulting in a long-term beneficial impact for residents and visitors.

Hiking has remained one of the most popular outdoor activities. Participation in hiking is relatively stable with close to a third of Americans aged 16 and older participating in the activity. In Nevada, just over 50% of the population participated in a trail-related activity in 2007 (Outdoor Industry Foundation 2007), so the presence of opportunities for outdoor recreation, specifically hiking, is a long-term minor to moderate beneficial impact for residents and visitors. However, overall trends in outdoor recreation indicate that the number of people recreating in the outdoors has been relatively flat since 1997 (Outdoor Industry Foundation 2006). The visitation numbers for Lake Mead National Recreation Area have been declining since 1995.

Alternative C would have a modest beneficial contribution to the overall beneficial effects of other past, present, and future actions, so cumulative effects on visitor use and

experience would be minor to moderate and beneficial.

Conclusion

Implementing alternative C would change how visitors use the areas and would increase the number of visitors; this would have a long-term, minor, beneficial impact and long-term, negligible to minor, adverse impacts on visitor use and experience. The overall cumulative effects associated with this alternative would be minor to moderate and beneficial.