

## 4.0 ENVIRONMENTAL CONSEQUENCES

### 4.1 INTRODUCTION

This chapter discusses the anticipated environmental effects (Environmental Consequences) of the alternatives presented in Chapter 2.0 (see Maps 5, 6, 7, 8, and 9). The No Action Alternative describes anticipated future conditions if none of the action alternatives are implemented. The level of analysis is commensurate with the expected level of potential effects.

The analysis of the potentially affected resources is based on the professional judgment and experience of BLM resource specialists, discussions with other agency resource experts and professionals, literature review, and field trips to the study area by resource personnel.

The goal of this chapter is to disclose, to the greatest extent possible, the effects of each alternative on the affected resources. If quantitative estimates are not possible, qualitative estimates are provided to facilitate the comparison of alternatives by the public and decision makers.

### 4.2 IMPACT THRESHOLDS

Direct, indirect, and cumulative effects are analyzed for each impact topic and are described in terms of type, duration, and intensity; general definitions of each are provided below.

#### 4.2.1 IMPACT TYPE

Impact Type classifies the effect as direct, indirect, or cumulative, and then determines whether the effect would result in beneficial or adverse effects.

- **Direct:** Effect caused by alternative and occurs in the same time and place (e.g., removal of vegetation, use of machinery, etc.).
- **Indirect:** Effect caused by alternative but is later in time or farther removed in distance, but is still reasonably foreseeable (e.g., increased recreational use, accelerated erosion).
- **Cumulative:** Incremental effect caused by alternative when added to other past, present, and reasonably foreseeable future actions (e.g., combined effect of vegetation removal between this trails project and the City of Henderson trail projects in the NCA); see Section 4.3 for more information.
  - **Beneficial:** Positive change in the condition or appearance of the resource, or a change that moves the resource toward the desired condition or goals.
  - **Adverse:** Negative change that detracts from the condition or appearance of the resource, or a change that moves the resource away from the desired condition or goals.

## 4.2.2 IMPACT DURATION

Impact Duration describes the length of time an effect would occur as short or long term.

- **Short Term:** Lasting no longer than the immediate 3-5 year implementation period (e.g., construction period, build-out period).
- **Long Term:** Lasting beyond the implementation period (beyond 5 years), typically extending beyond a decade or indefinitely.

## 4.2.3 IMPACT INTENSITY

Impact Intensity describes the degree, level, or significance of an effect as no effect, negligible, minor, moderate, or major.

- **No effect:** No discernable effect.
- **Negligible:** Effect is at the lowest level of detection and causes very little or no disturbance or improvement.
- **Minor:** Effect that is slight but detectable, with some perceptible effects of disturbance or improvement.
- **Moderate:** Effect is readily apparent and has measurable effects of disturbance or improvement.
- **Major:** Effect is readily apparent and has measurable effects of disturbance or improvement that are of local, regional, or global importance; or sets a precedent for future project undertakings by federal agencies.

## 4.3 CUMULATIVE EFFECTS ANALYSIS

### 4.3.1 CUMULATIVE EFFECTS UNDER NEPA

The Council on Environmental Quality defines cumulative effects as:

The impacts 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. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

The NEPA cumulative effects analysis is focused on defining the incremental effects of this trails planning project in context with the effects from:

- Past actions with relevance to the current resource conditions.
- Present actions of relevance, but not part of the Proposed Action or action alternatives.

- Reasonably foreseeable future actions of relevance, but not part of the Proposed Action or action alternatives.

To analyze the implications of cumulative effects, this analysis considers background levels of effects, past project contributions, ongoing project contributions, effects from this project's proposals, as well as the effects anticipated from reasonably foreseeable actions (future actions). Additionally, these effects will be collectively evaluated against legal or administrative thresholds to further judge significance of the effects. The geographic scope for cumulative effects analysis varies by resource. Each resource described in the following sections will indicate the geographic analysis area relevant for that resource.

Public scoping comments, local trend analyses (demographic and recreational), and consultation with various agencies or entities, such as Clark County, USFWS, municipalities, and project stakeholders, were used to develop an inventory of past, present, and reasonably foreseeable projects pertinent to this cumulative effects analysis.

The effects of various past, present, or future actions (regardless of the entity pursuing the action) and natural processes have the potential to coincide either in time or space with the effects of the Sloan Canyon Trails Master Plan project. The nexus of these effects will be discussed by resource throughout the remainder of this chapter. Identifying past and present activities is especially important to understanding the environmental baseline of resources within the analysis area. Furthermore, the following list of projects provides context for the Sloan Canyon Trails Master Plan project:

**Urban Development / Population Growth** – In recent years, Clark County has been among the fastest-growing counties in the United States. The County's population increased from 277,000 in 1970 to more than 1.7 million in 2004. Electric meter hookups, another indicator of population growth, exceeded national and regional averages for the same period. Steady in-migration is a cornerstone of the modern Southern Nevada economy; most observers believe it will continue, however, at a more modest pace due to the 2008-2009 recession, into the foreseeable future.

**City of Henderson Trails Projects in Sloan Canyon NCA (McCullough and Anthem Trails)** – The City of Henderson is currently preparing a trail plan and environmental review for the development of the McCullough Hills Trails within the North McCullough Road ROW. The road corridor currently provides service access for a high-voltage transmission line that is generally oriented east-west in the Dutchman Pass vicinity. The McCullough Hills Trails is envisioned as a scenic trail system to provide access from City of Henderson neighborhoods, parks, and open space areas to the NCA, trailheads, and overlook points. The environmental review for the McCullough Hills Trail is expected to be available for public review in late 2009.

Two Anthem area trail projects were jointly funded by Del Webb / Pulte and SNPLMA funds awarded to the City of Henderson. Planning for these projects, including an environmental review process, began in 1996. In 2006, the BLM approved the proposed trail plans and environmental reviews. Phase I construction began in 2006; all construction on the Anthem trails project(s) is anticipated to be complete by the end of 2009.

**City Of Henderson Park, Open Space, and Trails Planning Efforts** – In addition to over 40 existing parks, the City of Henderson has been awarded more than \$200 million in funding through the Southern Nevada Public Lands Management Act (SNPLMA) for the development of

more than 30 parks, trails, and natural area projects. Approximately 50 miles of trails will be added to the City of Henderson trails system over the next several years.

**Utility Corridors and Right-of-Way** – The North McCullough Road corridor currently provides service access for a high-voltage transmission line that is generally oriented east-west in the Dutchman Pass vicinity.

**Road Improvements** – The BLM will also improve the NCA access roads designated in the RMP. Improvements may include grading, widening, or hardening. The restoration and road improvement activities will be defined and analyzed under a separate planning process. At this time, there are no definitive plans or timeframe for accomplishing these tasks.

**Restoration of Unauthorized OHV Trails** – Unauthorized OHV use has resulted in an extensive network of unofficial roads and social trails throughout the NCA. These unofficial roads and the resulting resource damage are most prevalent in the Dutchman Pass and Quo Vadis areas on the east side of the NCA. These unofficial routes have perpetuated a number of resource issues and problems, including illegal trash dumping and target shooting, by providing accessible routes into the interior of the NCA. Many of the OHV routes are located on extremely steep slopes and/or unstable soils, which have accelerated erosion, denuded vegetation, and degraded habitat and visual / aesthetic resources. The BLM ultimately intends to close and restore many of the OHV trails; however, no definitive timeline has been identified. As part of this proposed project, the BLM intends to close OHV/user created routes that intersect proposed trails as necessary to facilitate appropriate use of the designated trail system. Additional detail regarding these closures and restoration efforts is provided in Chapter 2.0.

**Development of Trailhead and Visitor Center Facilities At Sloan Canyon NCA** – The 2006 RMP identifies potential locations for the construction of a visitor center and three main trailhead access points. The visitor center would serve as the primary visitor contact station and would be generally located north of the entrance to the Petroglyph Management Area. Trailhead facilities would be constructed in the Dutchman Pass, Hidden Valley, and Quo Vadis areas. Trailhead facilities may include parking lots, equestrian staging areas, vault toilets, interpretive signs and/or kiosks, and/or seasonal visitor contact stations. These facilities will be planned, designed, and constructed through a separate planning process. At this time, the BLM has not established a definitive timeframe for the planning or construction of these facilities. However, the trail network analyzed in this EA is designed to connect to each potential trailhead site.

**Regional Protected Area Conservation** – In addition to the recent and rapid urbanization trends in the greater Las Vegas valley, local, county, state, and Federal agencies have also been proactive in identifying lands suitable for conservation or protected status. The Regional Open Space Plan (approved by the Southern Nevada Regional Planning Coalition in 2006) and the Las Vegas Valley Perimeter Open Space Plan (approved by the same body in 2009) set ambitious goals for conserving open space to create appropriate transitions and connectivity to Sloan Canyon NCA, Red Rocks NCA, and other regional protected areas.

#### **4.3.2 CUMULATIVE EFFECTS UNDER ESA**

Cumulative effects under NEPA, as defined above, are distinct from the “cumulative effects” required by Section 7 of the ESA [50 C.F.R. § 402.02]. Cumulative effects under ESA are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation [50 C.F.R.

§402.02]. This definition applies only to Section 7 analyses, and should not be confused with the broader use of this term under NEPA or other environmental laws. For the purposes of this document, all discussions and analyses of cumulative effects adhere to the NEPA definition, unless otherwise noted. Additionally, ESA cumulative effect analyses will examine a separate list of future activities than those noted above. These activities will be noted on a case-by-case basis in the individual resource analyses.

#### 4.4 SPECIAL STATUS SPECIES

“Special status species” include federal and state listed species, BLM Sensitive Species, MSHCP species, and state and/or county listed noxious weeds identified as having potential to occur in the Sloan Canyon NCA. These species will be addressed under the “*Special Status Species*” subheading within the plants and wildlife Affected Environment and Environmental Consequences discussions, and in full detail in the Biological Assessment (to be filed at the Red Rock/Sloan Field Office). A determination of effects, as required by Section 7 of the ESA consultation guidelines, is presented for all federally listed species with potential to occur in the analysis area(s).

#### 4.5 BIOLOGICAL RESOURCES

##### 4.5.1 VEGETATION

##### Alternative A – No Action

###### *Direct and Indirect Effects*

Existing, unimproved routes under Alternative A affect the vegetation communities shown in Table 4-1.

Table 4-1. Vegetation communities affected by Alternative A trails.

Plant Community	Permanent Impacts (Acres)
Sparse Creosote / Bursage Mix	1.7 - 2.5
Moderate Creosote Communities	0.7 - 1.1
Volcanic-Basalt Slopes	~0.1
Desert Wash Communities	-
<b>TOTAL</b>	<b>2.5 - 3.7</b>

Note: For analysis purposes, an average width of 4 feet was assumed for area calculations in this table.

Because there would be no trail construction under Alternative A, there would be no direct effects to the overall NCA vegetation communities. Similarly, there would be no direct effects to the three special status species or the spread of noxious weeds.

Currently, the existing Alternative A unimproved routes cross through habitat for three sensitive plant species: Blue Diamond cholla, rosy two-toned penstemon, and white margined beardtongue. The approximate route mileages, by species habitat, are shown in Table 4-2.

Table 4-2. Alternative A mileage in sensitive species habitat.

Plant Community	Miles in Suitable Habitat
Blue Diamond cholla (per the RMP dataset)	0.0
Blue Diamond cholla (Baker 2005)	1.9
Rosy two-toned penstemon	4.8
White margined beardtongue	0.1

Illegal, horticultural collection of the special status species would continue under Alternative A. The spread of invasive, non-native species would also continue under Alternative A. However, these are not necessarily indirect effects of **no** trail development; instead, these effects would be the result of minimal agency presence, minimal resource monitoring, and/or minimal volunteer observations under Alternative A.

#### *Cumulative Effects*

The geographic scope of cumulative effects analysis for vegetation, including sensitive plant species, is the greater Las Vegas Valley area. Within this geographic area, Alternative A would not incrementally contribute any measurable effect to other past, present, and reasonably foreseeable future actions' effects on natural vegetation communities or special status species.

### **Alternative B**

#### *Direct and Indirect Effects*

#### **General Vegetation and Non-Native Invasive Species**

Alternative B would result in the direct, long-term removal of approximately 17 acres of native vegetation to accommodate the trail tread itself, and up to an additional 70 acres in the short term as a result of temporary construction disturbances. Temporary impacts would consist of cuts and fill and the removal of borrow material from individual sites adjacent to or nearby the trail corridor. The footprints of temporary impacts are difficult to quantify since they would vary by location, slopes, proposed trail widths, and the availability of suitable trail construction materials.

In addition to vegetation disturbances, desert pavement and cryptogammic crust would be adversely affected in the short term as a result of trampling by work crews during construction. Where soil crusts or desert pavement is affected by the movement of construction machinery (in non-wilderness areas), effects would be adverse and permanent. At the NCA scale, these effects would be minor to moderate in intensity.

The amount of vegetation proposed for removal under Alternative B is negligible compared to the amount of native vegetation remaining in the Sloan Canyon NCA. Table 4-3 lists the approximate amount of vegetation by type within the NCA that would be impacted as a result of Alternative B.

Table 4-3. Permanent impacts to vegetation by type for Alternative B.

Plant Community	Permanent Impacts (Acres)
Sparse Creosote / Bursage Mix	11.1
Moderate Creosote Communities	2.3
Volcanic-Basalt Slopes	2.5
Desert Wash Communities	0.6
<b>TOTAL</b>	<b>16.5</b>

Note: This table does not reflect trail footprints in washes because it is assumed that no improvements or vegetation removal would be necessary in these areas. Additionally, this table does not reflect trail footprints on existing roads or OHV routes because these areas are assumed to be currently denuded of all vegetation.

Although the short-term construction impacts could ultimately be successfully restored, the impacts would likely be considered to be long term since restoration in the harsh desert environment could take five to ten years. The timeframe for successful restoration would be highly dependent on the cyclical variations of quantity and timing of seasonal rainfall. Because of this timing, restoration efforts are likely to require several attempts to ensure the establishment of vegetation throughout all temporarily disturbed areas.

Although most cactus species would be avoided during trail construction, any cactus encountered along the proposed trail alignment would be transplanted to nearby sites. A number of transplanted cacti would not survive due to poor seasonal transplant timing, and limited water and staff availability for follow-up watering. Those cacti transplanted during the winter would likely have a greater chance for long-term survival.

The Alternative B trail network would provide improved, defined access into the NCA and would concentrate visitor impacts to the trail corridor. The new trail construction and improved user experience will likely bring more visitors to the Sloan Canyon NCA. The increased number of visitors would likely create greater interest in desert ecology and a greater awareness and appreciation for the native plants and vegetation communities, which would be a beneficial effect since it could help promote more stewardship and conservation interest. An enhanced appreciation of native plants may also result in the increased horticultural collection of wild flowers, cactus, and potential special status species.

However, the higher number of visitors could potentially increase the amount of off-trail disturbance on fragile desert soil and increase the amount of non-native weed seed that is imported from vehicles, horses, and field equipment (e.g., shoes, backpacks, etc.). In addition, vehicles traveling to and from the trailheads and parking lots have the potential to import and spread invasive weeds. Once invasive and non-native weeds become established, the new trail network provides an opportunity for weeds to spread throughout the Sloan Canyon NCA.

Additionally, the increase in visitation could also result in higher levels of cross-country use, which may result in increased trampling of native vegetation. However, most desert vegetation is resilient to such disturbance, such as browsing or trampling, and would not be adversely affected in the long term.

Finally, although fire is prohibited within the NCA, increased visitation creates greater opportunity for wildfire starts, particularly in those areas of the NCA open to camping. Historically, Mojave Desert vegetation is sparse enough that fires only spread a few yards. However, with the introduction of non-native weed species that tend to grow more densely, fire

can more easily spread in the shrub canopy (RMP 2006). The BLM's RMP policy is full fire suppression for any wildfire in desert tortoise habitat. Intense and repeated fires can lead to the replacement of native species by exotic species, such as cheatgrass.

### *Special Status Species*

The Alternative B trails would cross through habitat for three sensitive plant species: Blue Diamond cholla, rosy two-toned penstemon, and white margined beardtongue. The approximate trail mileages, by species habitat, are shown in Table 4-4.

Table 4-4. Alternative B mileage in sensitive species habitat.

Plant Community	Miles in Suitable Habitat
Blue Diamond cholla (per the BLM dataset)	0.0
Blue Diamond cholla (Baker 2005)	8.8
Rosy two-toned penstemon	15.8
White margined beardtongue	0.4

A total of 15.8 miles of trails would cross through rosy two-toned beardtongue habitat, as shown in the 2006 RMP. Several rosy two-toned beardtongue individuals were observed on proposed Alternative B trail alignments in the Hidden Valley area, east of Pyramid Peak. The individuals were observed on a steep talus slope during spring 2009 field surveys. It is unclear at this time whether the trail can avoid directly impacting all of the observed individuals of rosy two-toned beard-tongue due to the amount of cut and fill that may be required to construct partial and/or full bench trails along the contours steep slope. Although this species can generally handle some disturbance, with the dwindling population base in the region, it is anticipated that Alternative B would result in long-term adverse effects to this species.

A total of 0.4 mile of trails would cross through white-margined beardtongue habitat, as shown in the 2006 RMP. No white-margined beardtongue individuals were identified during field surveys. It is unlikely that this species or its habitat would be adversely affected in the long term.

The Alternative B trail network would not cross through any areas identified by the BLM as suitable for the Blue Diamond cholla. However, a recent species report has mapped nearly 4,000 acres of occupied habitat within the NCA. According to this dataset (Baker 2005), a total of 8.8 miles of Alternative B trails would be located in these occupied habitat areas.

The proposed trail system bisects two of the three known populations of the Blue Diamond cholla in the NCA (Baker 2005). Less than five years ago, the Blue Diamond cholla was considered for Federal Listing until additional populations, including the two that would be impacted by Alternative B, were discovered.

Proper and complete implementation of Project Design Features (Chapter 2.0) intended to protect rare plant habitat would help to offset or minimize some of the potential impacts. In general, these measures call for minor realignments of trail segments where possible to avoid individuals or populations. This should greatly reduce the potential for direct removal of this species. However, it is anticipated that some direct disturbance or removal of these individuals could still occur. Monitoring, mapping, seed collection, and restoration efforts in these habitat



types (as described in Section 2.2.6) would keep these impacts below the significance threshold.

Alternative B therefore results in a determination of may adversely impact individuals, but is not likely to result in a loss of viability in the analysis area, or cause a trend toward federal listing for the three special status species identified above.

Overall, Alternative B would directly affect rare plant habitat and would facilitate increased visitor access into rare plant habitat in the long term. The Alternative B impacts are anticipated to be moderate or greater, but would not contribute to a trend toward federal listing for the rosy two-toned penstemon and the Blue Diamond cholla if Project Design Features are properly implemented.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

Past and present impacts to native vegetation, both adverse and beneficial, throughout the Las Vegas Valley have been relatively major and will likely continue in the near future. The conversion of natural lands to residential, commercial, and other land uses has resulted in the loss of natural vegetation communities throughout the region. The rate at which urban development is occurring in the Las Vegas Valley has slowed in recent years; however, there are still a number of reasonably foreseeable future projects that will continue to contribute to the loss of native plant vegetation. However, notable recent conservation efforts to preserve lands, such as the establishment of Sloan Canyon NCA as well as other nearby NCAs and regional and local open space planning, have had a beneficial effect on protecting native vegetation from future urbanization.

Sensitive plant species are being lost throughout the region, primarily as a function of habitat conversion, weed competition, and horticultural collection. Additionally, wind and solar energy proposals on BLM lands in the region could potentially threaten rare plant habitat on a large-scale.

The effects of Alternative B on rare plants, when combined with the effects of other local projects, including the past and present urbanization along the NCA boundaries and the present and future development of City of Henderson trails connecting to the NCA, may result in minor cumulative effects on Blue Diamond cholla and the rosy two-toned penstemon habitat. Cumulatively, Alternative B and other past, present, and reasonably foreseeable future actions could result in a loss of viability in the region; however, present and future BLM conservation management actions are expected to prevent this from occurring.

## **Alternative C**

### *Direct and Indirect Effects*

The direct and indirect effects of Alternative C would be the same as described for Alternative B, with the following exceptions.

Table 4-5 provides a list of permanent impacts associated with Alternative C (same as Alternative B, since the incorporation of existing roads and OHV routes is not reflected in the

table). The trail construction and improvements proposed under Alternative C would permanently affect approximately 17 acres of native vegetation in the NCA, however, Alternative C would also result in the direct restoration of approximately 8 acres of native habitat, primarily in the Sparse Creosote / Bursage Mix community type. As such, the total net long-term disturbance as a result of Alternative C is approximately 9 acres. The acres disturbed are shown in Table 19, by plant community type. (Table 4-5 does not reflect the acreage, approx. 8 acres, of OHV route restoration efforts.)

Table 4-5. Permanent impacts to vegetation by type for Alternative C.

Plant Community	Permanent Impacts (Acres)
Sparse Creosote / Bursage Mix	11.1
Moderate Creosote Communities	2.3
Volcanic-Basalt Slopes	2.5
Desert Wash Communities	0.6
<b>TOTAL</b>	<b>16.5</b>

Note: This table does not reflect trail footprints in washes because it is assumed that no improvements or vegetation removal would be necessary in these areas. Additionally, this table does not reflect trail footprints on existing roads or OHV routes because these areas are assumed to be currently denuded of all vegetation.

A total of 10 miles of existing OHV routes would be restored from a width of approximately 10-12 feet to an average trail width of 4-6 feet. The amount of area restored by the conversion of existing OHV routes is estimated to be approximately 8 acres. The restoration of these areas would result in beneficial effects by increasing the amount of available native habitat and by reducing the effects of wind and water erosion in these areas.

### *Special Status Species*

The Alternative C trails would cross through habitat for three sensitive plant species: Blue Diamond cholla, rosy two-toned penstemon, and white margined beardtongue. The approximate trail mileages, by species habitat, are shown in Table 4-6. (Table 4-6 does not reflect the acreage, approx. 8 acres, of OHV route restoration efforts.)

Table 4-6. Alternative C mileage in sensitive species habitat.

Plant Community	Miles in Suitable Habitat
Blue Diamond cholla (per the RMP dataset)	0.0
Blue Diamond cholla (Baker 2005)	8.8
Rosy two-toned penstemon	19.5
White margined beardtongue	0.4

The potential effects to Blue Diamond cholla habitat and individuals would be the similar to those described for Alternative B.

The potential effects to the rosy two-toned penstemon habitat and individuals would be slightly more, given that there are more miles proposed in this habitat type than Alternative B.

The potential effects of Alternative C on the white margined beardtongue would be the same as described for Alternative B.

Alternative C results in a determination of may adversely impact individuals, but is not likely to result in a loss of viability in the analysis area, nor cause a trend toward federal listing for the three special status species identified above.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

The 8 acres of native habitat restoration, although beneficial in the Dutchman Pass area of the NCA, would not result in any truly notable benefits at the NCA or regional scale.

The effects of Alternative C on rare plants, when combined with the effects of other local projects, including the past and present urbanization along the NCA boundaries and the present and future development of City of Henderson trails connecting to the NCA, may result in minor cumulative effects on Blue Diamond cholla and the rosy two-toned penstemon habitat. Cumulatively, Alternative C and other past, present, and reasonably foreseeable future actions could result in a loss of viability in the region; however, present and future BLM conservation management actions are expected to prevent this from occurring.

## **Alternative D**

### *Direct and Indirect Effects*

The direct and indirect effects of Alternative D would be the same as described for Alternative C (and B), with the following notable exceptions.

Table 4-7 provides a list of permanent impacts associated with Alternative D. The trail construction and improvements proposed under Alternative D would permanently affect approximately 11 acres of native vegetation in the NCA, however, Alternative D would also result in the direct restoration of approximately 8 acres of native habitat, primarily in the Sparse Creosote / Bursage Mix community type. As such, the total net long-term disturbance as a result of Alternative D is negligible at the NCA scale. (Table 4-7 does not reflect the acreage, approx. 8 acres, of OHV route restoration efforts.) The majority of the new disturbance would occur in areas outside of the wilderness.

Table 4-7. Permanent impacts to vegetation by type for Alternative D.

Plant Community	Permanent Impacts (Acres)
Sparse Creosote / Bursage Mix	0.2
Moderate Creosote Communities	1.5
Volcanic-Basalt Slopes	6.4
Desert Wash Communities	2.5
<b>TOTAL</b>	<b>10.6</b>

Note: This table does not reflect trail footprints in washes because it is assumed that no improvements or vegetation removal would be necessary in these areas. Additionally, this table does not reflect trail footprints on existing roads or OHV routes because these areas are assumed to be currently denuded of all vegetation.

A total of 10 miles of existing OHV routes would be restored from a width of approximately 10-12 feet to an average trail width of 4-6 feet. The amount of area restored by the conversion of existing OHV routes is estimated to be approximately 8 acres. The restoration of these areas would result in beneficial effects by increasing the amount of available native habitat and by reducing the effects of wind and water erosion in these areas.

### *Special Status Species*

The Alternative D trails would cross through habitat for three sensitive plant species: Blue Diamond cholla, rosy two-toned penstemon, and white margined beardtongue. The approximate trail mileages, by species habitat, are shown in Table 4-8.

Table 4-8. Alternative D mileage in sensitive species habitat.

Plant Community	Miles in Suitable Habitat
Blue Diamond cholla (per the RMP dataset)	0.0
Blue Diamond cholla (Baker 2005)	3.2
Rosy two-toned penstemon	14.8
White margined beardtongue	0.2

The potential effects to Blue Diamond cholla habitat and individuals would be the similar to those described for Alternative A. Much of the 3.2 miles identified in Table 4-8 is along existing, unimproved routes and social trails (particularly in the Black Mountain area). As such, direct disturbance as a result of construction activities would be minimized. Additionally, as stated in Chapter 2.0, trails would be realigned where feasible to avoid previously unrecorded individuals or populations.

The potential effects to the rosy two-toned penstemon habitat and individuals would be similar to Alternative B.

The potential effects of Alternative D on the white margined beardtongue would be similar to Alternative B.

Alternative D results in a determination of may adversely impact individuals, but is not likely to result in a loss of viability in the analysis area, nor cause a trend toward federal listing for the three special status species identified above.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

For general vegetation and noxious weeds, the cumulative effects of Alternative D would be similar to those described for Alternative B. The 8 acres of native habitat restoration, although beneficial in the Dutchman Pass area of the NCA, would not result in any truly notable benefits at the NCA or regional scale.

The cumulative effects of Alternative D on rosy two-toned penstemon and white-margined beardtongue would be similar to those described for Alternative B.

Additionally, Alternative D proposes much less new disturbance in Blue Diamond cholla habitat areas. As such, the incremental contribution of Alternative D's to cumulative effects would be reduced to minor to moderate.

#### **4.5.2 WILDLIFE**

##### **Alternative A – No Action**

###### *Direct and Indirect Effects*

There would be no direct effects to wildlife species, including special status species, migratory birds, or other sensitive species under Alternative A.

However, indirect effects would occur as the existing unimproved routes would continue to be used. As use of these routes continues to increase commensurate with regional population growth, the amount of visitors in the area would also increase, including unauthorized OHV use and the likely creation of additional social trails. Without maintenance actions or increased BLM presence on site, potential abuses of the NCA may occur, which could directly and indirectly adversely impact all wildlife present in the NCA and inhibit the BLM's ability to protect and manage listed and sensitive wildlife species and their habitats both in the short and long term. Adverse impacts could range from negligible (temporary presence of visitors within a home-range territory, short-term hiding of prey species, etc.) to moderate or greater (take, direct harassment, etc.). The No Action alternative would not provide for managed use or education of visitors, thus potentially increasing adverse effects associated with illegal activities and increasing visitation.

Of particular concern is the interaction of desert tortoises and visitors. Many visitors have little knowledge of the regulations concerning the handling and harassing of desert tortoise. With increased use of the NCA, it could be expected that higher numbers of visitors accessing the NCA in an undirected and unmanaged way would lead to increased harassment of desert tortoises. This would be a moderate long-term adverse impact. For the purposes of ESA consultation, the analysis of Alternative A results in a determination of “**may affect, not likely to adversely affect**” for the desert tortoise within the analysis area.

###### *Cumulative Effects*

In the absence of a more structured trail system and observation by informed visitors and/or increased management presence, efforts by volunteers, and increased educational activities, it is likely that illegal activities would increase in response to population growth in the Las Vegas Valley and adjacent Henderson neighborhoods. This would increase the level of social trail development, wildlife harassment and other activities that adversely impact wildlife.

##### **Alternative B**

###### *Direct and Indirect Effects*

Alternative B trails are proposed for all habitat types within the NCA, potentially affecting all Federal and BLM Sensitive species of concern. Resource protection measures are recommended in Chapter 2.0 to minimize the amount of direct and indirect impacts to species and their habitats.

Wildlife species may be adversely impacted in the short term during construction of the trails network. The amount of direct disturbance would be small (less than 20 acres), but wildlife may be disrupted or avoid certain areas during construction. There would be no direct effects to migratory birds as a result of construction, however, bird species may be disturbed by noise, vibrations, or the presence of work crews in the trail corridor. These effects would be localized and overall, would result in a minor, short-term adverse effect on wildlife.

Some or all wildlife species may be adversely impacted in the long term due to loss of habitat where new trails are constructed, and the impacts may range from no effect to minor depending on the habitat type and inhabiting species.

No critical habitat has been designated for any species within the NCA that would be affected by Alternative B. All trail alignments were surveyed for desert tortoise and any identified burrows or sites where this species was observed were avoided. Further, clearance surveys will be completed prior to construction. For the purposes of ESA consultation, the analysis of Alternative B results in a determination of “**may affect, not likely to adversely affect**” for the desert tortoise within the analysis area.

Potential impacts to other BLM Sensitive Species are shown in Table 4-9. Potential adverse effects may be lessened due to management and education processes, thus decreasing adverse effects and creating lesser intensity levels; however, recreational use of the NCA would still occur and would be introduced into additional habitat areas. Effects are based on two factors: habitat loss or fragmentation and increased disturbance.

The construction of new trails would encourage the use of the NCA as a recreation destination. As the number of trips to access recreation destinations continues to increase as the local population increases, the potential for human use-related impacts to habitat and adverse visitor-wildlife interactions would also increase. Long-term management of the established trail system would play an important role in the protection of habitat and wildlife as visitor use increases. Long-term impacts may range from no effect to minor depending on the levels, types, frequencies, and durations of increased use and interactions with wildlife.

Additional long term impacts may be due to impairment of habitats. Erosion, habitat fragmentation, and the spread of noxious weeds are a few examples of impacts to habitat which degrades its quality for wildlife. Additional adverse long-term impacts to some species are the increased attraction of predators to human-used areas. Both of these impact types would be adverse and could range from no effect to moderate.

Table 4-9. Potential Impacts to BLM sensitive species.

Common Name	Scientific Name	Potential Impacts
<i>Mammals</i>		
Desert valley kangaroo mouse	<i>Microdipodops megacephalus albiventer</i>	Negligible to minor, adverse, long-term, indirect effects due to potential habitat loss.
Desert bighorn sheep	<i>Ovis canadensis nelsoni</i>	Minor to moderate, adverse, long-term, direct effects due to potential disturbance.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Negligible to moderate, adverse, short and long-term indirect effects due to potential disturbance.
Pallid bat	<i>Antrozous pallidus</i>	Negligible, adverse to beneficial, long-term, indirect effects due to potential habitat fragmentation. (Pallid bats typically catch their prey on the ground. Trail establishment may positively affect the availability and accessibility of prey species.) Negligible to moderate, adverse, short-term, indirect effects due to potential disturbance.
Long-eared myotis	<i>Myotis evotis</i>	Negligible due to probable lack of habitat.
Silver-haired bat	<i>Lasionycteris noctivagans</i>	Negligible due to probable lack of habitat.
<i>Birds</i>		
Northern goshawk	<i>Accipiter gentiles</i>	Negligible due to probable lack of habitat.
Golden eagle	<i>Aquila chrysaetos</i>	Negligible to moderate, short and long term, adverse, indirect impacts due to potential disturbance.
Prairie falcon	<i>Falco mexicanus</i>	Negligible to moderate, short and long term, adverse, indirect impacts due to potential disturbance.
Ferruginous hawk	<i>Buteo regalis</i>	Negligible to moderate, short and long term, adverse, indirect impacts due to potential disturbance.
Swainson's hawk	<i>Buteo swainsoni</i>	Negligible to moderate, short and long term, adverse, indirect impacts due to potential disturbance.
Loggerhead shrike	<i>Lanius ludovicianus</i>	Negligible to moderate, short and long term, adverse, indirect impacts due to potential disturbance.
Phainopepla	<i>Phainopepla nitens</i>	Negligible to minor, short and long term, adverse, indirect impacts due to potential disturbance.
Vesper sparrow	<i>Pooecetes gramineus</i>	Negligible to minor, short and long term, adverse, indirect and direct impacts due to potential disturbance and fragmentation/loss of habitat.

Common Name	Scientific Name	Potential Impacts
Gray vireo	<i>Vireo vicinior</i>	Negligible due to probable lack of habitat.
American peregrine falcon	<i>Falco peregrinus anatum</i>	Negligible to moderate, short and long term, adverse, indirect impacts due to potential disturbance.
Western burrowing owl	<i>Athene cunicularia hypugea</i>	Negligible to moderate, short and long term, adverse, indirect and direct impacts due to potential disturbance and loss of habitat.
<i>Reptiles</i>		
Gila monster	<i>Heloderma suspectum</i>	Negligible to moderate, short and long term, adverse, indirect and direct impacts due to potential disturbance and loss of habitat.
Western Chuckwalla	<i>Sauromalus obesus obesus</i>	Negligible to moderate, short and long term, adverse, indirect and direct impacts due to potential disturbance and loss of habitat.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

Increasing development and resulting population growth would fuel additional use of Sloan Canyon NCA. Increased use may lead to increased presence and use by visitors of sensitive wildlife habitats and increased visitor-wildlife interactions.

Restoration of roads and unauthorized OHV trails intersecting the proposed trail network would offset some habitat loss and provide a long-term benefit to wildlife. However, this offset is anticipated to be negligible at the NCA scale.

Overall, the incremental contribution of Alternative B to the effects of increasing development, population growth would result in minor, adverse cumulative effects on wildlife species in the long term.

### **Alternative C – Proposed Action**

#### *Direct and Indirect Effects*

The direct and indirect effects of Alternative C on wildlife resources, including special status species, are similar to those described for Alternative B. For the purposes of ESA consultation, the analysis of Alternative C results in a determination of “**may affect, not likely to adversely affect**” for the desert tortoise within the analysis area.

However, Alternative C has one additional benefit associated with the restoration of a portion of the network of unauthorized OHV trails in the Dutchman Pass area. By reestablishing vegetative cover on approximately 8 acres along these routes, Alternative C would result in a long-term beneficial effect on wildlife. However, this offset is anticipated to be negligible at the NCA scale.



### *Cumulative Effects*

The geographic scope and potential cumulative effects as a result of Alternative C would be similar to those described for Alternative B.

## **Alternative D**

### *Direct and Indirect Effects*

In areas outside of the wilderness, the direct and indirect effects of Alternative D would be the same as those described for Alternative C.

Within the wilderness, Alternative D would result in minor adverse effects in the short term as construction crews formally establish the Cowboy, Hidden Valley, and Petroglyph trails. The noise and vibrations generated by these construction activities would be minimal, as no power tools, gas-powered machines, or other mechanical equipment would be used. Some species would be temporarily displaced by the increase in human presence during construction. Overall, these impacts are anticipated to be minor.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

The cumulative effects of Alternative D would be similar to those described for Alternatives B and C. However, given that the trail network in the wilderness area would be greatly reduced in this alternative, it is anticipated that the cumulative effects to wildlife habitat in the NCA would also be somewhat reduced.

Increasing development and resulting population growth would fuel additional use of Sloan Canyon NCA. Increased use may lead to increased presence and use by visitors of sensitive wildlife habitats and increased visitor-wildlife interactions.

Restoration of roads and unauthorized OHV trails intersecting the proposed trail network would offset some habitat loss and provide a long-term benefit to wildlife. However, this offset is anticipated to be negligible at the NCA scale.

Overall, the incremental contribution of Alternative D to the effects of increasing development and population growth would result in negligible to minor adverse cumulative effects on wildlife species and habitat in the long term.

## 4.6 PHYSICAL RESOURCES

### 4.6.1 AIR QUALITY

#### Alternative A – No Action

##### *Direct and Indirect Effects*

Because no trail construction or other disturbance activities are proposed under Alternative A, this alternative would not result in any direct effects to air quality in the NCA or surrounding areas.

Without the development and designation of a formal trail network or the addition of new trail-related recreation opportunities, any visitation increases would be strictly a function of the area's population growth and growing awareness of the NCA. Under Alternative A, the existing trails (both RMP-designated and non-designated social trails) would continue to be used. As the local population increases, it is anticipated that use of the existing trails, the number of vehicle trips, and unauthorized OHV use in the area would subsequently increase.

Increased use of vehicles to and (illegally) within the NCA would directly contribute to the production of CO (from vehicle emissions) and particulate matter (from dust stirred up through off-road access), and, indirectly, increased O<sub>3</sub> through refueling of vehicles in the adjacent populated areas near the NCA. Both the short and long-term adverse air quality effects of current, ongoing, and future increased use, and the subsequent vehicle trips under Alternative A, are anticipated to be negligible at both the NCA and regional scales.

##### *Cumulative Effects*

The geographic scope for the air quality cumulative effects analysis is the Las Vegas Valley airshed, which is currently designated as a non-attainment area for particulate matter, carbon monoxide, and ozone.

All of the relevant projects referenced in the Cumulative Effects discussion above (Section 4.3) have the potential to affect air resources in the region. However, the incremental contribution of the air quality effects of Alternative A to the effects of other past, present, and reasonably foreseeable future projects described above would be negligible.

#### Alternative B

##### *Direct and Indirect Effects*

Trail construction activities, including crew vehicle access, operation of machinery, and the actual construction of individual trails would result in minor adverse effects to air quality in the short term as a result of increased particulate matter, CO production, and O<sub>3</sub> production. These short-term adverse effects are anticipated to be localized to specific construction sites, active access roads, and fueling stations near the NCA.

The development and designation of a new trail network under Alternative B would encourage increased use of the NCA as a recreation destination. Additionally, as described in Alternative A above, background (or baseline) visitation levels are also anticipated to increase as a result of

population growth in the valley and growing awareness of the NCA's opportunities. As such, the number of visitor vehicle trips to access trails and trailheads is expected to notably increase.

The increased use of vehicles to access the NCA would directly contribute to the production of CO (from vehicle emissions) and possibly particulate matter (from dust stirred up if access to trails is reached from dirt roads), and, indirectly, increased O<sub>3</sub> through refueling of vehicles in adjacent populated areas near the NCA.

At this time, it is not possible to quantify the number of potential vehicle trips or the resulting air quality effects; however, based on site characteristics, regional air quality history, and the anticipated level of increased visitation, the long-term adverse effects would likely be minor on both the NCA and regional scales.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

All of the relevant projects referenced in the Cumulative Effects discussion above (Section 4.3) have the potential to coincide with air quality effects of Alternative B.

In general, the direct and indirect effects of Alternative B are relatively minor, both locally and regionally. Therefore, the incremental contribution of air quality effects under Alternative B to other past, present, and reasonably foreseeable future activities is anticipated to be minor as well.

Ongoing urban development and population growth, the likely development of the Hidden Valley area, and future utility corridor expansion and ROW applications would all contribute to background levels of particular matter, O<sub>2</sub>, and O<sub>3</sub>, in the region. The incremental contribution of Alternative B's anticipated air quality effects would not result in any measurable long-term increases to background air quality levels. Additionally, the cumulative effect of Alternative B's impacts combined with the impacts of urban development, population growth, and the annexation of Hidden Valley is unlikely to result any further threshold or NAAQS exceedances.

Future City of Henderson trails and improved connectivity to and within the NCA may encourage more local NCA users to access the NCA by non-vehicular means, and would, therefore, reduce vehicle emission and O<sub>3</sub> production at fueling stations. Ongoing and future City of Henderson trails, open space, and recreation planning efforts in and adjacent to the NCA, and the future BLM road improvement and OHV restoration projects, would result in minor benefits to air quality at the NCA and regional scales. Theoretically, the cumulative effect of Alternative B's minor adverse air quality effects combined with the potential minor beneficial effects from other projects would likely result in little or no net change to air quality impacts on the NCA and regional scales.

## **Alternative C – Proposed Action**

### *Direct and Indirect Effects*

The direct and indirect air quality effects of Alternative C are the same as described for Alternative B above, with the following exceptions.

Alternative C would restore approximately 10 miles of approximately 12-foot wide unauthorized OHV trails to 4-6 feet wide non-motorized trails. By reestablishing vegetative cover on approximately 8 acres along these routes, Alternative C would result in a long-term beneficial effect on local air quality in the Dutchman Pass area. Currently, vegetation denuded areas, as a result of repetitive unauthorized OHV use, contribute to ambient particulate matter issues in the Dutchman Pass area, particularly in the dry season when winds can stir up dust and debris. The long-term effect of the proposed restoration of these areas is anticipated to be minor on a local scale but negligible on a regional scale.

#### *Cumulative Effects*

The geographic scope and cumulative effects of Alternative C would be the same as described for Alternative B. The anticipated beneficial effects of restoration in the Dutchman Pass area would be so localized that it would not contribute to cumulative effects beyond the NCA boundary.

### **Alternative D**

#### *Direct and Indirect Effects*

The direct and indirect air quality effects of Alternative D would be similar to Alternative C, including long-term effects associated with visitor vehicle emissions, with the following exception.

Within the wilderness boundary, Alternative D proposes a greatly reduced trail network from Alternative C. As such, the particulate matter produced from construction activities would be extremely limited. Within the wilderness, realignments of the Cowboy and Hidden Valley trails are anticipated to produce no effects, or only negligible short-term effects on air quality.

#### *Cumulative Effects*

The geographic scope and cumulative effects of Alternative D would be the same as described for Alternative B. The anticipated beneficial effects of restoration in the Dutchman Pass area would be so localized that it would not contribute to cumulative effects beyond the NCA boundary.

### **4.6.2 SOILS**

#### **Alternative A – No Action**

#### *Direct and Indirect Effects*

Because there would be no trail construction under Alternative A, there would be no direct effects to soil resources. Existing erosion issues would continue, but would not be directly exacerbated by Alternative A. Table 4-10 reflects the approximate area affected by the footprint of the existing, unimproved routes shown in the RMP.

Table 4-10. Soil types affected by Alternative A.

	Soil Type (Number and Association)	Acres Permanently Disturbed
112	Arizo Very Gravelly Loamy Sand	-
117	Arizo Very Gravelly Fine Sandy Loam	-
141	Nipton-Haleburu Rock Outcrop Assoc.	2.2
150	Cave Very Stony Sandy Loam	-
152	Cave Gravelly Fine Sandy Loam	-
360	Rock Outcrop-St.Thomas Complex	<0.1
380	Tonopah-Arizo Association	-
400	Arizo-Cafetal Association	-
450	Arizo Association	-
480	Vace-Arizo Association	-
484	Hobog Very Cobbly Fine Sandy Loam	-
510	Railroad Association	0.3
674	Nipton-Rubble Land Railroad Assoc.	1.5
750	Haleburu-Crosgrain Rock Outcrop Assoc.	-
753	Nipton-hiddensun-Haleburu Association	<0.1
754	Haleburu-Hiddensun Association	-
TOTAL		<4.2

Note: Acres of permanent disturbance reflect the length of the RMP proposed trails (7.3 miles) with an average width of approximately 5 feet.

Visitation to the NCA is anticipated to increase, commensurate with population growth and as awareness about the NCA grows. With the additional anticipated visitor traffic and without adequate trail improvements, the erosion potential would continue to increase as a result of visitor disturbance. The indirect long-term adverse effects of Alternative A are anticipated to be minor overall, with some isolated areas of moderate effects, such as along the Black Mountain social trail.

### *Cumulative Effects*

The geographic scope for soils cumulative effect analysis is the NCA boundary because there are limited or no external factors (activities outside of the NCA boundary) that have direct influence on soil characteristics within the NCA. Soil characteristics are typically influenced by upstream or higher elevation activities. The McCullough Range as well as the majority of the Sloan NCA landscape is located upstream of all other past, present, and reasonably foreseeable future actions in the region.

However, the incremental contribution of the soil resource effects of Alternative A to the effects of other past, present, and reasonably foreseeable future projects in the NCA would be minor to negligible, but ultimately dependent on the severity of the indirect effects of increasing visitation.

## **Alternative B**

### *Direct and Indirect Effects*

Under Alternative B, trail construction activities would directly affect soil resources in the project area by creating new short and long-term disturbances. Short-term direct effects would be limited to those areas adjacent to the final trail bed; for example, in work areas adjacent to the trail corridor. The disturbance of new areas would increase the potential for erosion and

transportation of soils to lower elevations; these effects would be minimized over time as natural and manual restoration occurs.

Long-term effects would be limited to the trail bed itself. The footprint of permanent trail treads and trail improvements proposed under Alternative B would affect up to approximately 33 acres of soil in the NCA; the soil types disturbed are shown in Table 4-11. Table 4-11 represent the worst case scenario for Alternative B because the acreages shown assume maximum widths for all trail width categories (e.g., if a new trail segment is identified as “4-6 foot wide”, the maximum width of feet was used to calculate the area of permanent disturbance). Additionally, Table 4-11 includes the footprints of trails located on existing roads or OHV routes in the total acres permanently disturbed because these soils would remain exposed to hiking, biking, and equestrian travel.

Under Alternative B, the new trail construction and existing social trail improvements would be implemented using on-site native soil and materials, and would preserve the natural flow of stormwater with only very minor modifications for enhanced sustainability. The erosion control measures discussed in Chapter 2.0, Section 2.2.5 and the hydrology section, Section 4.6.3, would be used to counteract this natural process in a low impact and sustainable way. For this reason, the soil composition and hydrology would be only minimally affected as a result of the proposed construction.

Both short and long-term adverse effects would be minor and localized to the disturbance footprints.

Table 4-11. Soil types affected by Alternative B.

	Soil Type (Number and Association)	Acres Permanently Disturbed
112	Arizo very gravelly loamy sand, flooded	0.0
117	Arizo very gravelly fine sandy loam	0.3
141	Nipton-Haleburu-Rock Outcrop association	9.9
150	Cave very stony sandy loam	0.9
152	Cave gravelly fine sandy loam	1.1
360	Rock outcrop-St. Thomas complex	5.2
400	Arizo-Cafetal association	1.2
450	Arizo Association	0.9
480	Vace-Arizo Association	1.0
484	Hobog very cobbly fine sandy loam	0.1
510	Railroad Association	7.3
674	Nipton-Rubble Land-Railroad Association	4.1
753	Nipton-Hiddensun-Haleburu Association	1.5
	TOTAL	33.5

Notes: Acres of permanent disturbance reflect trail segment widths (e.g., 2-3 ft, 4 ft, 5-6 ft, 6-8 ft, and 8-12 ft). For calculation and analysis purposes, the maximum width in each category was assumed. The totals shown in this table represent the total trail network footprint once constructed, regardless of existing conditions (e.g., wash, OHV route, etc.). The acreages shown here do not correlate with the vegetation disturbance acreages in Section 4.5.1. The vegetation disturbance acreages do not reflect trails located on existing roads, OHV routes, or other existing social trails as these areas are already considered to be devoid of vegetation and would not constitute any additional impact. These existing disturbance areas are currently exposed from a hydrology, erosion, and soils standpoint and would continue to be exposed under this Alternative. Therefore, these areas are included in the impact table.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

The incremental contribution of Alternative B effects, when combined with reasonably foreseeable future projects such as new trailhead construction and road improvements, would result in minor adverse cumulative effects to soil resources in the NCA. However, on the regional and/or global scales, this incremental contribution to cumulative soil impacts is anticipated to be negligible.

### **Alternative C – Proposed Action**

#### *Direct and Indirect Effects*

The direct and indirect effects to soil resources, as a result of Alternative C, would be the same as described for Alternative B, with the following exceptions. The footprint of permanent trail treads and trail improvements proposed under Alternative C would affect up to approximately 46 acres of soil in the NCA; the soil types disturbed are shown in Table 4-12.

Table 4-12. Soil types affected by Alternative C.

	Soil Type (Number and Association)	Acres Permanently Disturbed
112	Arizo very gravelly loamy sand, flooded	0.6
117	Arizo very gravelly fine sandy loam	0.3
141	Nipton-Haleburu-Rock Outcrop association	19.3
150	Cave very stony sandy loam	0.9
152	Cave gravelly fine sandy loam	1.1
360	Rock outcrop-St. Thomas complex	5.2
380	Tonopah-Arizo association	0.7
400	Arizo-Cafetal association	1.6
450	Arizo Association	0.9
480	Vace-Arizo Association	1.0
484	Hobog very cobbly fine sandy loam	2.1
510	Railroad Association	7.3
674	Nipton-Rubble Land-Railroad Association	4.1
753	Nipton-Hiddensun-Haleburu Association	1.5
	TOTAL	46.6

Notes: Acres of permanent disturbance reflect trail segment widths (e.g., 2-3 ft, 4 ft, 5-6 ft, 6-8 ft, and 8-12 ft). For calculation and analysis purposes, the maximum width in each category was assumed. The totals shown in this table represent the total trail network footprint once constructed, regardless of existing conditions (e.g., wash, OHV route, etc.). The acreages shown here do not correlate with the vegetation disturbance acreages in Section 4.5.1. The vegetation disturbance acreages do not reflect trails located on existing roads, OHV routes, or other existing social trails as these areas are already considered to be devoid of vegetation and would not constitute any additional impact. These existing disturbance areas are currently exposed from a hydrology, erosion, and soils standpoint and would continue to be exposed under this Alternative. Therefore, these areas are included in the impact table.

Additionally, Alternative C would rehabilitate and revegetate denuded, OHV routes in the Dutchman Pass area. The existing OHV routes proposed for restoration and trail designation under Alternative C vary in width. For the purposes of analysis, it is assumed that these routes have an average width of 12 feet and would be restored to an average width of 6 feet. Over 10 miles, this would result in approximately 8 acres of restored areas and soil improvements.

In the Dutchman Pass area, the denuded OHV routes proposed for restoration and trail development have acted as sediment traps accumulating finer materials. Restoration efforts in these areas, including new native plantings and placement of larger rocks to disperse water, would assist with returning these soil areas to a more natural condition, less conducive to erosion issues. In the Dutchman Pass area, Alternative C would result in long-term minor beneficial effects on soil resources.

As such, the total net long-term disturbance as a result of Alternative C is approximately 38 acres. (Table 4-12 does not reflect the acreage of OHV route restoration efforts.) Both short and long-term adverse effects would be minor and localized to the disturbance footprints.

### *Cumulative Effects*

The geographic scope and cumulative effects of Alternative C would be the same as described for Alternative B. The anticipated beneficial effects to soil resources as a result of restoration in the Dutchman Pass area would be so localized that it would not have any measurable contribution to cumulative effects within NCA boundary.

## **Alternative D**

### *Direct and Indirect Effects*

The direct and indirect effects to soil resources, as a result of Alternative D, would be the same as described for Alternatives B and C, with the following exceptions. The footprint of permanent trail treads and trail improvements proposed under Alternative D would affect up to approximately 36 acres of soil in the NCA; the soil types disturbed are shown in Table 4-13. The majority of this disturbance would occur outside of the wilderness boundary.

Table 4-13. Soil types affected by Alternative D.

	Soil Type (Number and Association)	Acres Permanently Disturbed
112	Arizo very gravelly loamy sand, flooded	0.6
117	Arizo very gravelly fine sandy loam	0.3
141	Nipton-Haleburu-Rock Outcrop association	19.3
150	Cave very stony sandy loam	0.4
152	Cave gravelly fine sandy loam	0.7
360	Rock outcrop-St. Thomas complex	1.9
380	Tonopah-Arizo association	0.7
400	Arizo-Cafetal association	1.6
450	Arizo Association	0.5
480	Vace-Arizo Association	1.0
484	Hobog very cobbly fine sandy loam	2.1
510	Railroad Association	2.3
674	Nipton-Rubble Land-Railroad Association	4.1
753	Nipton-Hiddensun-Haleburu Association	0.1
	TOTAL	35.7

Notes: Acres of permanent disturbance reflect trail segment widths (e.g., 2-3 ft, 4 ft, 5-6 ft, 6-8 ft, and 8-12 ft). For calculation and analysis purposes, the maximum width in each category was assumed. The totals shown in this table represent the total trail network footprint once constructed, regardless of existing conditions (e.g., wash, OHV route, etc.). The acreages shown here do not correlate with the vegetation disturbance acreages in Section 4.5.1. The vegetation disturbance acreages do not reflect trails located on existing roads, OHV routes, or other existing social trails as these areas are already considered to be devoid of vegetation and would not constitute any additional impact. These existing disturbance areas are currently exposed from a hydrology, erosion, and soils standpoint and would continue to be exposed under this Alternative. Therefore, these areas are included in the impact table.



As described for Alternative C, Alternative D would also rehabilitate and revegetate denuded OHV routes in the Dutchman Pass area. The existing OHV routes proposed for restoration and trail designation under Alternative C vary in width. For the purposes of analysis, it is assumed that these routes have an average width of 12 feet and would be restored to an average width of 6 feet. Over 10 miles, this would result in approximately 8 acres of restored areas and soil improvements.

In the Dutchman Pass area, the denuded OHV routes proposed for restoration and trail development have acted as sediment traps, accumulating finer materials. Restoration efforts in these areas, including new native plantings and placement of larger rocks to disperse water, would assist with returning these soil areas to a more natural condition, less conducive to erosion issues. In the Dutchman Pass area, Alternative C would result in long-term minor beneficial effects on soil resources.

As such, the total net long-term disturbance as a result of Alternative C is approximately 28 acres. (Table 4-13 does not reflect the acreage of OHV route restoration efforts.) Both short and long-term adverse effects would be minor and localized to the disturbance footprints.

#### *Cumulative Effects*

The geographic scope and cumulative effects of Alternative D would be the same as described for Alternatives B and C, with the following exception. Within the wilderness boundary, soil disturbance would be reduced and limited to formalizing the RMP proposed routes. This would result in negligible cumulative effects when combined with reasonably foreseeable future actions, such as increased visitation.

### **4.6.3 HYDROLOGY, DRAINAGE, AND EROSION**

#### **Alternative A – No Action**

##### *Direct and Indirect Effects*

Because there would be no trail construction activities under Alternative A, there would be no direct effects to existing hydrology or erosion conditions.

However, under Alternative A, the existing, unimproved routes (both RMP-designated and non-designated social trails) would continue to be used and the natural effects of erosion, primarily from large rainfall event runoff, would continue to transport disturbed material downslope. As the use of these trails continues to increase commensurate with the local population growth, the trails may continue to widen in an uncontrolled manner and the effects of the erosion would worsen. The social trails, wider unauthorized OHV trails with random alignments and on excessive slopes, and larger amounts of disturbed area would likely see the highest impacts from erosion.

One particular example of worsening erosion is on the upper portion of the existing Black Mountain social trail. A social trail has developed on excessively steep slopes parallel to the dominant drainage path. As such, this social trail has essentially created a new, unnatural water flow conduit during heavy rainfall events (see Figure 49 and 50). Over time, this social trail has degraded to a condition that is not navigable by average trail users; subsequently, these users have created altogether new social routes to circumnavigate the eroding original trail.

In the absence of trail maintenance and management, whether through reconstruction, improvements, or maintenance, the indirect adverse effects from erosion on these trails would continue in the long term and the impact to the existing ecology would increase. The level of impact would vary by area, ranging from minor in flatter terrain areas to moderate in steeper areas, such as the Black Mountain social trail example noted above.



Figures 49 and 50.

### *Cumulative Effects*

The geographic scope for hydrology, drainage, and erosion cumulative effects is defined as the extent of the watershed sub-basins shown on Map 12.

Overall, the cumulative effects of Alternative A, when combined with the effects of other past, present, and reasonably foreseeable future projects, are anticipated to be negligible to minor for hydrology, drainage, and erosion with the following exception. With the addition of new City of Henderson trails in the Black Mountain area, existing erosion and drainage issues on the Black Mountain social trail(s) would continue to worsen. The cumulative effects of improved access via city trails, increased visitation and trail use, and existing, unaddressed erosion issues could result in moderately adverse cumulative effects in the long term.

### **Alternative B**

#### *Direct and Indirect Effects*

Alternative B would result in approximately 33 acres of new, permanent ground disturbance. Under Alternative B, trail construction activities would have a direct effect on existing hydrologic and erosion conditions in the short term. These disturbances, including construction crew access and the building or reconstruction of trails, would impact a limited area along the new trail treads (trail corridor). With the removal of existing vegetation and additional disturbances along these trail corridors, the effects of erosion would increase in the short term as soils would be temporarily loosened by construction activities. However, with the addition of new erosion

control measures, such as water bars, uphill swales, or cross-slope drainages, both on new trails and on existing trails (as described in Chapter 2.0) and as trail surfaces naturally become compacted, the amount of erosion would likely be reduced in the long term. (See Section 4.6.2 for miles and acres disturbed by soil type.)

As identified in Chapter 2.0, some typical methods for conveying stormwater runoff downhill and across the trails to minimize potential erosion and water channeling are the use of downhill cross-slopes in flatter areas, drainage dips or low water crossings in areas with intermediate grades, and with the use of culvert or water bars made from native rock in steeper areas. These methods all perform the same basic function of limiting the potential for transportation of soil onto, across, and away from the trail system.

Erosion control measures, such as waterbars, uphill swales, or culverts (as described in Chapter 2.0), would be implemented on any section of trail where the stormwater flow is parallel or perpendicular to across a trail (however, culverts would not be installed within the wilderness boundary). This would be done in order to provide a sustainable trail system with minimal maintenance and safety concerns for users.

In the long term, with implementation of erosion control methods and a trail maintenance program (as described in Chapter 2.0), Alternative B would not cause any additional erosion or other adverse impacts to the existing hydrology of the area. Alternative B would instead provide a sustainable recreational opportunity to visitors while preserving the natural watercourses and habitat.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

Short-term effects of Alternative B would be localized and of such short duration that it is unlikely that these effects would measurably contribute to cumulative effects at the regional scale.

The City of Henderson is also building trails within the NCA boundaries, which would connect to the trails proposed under Alternative B. The intersection of these trails would require additional design elements, construction efforts, and maintenance to ensure they remain sustainable without excessive erosion. The potential for more disturbance and/or activity and, therefore, additional erosion is increased at these intersections. If city trails were to be paved, there would be a higher potential for increased stormwater runoff velocities. The runoff from paved trails would need to be mitigated to prevent cumulative damage to the existing and proposed Alternative B trails in the long term.

Overall, however, the cumulative effect of an expanded, designated trail system as a result of the City of Henderson trails projects and the Alternative B trails network, would be an overall minor benefit to soil and hydrologic resources in the sub-basin. The designated trail system would help to reduce the total area disturbed by visitors by discouraging the potential for user-created trails in poorly drained areas or on steep slopes.

## **Alternative C – Proposed Action**

### *Direct and Indirect Effects*

The direct and indirect effects of Alternative C would be the same as described for Alternative B, with the following exception. Alternative C would result in a total net disturbance for approximately 38 acres of new, permanent ground disturbance in the NCA.

The restoration of approximately 10 miles of existing OHV routes would reduce the existing erosion potential in the Dutchman Pass area. These improvements would reduce the amount of disturbed, exposed ground; and would include planting new native vegetation, which would ultimately have the effect of diminishing runoff rates and reducing the transportation of soil during or following rainfall events. The restoration of these routes would result in long-term moderate beneficial effects to existing hydrology and erosion conditions in the NCA.

### *Cumulative Effects*

The geographic scope and cumulative effects of Alternative C would be the same as described for Alternative B. However, the anticipated beneficial effects resulting from restoration in the Dutchman Pass area, such as revegetation of highly erodible social routes, would be so localized that it would not measurably contribute to cumulative effects at the watershed sub-basin scale.

## **Alternative D**

### *Direct and Indirect Effects*

The direct and indirect effects of Alternative D would be the same as described for Alternatives B and C, with the following exception. Alternative D would result in a total net disturbance for approximately 28 acres of new, permanent ground disturbance in the NCA. The majority of this disturbance would occur outside of the wilderness boundary.

The restoration of approximately 10 miles of existing OHV routes would reduce the existing erosion potential in the Dutchman Pass area. These improvements would reduce the amount of disturbed, exposed ground; and would include planting new native vegetation, which would ultimately have the effect of diminishing runoff rates and reducing the transportation of soil during or following rainfall events. The restoration of these routes would result in long-term moderate beneficial effects to existing hydrology and erosion conditions in the NCA.

### *Cumulative Effects*

The geographic scope and cumulative effects of Alternative D would be the same as described for Alternatives B and C. The anticipated beneficial effects resulting from restoration in the Dutchman Pass area, such as revegetation of highly erodible social routes, would be so localized that it would not measurably contribute to cumulative effects at the watershed sub-basin scale. With a reduced trail system within the wilderness boundary, the cumulative effects on hydrologic processes or drainage are anticipated to be negligible at the watershed sub-basin level.

## 4.7 HUMAN AND CULTURAL RESOURCES

### 4.7.1 RECREATION

#### Alternative A – No Action

##### *Direct and Indirect Effects*

Because no trail construction would occur under Alternative A, this alternative would not result in any direct effects to recreation resources in the project area or the greater Las Vegas Valley. Alternative A would not fulfill the 2006 RMP management goals and objectives for recreation resources in the NCA, which indicate the need for a designated trail network and trail-related recreational uses. Similarly, Alternative A is not consistent with the 2007 Interpretive Plan; this alternative would not advance the desired visitor experiences or opportunities described above.

With a limited trail network under Alternative A, there is little incentive for volunteer, conservation, and/or stewardship groups to pursue formal opportunities for trail maintenance, educational or interpretive programs, or resource monitoring. Furthermore, the ongoing illegal shooting, as well as unauthorized OHV use, in the NCA is a deterrent to many volunteer groups that may otherwise wish to pursue trail improvements or resource enhancements in the NCA.

##### *Cumulative Effects*

The geographic scope for recreation related cumulative effects include Federal, state, and local open space and trail systems within the greater Las Vegas Valley.

Alternative A would have no incremental contribution to cumulative effects on recreation resources in the project area or region.

#### Alternative B

##### *Direct and Indirect Effects*

Recreational uses would be adversely affected in the short term as a result of construction activities in the project area. Potential impacts to recreational resources would include temporary displacement of uses from active construction areas, additional noise, or the presence of construction crews, vehicles, and/or equipment in the project area. The majority of the construction related impacts would be minor and would not result in any long-term changes or impacts to recreational uses, experiences, or opportunities. Similarly, it is unlikely that the temporary construction impacts would result in permanent displacement of user groups to other nearby recreation areas.

In the long term, however, the additional trails constructed under Alternative B would result in moderate or greater new benefits for trail related recreational opportunities in the NCA as well as the greater Las Vegas area. The trail network would be a major new facility for hikers, equestrian users, and mountain bikers.

The development of trails throughout the NCA would provide new opportunities for users who might not otherwise access the NCA via cross-country travel. The construction and/or designation of trails would help to advance several of the top 10 outdoor recreation activities identified in the 2003 Nevada SCORP (Nevada Division of State Parks 2004). Specifically, trails

leading into the interior of the NCA would provide new opportunities for walking for pleasure, family gathering, viewing and photographing natural scenery and wildlife, picnicking, and sightseeing.

The Alternative B trail network would provide additional interpretive opportunities, including, but not limited to, desert ecology, conservation, public lands management, and/or cultural resources. Alternative B would directly advance the desired visitor experiences or opportunities described in the 2007 Interpretive Plan. For example, Alternative B would provide opportunities to (BLM 2007a):

- View extensive vistas and be inspired by this landscape.
- Experience a wilderness environment.
- Learn about the interpretive themes through a variety of media (hands-on exhibits, videos, web site, web Ranger, publications, etc.).
- Access facilities regardless of physical ability.
- Develop a sense of stewardship toward protecting the resources and values.
- Provide various types of recreation: hiking, mountain biking, equestrian use, primitive camping, and wildlife viewing.

With the additional trail related visitation to areas that are currently used for illegal motorized activities, it is possible that these unauthorized uses would be discouraged. Consistent with the 2006 RMP, this indirect effect of increased trail related visitation would result in long-term moderate beneficial impacts for recreation resources in the NCA.

The construction and designation of 58.4 miles of trail under Alternative B, as well as the likely OHV use discouragement, may attract volunteer, conservation, and/or stewardship groups that may be interested in long-term trail maintenance activities, hosting educational or interpretive programs, or serving as resource monitors.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

In recent years, the greater Las Vegas area has developed a reputation as one of the west's most accessible and diverse outdoor recreational destinations. The contribution of Alternative B's trails and trail related recreational opportunities would result in notable and beneficial cumulative effects to regional recreation resources.

With the recent adoption of the City of Henderson Open Space and Trails Plan (2005b), the city has actively pursued the development of city managed trails within the NCA, as well as future trail connectors to the NCA. The city's network of trails, combined with the Alternative B trails, would provide major trail and neighborhood connectivity enhancements.

Alternative B would have a moderate contribution to beneficial cumulative effects for recreation resources and opportunities in the Las Vegas Valley.

## **Alternative C – Proposed Action**

### *Direct and Indirect Effects*

The short and long-term effects of Alternative C would be the same as described for Alternative B; Alternative C would have additional effects in the Dutchman Pass area as a result of restoration and designation of 10 miles of OHV routes into the trail network.

The restoration and incorporation of approximately 10 miles of existing unauthorized motorized routes into the Alternative C network would provide several additional trail related recreational benefits. The restoration of select OHV routes would result in some minor aesthetic improvements for recreational users on or nearby these routes (see also the Visual Resources section, Section 4.7.4). The OHV routes identified for restoration and designation into the Alternative C network are all located in the Dutchman Pass area. This is the only area within the NCA open to mountain bike use. Additionally, this area is anticipated to receive the highest amount of immediate visitation due to its proximity to growing residential areas and ease of access. As such, the inclusion of approximately 11 additional miles of trail under Alternative C would benefit recreational uses in two primary ways.

First, the additional mileage would present opportunities for longer trail rides or hikes as well as additional loop opportunities.

Secondly, given the expectation that the Dutchman Pass area would receive heavy use, a larger trail network would help to disperse users over a greater area or more routes. Theoretically, this would help to lower the density of users on any given trail, and may have a minor beneficial effect on recreational experiences as well as potentially reducing user conflicts.

### *Cumulative Effects*

The geographic scope and cumulative effects of Alternative C would be similar to those as described for Alternative B.

## **Alternative D**

### *Direct and Indirect Effects*

The short and long-term effects of Alternative C would be the same as described for Alternatives B and C. Like Alternative C, Alternative D would have additional beneficial effects in the Dutchman Pass area as a result of restoration and designation of 10 miles of OHV routes into the trail network.

Within the wilderness, Alternative D does not propose any trails additional to those identified in the 2006 RMP. As such, opportunities for primitive, unconfined recreation and solitude within the wilderness boundary would remain unchanged (see Wilderness Environmental Consequences, Section 4.7.2).

### *Cumulative Effects*

The geographic scope and cumulative effects of Alternative D would be similar to those as described for Alternatives B and C, with the following exceptions.

As described previously, once adequate infrastructure is in place, the Petroglyph Canyon, the primary destination for all NCA visitors, would be closed to general visitation except by permit or with a BLM guide. Additionally, the Petroglyph Management Area and area surrounding the site of the proposed Visitor Center would be limited to hiking on designated routes (see Maps 3 and 8). Given that the majority of visitors would be arriving at the Visitor Center (reasonably foreseeable future BLM action) and Alternative D proposes only one trail with limitations on its use leading into the core of the NCA (including the wilderness) from this location, it is reasonable to assume adverse long-term cumulative effects to the recreational opportunities and experiences in this portion of the NCA. These adverse effects would result from the limited options an NCA visitor would have for recreational opportunities, including access to the wilderness area from the Visitor Center. All persons interested in visiting the wilderness would have to obtain a permit, join a BLM tour into the Petroglyph Canyon, or violate the no cross-country travel zone defined in the RMP, which lies between the visitor center and wilderness boundary.

Overall, Alternative D would still have a moderate or greater beneficial contribution to the cumulative recreational spectrum in the Las Vegas Valley, but the expectations of some NCA visitors would not be met.

## **4.7.2 WILDERNESS AND SPECIAL MANAGEMENT AREAS**

### **Alternative A – No Action**

#### *Direct and Indirect Effects*

Because there would be no trail construction or trail network designation under Alternative A, there would be no direct effects to the North McCullough Wilderness. The wilderness area is currently open for cross-country hiking and equestrian travel. Under Alternative A, wilderness use patterns would remain unchanged.

For Alternative A, there would be no distinction between areas within the Petroglyph Management Area and areas in the remainder of the wilderness. As such, these potential effects are described together for the following wilderness character attributes.

The existing trail designations would remain unchanged and no additional trail construction or improvements would occur. Therefore, this administrative action would not result in direct modification or manipulation of the ecological systems, and no impacts to the untrammeled characteristics of wilderness would occur.

Designation of trails without a constructed trail network may cause direct impacts by drawing visitors to certain corridors, resulting in trampling of individual plants and causing increased surface disturbance, leading to the creation of social trails. Alternative A would have no effect or only negligible indirect effects on the natural characteristics of wilderness.

Alternative A would have negligible or no effect on the outstanding opportunities for solitude and primitive, unconfined types of recreation. Without additional trail infrastructure in the NCA, all



areas outside of the Petroglyph Management Area would remain open to cross-country hiking. As such, opportunities for solitude and primitive or unconfined types of recreation would remain unchanged.

Alternative A would not result in any direct effects to the other unique components that reflect the character of this wilderness, specifically geologic features and heritage and/or cultural resources. No prominent or unique geologic features are identified within the Petroglyph Management Area; therefore, no direct or indirect impacts would occur. In the remainder of the wilderness, no direct effects to geologic features are expected since no trail construction is proposed. Indirect effects may include impacts to geologic features from visitors traveling cross-country off the designated trail, thereby reducing resource integrity due to trampling.

There would be no direct effects to the Petroglyph Management Area as a result of Alternative A. However, without a constructed or improved trail system in this heavily visited area (per the 2006 RMP), critical characteristics of the Petroglyph Management Area, such as cultural artifacts, petroglyphs, and scenic characteristics, may be jeopardized as a result of continued, largely unmanaged cross-country travel in this sensitive area. Although the Petroglyph Management Area is not currently open to cross-country travel, this type of use is still occurring. With future visitation increases and no formalized routes, visitors would be increasingly likely to pursue their own routes in this area. In the long term, Alternative A would result in moderate adverse effects to the characteristics and resources of the Petroglyph Management Area.

No special provisions, as identified in Sections 4 and 5 of the Wilderness Act, are relevant to Alternative A.

Because this alternative does not require any on-the-ground improvements or construction, there are no economic or time constraints for implementation.

Implementation of Alternative A would have an impact to visitor safety for those unable to maneuver the dry falls along the route to Petroglyph Canyon. The identified alternate route, Cowboy Trail, would not have improvements and would be a proven challenge to those with physical limitations.

### *Cumulative Effects*

The geographic scope of the wilderness cumulative effects analysis is defined as the North McCullough Wilderness boundary, located entirely within the NCA.

Given that Alternative A is not anticipated to have either direct or indirect effects on the wilderness, Alternative A would not incrementally contribute to the cumulative effects on wilderness resources, except as noted below for the Petroglyph Management Area, which is mostly contained within the wilderness boundary.

The incremental contribution of Alternative A effects would result in minor adverse cumulative effects on Petroglyph Management Area resources when combined with the rapidly urbanizing desert edge, adjacent to the NCA boundary, and the development of City of Henderson trails and trail connections to the NCA. As noted in the Affected Environment discussion, once residential build-out is complete and the City of Henderson trail network is constructed, the Petroglyph Management Area will be easily accessible by a large metropolitan population. Without adequate trail, visitor reception, and signage infrastructure, the Petroglyph Management Area resources and characteristics would be jeopardized. As such, the indirect effects of

Alternative A have the potential to result in moderate long-term adverse cumulative effects to the Petroglyph Management Area.

### **Alternatives B and C**

*Within the wilderness boundary, there is no distinction between Alternatives B and C. These alternatives vary only by the proposal to restore and incorporate approximately 10 miles of existing OHV social trails in the Dutchman Pass area of the NCA (outside of the wilderness).*

*These alternatives will therefore be analyzed together.*

#### *Direct and Indirect Effects*

Alternatives B/C would result in the designation of approximately 21.2 total miles of trails within the wilderness. These alternatives would realign and reroute portions of the trails previously identified and described under Alternative A - No Action, resulting in approximately 3.7 miles. Trails would typically be 2 feet wide; however, in some locations, trails may need to be constructed up to 3-4 feet wide for safety purposes (e.g., passing zones on steep, loose terrain). Locations where 3-4-foot wide trails are necessary would be determined at the time of construction. The extent of these wider trails is anticipated to be minimal and therefore irrelevant for analysis purposes. As such, a standard trail tread width of 2 feet is assumed for impacts analysis.

The direct effects of Alternatives B/C would be the result of establishing a discernible 2-foot trail tread and some minor improvements, such as rock steps or rock walls for the entire wilderness trail network shown on Maps 6/7 and 9.

The designation of 21.2 miles of trail would not result in direct modification or manipulation of the ecological systems and, therefore, no direct impacts would occur to untrammelled characteristics of wilderness. However, the construction of 21.2 miles of trail would manipulate one or more component of wilderness. The overall effect to untrammelled characteristics of wilderness would be long term, minor to moderate and adverse.

The designation of new trails would not result in direct impacts to the undeveloped character of wilderness. However, the construction of 21.2 miles of trail would result in direct moderate impacts to this character due to the extent of trails and modifications proposed. Construction of trails would utilize natural materials, but would be evidence of man's work and would therefore diminish this characteristic. Additionally, Alternatives B/C would allow for small, non-permanent rock cairns to be erected on designated routes. The wilderness would, therefore, present less of a contrast to other areas where man's work is in evidence. The long-term effects would be minor to moderate and adverse.

The designation of 21.2 miles of trails may cause an indirect impact by drawing visitors to certain corridors, resulting in trampling of individual plants and causing increased surface disturbance in areas adjacent to the trail. However, trail designations may indirectly benefit naturalness by reducing the creation of social trails and resulting erosion.

Construction would directly impact the natural character of the wilderness by removing and destroying cryptogamic crusts, exposing loose soils to increased erosion via wind and rain, altering the movement of water across the landscape, and removing vegetation. On a regional scale, the action would adversely impact populations of plant species, such as Blue Diamond

cholla and two-toned penstemon, which have a very limited distribution. The proximity of trails to the wildlife water development (less than ¼ mile) or near wildlife travel corridors may adversely impact the naturally distributed populations of bighorn sheep, dependent on this water source.

This action proposes the development of trails in the northwest portion of the wilderness, concentrated in the Petroglyph Management Area and Hidden Valley area. This would concentrate the majority of wilderness visitation into this portion of the wilderness. Subsequently, this would reduce opportunities for solitude in these areas and where the trail is visible in certain viewsheds. Alternatives B/C are proposing a total of 21.2 miles of trail within a 4 square mile area, resulting in approximately 1.25 miles of trail per 1 square mile. Impacts to solitude within this area would be moderate or greater; however, opportunities for solitude outside of the Hidden Valley area would remain unchanged. As such, Alternatives B/C would have minor to moderate adverse effects on the overall opportunities for solitude in the wilderness.

Trail construction durations would be extensive with Alternatives B/C. Opportunities for solitude would be affected for up to several seasons during construction. This would be a minor to moderate short-term adverse effect on opportunities for solitude.

A constructed trail system would make travel “easier;” however, a wilderness journey is intended to provide the ideal conditions for developing physical hardiness and to accept the wilderness on its own terms. Primitive recreation also encompasses reliance on personal skills to travel and camp in an area, rather than rely on facilities or outside help. Within the Petroglyph Management Area, recreation is restricted to designated trails, while the remainder of the wilderness provides outstanding opportunities to experience self-discovery, exploration, and freedom from societal or managerial controls. Although Alternatives B/C propose more trails within the Petroglyph Management Area as compared to Alternatives A and D, this does not actually reduce the extent of managerial controls in this area. Within the proposed project area, primitive recreation would be directly and adversely impacted by the addition of facilities and decreased opportunities to use technical skills necessary to travel in a backcountry setting and reduced need for self-reliance. Outside of the Hidden Valley area, primitive recreation wilderness would remain unchanged. Overall, Alternatives B/C would result in a net decrease in opportunities for primitive recreation in the wilderness; this is a minor to moderate long-term adverse effect.

Alternatives B/C would have direct effects on the other unique components that reflect the character of this wilderness, specifically notable cultural resources. Designated and constructed trails within the Petroglyph Management Area would help preserve cultural resources by providing several identified routes and direction to access the Petroglyph Management Area, thereby decreasing the likelihood of trampling sensitive cultural resources. However, additional designated routes and access points into the Petroglyph Management Area, and adjacent trails, may indirectly adversely impact cultural resources by making it more difficult to manage visitor use within the area. Designated trails outside of the Petroglyph Management Area may help protect other cultural resources by directing visitors away from sensitive locations.

No prominent or unique geologic features are identified within the Petroglyph Management Area; therefore, no direct or indirect impacts would occur. In the remainder of the wilderness, especially the Hidden Valley area, direct effects to geologic features would occur as a result of new trail construction. However, trail construction may indirectly benefit this component by concentrating visitor use on trails, possibly reducing the creation of social trails and any resulting trampling of geologic features.

The use of hand tools in trail construction would allow the maintenance of traditional skills. Alternatives B/C would promote the use of traditional skills, distinct from non-wilderness area tools, techniques, or methods. Under Alternatives B/C, no power tools or mechanized devices would be used. Alternatives B/C would rely on the use of basic hand tools, human labor, and small crews to construct all trails. Outside of the wilderness, these methods are rarely employed because of the additional time and, ultimately, costs involved. However, these methods represent a light-on-the-land approach and a return to basic human ingenuity and wherewithal.

No special provisions, as identified in Sections 4 and 5 of the Wilderness Act, are relevant to Alternative A.

This alternative proposes an extensive trail system and associated construction. As a result, work would be accomplished over a longer timeframe and construction costs would be higher. Over time, more investment would be required to maintain the 21.2 miles of constructed trail.

Although Alternatives B/C would involve the construction of new trail facilities, the safety risks to personnel and contractors are relatively low, given that no Section 4(c) exceptions are proposed and no mechanized, electric, or explosive devices would be used during construction. Trail construction would involve only non-motorized and non-mechanized hand tools and would be performed year-round. Construction would be performed on rocky and rugged terrain, commonly encountered by trail construction crews. Access to the worksite would require hiking long distances cross-country. Alternatives B/C would remedy visitor safety concerns that currently exist on the designated, unimproved Cowboy Trail route.

The Alternatives B/C wilderness trails were designed to provide sustainable routes into and through the wilderness. Ultimately, the designation of formal routes in the wilderness may deter some social trail development as a result of cross-country travel. Although cross-country hiking and equestrian uses would be permitted in the wilderness outside of the Petroglyph Management Area under Alternative B, it is likely that many wilderness visitors would opt to use the designated trail system, thereby reducing the creation of new social trails and associated human disturbances.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

The effects of Alternative B would have a minor to moderate contribution to the overall cumulative effect on the characteristics and opportunities available in the North McCullough Wilderness and Petroglyph Management Area. The effects described for Alternative B would be magnified by other reasonably foreseeable future activities, including completion of the City of Henderson trail system, which would make the NCA more accessible to residents living near the NCA boundary, as well as ongoing population growth in the Las Vegas Valley. These actions, in conjunction with an improved trail system under Alternative B, are likely to result in increased visitation to the wilderness and subsequently, adverse cumulative effects to wilderness characteristics and values.

## Alternative D – Proposed Action

### *Direct and Indirect Effects*

Alternative D closely resembles Alternative A within the wilderness and Petroglyph Management Area. Alternative D proposes to formally establish the wilderness and Petroglyph Management Area trails identified in the 2006 RMP, with some minor route realignments as described in Chapter 2.0 (total of 3.9 miles).

The direct effects of Alternative D would be the result of establishing a discernible 2-foot trail tread and some minor improvements, such as rock steps or rock walls.

Trail improvements and construction includes approximately 15 rock steps, 200 feet of rock retaining wall, 200 feet of full bench trail, 500 feet of partial bench trail, pruning vegetation, raking, and removal of boulder obstructions.

Minor realignments and construction/improvements to the Cowboy and Hidden Valley trails would have minor direct effects on the untrammelled characteristics of the wilderness. However, effects would be very localized and limited to point-specific destruction of cryptogamic crusts and removal of vegetation. Due to the limited extent of these modifications (less than 1,000 feet total), the overall effect to the untrammelled character of the wilderness would be negligible at most.

Minor realignments and construction/improvements to the Cowboy and Hidden Valley trails would have minor direct effects on the undeveloped character of the wilderness. Realignment of the Cowboy and Hidden Valley trails would utilize natural materials, and work would be completed with the use hand tools (no motorized equipment or mechanical transport is proposed). Additionally, Alternative D would allow for small, non-permanent rock cairns to be erected on designated routes.

Construction would directly impact the natural character of the wilderness by removing and destroying cryptogamic crusts, exposing loose soils to increased erosion via wind and rain, altering the movement of water across the landscape, and removing vegetation. However, due to the type and extent of the proposed modifications, naturalness effects would be negligible and adverse in these localized areas; on a regional scale, the action will help protect populations of plant and animal species. A designated trail would protect the movement of bighorn sheep, dependent on the wildlife water development, by directing use away from that area.

Outside of the Petroglyph Management Area, Alternative D would have negligible or no effect on the outstanding opportunities for solitude or a primitive and unconfined type of recreation. Opportunities for solitude would, however, be reduced in the Petroglyph Management Area where hiking is limited to designated routes and the likelihood of seeing others is high, and throughout the wilderness where the trails are visible within certain viewsheds. Although approximately 3.9 total miles of designated/constructed trails may promote hiking and equestrian use, primitive recreation would be decreased as travel would be easier with the aid of trails. Overall, effects to the primitive character would be minor.

Within the Petroglyph Management Area, recreation is far more restricted than the remainder of the wilderness where visitors can experience more “freedom.” Therefore, this alternative would have no impacts to unconfined recreation. Trail construction will slightly diminish the opportunity

for solitude in the Hidden Valley area in the short term due to the presence of the trail crew during the construction phase.

Alternative D would have direct beneficial effects on the other unique components that reflect the character of this wilderness, specifically notable cultural resources. Designated and constructed trails within the Petroglyph Management Area would help preserve cultural resources by providing identified routes and direction to access the Petroglyph Management Area, thereby decreasing the likelihood of trampling sensitive cultural resources.

No prominent or unique geologic features are identified within the Petroglyph Management Area; therefore, no direct or indirect impacts will occur. In the remainder of the wilderness, no direct effects to geologic features are expected since trail construction would avoid these features. Trail construction may indirectly benefit this component by concentrating visitor use on trails, possibly reducing the creation of social trails and any resulting trampling of geologic features.

All other effects to other unique components would be the same as described for Alternative A – No Action.

The use of hand tools in trail construction would allow the maintenance of traditional skills. Alternative D would promote the use of traditional skills, distinct from non-wilderness area tools, techniques, or methods. Under Alternative D, no power tools or mechanized devices would be used. Alternative D would rely on the use of basic hand tools and human labor to construct all trails.

Special provisions, as identified in Sections 4 and 5 of the Wilderness Act, are not relevant to Alternative D.

This alternative proposes 3.9 miles of designated/constructed trail. As a result, work would be accomplished within a longer timeframe and at a higher cost when compared to the No Action alternative. However, the construction timeline and associated cost fall within approved guidelines to implement the RMP. Alternative D would require more maintenance over time to maintain trail improvements.

Implementation of Alternative D would have a direct benefit to safety of visitors and personnel. Providing a constructed, more accessible route to Petroglyph Canyon will aid in more visitors getting to appreciate this resource. The Cowboy Trail would be fully utilized, as intended in the Wilderness and Resource Management Plans, by providing a safer route to this area.

Trail construction would involve only non-motorized and non-mechanized hand tools and would be performed year-round. Construction would be performed on rocky and rugged terrain, commonly encountered by trail construction crews. Access to the worksite would require hiking long distances cross-country. Alternative D would remedy visitor safety concerns that currently exist on the designated, unimproved Cowboy Trail route.

### *Cumulative Effects*

The geographic area for cumulative effects analysis is the same as described under Alternative A – No Action.

Within the wilderness boundary, Alternative D would ultimately result in minor beneficial cumulative effects. Although wilderness characteristics would, in the short term, be adversely affected by construction activities, the long-term effects of designated trails and imposing visitor access restrictions in the Petroglyph Management Area would help limit destruction of other unique components of the wilderness, primarily cultural resources in the Petroglyph Canyon.

### **4.7.3 CULTURAL RESOURCES**

#### **Alternative A**

##### *Direct and Indirect Effects*

There would be no direct effects to cultural resources as a result of the No Action Alternative.

Under the No Action Alternative, there would be no indirect effects to cultural properties in the NCA. However, without a designated trail system there is a possibility that future effects may indirectly result from unconstrained pedestrian use of areas near historic properties. (Note: the Sloan Canyon Petroglyph Trail has been previously designated under the Sloan Canyon NCA RMP/EIS and will continue to be managed per this plan, which provides for visitation of the site.)

##### *Cumulative Effects*

Given that Alternative A is not anticipated to have direct effects and only limited indirect effects on cultural resources, Alternative A would not incrementally contribute to cumulative effects on eligible historic properties.

#### **Alternative B**

##### *Direct and Indirect Effects*

In accordance with NHPA, and the BLM-State Protocol Agreement, the BLM has determined that sites 26CK8639, -8640, -8642, -8643 and 26CK-2240/2621 are within the APE of this Alternative. Alternative B would have “no effect” to any eligible historic properties, as the BLM would ensure that the alignment will be shifted away from these sites providing for an adequate buffer as specified in the BLM-State Protocol Agreement. Also, no construction will be permitted in the Sloan Petroglyph Canyon Special Management Area (site 26CK-2240/2621). Where construction may occur outside of the Sloan Petroglyph Canyon, all construction limits shall be confined to areas in such a manner as no sites would be harmed.

##### *Cumulative Effects*

Given that Alternative B is expected to have “no effect” on eligible properties, there would be no potential for cumulative effects as a result of this project.

#### **Alternative C**

##### *Direct and Indirect Effects*

In accordance with NHPA, and the BLM-State Protocol Agreement, the BLM has determined that sites 26CK8639, -8640, -8641, -8642, -8643 and 26CK-2240/2621 are within the APE of

this Alternative. Alternative C would have “no effect” to any eligible historic properties, as the BLM would ensure that the alignment will be shifted away from these sites providing for an adequate buffer as specified in the BLM-State Protocol Agreement. Also, no construction will be permitted in the Sloan Petroglyph Canyon Special Management Area. Where construction may occur outside of the Sloan Petroglyph Canyon, all construction limits shall be confined to areas in such a manner as no sites would be harmed.

#### *Cumulative Effects*

Given that Alternative C is expected to have “no effect” on eligible properties, there would be no potential for cumulative effects as a result of this project.

### **Alternative D**

#### *Direct and Indirect Effects*

In accordance with NHPA, and the BLM-State Protocol Agreement, the BLM has determined that Alternative D would have “no effect” to any eligible historic properties, as the BLM would ensure that design measures would shift the alignment away from sites 26CK8641 -8642, and -8643 providing for an adequate buffer as specified in the BLM-State Protocol Agreement. In addition, no construction will be permitted in the Sloan Petroglyph Canyon Special Management Area near site 26CK-2240/2621. Where construction may occur outside of the Sloan Petroglyph Canyon, all construction limits shall be confined to areas in such a manner as no sites would be harmed.

#### *Cumulative Effects*

Given that Alternative D is expected to have “no effect” on eligible properties, there would be no potential for cumulative effects as a result of this project.

### **4.7.4 VISUAL AND AESTHETIC RESOURCES**

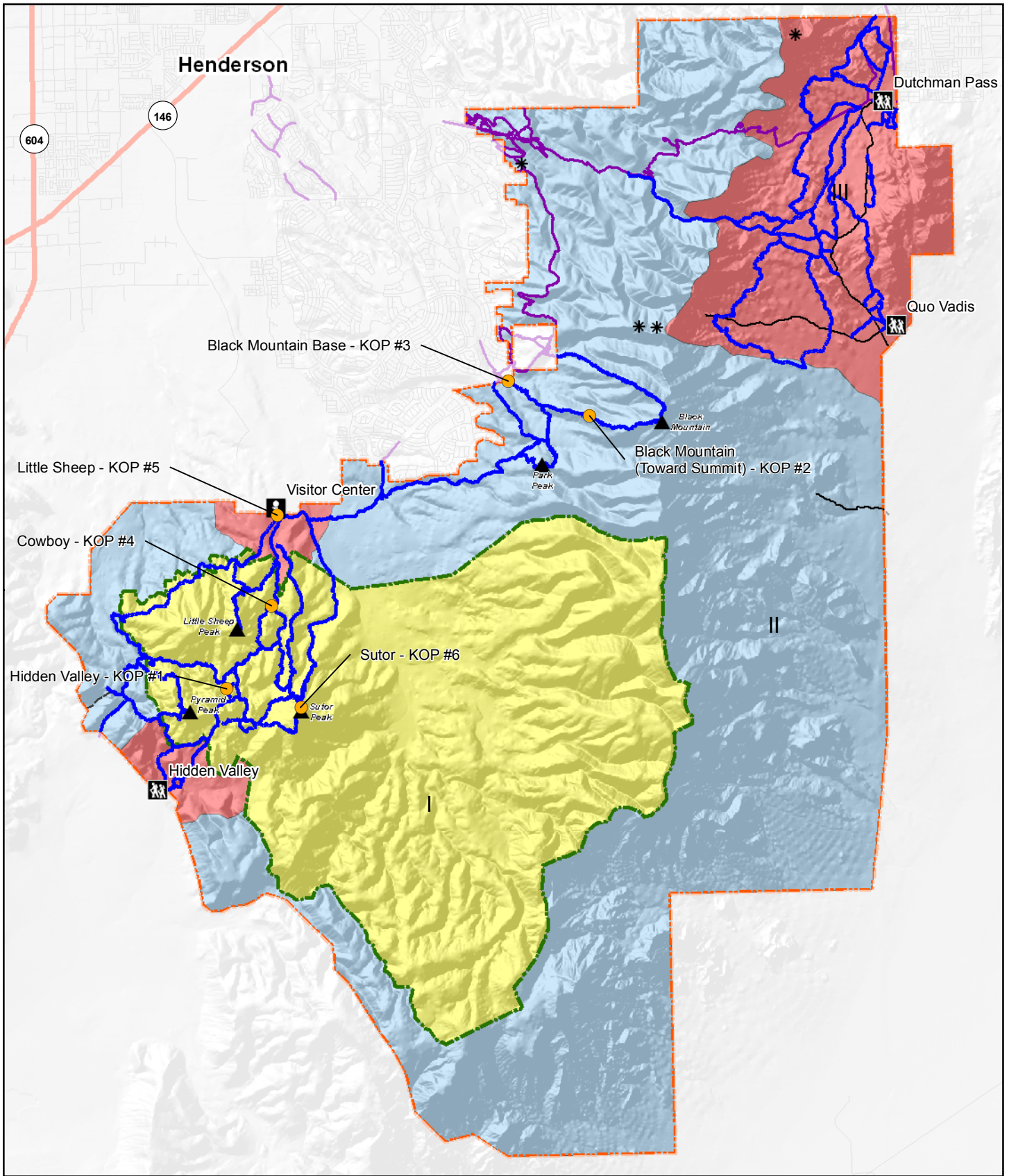
The potential impacts to visual and aesthetic resources were evaluated through Key Observation Points (KOPs), VRM inventory data, contrast ratings, field observations, representative photographic simulations (see various figures in Chapter 2.0), and Google Earth simulations for all action alternatives.

Six KOPs were identified by the BLM from which to analyze the typical effects of each alternative. Map 13 shows the locations of each KOP and correlating VRM classes. For each KOP, the BLM’s Visual Contrast Rating Worksheets (Form 8400-4) compared the characteristics of the existing landscape and basic elements of form, line, color, and texture to each alternative’s degree of contrast and compliance with VRM Classes. Table 4-14 lists the KOPs and compliance with VRM Classes. Scenic quality, viewer sensitivity, and distance zones from the VRM inventory, completed as part of the Sloan Canyon NCA RMP, were also consulted.



Table 4-14. Compliance with VRM Classes by KOP.

KOP	KOP Name	VRM Class	VRM Class Achieved			
			Alt A	Alt B	Alt C	Alt D
1	Hidden Valley	I	Yes	Yes	Yes	Yes
2	Black Mountain, looking east towards summit	II	Yes	Yes	Yes	Yes
3	Black Mountain Base	III	Yes	Yes	Yes	Yes
4	Junction of Petroglyph Canyon and Cowboy Trail	I	Yes	Yes	Yes	Yes
5	Little Sheep Peak (from approximate location of new Visitor Center)	I, III	Yes	Yes	Yes	Yes
6	Sutor Peak Summit	I	Yes	Yes	Yes	Yes



**LEGEND**

Sloan Canyon NCA Boundary	Existing NCA Major Roads	Communication Towers	Key Observation Points
North McCullough Wildemess	Alternative C Trails 68.4 Miles	Visitor Center	VRM Class I
		Proposed Trailheads	VRM Class II
		Peaks	VRM Class III

**Sloan Canyon NCA  
Trails Master Plan  
MAP 13 - KOP AND VRM CLASS  
OCTOBER 4, 2009**

0 0.5 1 Miles EDAW AECOM

## Alternative A – No Action

### *Direct and Indirect Effects*

Because no trail construction activities would occur under Alternative A, there would be no direct effects to visual resources within the project area.

However, under Alternative A, the existing, unimproved routes (both RMP designated and social trails) would continue to be used without any formal maintenance. As use of the existing trails continues to increase commensurate with local population growth, the trails would continue to widen, proliferate into new areas, and degrade in an uncontrolled manner. Unauthorized OHV trail use would likely occur at higher levels under Alternative A.

The effects of Alternative A by KOP are as follows:

- KOP #1 Hidden Valley: The existing unimproved Alternative A routes create no contrast in this view.
- KOP #2 Black Mountain, looking east towards summit: Alternative A would not be visible from this KOP. Closing and restoring existing social trails within this view would result in long-term beneficial effects.
- KOP #3 Black Mountain Base: Alternative A would not be visible from this KOP. Closing and restoring existing social trails within this view would result in long-term beneficial effects.
- KOP #4 Junction of Petroglyph Canyon and Cowboy Trail: The existing unimproved Alternative A routes follow the lines, colors, and textures of existing washes, creating no contrasts.
- KOP #5 Little Sheep Peak (from approx. location of new Visitor Center): Alternative A follows existing roads and washes, creating no contrast.
- KOP #6 Sutor Peak Summit: The existing unimproved Alternative A routes follow the lines, colors, and textures of existing washes and roads, creating no contrasts.

In summary, there would be no direct effects to VRM Class I, II, or III objectives as a result of Alternative A. Indirectly, however, visual effects from widening trails (as a result of poor routing and/or user demand) and a proliferation of new social trails would result in weak to moderate line and color contrasts. These increased disturbances would have a moderate adverse effect on VRM Class II and III areas of the NCA in the long term, but would ultimately comply with these VRM Class objectives. VRM Class I objectives, which require preservation of the existing character of the landscape through activities that do not attract the attention of casual viewers, would not be achieved over the long term, where viewing angle and viewing distance magnify contrasts. As such, Alternative A would indirectly contribute to moderate adverse effects to visual resources.

### *Cumulative Effects*

The geographic scope for the visual resources cumulative effects analysis is defined as the NCA boundary, where BLM VRM Class objectives are applicable, and residential developments immediately adjacent to the NCA boundary (e.g., Black Mountain and Dutchman Pass areas).

Past and present actions within the NCA have contributed to visual and scenic degradation, including, but not limited to, overhead electric transmission lines, illegal garbage dumping, and the proliferation of unauthorized OHV routes. The incremental contribution of Alternative A's effects to the effects of past actions would be negligible.

## **Alternative B**

### *Direct and Indirect Effects*

In the short term, Alternative B would have direct adverse effects on visual resources as a result of construction activities, machinery, and/or personnel. However as described in the RMP, once constructed, hiking use would be restricted to designated trails in some portions of the NCA. This restriction would ultimately result in minor beneficial effects as it would reduce the likelihood of social trail proliferation.

Visual effects vary depending on whether Alternative B follows an existing road or wash, restores existing social trails, or creates a new trail. Through appropriate use of the Project Design Features in Chapter 2.0, including use of native materials, contouring of slopes, and site-appropriate trail widths, the long-term impact on visual and aesthetic quality would be minimized.

Trails located on existing roads or in washes would result in no effect or minor beneficial effects to visual resources, as road edges would be restored to a narrower width.

Closure and restoration of existing social trails and/or OHV routes would further offset the adverse visual impacts of new trail construction over the long term, and would ultimately result in minor beneficial effects to scenic quality.

The visibility and contrast of newly constructed trails would be similar to existing trails, and would primarily be dependent upon viewing distance and viewing angle. In the immediate foreground, the trail would be highly visible within 500 feet of the viewer when not screened by vegetation or terrain. Within 500 feet, construction of the trail tread would expose a light colored line bordered by dark rocks, resulting in moderate color contrasts. In the foreground–middleground zone (up to 4 miles), new trails would generally be visible when 1) parallel to the line of sight of the viewer, 2) when on a surface that is more than 10% slope, sloping towards the viewer, or 3) in an area with little or no vegetation. Under these conditions, new trails would result in weak to moderate line and vegetation contrasts. In other conditions, such as in vegetated areas not tilted towards the viewer, vegetation and terrain screening would naturally reduce the visibility and contrast of new trails. Rock steps, switchbacks, and retaining walls may, however, increase contrasts. Figures 51-52 shows that the visual contrast of an existing trail is reduced though terrain and vegetation screening, increasing viewing distance, and viewing angle.

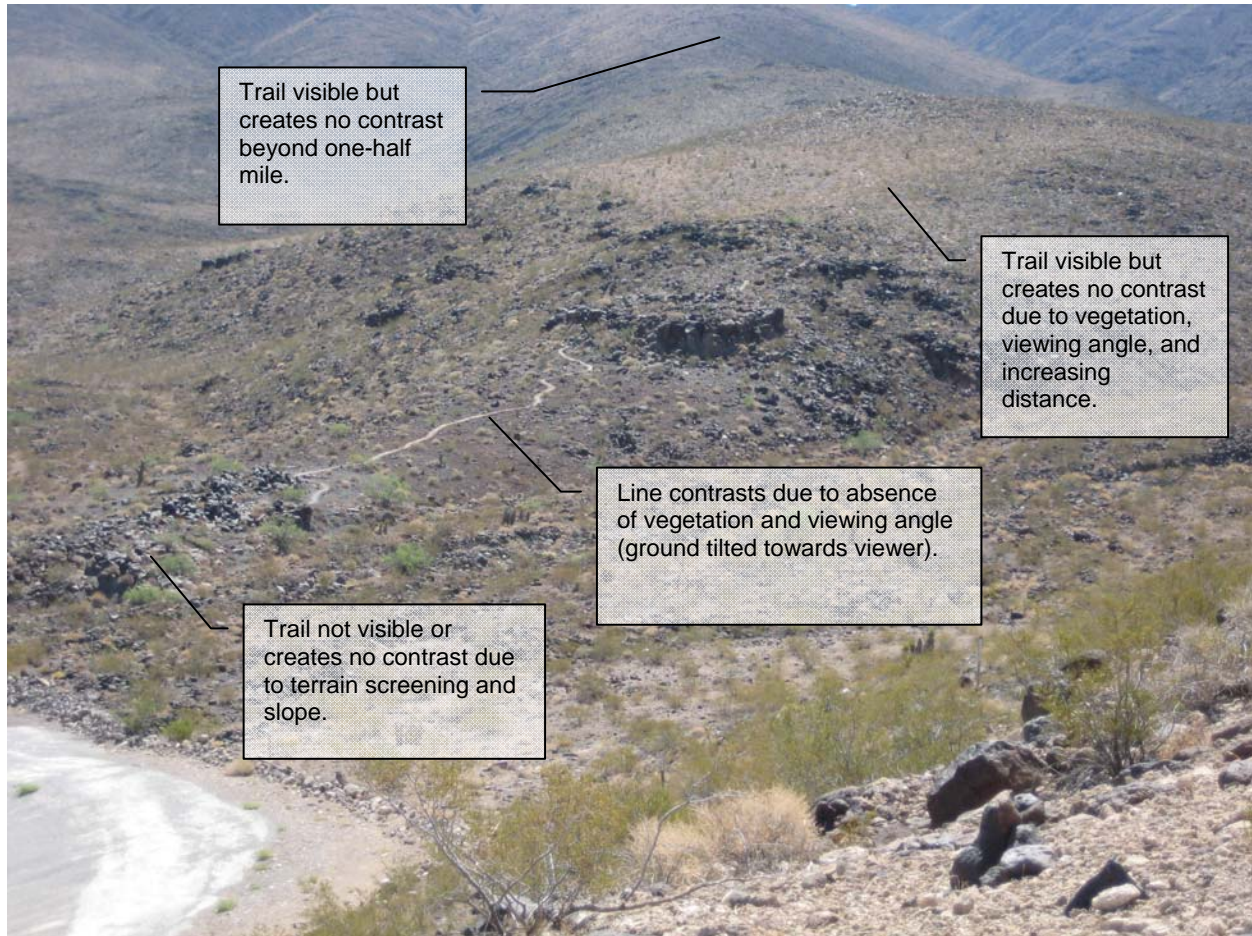


Figure 51. Black Mountain Base KOP #2, existing conditions in VRM Class III.



Figure 52. Sutor Peak KOP #6, existing conditions in VRM Class I. The existing two-track road is approximately 8' wide. New wilderness trails under action alternatives would be 2' wide.

The effects of Alternative B by KOP are as follows:

- KOP #1 Hidden Valley: Within 500 feet of viewers, the lines, colors, and textures of the existing and realigned trails would be apparent, creating a weak to moderate degree of contrast. When looking beyond 500 feet, the realigned trail may be screened by vegetation or terrain, or not apparent due to viewing distance, resulting in negligible to weak contrasts, similar to the existing conditions. The overall change to the characteristic landscape of the panoramic viewshed would be very low.
- KOP #2 Black Mountain, looking east towards summit: Within 500 feet of the viewer, the lines, colors, and textures of the existing and realigned trails would be visible. When looking towards the focal point (Black Mountain) beyond 500 feet, the realigned trail may be screened in sections by vegetation or terrain, or altogether not apparent due to viewing distance, resulting in no contrasts to the existing conditions. As a result, the overall effect to the characteristic landscape of the panoramic viewshed would be low.
- KOP #3 Black Mountain Base: Within 500 feet of viewers, the lines, colors, and textures of the existing and realigned trails would be apparent, creating a weak to moderate degree of contrast. When looking beyond 500 feet, the realigned trail may be screened by vegetation or terrain, or altogether not apparent due to viewing distance, resulting in no contrasts to the existing conditions. The overall effect to the characteristic landscape of the panoramic viewshed would be low.
- KOP #4 Junction of Petroglyph Canyon and Cowboy Trail: Alternative B follows the lines, colors, and textures of existing washes, creating no contrasts.
- KOP #5 Little Sheep Peak (from approx. location of new Visitor Center): Four trails would be visible from this KOP: Petroglyph Canyon Trail (following the existing road and wash), Northern Traverse Trail (new trail directly in front of the KOP heading south to Little Sheep), the Park Peak Connector (heading east across Petroglyph Canyon Wash following an existing two-track), and the West Sutor Trail (new trail diverging from Petroglyph Canyon Trail 0.5 mile south of KOP). Of these four, only the Northern Traverse Trail and West Sutor Trail would likely create new line and color contrasts. Within the VRM Class III foreground (0-0.5 mile), the Northern Traverse Trail would create weak to moderate line, color, and texture contrasts where not screened by vegetation and terrain, and would meet VRM Class III objectives. New trails visible in VRM Class I areas beyond 0.5 mile would create a negligible contrast. Some existing roads (i.e., Park Peak Connector) would be restored to a narrower trail width, resulting in a long-term beneficial effect.
- KOP #6 Sutor Peak Summit: Most new trail segments follow existing lines (washes and two-track roads), resulting in no contrasts. Some segments would be screened by vegetation or terrain, resulting in no contrasts. Other segments would be located at such a viewing angle (parallel to the line of sight), with the ground tilted toward the viewer, and/or in unvegetated areas where they would be visible and would create weak to moderate color and line contrasts, depending on viewing distance. The overall effect to the characteristic landscape of the panoramic viewshed would be very low and would not attract attention.

In summary, under Alternative B, trail construction and maintenance activities (including ground disturbance and vegetation removal) would adversely affect visual resources in the short term. Long-term effects would be similar to existing trail contrasts. Negligible and weak form, line, color, and texture contrasts would repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape, as seen in the

immediate foreground and foreground-middleground distance zone. Short and long-term effects would comply with all VRM Classes. With the addition of a long-term maintenance program, reduced demand for new social trails, and the closure and rehabilitation of existing non-designated social trails, the overall long-term impact on scenic quality would be beneficial.

### *Cumulative Effects*

The geographic scope for visual resource cumulative effects analysis would be the same as described for Alternative A.

Past and present actions within the NCA have contributed to visual and scenic degradation, including, but not limited to, overhead electric transmission lines, illegal garbage dumping, and the proliferation of unauthorized OHV routes. The development of the Alternative B trail network would result in long-term but minor cumulative impacts to the visual resources throughout the NCA by introducing new lines and human disturbances into the landscape. These effects, when combined with the following past, present, and reasonably foreseeable future human disturbance activities, cumulatively result in adverse effects to the visual and scenic resources of the NCA. The degree of effect would vary by area. Cumulative effects in the Dutchman Pass area would be negligible at most, due to the high level of human disturbances and overhead structures in this area currently. Cumulative effects in the Black Mountain / Visitor Center area would also be negligible due to the presence of existing, well-established social trails (e.g., Black Mountain Summit and Fracture Ridge) and proximity to human developments. Within the wilderness or Hidden Valley area, the cumulative effects would be most noticeable, but still minor in intensity. Alternative B would not result in any above ground structures, but when combined with views to the overhead transmission lines, communications towers, or existing roads, the trails would have a minor incremental contribution to adverse cumulative effects.

Overall, the incremental contribution of Alternative B effects to the effects of past, present, and reasonably foreseeable future actions is not anticipated to result in impairment of VRM objectives or the need to modify classifications in any portion of the NCA. As such, the cumulative effect of implementing Alternative B may cause some negligible to minor long-term adverse effects, but would not result in any moderate or greater effects to visual or scenic resources in the NCA.

## **Alternative C – Proposed Action**

### *Direct and Indirect Effects*

The direct and indirect effects of Alternative C would be the same as described for Alternative B, with the following exception.

The restoration of approximately 10 miles of OHV routes would reduce the width of existing routes in the Dutchman Pass area, as well as remedy some of the OHV degradation in the area. Therefore, OHV route restoration and new non-motorized trail designation would result in beneficial effects to scenic quality by rehabilitating existing trails and reducing the number of social trails. This would have a minor long-term beneficial effect on existing visual resources in the Dutchman Pass area.

All KOP effects would be identical to those described for Alternative B.

### *Cumulative Effects*

The geographic scope for visual resource cumulative effects analysis would be the same as described for Alternative A.

The cumulative effects of Alternative C would be similar to those described for Alternative B. Although the restoration of OHV routes in the Dutchman Pass area would have direct and indirect beneficial effects, these effects would be of such small magnitude in an area that is already heavily impacted, that these effects would have no additional bearing on the cumulative effects to visual resources.

## **Alternative D**

### *Direct and Indirect Effects*

In VRM Class II and III areas, the direct and indirect effects of Alternative D would be the same as described for Alternative B. In VRM Class I areas, the direct and indirect effects of Alternative D would be similar to those described for Alternative A. Within VRM Class I, Alternative D does not propose any new designated routes, but does propose to formally establish the existing unimproved routes identified in the RMP, including several minor realignments to those routes.

The effects of Alternative D by KOP are as follows:

- KOP #1 Hidden Valley: Within 500 feet of viewers, the lines, colors, and textures of the existing and realigned trails would be apparent, creating a weak to moderate degree of contrast. When looking beyond 500 feet, the realigned trail may be screened by vegetation or terrain, or not apparent due to viewing distance, resulting in negligible to weak contrasts, similar to the existing conditions. The overall effect change to the characteristic landscape of the panoramic viewshed would be very low.
- KOP #2 Black Mountain, looking east towards summit: Effects would be the same as described for Alternative B.
- KOP #3 Black Mountain Base: Effects would be the same as described for Alternative B.
- KOP #4 Junction of Petroglyph Canyon and Cowboy Trail: Effects would be the same as described for Alternative B.
- KOP #5 Little Sheep Peak (from approx. location of new Visitor's Center): Effects would be the same as Alternative A.
- KOP #6 Sutor Peak Summit: Effects would be similar to Alternative A. (The existing unimproved Alternative A routes follow the lines, colors, and textures of existing washes and roads, creating no contrasts.) Some of the minor Alternative D realignments would be screened by vegetation or terrain, resulting in no contrasts. Other realignments would be located at such a viewing angle (parallel to the line of sight), with the ground tilted toward the viewer, and/or in unvegetated areas where weak to moderate color and line contrasts would be visible, depending on viewing distance. The overall effect to the characteristic landscape of the panoramic viewshed would be very low and would not attract attention.



In summary, under Alternative D, trail construction and maintenance activities (including ground disturbance and vegetation removal) would adversely affect visual resources in the short term in all VRM Classes. However, the long-term effects would be similar to the existing trail contrasts. Negligible and weak form, line, color, and texture contrasts would repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape, as seen in the immediate foreground and foreground-middleground distance zone. Short and long-term effects would comply with all VRM Classes. With the addition of a long-term maintenance program, reduced demand for new social trails, and the closure and rehabilitation of existing non-designated social trails, the overall long-term impact on scenic quality would be beneficial. Of the action alternatives analyzed, Alternative D would most closely fulfill VRM Class I objectives.

### *Cumulative Effects*

The geographic scope for visual resource cumulative effects analysis would be the same as described for Alternative A.

In areas outside of the wilderness boundary, the cumulative effects of Alternative D would be the same as described for Alternative C.

Within the wilderness, the cumulative effects of Alternative D would be very similar to those described for Alternative A. The incremental contribution of the effects of improved trails under Alternative D, when combined with the effects of past actions, such as the guzzlers and rock and mortar dam, would be negligible.

Overall, the incremental contribution of Alternative D effects to the effects of past, present, and reasonably foreseeable future actions is not anticipated to result in impairment of VRM objectives or the need to modify classifications in any portion of the NCA. As such, the cumulative effect of implementing Alternative D may cause some negligible to minor long-term adverse effects in areas, but would not result in any major effects to visual or scenic resources in the NCA.

## **4.8 UNAVOIDABLE ADVERSE EFFECTS**

Unavoidable adverse effects are those environmental consequences of an action that cannot be avoided, either because modifying the action would change the nature of the project or effective mitigation through project design is not feasible. Pursuant to NEPA Sec. 102 [42 USC § 4332] (2)(C)(ii), this analysis must identify those alternative actions that would result in unavoidable adverse effects.

The action alternatives would result in adverse effects that are unavoidable. One of these is the likelihood of promoting increased visitation to the NCA, which in turn contributes to a loss of solitude for some visitors. This effect is unavoidable but would be offset by the benefits to other visitors and the increased accessibility resulting from a developed trail system.

Other unavoidable effects are losses of vegetation in areas displaced by trail development and increased interaction between wildlife and visitors. Both of these effects are minor but long term.

#### **4.9 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

Pursuant to NEPA Sec. 102 [42 USC § 4332] (2)(C)(iv), this analysis must identify alternative actions that would result in trade-offs between short-term uses and long-term productivity.

For this federal action, “short term” is defined as within the 3-5 year implementation period. Long term is defined as any time period beyond the implementation period.

None of the alternatives presented in Chapter 2.0 or impacts identified in Chapter 3.0 would result in trade-offs between short-term uses and long-term productivity.

Alternative A (No Action) would result in some short and long-term adverse effects to specific resources as previously described. However, Alternative A would not directly impair the long-term productivity, operational, or conservation goals of the NCA.

The proposed action alternatives (Alternatives B and C) were developed to be consistent with the 2006 RMP. The short-term management actions detailed in this document are intended to support the long-term management goals and objectives within the NCA. The construction and designation of a formal trail network would not conflict with the long-term operational or conservation goals of the NCA.

#### **4.10 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

Pursuant to NEPA Sec. 102 [42 USC § 4332] (2)(C)(v), this analysis must identify alternative actions that would result in the irreversible and/or irretrievable commitments of resources.

Irreversible commitments are those that cannot be reversed, such as species extinction, mining ore, or logging old growth forest, which would take hundreds of years to recover. Such decisions are considered irreversible when their implementation would affect a resource such that its useful renewal could occur only over a period of time longer than the useful life of the project, at exorbitant expense, or because they would cause the resource to be destroyed or removed. Irreversible commitments of resources on federal lands are typically attributed to major infrastructure construction projects, such as the use of federal lands for the original construction of dams, reservoirs, or associated conveyance features.

Both of the action alternatives would result in the irreversible commitment of fossil fuel resources during construction activities. It is anticipated that the amount would be locally minor and globally negligible. Otherwise, there would be no irreversible commitments of resources as a result of project implementation.

Irretrievable commitments of resources result in the loss of production or use of resources as a result of a decision where the resource commitments represent a moratorium on other site-specific uses or opportunities for the useful life of the associated project. For example, if a paved highway is constructed through a forest, the timber productivity of the cleared ROW is lost for as long as the highway remains. The construction of the highway represents an irretrievable loss in exchange for the benefits of the highway.

Both action alternatives would cause some minor irretrievable commitment of soil and vegetation resources that would be removed during trail bed excavation. These losses would

be largely offset by the restoration of other areas within the NCA that have been disturbed by OHV use and other motorized activities.

Although implementation of Alternative A may result in long-term adverse effects on some resources, it is not expected to affect any existing conditions so severely that the resource detriment would be considered irretrievable.

#### **4.11 COMPARISON OF ALTERNATIVE EFFECTS**

Table 4-15 provides a summary of effects for each alternative alphabetically by resource. All of the effects described above are not reiterated below; instead, Table 4-15 identifies where notable similarities and distinctions exist between the alternatives.

Table 4-15. Comparison of alternative effects.

Resource(s)	Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Proposed Action)
Air Quality	<p>No direct effects to air quality.</p> <p>Indirect effects of continued, less deterred illegal motorized activities would result in negligible adverse effects in the long term.</p>	<p>Minor short-term adverse effects as a result of increased particulate matter, CO production, and O<sub>3</sub> production during construction activities. Within the wilderness, short-term effects would be limited to negligible particulate matter production as no CO or O<sub>3</sub> producing tools would be used.</p> <p>Minor, long-term adverse effects as a result of increased visitation and vehicle trips to access the NCA.</p> <p>No measurable cumulative effect on NAAQS exceedances.</p>	<p>Same as Alternative C.</p>	<p>Same as Alternative B. However, with the reduced trail network in the wilderness under Alternative D, effects would be below the level of detection and would essentially be considered to have no effect on local particulate matter increases.</p>
Cultural Resources, Native American Religious Concerns	<p>No direct effects to cultural resources.</p> <p>Indirect effects would be limited; minor increased risk of damage and vandalism of some cultural sites.</p> <p>"No effect" to any eligible historic properties.</p>	<p>No adverse short or long-term effects to eligible historic properties.</p> <p>Long-term beneficial effects with the development of a cultural resource treatment plan and improved on-the-ground management presence.</p> <p>"No effect" to any eligible historic properties.</p>	<p>Same as Alternative B.</p>	<p>Same as Alternative B.</p>

<p>Hydrology, Drainage, and Erosion</p>	<p>(See also the Soils summary of effects above.)                  No direct effects to hydrology, drainage, and erosion.                  Existing trails would continue to be used and the natural effects of erosion, primarily from large rainfall event runoff, would continue to transport disturbed material downslope.                  Minor adverse cumulative effects in areas with existing erosion or drainage problems.</p>	<p>Minor short-term adverse effects to erosion and hydrology as a result of construction activities.                  Minor to moderate beneficial effects in the long term due to improved erosion control measures, sustainable trail alignments, and implementation of a trail maintenance program</p>	<p>Same as described for Alternative C.</p>	<p>Same as described for Alternative B with the following exception:                  Overall, Alternative D would result in less permanent disturbance than Alternatives B and C in the wilderness.</p>
<p>Recreation</p>	<p>No direct effects to recreation resources.                  Alternative A would be inconsistent with the RMP and Interpretive Plan.</p>	<p>Minor short-term adverse effects if recreational uses are displaced during construction.                  Major long-term beneficial effects as a result of new recreational opportunities and improved access to the NCA and wilderness.                  Notable beneficial cumulative contribution to local and regional recreational opportunities.</p>	<p>Same as Alternative B.</p>	<p>Minor short-term adverse effects if recreational uses are displaced during construction.                  Major long-term beneficial effects as a result of new recreational opportunities and improved access to portions of the NCA.                  Adverse long-term cumulative effects to the recreational opportunities and experiences in the wilderness and Visitor Center area. These adverse effects would result from the limited options an NCA visitor would have for recreational opportunities, including access to the wilderness area from the Visitor Center. All persons interested in visiting the wilderness would have to obtain a permit, join a BLM tour into the Petroglyph Canyon, or violate the no-cross country travel zone.</p>

	<p>No measurable effects attributable to Alternative A.</p> <p>Existing erosion issues would continue unabated.</p> <p>Increased visitation on undefined routes or poorly aligned social routes would likely exacerbate erosion in the long term; however, effects would be minor.</p>		<p>Minor short-term adverse effect as a result of construction disturbances.</p> <p>Long-term effects would be limited to approximately 33 acres within the NCA, some of which consists of already disturbed or exposed soils (for example, where proposed trails are routed on existing roads or OHV routes). Cumulative effects would be negligible.</p>	<p>defined in the RMP, which lies between the Visitor Center and wilderness boundary.</p> <p>Alternative D would still have a major beneficial contribution to the cumulative recreational spectrum in the Las Vegas Valley, but the expectations of some NCA and wilderness visitors would not be met.</p>
<p>Soils</p>	<p>Same as described for Alternative B, with the following exception:</p> <p>The footprint of permanent trail treads and trail improvements proposed under Alternative D would affect up to approximately 36 acres of soil in the NCA. However, some of this area consists of existing disturbed or exposed soils as noted in the Alternative B summary. Restoration efforts on approximately 8 acres in the Dutchman Pass area would help to slow or eliminate current erosion issues on existing unauthorized OHV routes. The total net long-term disturbance as a result of Alternative C is approximately 28 acres</p> <p>Additionally, Alternative D would have less impact on soils within the wilderness (approximately 10 acres less than Alternatives B and C).</p>	<p>Same as described for Alternative B, with the following exception:</p> <p>The footprint of permanent trail treads and trail improvements proposed under Alternative C would affect up to approximately 46 acres of soil in the NCA. However, some of this area consists of existing disturbed or exposed soils as noted in the Alternative B summary. Restoration efforts on approximately 8 acres in the Dutchman Pass area would help to slow or eliminate current erosion issues on existing unauthorized OHV routes. The total net long-term disturbance as a result of Alternative C is approximately 38 acres</p>	<p>Same as described for Alternative B, with the following exception:</p> <p>The footprint of permanent trail treads and trail improvements proposed under Alternative D would affect up to approximately 36 acres of soil in the NCA. However, some of this area consists of existing disturbed or exposed soils as noted in the Alternative B summary. Restoration efforts on approximately 8 acres in the Dutchman Pass area would help to slow or eliminate current erosion issues on existing unauthorized OHV routes. The total net long-term disturbance as a result of Alternative C is approximately 28 acres</p> <p>Additionally, Alternative D would have less impact on soils within the wilderness (approximately 10 acres less than Alternatives B and C).</p>	

<p>Vegetation, Threatened and Endangered Plant Species, Non-Native Invasive and Noxious Species</p>	<p>No direct effects to existing vegetation communities or special status species.                  Limited potential for cumulative effects.                  4.8 miles of trail in rosy two-toned penstemon habitat                  0.1 mile of trail in white-margined beardtongue habitat                  1.9 miles of trail in Blue Diamond cholla habitat (Baker 2005).</p>	<p>Permanent removal of approximately 17 acres of native vegetation.                  Short-term trampling impacts as a result of construction activities.                  Long-term adverse effects as a result of habitat modification and increasing visitor traffic in suitable habitat areas; increased visitation and access also contributes to the risk of illegal collecting.                  15.8 miles of trail in rosy two-toned penstemon habitat                  0.4 mile of trail in potential white-margined beardtongue habitat.                  8.8 miles of trail in Blue Diamond cholla habitat (Baker 2005).                  Project design features (e.g., monitoring, mapping, seed collection, and restoration) would reduce overall effect of new trail construction to below the significance threshold.                  May adversely impact individuals, but is not likely to result in a loss of viability in the analysis area, or cause a trend toward federal listing for the three special status species identified above.</p>	<p>Net permanent removal of 9 acres of native vegetation.                  All other impacts would be the same as described for Alternative B.                  19.5 miles of trail in rosy two-toned penstemon habitat.                  0.4 mile of trail in potential white-margined beardtongue habitat                  8.8 miles of trail in Blue Diamond cholla habitat (Baker 2005)                  Project design features (e.g., monitoring, mapping, seed collection and restoration) would reduce overall effect of new trail construction to below the significance threshold.                  May adversely impact individuals, but is not likely to result in a loss of viability in the analysis area, or cause a trend toward federal listing for the three special status species identified above.</p>	<p>Net permanent removal of native vegetation is negligible, considering route restoration efforts in the Dutchman Pass area.                  14.8 miles of trail in rosy two-toned penstemon habitat.                  0.2 mile of trail in potential white-margined beardtongue habitat.                  3.2 miles of trail in Blue Diamond cholla habitat (Baker 2005).                  Project design features (e.g., monitoring, mapping, seed collection and restoration) would reduce overall effect of new trail construction to below the significance threshold.                  May adversely impact individuals, but is not likely to result in a loss of viability in the analysis area, or cause a trend toward federal listing for the three special status species identified above.</p>
<p>Visual and Aesthetic Resources</p>	<p>No direct effects to VRM Class I, II, or III objectives as a result of Alternative A.</p>	<p>Short-term minor adverse impacts as a result of construction activities: impacts would be limited</p>	<p>Same as Alternative B.</p>	<p>In VRM Class II and III areas, the direct and indirect effects of Alternative D would be the same</p>

	<p>Indirectly, however, visual effects from widening trails and a proliferation of new social trails would result in weak to moderate line and color contrasts resulting in moderate adverse effects on VRM Class II and III areas in the long term, but would ultimately comply with these VRM Class objectives. VRM Class I objectives would not be achieved over the long term where viewing angle and foreground viewing distance magnify contrasts.</p>	<p>to areas within sight distance of construction areas</p> <p>Short and long-term effects would comply with all VRM classes based on selected KOP analysis.</p>	<p>as described for Alternative B. In VRM Class I areas, the direct and indirect effects of Alternative D would be similar to those described for Alternative A.</p> <p>Short and long-term effects would comply with all VRM Classes.</p>
<p>Wilderness and Special Management Areas</p>	<p>No direct effects to wilderness characteristics.</p> <p>Continued degradation of resource and/or Petroglyph Management Area characteristics as a result of increasing uncontrolled use.</p> <p>No effect on opportunities for solitude, wilderness characteristics, and other unique components of wilderness.</p> <p>Minor adverse cumulative effects when combined with the effects of urbanization and increasing population adjacent to NCA and Petroglyph Management Area boundaries.</p>	<p>Alternatives B/C would result in the designation of approximately 21.2 total miles of trails within the wilderness.</p> <p>Short-term direct effects as a result of minor trail construction and/or reconstruction.</p> <p>Long-term effects to wilderness characteristics (untrammeled, undeveloped, natural, etc.) would be adverse, ranging from negligible to moderate.</p> <p>In the long term, Alternative B would result in increased visitation to these areas and subsequently, increased human presence and decreased opportunities for solitude.</p> <p>Cumulative effects would result in a minor to moderate contribution to the overall degradation of wilderness characteristics. The</p>	<p>Same as Alternative B.</p> <p>Alternative D would result in the designation of approximately 3.9 miles of trails within the wilderness.</p> <p>Short-term direct effects as a result of minor trail construction and/or reconstruction.</p> <p>Long-term effects to wilderness characteristics (untrammeled, undeveloped, natural, etc.) would be adverse, ranging from negligible to minor.</p> <p>In the long term, Alternative D would limit visitation to the wilderness from the Visitor Center because of the limitations on the Petroglyph Trail and no-cross country hiking zone surrounding the north and west boundaries of the wilderness.</p> <p>In the long term, Alternative D would have no effect on</p>



		<p>direct and indirect effects described for Alternative B would be magnified by other reasonably foreseeable future activities.</p>		<p>opportunities for solitude.</p> <p>Alternative D would ultimately result in minor beneficial cumulative effects. Although wilderness characteristics would, in the short term, be adversely affected by construction activities, the long-term effects of designated trails and imposing visitor access restrictions in the Petroglyph Management Area would help to limit destruction of other unique components of the wilderness, primarily cultural resources in the Petroglyph Canyon.</p>
<p>Wildlife, Threatened and Endangered Wildlife Species, Migratory Birds</p>	<p>No direct effects to wildlife species, including threatened and endangered species and migratory birds.</p> <p>Indirect effects resulting from increased visitation with no additional maintenance or monitoring; negligible to moderate or greater adverse impacts to wildlife and habitat in the long term.</p>	<p>Minor short-term direct adverse effects during construction activities.</p> <p>Effects would be limited to displacement, noise, increased human presence, etc., and would not result in the taking or removal of any individuals.</p> <p>Minor long-term adverse effects as a result of increased human presence</p>	<p>Same as Alternative C.</p>	<p>In areas outside of the wilderness, effects would be the same as described for Alternative B.</p> <p>Within the wilderness, short-term minor adverse effects resulting from construction activities. Trail network is greatly reduced in Alternative D, as such the duration of disturbance would be much shorter.</p>

## 5.0 PREPARERS AND CONTRIBUTORS

### 5.1 INTERDISCIPLINARY TEAM

In accordance with 40 CFR 1501.2a, the BLM and contractors selected an ID Team of resource specialists to systematically plan and analyze all project components that may have an impact on the physical or human environment. The ID Team consisted of the following BLM and contractor personnel (in alphabetical order):

Jayson Barangan	Natural Resource Specialist, BLM
Jason Bird	Civil Engineer, EDAW
Mark Boatwright	Archaeologist, BLM
Rebecca Brofft	Environmental Planner, EDAW
Lauren Brown	Visual Resources, Las Vegas Field Office
Jeremy Call	Visual Resources, EDAW
Molly Cobbs-Lozon	NEPA / ID Team Leader, EDAW
Joshua Corona-Bennett	Field Biologist, EDAW
Shelley Dayman	Field Biologist, EDAW
Fred Edwards	Botanist, BLM
Phil Hendricks	Landscape Architect, EDAW
Sendi Kalcic	Wilderness/Visual Resources, Las Vegas Field Office, BLM
Kimberly Karish	Wildlife Biologist, EDAW
Tom Keith	Principal-in-Charge, EDAW
John Ko	Biologist, EDAW
Michael Mak	GIS Specialist, EDAW
Robbie McAboy	Sloan Canyon NCA Manager, Red Rock-Sloan Field Office, BLM
Greg Oakes	Landscape Designer, EDAW
Melissa Perez	Interpreter, BLM
Scott Reyman	GIS Specialist, EDAW
Kevin Routsong	Law Enforcement/Wilderness Ranger, BLM
Chad Schneckenburger	Recreation Planner, EDAW
Linda Spangler	Technical Editor, EDAW
Bob Taylor	Special Project, Red Rock/Sloan Field Office, BLM

### 5.2 FEDERAL, STATE, AND LOCAL AGENCIES

Notification letters were sent to various federal, state, and local agencies describing the Sloan Canyon National Conservation Area Trails Master Plan and outlining the agency and public scoping process. A letter was sent to representatives from each of the following agencies on May 22, 2008. Each agency was asked to provide general comments on the proposed project, as well as resource-specific comments germane to their area of expertise or jurisdiction.

Arizona Strip Bureau of Land Management  
 Bureau of Reclamation  
 City of Boulder City  
 City of Henderson  
 Clark County Department of Comprehensive Planning

National Park Service  
Nevada Department of Wildlife  
Nevada Division of Wildlife (NDOW)  
Nevada Natural Heritage Program (NNHP)  
Nevada State Historic Preservation Office  
U.S. Environmental Protection Agency  
U.S. Fish and Wildlife Service  
U.S. Fish and Wildlife Service, Las Vegas, Nevada

Each of these agencies was also notified of a public alternatives development workshop held on December 9, 2008.

### 5.3 TRIBAL GOVERNMENT CONSULTATION

As described in Section 1.7, Tribal Government consultations regarding the effects of the proposed project, including the identification of the proposed trail routes, were initiated during the planning phases of the project. Eleven tribes in the region of Southern Nevada were identified by the BLM as potentially having concerns. All of these tribes were contacted and invited to participate in one of three BLM-Tribal Coordination meetings held at three different locations: Lake Havasu City, Arizona on June 23, 2008; Cedar City, Utah on June 25, 2008; and Las Vegas, Nevada on June 26, 2008. The following tribes were contacted:

Chemehuevi Indian Tribe  
Colorado River Indian Tribes  
Fort Mojave Indian Tribe  
Hopi Tribe Council  
Hualapai Tribal Council  
Kaibab Paiute Tribe  
Las Vegas Paiute Tribe  
Moapa Paiute Tribe  
Pahrump Paiute Tribe (not a Federally recognized tribe)  
Paiute Indian Tribe of Utah  
*Cedar Band Paiute Tribe*  
*Indian Peaks Band of Paiute Indian Tribes of Utah*  
*Kanosh Band of Paiute Indian Tribes of Utah*  
*Koosharem Band of Paiute Indian Tribe of Utah*  
*Shivwits Band of Paiute Indian Tribes of Utah*  
Twenty-Nine Palms Band of Mission Indians

### 5.4 OTHER GROUPS

Public, stakeholder, and agency involvement opportunities are also summarized in Section 1.7.

Notification letters were sent to stakeholders and the general public describing the Sloan Canyon National Conservation Area Trails Master Plan and outlining the public scoping process. A letter was sent to the general public mailing list on May 22, 2008. A separate letter, which included a user survey, was also sent to stakeholder groups on May 22, 2008.

Each of these stakeholder groups was also notified of a public alternatives development workshop held on December 9, 2008, as well as two other stakeholder workshops throughout the project development process.

## STAKEHOLDER GROUPS

City of Henderson  
 Friends of Sloan  
 International Mountain Bicycling Association  
 Las Vegas Distance Riders  
 Nevada Division of Wildlife  
 Outside Las Vegas Foundation  
 River Mountain Trails Partnership  
 Southern Nevada Regional Trails Partnership  
 Steve Howland  
 Sun City Anthem Hiking Club

## OTHER AGENCIES AND ORGANIZATIONS

Staff and/or members of the following agencies and organizations were contacted during the public scoping, alternatives development, and/or the wilderness scoping efforts:

4 x 4 Club	Colorado River Commission, NV
99 Air Base Wing	Colorado River Indian Tribes
Aggregate Industries	Desert Research Institute
Aha Makav Cultural Society, Fort Mojave Indian Tribe	Desert Rock Sports
American Alpine Institute	Desert Survivors
American Nevada Corporation	Drinkers of the Wind/Equestrian
Animal Control	Ducks Unlimited
Anthem Heights	Dunes and Trails ATV Club
Anthem Resident Council	DVNP
Arizona Strip Bureau of Land Management	EARTHMARK
Barrick Museum of Natural History	Fort Mojave Indian Tribe
Basin and Range Trail Advocates (B.A.R.T.A)	Fraternity of the Desert Bighorn
Best in the Desert	Friends of Desert Wetlands
BLM Lands Foundation	Friends of Nevada Wilderness
Bow and Arrow Cattle Company	Friends of Red Rock Canyon
Boy Scouts	Friends of Tule Springs
Budget and Planning Division	Gold Searchers of SNV
Bureau of Reclamation	Grimm Jeepers
CA/NV Ops Office	Harry Reid Center
Chemehuevi Indian Tribe	Hike This
Citizens for Active Management	Hopi Tribe Council
City of Boulder City	Horse Council of Nevada
City of Las Vegas	Howard Hughes Corporation
City of Mesquite	Hualapai Tribal Council
Clark County	Hualapai Tribe
Clark County Admin Services	Indian Peaks Band of Paiute Indian Tribe of Utah
Clark County DAQEM	Jackson Hole Mountain Guides
Clark County Department of Aviation	Janet E Trigg
Clark County School District	Kaibab Paiute Tribe
Clark County Wildlife Advisory	Kanosh Band of Paiute Indian Tribes of Utah

Kimley-Horn & Associates, Inc.  
 Koosharem Band, Paiute Indian Tribe of Utah  
 Lake Mead National Recreation Area  
 Las Vegas Band Southern Paiute  
 Las Vegas Bird Dog Club  
 Las Vegas Chamber of Commerce  
 Las Vegas Climbers Liaison Council  
 Las Vegas Distance Riders Club, Inc  
 Las Vegas Jeep Club  
 Las Vegas League of Woman Voters  
 Las Vegas Mercury  
 Las Vegas Mountaineers Club  
 Las Vegas One T.V.  
 Las Vegas Paiute Tribe  
 Las Vegas Review Journal  
 Las Vegas Search and Rescue  
 Leisure Services Department  
 Marydean & Associates  
 MBP Consulting, LLC  
 Midwestern University  
 Moapa Paiute Tribe  
 Morse & Mowbray  
 Mountain Bikes/Basin and Range Trail Advocates  
 Mountain Springs Citizen Advisory Council  
 Mountain Springs Town Board  
 Mrs. Ursula Wilson-Booth  
 Mt. Charleston Town Board  
 Mule Deer Foundation  
 Municipal Court  
 National Field Archery  
 National Park Service  
 National Science Foundation  
 National Wild Horse Association  
 National Wild Turkey Federation  
 Neighborhood Services  
 Nellis AFB, 99 ABW/CV  
 Nevada Archaeological Association  
 Nevada Association of Counties  
 Nevada Backroaders Scenic 4X4 Club  
 Nevada Bighorns Unlimited & Coalition for Nevada Wildlife  
 Nevada Bow Hunters Association  
 Nevada Commission on Tourism  
 Nevada Commission on Tourism, Motorsports  
 Nevada Department of Cultural Affairs  
 Nevada Department of Wildlife  
 Nevada Division of Minerals  
 Nevada Land Users Coalition  
 Nevada Outdoor Recreation Association  
 Nevada Power Company (OLV)  
 Nevada Seniors Coalition  
 Nevada State Historic Preservation Office  
 Nevada State Museum  
 Nevada State Rifle & Pistol Association  
 Nevada United Four Wheelers Association  
 Nevada Wilderness Project  
 Nevada Wildlife Federation  
 Off Road Club  
 Old Spanish Trail Association (OLV)  
 Ormsby Sportsmen Assoc.  
 Outside Las Vegas  
 Pahrump Chamber of Commerce  
 Pahrump Paiute Tribe  
 Paiute Indian Tribe of Utah  
 Partners in Conservation  
 Partners in Parks  
 Pershing County Wildlife Advisory Board  
 Public Lands Advisory Board - Town of Pahrump  
 Red Rock Audubon Society  
 Red Rock Canyon Interpretive Association  
 Red Rock Citizens Advisory Council  
 Red Rock Rendezvous  
 Rock Art Acoustics  
 RRCIA  
 Safari Club International  
 Sandy Valley Citizens Action Council  
 SCORE International  
 Search and Rescue, Las Vegas Metropolitan Police  
 Shivwits Band of Paiute Indian Tribes of Utah  
 Sierra Club  
 Sierra Club, Toiyabe Chapter  
 Southern Nevada Off Road Enthusiasts  
 Southern Nevada Paiute Elders Group  
 Southern Nevada Regional Trails Partnership  
 Southern Nevada Water Authority  
 Southwest Gas Trailhikers  
 Spring Mountain Youth Camp  
 State of Nevada, Reg 6, Nevada State Parks  
 Sun City MacDonald Ranch  
 Sun City MacDonald Ranch Hiking Club  
 Sun City MacDonald Ranch Hillside Press Committee  
 Tate Snyder Kimsey Architects  
 The Access Fund

The American Alpine Club  
The Campbell Company (OLV)  
The Clearing House  
The Nature Conservancy of Nevada  
The Wilderness Land Trust  
The Wilderness Society  
Total Karnage  
Town of Pahrump  
Trout Unlimited  
Twenty-Nine Palms Band of Mission Indians  
University of Nevada Las Vegas (UNLV)

UNLV Landscape Architecture Program  
UNLV Outdoor Adventures  
U.S. Environmental Protection Agency  
U.S. Fish & Wildlife Service  
U.S. Forest Service  
Vegas Valley Four Wheelers  
Washoe County Wildlife Advisory Board  
Western Land Exchange Project  
Wilderness Society  
Wilderness Watch  
Wildlife & Habitat Improvement of Nevada

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