

## **3.0 AFFECTED ENVIRONMENT**

### **3.1 INTRODUCTION**

This chapter discusses the existing physical, biological, and socioeconomic resources in the study area (Affected Environment).

In addition to the BLM Nevada supplemental authorities identified for further analysis (Table 3-1), the following resources and/or issues will also be described in Chapter 3.0 as well as Chapter 4.0, Environmental Consequences.

- Recreation
- Soils
- Hydrology, Drainage, and Erosion
- Visual and Aesthetic Resources

Table 3-1. BLM Nevada Supplemental Authorities.

Element	Relevant Authority	BLM Manual or Regulation	Not Present	Present / Not Affected	Present / May be Affected	Rationale
<b>Air Quality</b>	Clean Air Act, as amended (42 USC 7401 <i>et seq.</i> ); Section 176(c) CAA - General Conformity	MS 7300 40 CFR 93 subpart B			X	Air quality is addressed under Section 3.4.1.
<b>Areas of Critical Environmental Concern</b>	Federal Land Policy and Management Act of 1976 (43 USC 1701 <i>et seq.</i> )	MS 1613	X			Resource is not present. The area encompassed by the current Petroglyph Management Area was formerly designated as an Area of Critical Environmental Concern; however, this designation was removed in the Sloan Canyon NCA RMP (2006).
<b>Cultural Resources</b>	National Historic Preservation Act, as amended (16 USC 470)	MS 8100			X	Cultural resources are addressed under Section 3.5.3.
<b>Environmental Justice</b>	E.O. 12898 "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations" 2/11/94	H-1601-1		X		Although minority and low-income populations do exist within the Las Vegas Valley, no minority or low-income groups would be disproportionately affected by health or environmental effects of this project.
<b>Farm Lands (Prime or Unique)</b>	Surface Mining Control and Reclamation Act of 1977 (30 USC 1201 <i>et seq.</i> ) Farmland Protection Policy Act (7 USC 4202 <i>et seq.</i> )	7 CFR 658.4	X			Resource is not present.
<b>Floodplains</b>	E.O. 11988, as amended "Floodplain Management" 5/24/77	MS 7260	X			Resource is not present.
<b>Forests and Rangelands (HFRA projects only)</b>	Healthy Forests Restoration Act of 2003 (P.L. 108-148)	N/A	X			(Project not applicable.)
<b>Human Health and Safety (Herbicide Projects)</b>	E.O. 13045 "Protection of Children from Environmental Health Risks and Safety Risks"	MS 9011	X			(Project not applicable.)

Element	Relevant Authority	BLM Manual or Regulation	Not Present	Present / Not Affected	Present / May be Affected	Rationale
<b>Migratory Birds</b>	E.O. 13186 "Migratory Birds"; Migratory Bird Treaty Act (16 USC 703 - 711)	50 CFR 10, 17			X	Migratory birds are addressed under the Wildlife Resources section, Section 3.2.2.
<b>Native American Religious Concerns</b>	American Indian Religious Freedom Act of 1978 (42 USC 1996)	MS 8100 H-8160-1			X	Native American Religious Concerns are addressed under the Cultural Resources section, Section 3.5.3.
<b>Non-Native Invasive and Noxious Species</b>	E.O. 13112, Invasive Species, 2/3/99	MS 9015 517 DM 1			X	Non-native invasive and noxious species are addressed under the Vegetation Resources section, Section 3.2.1.
<b>Threatened and Endangered Species</b>	Endangered Species Act of 1973, as amended (16 USC 1531)	MS 6840			X	Threatened and Endangered Species are addressed under the Wildlife and Vegetation Resources sections, Sections 3.2.2 and 3.2.1.
<b>Wastes, Hazardous or Solid</b>	Resource Conservation and Recovery Act of 1976 (42 USC 6901 <i>et seq.</i> ) Comprehensive Environmental Response, compensation, and Liability Act of 1980, as amended (42 USC 9615)	MS 9180 MS 9183	X			The project would not generate or expose solid or hazardous wastes. Resource is not present.
<b>Water Quality, Surface/Ground</b>	Safe Drinking Water Act, as amended (42 USC 300f <i>et seq.</i> ) Clean Water Act of 1977 (33 USC 1251 <i>et seq.</i> )	MS 7240 MS 9184	X			Resource is not present.
<b>Wetlands/Riparian Zones</b>	E.O. 11990 "Protection of Wetlands" 5/24/77	MS 6740	X			Resource is not present.
<b>Wild and Scenic Rivers</b>	Wild and Scenic Rivers Act, as amended (16 USC 1271)	MS 8014	X			Resource is not present.
<b>Wilderness</b>	Federal Land Policy and Management Act of 1976 (43 USC 1701 <i>et seq.</i> ) Wilderness Act of 1964 (16 USC 1131 <i>et seq.</i> )	43 CFR 6300 H-8550-1 MS 8560			X	Wilderness is addressed under Section 3.5.2.

## 3.2 BIOLOGICAL RESOURCES

### 3.2.1 VEGETATION

Vegetation within the project area consists primarily of Great Basin plant communities commonly found in the Mojave Desert ecosystem. The Mojave Desert extends from southern Nevada, southwestern Utah, southeastern California, and into northern Arizona. Typical vegetation types found within the project area, as described in the 2006 RMP, include moderate creosote communities, sparse creosote/bursage mix, desert wash communities, and volcanic basalt slope association. Creosote (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) are the most common species found throughout the project area, with other species making up more minor vegetation components. Other, less dominant components of this community include ephedra (*Ephedra viridis*), brittlebush (*Encelia frutescens*), four-wing saltbush (*Atriplex canescens*), burrobrush (*Hymenocilea salsola*), Mojave yucca (*Yucca schindegera*), Joshua tree (*Yucca brevifolia*), and a variety of cactus (cholla, barrel, and hedgehog cactus). A list of all species observed during the reconnaissance surveys are provided in Appendix C.

Reconnaissance level field surveys were performed to supplement the RMP plant community descriptions. Field surveys were conducted between June 3-10, 2008 and a second visit between July 16-19, 2008. In general, species composition and distribution were observed to vary across the project area based on soil type, available soil moisture, elevational gradient, slope aspect, and geomorphology. Like many desert environments, plant density is relatively sparse with exposed soil and rock being the predominant cover. Much of the unvegetated areas are covered by desert pavement (thin layer of tightly packed rock) and cryptogammic crust (fungi, bacteria, lichen, and soil algae) that prevent the erosion of the fragile soils below and reduce moisture loss.

During the reconnaissance level field surveys, most annual and perennial forbs had senesced for the year. Most of these species flower between March and May, following the cooler temperatures and precipitation in winter and spring. The distribution of vegetation communities is shown in Map 10. A summary of the plant communities is provided in Table 3-2. Each of the plant communities are described below based on adapted RMP vegetation descriptions and field surveys.

**Table 3-2. Vegetation communities found within the project area.**

Plant Community	Acres
Sparse Creosote / Bursage Mix	31,776
Moderate Creosote Communities	6,485
Volcanic-Basalt Slopes	7,100
Desert Wash Communities	3,364
<b>TOTAL</b>	<b>48,725</b>

Source: BLM 2006

#### **Sparse Creosote/Bursage Mix**

The sparse creosote association is the most prevalent plant community found within the project area, making up 65 percent of the total project area (31,776 acres). This sparsely vegetated plant community is generally found at the lower elevations and contains less than 30 percent cover. The dominant plant species include creosote bush and white bursage. Species diversity

is relatively high in the sparse creosote/bursage mix and include other common, but less dominant species such as four-wing saltbush, ephedra, shiny-leaf sandpaper plant (*Petalonyx nitidus*), California encelia (*Encelia frutescens*), burrobush, Mojave sage (*Salvia Mojavensis*), Joshua tree, eastern Mojave buckwheat (*Eriogonum fasciculatum*), and western Mojave buckwheat (*Eriogonum mohavense*). In addition, cactus are relatively abundant in this plant community, with diamond cholla (*Opuntia ramosissima*), silver cholla (*Opuntia echinocarpa* ssp. *echinocarpa*), beavertail (*Opuntia basilaris*), teddy bear cholla (*Opuntia bigelovii*), and many-headed hedgehog cactus (*Echinocactus polycephalus*) being the most common.

Common grasses and forbs included three-awn (*Aristida purpurea*), fluff grass (*Erioneuron pulchellum*), desert apricot mallow (*Sphaeralcea ambigua*), round leaf spineflower (*Oxytheca perfoliata*), spine flower (*Chorizanthe* spp.), skeleton weed (*Eriogonum brachypodium*), desert trumpet (*Eriogonum inflatum*), California cottonrose (*Filago californica*), cryptantha (*Cryptantha* spp.), and rattlesnake weed (*Chamaesyce albomarginata*).

### **Moderate Creosote**

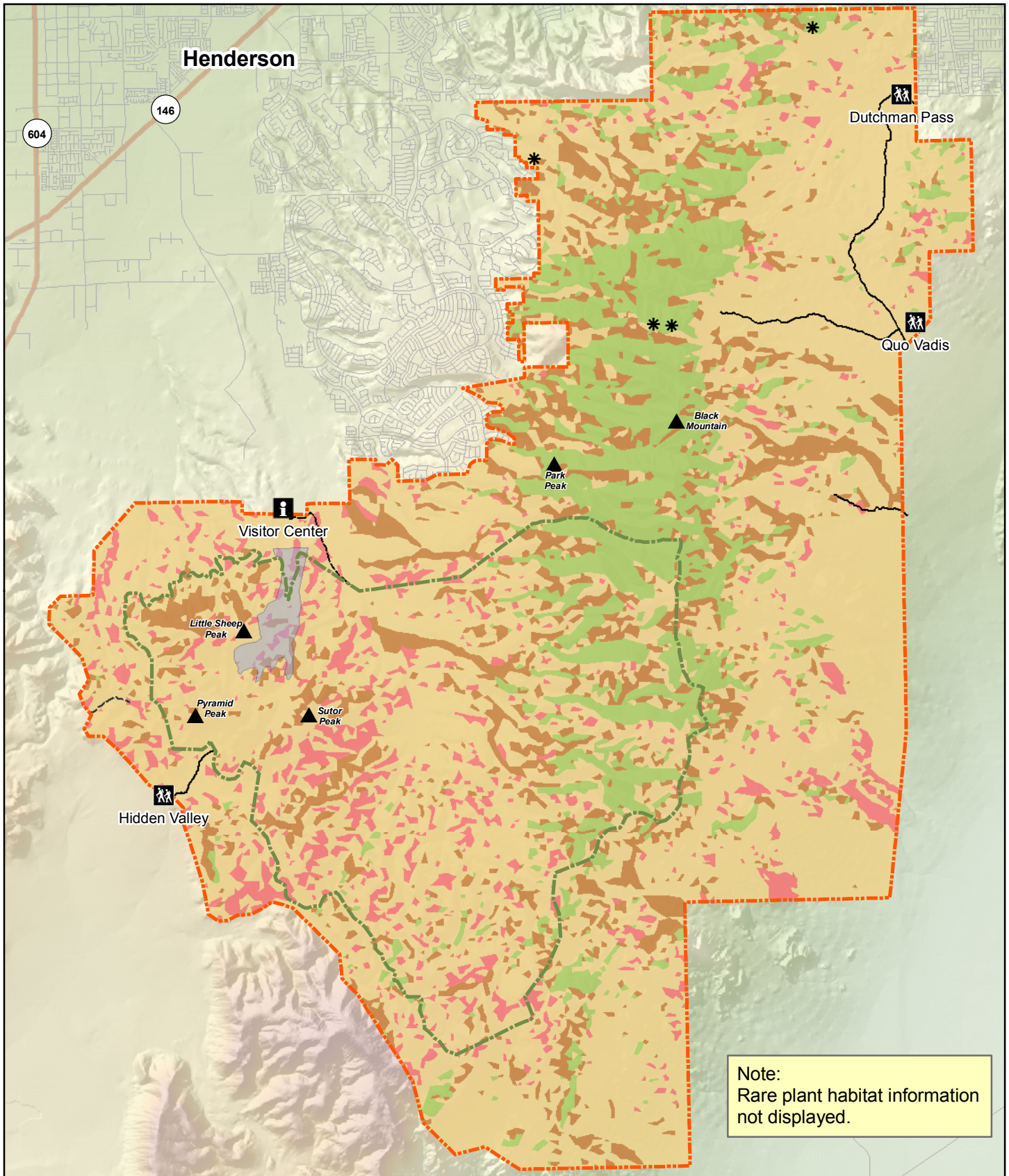
The moderate creosote community is similar to the composition of the sparse creosote/bursage mix association; however, vegetative cover is greater than 30 percent. Distribution of this plant community is relatively limited, with 6,485 acres (13 percent) of the project area, and is likely associated with greater water availability. Species composition and diversity is similar to the sparse creosote/bursage mix association.

### **Volcanic Basalt Slope Association**

The volcanic basalt slope association is the second most prevalent vegetation association, comprised of 7,100 acres (15 percent) of the project area. This association consists of large, boulder size basalt rock outcrops with a highly variable species composition. The volcanic basalt slope association is generally located on steep north-facing slopes and is generally found at higher elevations. Volcanic basalt rock boulder fields are found throughout the project area in other communities, but these boulders are generally smaller in size. Creosote is the most dominant species found within this association, but sparse creosote/bursage mix and moderate creosote communities are also found in the volcanic basalt slope association.

### **Desert Wash Associations**

Desert washes found within the project area are ephemeral drainages that may only convey water during and immediately after a storm event. The size of these washes can be highly variable and they generally occur below 5,000 feet in elevation. Desert washes are prone to flash flooding due to the large watersheds and low absorption capacity of many desert soil types. These washes are deposited with alluvial sands and tend to have greater soil moisture than the surrounding plant communities. In addition to the plant species found in the surrounding plant communities, the greater soil moisture generally supports cat claw (*Acacia greggii*), desert willow (*Chilopsis linearis*), Mormon tea (*Ephedra* spp.), and indigo bush (*Psoralea fremontii*).



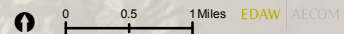
Note:  
Rare plant habitat information  
not displayed.

**LEGEND**

- |                             |                               |                      |
|-----------------------------|-------------------------------|----------------------|
| Sloan Canyon NCA Boundary   | <b>Vegetation Communities</b> | Communication Towers |
| North McCullough Wilderness | Desert Wash Communities       | Visitor Center       |
| Petroglyph Management Area  | Moderate Creosote Communities | Proposed Trailheads  |
| Existing NCA Major Roads    | Sparse Creosote / Bursage Mix | Peaks                |
|                             | Volcanic-Basalt Slopes        |                      |

**Sloan Canyon NCA  
Trails Master Plan  
MAP 10 - VEGETATION**

OCTOBER 4, 2009



## Special Status Species

The RMP identifies three special status plant species as being present in the project area, including blue diamond cholla (*Opuntia whipplei multigenicula*), rosy two-toned beardtongue (*Pentstemon bicolor* ssp. *roseus*), and white margined beardtongue (*Penstemon albomarginatus*). Several individuals of the rosy two-toned beardtongue were observed during supplemental trail surveys in April 2009. No other sensitive plant species were observed during the field surveys; however, most of the surveys were performed outside of the blooming period. These species could be present within the trail alignments, but were not observed during the time of the survey.

None of the special status species are listed as Federally Threatened or Endangered under the Endangered Species Act. The special status designation for each of these species is listed in Table 3-3.

Table 3-3. List of special status species.

Scientific Name	Common Name	NV BLM Sensitive Species	NNHP* Sensitive MSHCP Watch	MSHCP Covered	State-Listed Critically Endangered
<i>Cylindropuntia multigeniculata</i>	blue diamond cholla	•		•	•
<i>Penstemon bicolor</i> ssp. <i>roseus</i>	rosy two-toned beardtongue	•	•		
<i>Penstemon albomarginatus</i>	white margined beardtongue	•		•	

Source: Sloan Canyon NCA RMP (BLM 2005)

\*Nevada Natural Heritage Program

### *Blue Diamond cholla*

This short, compact cactus grows on dry, open carbonate ledges, crevices, and rocky colluvium on gentle to steep slopes of all aspects (NNHP 2001a). It grows predominantly on northerly exposures, canyon walls, or other cooler or protected exposures in close proximity to overlying gypsum beds upslope, and is associated with numerous other succulent and shrub species of the creosote bush and blackbrush vegetation zones (NNHP 2001). This species is endemic to Clark County, Nevada and occurs at elevations ranging from 3,585-4,250 feet. The blue diamond cholla is a Nevada BLM sensitive species, a *Clark County Multi-Species Habitat Conservation Plan* (MSHCP) species, and is state listed as Critically Endangered. Like many native cactus species, blue diamond cholla is fully protected by the state of Nevada. Blue Diamond cholla were not observed during the reconnaissance level surveys; however, there are several documented populations within the project area. Most of the suitable habitat mapped in the RMP and a recent species report (2005) is located along the eastern edge of the North McCullough Wilderness boundary (Baker 2005). The RMP identifies approximately 415 acres of potential blue diamond cholla habitat within the project area; however, a 2005 species report identifies approximately 3,700 acres of suitable habitat for this species in the NCA (Baker 2005).

### *White margined beardtongue*

This low growing perennial herb occurs in sandy dunes and deep sand (NNHP 2001b). The white margined beardtongue is only found in Clark and Nye counties in Nevada, as well as parts of California and Arizona. It occurs at elevations between 2,750-5,890 feet. The white margined

beardtongue is listed as a BLM sensitive species and is a covered species by the MSHCP. Populations are known to occur in the Hidden Valley area, and potential habitat has been mapped in the RMP along the northwest and southwest margins of the project area, totaling 360 acres. No white margined beardtongue was observed during the reconnaissance level surveys; however, surveys were not conducted during the March-May flowering period.

#### *Rosy two-toned beardtongue*

The rosy two-toned beardtongue is a perennial herb that grows on rocky calcareous, granitic, or volcanic soils in washes, along roadsides, scree at outcrop bases, rock crevices, or other places that receive greater runoff (BLM 2006 and NNHP 2001c). This species is only found in Clark and Nye counties in Nevada, as well as parts of California and Arizona. It occurs at elevations ranging from 1,800-4,839 feet. This species tends to flourish with disturbance and is typically associated with creosote-bursage, blackbrush, and mixed-shrub zones. The RMP maps potential habitat for the rosy two-toned beardtongue in most of the washes with rocky conditions, which are found throughout the study area. Several individuals of rosy two-toned beardtongue were found along a north-facing scree slope east of Pyramid Peak. No other rosy two-toned beardtongue was observed during the reconnaissance level surveys; however, a majority of the surveys were not conducted during the March-May flowering period. The RMP mapped a total of approximately 7,000 acres of potential rosy two-toned beardtongue habitat within the project area.



Figure 43. Rosy two-toned beardtongue.

### **Invasive, Non-Native Species**

Noxious and invasive weeds are a continuing threat to the biological diversity and integrity of native ecosystems. Noxious and invasive weeds cause the loss of productive rangeland, loss of wildlife habitat, increased soil erosion, decreased biological diversity, and increased risk of fire. Most of the project area has not been surveyed for invasive and noxious weeds. No noxious weeds were observed during the field surveys; however, surveys were not conducted during the most appropriate time of year.

Executive Order 13112, signed by President Clinton in 1999, sets up a mechanism to prevent the introduction of invasive species; provides for their control; and minimizes the economic, ecological, and human health impacts that invasive species cause. Weeds are difficult to control unless there is regional land management cooperation, such as federal, state, county, and private groups. The Carlson-Foley Act (Public Law 90-583), as well as state and county laws, hold the federal government responsible to control designated noxious and invasive weeds on federal land and provide direction on their control.

The state of Nevada's Agricultural Department has designated a list of non-natives species as noxious. Appendix B lists these noxious weeds by threat category.

Although no specific weed surveys have been performed within the project area, the RMP identifies the project area as being highly susceptible to invasion by Sahara mustard (*Brassica tournefortii*) and tamarisk (*Tamarisk* spp.) (BLM 2005). Weed seeds are spread by humans, wind, water, and animals. These highly invasive weeds spread rapidly, especially along disturbance corridors, such as roads and trails. Sahara mustard could potentially spread to



most of the lower elevation areas containing sandy soils, and the tamarisk could potentially spread to the drainages and washes. No noxious weeds were observed during the reconnaissance level surveys; however, a few non-native weeds species were observed. These non-native weeds include redstemmed stork's bill (*Erodium cicutarium*), red brome (*Bromus madritensis* ssp. *rubens*), cheatgrass (*Bromus tectorum*), split grass (*Schismus arabicus*), and Russian thistle (*Salsola tragus*). Overall, these weeds were found in limited quantity and with limited distribution. Most of these non-native weeds were found along the margins of development or in areas with soil disturbance, especially at the northeast corner of the project area.

Invasive species and noxious weeds are already well established in the Las Vegas Valley. Noxious weeds are being managed by land managers, such as the BLM, and on a regional level by Clark County Vector Control, Conservation District of Southern Nevada, Southern Nevada Water Authority, and others.

### **3.2.2 WILDLIFE**

The Sloan Canyon NCA contains one major ecosystem type, Mojave Desert scrub, but contains a variety of wildlife species in four major classes: mammals, reptiles, birds, and invertebrates. Nine species of mammals, 11 species of birds and raptors, and 18 species of reptiles with a protected or sensitive status (BLM Sensitive, NNHP tracked, MSHCP covered) are predicted to occur in the NCA (see Table 3-3, BLM 2005). Only one species of amphibian has been recorded in the NCA; the red spotted toad (*Bufo punctatus*) has been observed in temporary pools around the water guzzlers (BLM 2005, BLM 2006). Water in the NCA is a limiting resource and wildlife has been found to concentrate around the springs and seeps, ephemeral flows, and two water guzzlers throughout the site (BLM 2005). Other processes that influence wildlife distribution and density in the NCA include topography, meteorology, vegetation patterns, and human uses.

The project team consulted with the U.S. Fish and Wildlife Service (USFWS) and Nevada Division of Wildlife (NDOW) throughout the scoping and alternatives development processes to identify and address wildlife concerns, including the location of proposed trails relative to established wildlife water improvements (guzzlers) in the NCA and potential for impacts to the federally listed desert tortoise.

#### **Management Direction**

The goal of the BLM's biological management strategy for the Sloan Canyon NCA "is to maintain and enhance native wildlife resources and provide for biological diversity of wildlife resources while ensuring healthy ecosystems" (BLM 2006). Several accepted regulatory plans cover different aspects of the biological resources found on the NCA. The BLM implements the Las Vegas Resource Management Plan, the Sloan Canyon NCA Act, the Rangeland Plan for Managing Bighorn Sheep Habitat on Public Lands, and participates in the implementation of the Clark County Multiple Species Habitat Conservation Plan in cooperation with the USFWS, NDOW, U.S. Forest Service (USFS), National Park Service (NPS), and other state and federal agencies. Federal regulatory plans that apply to the management of NCA resources include the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), and the Desert Tortoise Recovery Plan. These plans and regulations should act in concert to protect sensitive species and their habitats in the NCA and Wilderness.

The MBTA (16 United States Code [U.S.C.] 703-711) covers all migratory birds against unintentional or purposeful “taking”, which includes killing, possessing, or transporting any migratory bird or its eggs, nests, or parts. All native bird species that are found in the NCA are protected by the MBTA.

The mission of the Nevada Natural Heritage Program “is to coordinate the resource need of Nevada’s diverse biological heritage with human activities.” The publically-funded program is located within the State of Nevada’s Conservation & Natural Resources Department and researches, collects, and organizes data on and evaluates conservation priorities for over 700 native species and their habitats, particularly those at the greatest risk of extinction or in population decline.

The list of MSHCP Covered Species originates from the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and Environmental Impact Statement for Issuance of a Permit to Allow Incidental Take of 79 Species in Clark County, Nevada (Clark County 2000); a document prepared primarily to conserve 242 species and their habitats within the County. The MSHCP identified actions to protect species and habitats, and proposed that 79 of the species be specifically protected: by Section 10(a) Permits for species which are currently federal or state listed, and with Prelisting Agreements for those species that are not currently listed (Covered Species). All Covered Species are treated in Clark County as though they are listed species subject to the specifications of the Endangered Species Act, including protection of habitat.

### **Special Status Species**

Protective or special status designations for species are delineated independently by several federal and state agencies, including USFWS, BLM, NDOW, and the State of Nevada’s Natural Heritage Program (NNHP), among others. Each agency has its own list of special status species, which often overlap between the agencies.

### **U.S. Fish and Wildlife Service Listed Species**

Only one federally listed threatened species, desert tortoise (*Gopherus agassizii*), is found in the NCA (USFWS 2008). Desert tortoise is also listed as a State of Nevada threatened species. Desert tortoise population declines have been documented since the 1970s, and the Mojave Desert population of tortoise was listed as threatened in 1990 based on concerns for the species due to habitat degradation and loss, predation and take (particularly as juveniles), and the effects of disease and drought. Critical habitat for the tortoise has been established by USFWS in areas of the species’ range, but these critical habitat designation areas do not overlap any portion of the NCA (DOI 1994). Typical habitats for tortoise within the NCA area are flats, alluvial fans, and bajadas, but tortoises will readily use rockier, steeper terrain. Burrows are dug in friable soils, often in embankments or under vegetation. The wildlife habitat model for this species indicates that the entire area east of the McCullough Mountains, and a majority of the wilderness area, are potential tortoise habitats (see Figure 3.13 in BLM 2005). Desert tortoises are relatively slow-moving and easy to approach in open areas, leading to negative impacts from human interactions. The BLM is responsible for the protection of all federally listed species and their habitat present in the NCA.

There is a slight possibility that the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) might be seen in the NCA as an incidental occurrence, but lack of suitable habitat likely prevents regular use by this species (USFWS 2002) so it will not be evaluated as part of this EA.

## Bureau of Land Management Sensitive Species

Nineteen Nevada BLM Sensitive Species have the potential to occur in the project area (BLM 2003). BLM sensitive wildlife species that may occur in the NCA according to the BLM's county level and existing survey data (BLM 2003) will be evaluated by this EA and are listed in Table 3-4.

**Table 3-4. BLM sensitive species potentially occurring in Sloan Canyon NCA**

Common Name	Scientific Name	Habitat Characteristics
<i>Mammals</i>		
Desert valley kangaroo mouse	<i>Microdipodops megacephalus albiventer</i>	Creosote scrub.
Desert bighorn sheep	<i>Ovis canadensis nelsoni</i>	Steep rocky mountainous terrain above desert floor and lower elevation areas with moderate slopes and ruggedness; access to surface water.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Shrub-steppe or forest edge in rocky outcrops or caves.
Pallid bat	<i>Antrozous pallidus</i>	Found in various habitats from desert to brushy terrain to coniferous forest and non-coniferous woodlands; found in all habitats from low desert (creosote bush) to coniferous forest.
Long-eared myotis	<i>Myotis evotis</i>	Brush, woodland, and forest habitats; prefers coniferous woodlands and forests.
Silver-haired bat	<i>Lasiorycteris noctivagans</i>	Hot, semi-arid, shrubby habitats, especially mesquite and brushy pinyon-juniper woodlands; also chaparral, desert scrub. Thorn scrub, oak-juniper woodland, pinyon-juniper, juniper-cholla, mesquite, dry chaparral.
<i>Birds</i>		
Northern goshawk	<i>Accipiter gentiles</i>	Creosote scrub.
Golden eagle	<i>Aquila chrysaetos</i>	Shrubby vegetation near clearings and open areas for foraging; otherwise, a mosaic of altered and unaltered habitat on a landscape scale.
Prairie falcon	<i>Falco mexicanus</i>	Perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas.
Ferruginous hawk	<i>Buteo regalis</i>	Sagebrush scrub, pinyon-juniper, montane scrub, yellow pine-white fir, lodgepole pine-red fir, cliff faces, salt-tolerant desert scrub, rangeland.
Swainson's hawk	<i>Buteo swainsoni</i>	Grassland, shrubland, agricultural areas where it has open areas to forage and where roost sites are available.
Loggerhead shrike	<i>Lanius ludovicianus</i>	Open grassland or agricultural areas with some shrubs or small trees for perching, hunting, nesting. Prefers habitats with relatively short grasses and forbs.

Common Name	Scientific Name	Habitat Characteristics
Phainopepla	<i>Phainopepla nitens</i>	Desert, scrubland, riparian, and woodland habitat, areas supporting desert trees bearing mistletoe. These trees typically are mesquite, catclaw acacia, and juniper.
Vesper sparrow	<i>Pooecetes gramineus</i>	Breeds in sagebrush and other shrub habitats with sparse vegetation. Occupies grasslands and croplands in winter, often using scattered shrubs and patches of tall herbs for cover.
Gray vireo	<i>Vireo vicinior</i>	Arid, shrub-covered slopes in pinyon-juniper, juniper, and chamise-redshank chaparral habitats on foothills and mesas.
American peregrine falcon	<i>Falco peregrinus anatum</i>	All wetlands, marsh, riparian, sagebrush scrub, springs.
Western burrowing owl	<i>Athene cunicularia hypugea</i>	Open, well-drained grasslands, steppes, deserts, prairies, and agricultural lands.
<b>Reptiles</b>		
Gila monster	<i>Heloderma suspectum</i>	Mountain foothills dominated by saguaros and palo verde trees, also washes that extend down into valleys.
Western Chuckwalla	<i>Sauromalus obesus obesus</i>	Rocky, creosote bush, desert.

Desert bighorn sheep are distributed across the desert southwest from California to Texas and prefer arid, extremely rocky areas with access to canyons and washes. They require water in the summer months, but will drink water year-round during drought periods. Bighorn are a state-protected and BLM sensitive species and are listed due to population declines from over-harvesting, habitat degradation, disease, and overgrazing competition from livestock and wild burros and horses. However, the species can be legally hunted through a system of permits based on population dynamics; the permits are issued by NDOW. Active management and water development have helped support the recent increases in population numbers and distribution (BLM 2005). The Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands (BLM 1998a) directs priorities for management of bighorn and the facilitation of their recovery on 115 BLM sites in six states including Nevada. The McCullough mountain range, including the areas of the range covered by the NCA, is one of the recovery sites for bighorn in Nevada and is considered capable of supporting a viable herd (BLM 2005). The habitat model for bighorn identifies rocky areas and high elevations of the mountain range within the NCA and wilderness area as both winter and summer habitat, and includes additional lowland and canyon areas as summer range (see Figure 3.16 in BLM 2005). The bighorn sheep in this area are likely to be using the guzzlers on the NCA as main or supplemental water sources.

### Observed Species

During field surveys for sensitive plant and wildlife species during the spring and summer of 2008 and 2009, federally listed and BLM sensitive species were observed, as well as additional species listed as priority MSHCP species. Listed and sensitive species observed included desert tortoise and loggerhead shrike. Several live desert tortoises were observed in multiple

locations across the NCA. Tortoise sign (burrows, scat, carcasses) and live presence were primarily observed west of the McCullough Mountains and were found in both wash/bajada areas and steeper, rocky terrain. One live tortoise was observed in the middle of a heavily-used access road on the northeast section of the NCA. Loggerhead shrikes were observed west of the McCullough Mountains in the bottoms of wash/canyon areas, often where the landform rapidly opened out onto flatter areas.

MSHCP species observed included desert bighorn sheep, western chuckwalla (*Sauromalus obesus obesus*), Great Basin collared lizard (*Crotaphytus insularis bicinctores*), large-spotted leopard lizard (*Gambelia wislizenii wislizenii*), desert iguana (*Dipsosaurus dorsalis*), California (common) kingsnake (*Lampropeltis getulus californiae*), sidewinder (*Crotalus cerastes*), and Mojave green rattlesnake (*Crotalus scutulatus scutulatus*).

Non-sensitive species observed included Audubon cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), variable groundsnake (*Sonora semiannulata semiannulata*), western fence lizard (*Sceloporus occidentalis*), Mojave ground squirrel (*Spermophilus mohavensis*), black-throated sparrow (*Amphispiza bilineata*), lark sparrow (*Chondestes grammacus*), sage sparrow (*Amphispiza belli*), a vagrant black-and-white warbler (*Mniotilta varia*), willow flycatcher (*Empidonax traillii*), rock wren (*Salpinctes obsoletus*), horned lark (*Eremophila alpestris*), Bell's vireo (*Vireo bellii*), lesser nighthawk (*Chordeiles acutipennis*), Gambel's quail (*Callipepla gambelii*), common poorwill (*Phalaenoptilus nuttallii*), red-tailed hawk (*Buteo jamaicensis*), Mormon metalmark (*Apodemia mormo*), Common white (*Pontia protodice*), Acmon blue (*Plebejus acmon*), Painted lady (*Vanessa cardui*), and Western pygmy blue (*Brephidium exile*).

### 3.3 PHYSICAL RESOURCES

#### 3.3.1 AIR QUALITY

The Clark County Department of Air Quality and Environmental Management (DAQEM) manages air quality monitoring stations and develops implementation plans to achieve air quality standards compliance within the county and statewide (Clark County 2009b and DAQEM 2007). Compliance requires that air quality levels for monitored pollutants do not exceed the National Ambient Air Quality Standards published by the EPA within delineated airsheds (Appendix A).

Approximately two-thirds of the area of the Sloan Canyon NCA falls within the Las Vegas Valley airshed (Hydrographic Drainage Basin #212). The remainder of the NCA falls within the Eldorado Valley airshed (Hydrographic Drainage Basin #167), and a small area in the Hidden Valley airshed (Hydrographic Drainage Basin #166). The Las Vegas Valley airshed was designated as a non-attainment area for particulate matter in 1993, for carbon monoxide in 1997, and for ozone in 2004. A non-attainment area designation indicates that the airshed in question has exceeded safe levels for one or more monitored pollutants that contribute to poor air quality, and which may affect human health and welfare. Currently, the two major contributing pollutants are particulate matter and ozone; carbon monoxide in the valley has not triggered a violation since 1999. The closest active monitoring stations to the NCA are located in Green Valley (particulate matter) and Boulder City (particulate matter and ozone). As of 2008 in Clark County, all monitored pollutants that have an EPA-designated 8-hour standard have been recorded as below the standard, with the exception of ozone. The levels of most pollutants have remained constant; however, carbon monoxide levels have been steadily decreasing over the last 10 years.

Carbon monoxide (CO) is a gaseous pollutant produced primarily by motor vehicles and internal combustion engine sources, as well as other fuel combustion sources such as home heating devices, including fireplaces. CO levels are monitored as an average concentration over an 8-hour period. CO concentrations are affected by meteorological conditions, and most often reach hazardous levels during temperature inversions in the late fall and winter months.

Ground-level ozone (O<sub>3</sub>) is a toxic gas that is naturally found as a component of ambient air, which reaches hazardous levels due to human impacts. O<sub>3</sub> levels are monitored as an average concentration over an 8-hour period. Unlike other pollutants, O<sub>3</sub> is not produced by any specific source; rather, it is formed in the air through reactions between other airborne man-made chemicals in the presence of sunlight. Sources of contributing chemical components primarily stem from gasoline vapors, but also include other fuel and solvent vapors and consumer products. Emissions from these sources can be carried over hundreds of miles, forming high ground-level O<sub>3</sub> concentrations over very large areas, and in locations other than the source areas. Weather and temperature affects the production of O<sub>3</sub>; warm, sunny days increase the levels of O<sub>3</sub>. In Clark County, ground-level ozone is predicted to be at moderate levels throughout the warmer months (May-September), particularly within the Las Vegas Valley, with occasionally higher, unhealthy levels occurring in the afternoons when breezy conditions do not exist.

Particulate matter as a pollutant can be any type of material substance suspended in air, either liquid or solid. Particulate pollutant levels are monitored as the total weight of matter collected over a 24-hour period, every sixth day. Particles are typically classified into two size categories: coarse particles smaller than 10 microns in size (PM<sub>10</sub>), or fine particles smaller than 2.5 microns in size (PM<sub>2.5</sub>). Coarse particle emissions typically occur from man-made processes, such as travel over unpaved roads, rock and gravel mining, or processing or construction activities. Weather activity can contribute to higher levels of PM<sub>10</sub>, such as high winds over lands naturally or artificially cleared of vegetation. Fine particle sources include liquids and solids from all types of fuel combustion, and pollutants that are formed in the air from interactions between airborne chemicals and compounds. The majority of monitored fine particulates consist of sulfates and organic carbon. PM<sub>2.5</sub> levels have a tendency to be higher in the eastern portion of the country due to higher proportions of sulfates from coal-fired power plants.

Current uses of the Sloan Canyon NCA include hiking, bicycling, and horseback riding, and vehicles are used to access trailheads. An emergency closure was put into effect in 2006, which prohibited shooting, camping, and the use of OHVs within the NCA. These uses may still occur illegally; as such, for this EA, they will be considered as contributing factors. Current uses within the NCA and adjacent trailheads may contribute minor amounts to the monitored air quality pollutants CO and particulate matter in the immediate area of the NCA, and may be carried off site depending on weather patterns.

### **3.3.2 SOILS**

Soils in the project area consist primarily of sand and sandy loam, with an abundance of rock outcroppings and cobble to boulder size material. Table 3-5 and Map 11 represent local soils mapping and quantification from the Sloan Canyon RMP (2006).

Much of the unvegetated areas are covered by desert pavement (thin layer of tightly packed rock) and cryptogammic or biological soil crust (fungi, bacteria, lichen, and soil algae). Desert

pavement and soil crusts help to prevent the erosion of fragile soils and ultimately reduce moisture loss. Each of these resources is well adapted to severe desert climates, but is very susceptible to disturbance. Generally, the loss of or damage to these resources is considered to be permanent, as the development of biological crusts and desert pavement can take as long as several hundred years (USGS 2006).

Based on an evaluation of soil types and characteristics, there is a substantial potential for erosion and the transportation of fine sandy material from higher elevations to lower valleys via high intensity rainfall events. This is obvious from the lack of fine sandy material exposed at higher elevations. Much of this sandy material is found at lower elevations and in sediment traps, such as OHV roads and flat areas where the water velocity slows and the sediment drops out (see Figures 44 and 45). However, much of the erosion potential is based on disturbed areas. Areas of higher elevation within the project area tend to have well-drained soils with very high runoff potential, like the Nipton-Haleburu rock outcrop and Nipton-Rubble land railroad association soils. This is primarily as a result of higher elevation areas having steeper grades. Lower elevation areas and valleys, which both have a flatter slope, tend to have lower runoff potential, medium to high permeability, and moderate erosion potential. The high runoff potential of large portions of the contributing sub-watersheds and erosive potential of lower areas highlights two key potential environmental issues relative to any construction or disturbance within the project area:

- The desert hydrology and high runoff potential of local soils can result in large runoff volumes as a result of the unpredictable, high intensity rainfall events in the otherwise dry region. Large volumes and high rates of runoff are concentrated within specific conveyance zones – existing channels and washes.
- Infrequent but large stormwater generating precipitation events result in quick stormwater concentration and conveyance to sandy valley areas, which have the highest potential to erode. Disturbed areas with moderate (and even slight) erosive potential may experience local scour and contribute additional sediment to stormwater when subjected to large volumes and high rates of concentrated stormwater runoff.



Figures 44. and 45.

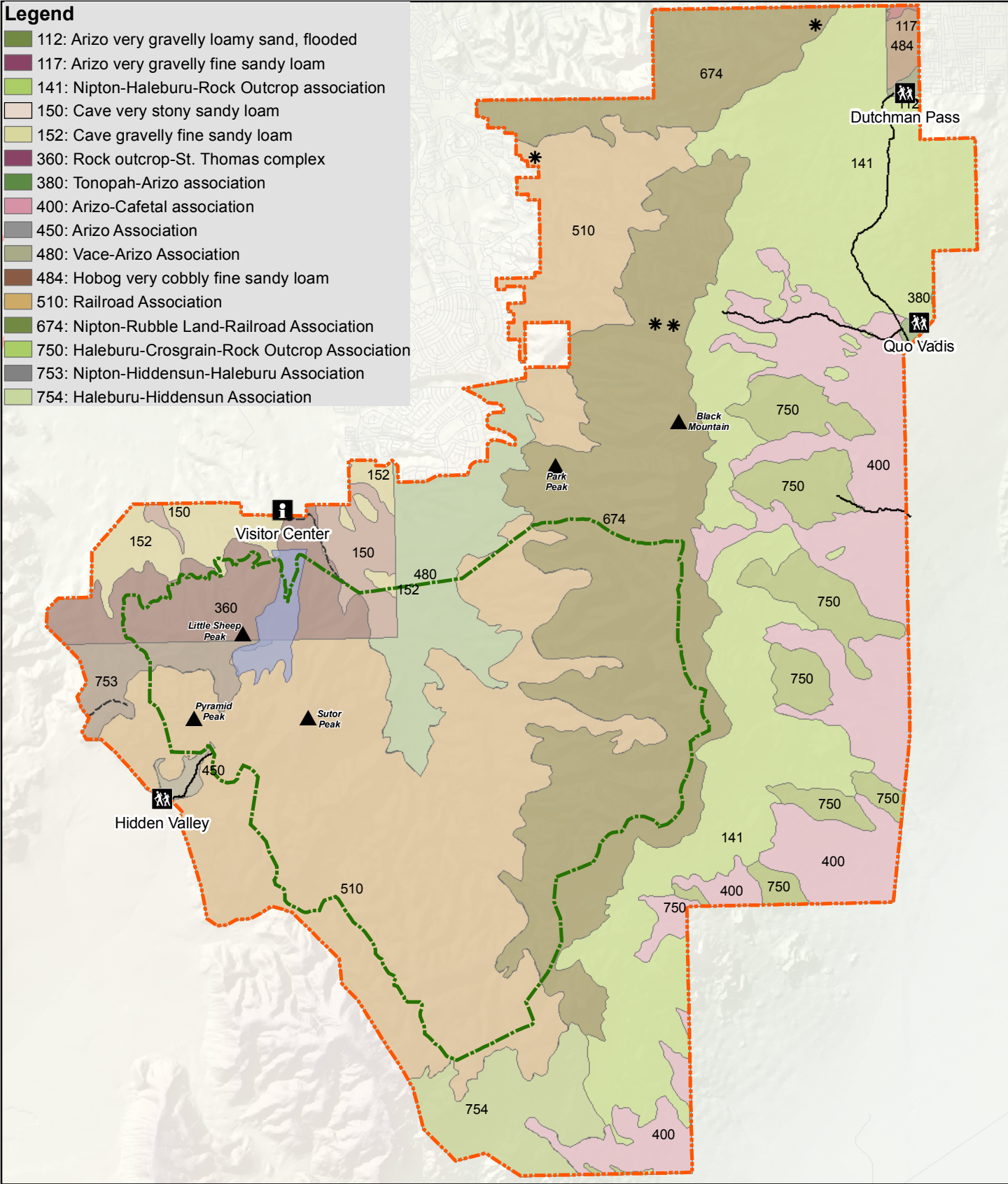
**Table 3-5. Soil types within Sloan Canyon NCA.**

Soil Number	Soil / Association Name	Hydrological Description
112	Arizo Very Gravelly Loamy Sand	Deep, excessively drained soils in channels on fan piedmonts; permeability rapid; runoff slow; water erosion hazard slight
117	Arizo Very Gravelly Fine Sandy Loam	Very deep, excessively drained soil on alluvial fans and inset fans; permeability very rapid; runoff slow; water erosion hazard slight
141	Nipton-Haleburu Rock Outcrop Association	Well drained soil on backslopes of mountains; permeability moderately rapid; runoff very high
150	Cave Very Stony Sandy Loam	Shallow, well drained soil on erosional fan remnants; permeability moderate; runoff slow; water erosion hazard slight
152	Cave Gravelly Fine Sandy Loam	Shallow, well drained soil on erosional fan remnants; permeability moderate; runoff slow; water erosion hazard slight
360	Rock Outcrop-St. Thomas Complex	Shallow, well drained soil on hills and low mountains; permeability moderately rapid; runoff rapid; water erosion hazard moderate
380	Tonopah-Arizo Association	Excessively drained soil in intermontane basins; permeability moderately rapid; runoff low
400	Arizo-Cafetal Association	Excessively drained soil on fan piedmonts; permeability rapid; runoff very low
450	Arizo Association	Excessively drained soil on fan piedmonts; permeability rapid; runoff very low
480	Vace-Arizo Association	Well drained soil on fan piedmonts; permeability moderate; runoff very high
484	Hobog Very Cobbly Fine Sandy Loam	Shallow, well drained soil on hills; permeability moderately rapid; runoff rapid; water erosion hazard moderate
510	Railroad Association	Well drained soil on lava flows; permeability moderately rapid; runoff high
674	Nipton-Rubble Land Railroad Association	Well drained soil on backslopes of mountains; permeability moderately rapid; runoff very high
750	Haleburu-Crosgrain Rock Outcrop Association	Well drained soil on backslopes of mountains; permeability moderately rapid; runoff very high
753	Nipton-hiddensun-Haleburu Association	Well drained soil on backslopes of mountains; permeability moderately rapid; runoff very high
754	Haleburu-Hiddensun Association	Well drained soil on summits of mountains; permeability moderately rapid; runoff very high



**Legend**

- 112: Arizo very gravelly loamy sand, flooded
- 117: Arizo very gravelly fine sandy loam
- 141: Nipton-Haleburu-Rock Outcrop association
- 150: Cave very stony sandy loam
- 152: Cave gravelly fine sandy loam
- 360: Rock outcrop-St. Thomas complex
- 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
- 674: Nipton-Rubble Land-Railroad Association
- 750: Haleburu-Crosgrain-Rock Outcrop Association
- 753: Nipton-Hiddensun-Haleburu Association
- 754: Haleburu-Hiddensun Association



**LEGEND**

- Sloan Canyon NCA Boundary
- North McCullough Wilderness
- Petroglyph Management Area
- Existing NCA Major Roads
- \* Communication Towers
- i Visitor Center
- hiker icon Proposed Trailheads
- ▲ Peaks

**Sloan Canyon NCA  
Trails Master Plan**

MAP 11 - SOILS

OCTOBER 4, 2009



### 3.3.3 HYDROLOGY, DRAINAGE, AND EROSION

The project area is located entirely within the arid Mojave Desert. This area receives an average of approximately 4 inches of rainfall annually. Table 3-6 shows average annual rainfall for Las Vegas (approximately 10 miles north of the NCA).

**Table 3-6. Monthly average rainfall Las Vegas McCarran International Airport, 1937-1990**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
mm	12.7	10.6	10.6	5.6	4.4	2	10.5	12	7.9	5.6	9.5	9.6	101.5
inches	0.5	0.4	0.4	0.2	0.2	0.1	0.4	0.5	0.3	0.2	0.4	0.4	4

[Source: LAS VEGAS/MCCARRAN, NV. data derived from GHCN 1. 646 months between 1937 and 1990](#)

Most months average less than a 0.5 inch of rain. One average rainfall event per month can deliver the full amount of rainfall expected for that month. A statistical analysis of the historic daily precipitation events between 1950-1990 indicate that the majority of all rainfall events deliver less than 0.5 inch of precipitation.

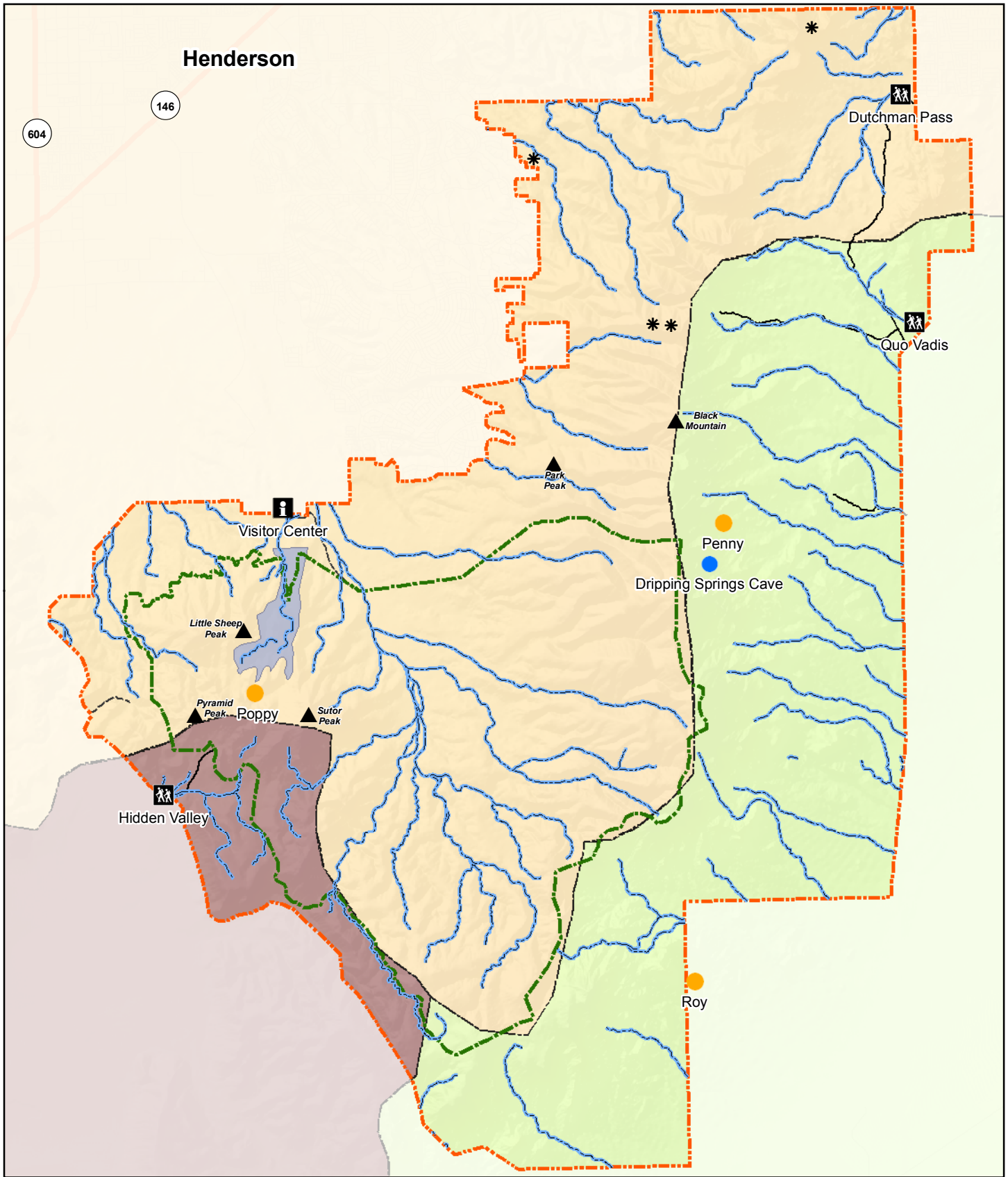
Although the Sloan Canyon area is typically very dry, occasional high intensity and large volume rainfall events do occur on site. Nineteen occasions of rainfall exceeding 1 inch in 24 hours were recorded between 1950-2006 at McCarran Airport. These infrequent, large rainfall events can produce large amounts of concentrated runoff from the larger watersheds, and may result in flash flooding within the natural on-site collection channels and washes.

Field reconnaissance and on-site observations of flood mobilized debris and high-water marks indicate that some of the washes can convey high volumes of runoff through the project area in response to these rainfall events.

The infrequent nature of rainfall in this part of the country results in only intermittent channelized flow in the project area; there are no perennial streams or surface waters within the project area. Some isolated springs are found in the eastern part of the Sloan Canyon NCA within the Eldorado Drainage Basin. These freshwater springs are isolated from groundwater and are essentially caused by groundwater trapped by impermeable rock layers near the surface.

The steep and rocky character of the higher elevation portions of Sloan Canyon watersheds causes rainfall to collect, concentrate, and run off through existing natural channels, thereby discouraging infiltration to groundwater until the channel slopes flatten out in the valleys. Watershed sub-basins and concentrated flowpaths representing the natural Sloan Canyon drainage system are shown in Map 12.

Natural stormwater conveyance channels may be 10-20 feet wide at the bottom and their side slopes are determined by the valleys that they bisect. Typical channels will have a 3:1 or 4:1 horizontal to vertical side slope. Figure 46 shows a typical existing natural collection and conveyance channel.



**LEGEND**

Sloan Canyon NCA Boundary	<b>NCA BASINS</b>	Existing NCA Major Roads	Communication Towers
North McCullough Wilderness	Eldorado Valley	Intermittent Washes	Visitor Center
Petroglyph Management Area	Hidden Valley	Dripping Springs Cave	Proposed Trailheads
	Jean Lake Valley	Guzzlers	Peaks
	Las Vegas Valley		



**Figure 46. Existing Natural Stormwater Conveyance Channel**

As stormwater flows reach the valley floor, longitudinal channel slopes decrease, the bed material becomes sandier and finer grained, and runoff eventually fans out in very shallow and wide, disorganized flowpaths through the alluvium. At this point, some portion of runoff will make its way to valley groundwater aquifers. Groundwater in this region tends to be very deep, often more than 500 feet underground. A well yield test performed on a ranch just south of the Sloan Canyon project area showed static groundwater at 650 feet below ground level.

Erosion in the desert environment can be manifested in many ways. What begins as small rills within upper portions of watersheds concentrates into small channels. As small channels collect and combine within the watershed, washes are formed. Depending on the stability of the channel material (sand, cobbles, bedrock, etc.), large washes and possibly deep gullies may occur. Development related disturbances, which can accelerate or amplify stormwater (i.e., reduction in vegetative cover, or increased imperviousness caused by concentrated travel and zones of focused impact), disturb the natural channel balance and may lead to increased erosion.



**Figure 47. Wash Trail**



**Figure 48. Natural Rock Step Formation**

## 3.4 HUMAN AND CULTURAL RESOURCES

### 3.4.1 RECREATION

Recreation use in Sloan Canyon NCA has been primarily dispersed uses at low to moderate levels. Slowly, however, use is increasing due to growth of the Las Vegas Valley and the growing awareness of recreational opportunities at Sloan Canyon NCA. Much of this increased use occurs along the urban interface with the NCA. Currently, there are no formalized or developed roads, routes, trails, or facilities to support recreation. Primary recreation activities in the NCA include hiking and sight-seeing, mainly to the petroglyph sites. Recreational uses in the Sloan Canyon NCA (other than trails uses) include small levels of dispersed camping, rockhounding, and wildlife viewing. Hunting is also permitted outside of the Petroglyph Management Area.

OHV riding also continues to be a routine recreation activity in the area, although it is no longer a permissible activity in the NCA. Recreationists are frequently long-time users of specific locations, largely self-sufficient, and may be unaware of the relatively recent NCA designation.

Before the Sloan Canyon NCA Act was passed by Congress, the Proposed Las Vegas Resource Management Plan and Final Environmental Impact Statement (Las Vegas RMP) (BLM 1998b) guided management of recreation in the North McCullough Range. However, there was little direction for management of recreation on the land currently within the NCA. Administrative actions taken through the Las Vegas RMP (BLM 1998b) closed much of the northern portion of the NCA to shooting, camping, and OHV use.

BLM began visitor use observations in November 2003 to track visitor numbers, determine types of visitors, and discern daily and seasonal recreation activities. The number of visitors was recorded daily between November 2003 and July 2004 at several spots throughout the NCA, including Hidden Valley, the Sloan Canyon Petroglyph Site, and the northeast corner of the NCA. During this observation period, approximately 4,000 visitors were counted within the NCA (one visitor equals one person recreating in the NCA for any amount of time in the course of one day). This total equates to an average of 15 visitors per day. Visitor patterns indicated peak visitation (15-35 visits per day) on weekends and lower use (5-15 visits per day) on weekdays. Extrapolated to a full calendar year, the observed visitor total would be approximately 5,500 annual visits. For purposes of planning and analysis, it was assumed that actual visitation is five times higher than the observed. Hence, current visitation is estimated to be about 28,000 visitors per year (BLM 2006).

The ongoing growth and development in the Las Vegas Valley, combined with the development of a formalized trail system and visitor facilities, is likely to result in increased visitation to the NCA over time. The annual growth rate in Clark County for 2007 was 3.68 percent (Clark County 2009a); however, due to an overall economic slowdown, the growth rate dropped to 0.52 percent in 2008. Still, overall average growth in Clark County has been 5.22 percent since 1990. It can be expected that population growth in the region will resume as the economy stabilizes. Other factors could also contribute to increased visitation at Sloan Canyon. For example, Las Vegas has numerous weekly and monthly publications that list "things to do," including visiting natural areas such as Red Rock Canyon NCA and Valley of Fire State Park. The Sloan Canyon NCA is not currently listed in these publications but may be in the future, and visitation may increase as such.

*Nevada's 2003 Statewide Comprehensive Outdoor Recreation Plan - Assessment and Policy Plan* reports that 44.2 percent of the population in Nevada participates in some type of walking activity as part of their regular recreation (Nevada Division of State Park 2004). Other activities in the top 10 that occur in Sloan Canyon NCA are picnicking (37.4 percent), wildlife viewing (30.7 percent), and hiking (28.0 percent). The SCORP also reports results of the Nevada Market Region Report, which is based on the National Survey on Recreation and the Environment (NSRE) conducted by the USFS in 2002. These results show that of the top 10 most popular outdoor recreation activities in Nevada, 7 occur, or could occur at Sloan Canyon NCA. These activities are: walking for pleasure, family gathering, view and photograph natural scenery, picnicking, visiting nature centers, sightseeing, and view and photograph other wildlife.

Although the precise numbers of visitors participating in specific activities are unknown, general patterns have been derived through visitor observations throughout the NCA. Because of the rugged terrain and distinct natural boundaries within the NCA, recreational use is discussed below by geographic area.

Currently, there are no special recreation permits for the Sloan Canyon NCA.

### **Interpretation and Education**

In June 2007, a long-range interpretive plan was developed for Sloan Canyon NCA (BLM 2007a). This plan describes both the existing and desired visitor experiences for Sloan Canyon as they relate to education and interpretation. Currently, general information regarding Sloan Canyon NCA is found in an interim brochure and newsletter available at visitor centers, museums, and city offices. NCA staff also responded to numerous telephone and email requests with an informational packet. There are also informational kiosks located at two entrances, Petroglyph Canyon and Hidden Valley, which have a regional map, desert safety information, brochures, and trail register.

In spring 2006, Sloan Canyon NCA's Lead Environmental Education Specialist collaborated with the Clark County Heritage Museum and Nevada State Museum to guide tours of 20 people to visit the petroglyph site. These tours and partnerships have been successful, and plans to continue guiding visitors for fall/winter are being discussed. In an attempt to provide a safe visit, it is intended that Sloan Canyon staff will train museum staff about Sloan Canyon themes; therefore, each visiting group will have two trained leaders to accompany and strengthen the partnership.

### **Desired Visitor Experience**

As described in the 2007 Interpretive Plan, interpretation and education in Sloan Canyon NCA will provide visitors and students with opportunities to:

Expand their knowledge and appreciation of:

- Prehistoric and historic cultural resources in Sloan Canyon NCA.
- Geologic processes and ability to identify geologic features.
- The complicated interactions of the plant and animal communities of the Mojave Desert.
- Desert safety and natural/cultural resources protection.
- BLM rules, regulations, and policies.

- View extensive vistas and be inspired by this landscape.
- Expand their cultural horizons and develop cultural respect.
- Receive accurate and consistent information from a variety of sources: NCA staff, Native American guides, partners, outfitters, Internet sites, and concessioners.
- Have access to current scientific research about Sloan Canyon resources.
- 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.
- Take advantage of educational programs (cultural programs, off-site programs, and environmental education programs).
- Develop a sense of stewardship toward protecting the resources and values.
- Have access to an array of sales and reference literature directly related to the site and its themes.
- Witness demonstrations by Native American tribal members.
- Feel comfortable about inquiring about Native American (Southern Paiute and Fort Mojave) cultures.
- Provide various types of recreation: hiking, mountain biking, equestrian use, primitive camping, and wildlife viewing.

## Recreation Use by Area

### *Dutchman Pass Area*

Overall, the Dutchman Pass area of the NCA is characterized by terrain of a highly rugged nature and rocky soils. There are limited formal access points to this area, including the Dutchman Pass Trailhead and Quo Vadis Trailhead.

In the past, OHV use was the primary recreation activity in the Dutchman Pass portion of the NCA. The basin in the far northeast corner of the NCA has been heavily used by motorcycles, OHVs, and four-wheel-drive vehicles, and contains unauthorized (or social) trails created as a result of this use. Large portions of Dutchman Pass have experienced resource damage from braided routes, steep grades, and the pioneering of new routes. Historically, none of the routes and trails in the area have been maintained by BLM. Although the most recent management plan for the area prohibits motorized use in the NCA, it still frequently occurs, particularly in the Dutchman Pass area.

Other permissible recreational trail uses in Dutchman Pass include hiking, equestrian use, and mountain biking in certain areas. Cross-country hiking is permitted in most of the southern portion of Dutchman Pass, while hiking is limited to designated trails only in the northern portion.

Another non-permitted but continuing activity in this area is recreational target shooting.

Regional trail planning efforts by other non-federal agencies, particularly the City of Henderson, provide an opportunity to develop an integrated trail system. Within the Dutchman Pass area, the City of Henderson, in cooperation with BLM, is planning the McCullough Hills Trails Connection. This 7-mile trail will connect the foothills of Henderson's Anthem development on the west, to Mission Drive in the Foothills detention basin on the east. Future phases of the project will connect to the River Mountains Loop Trail, which will connect Boulder City, Henderson, and the Lake Mead National Recreation Area.

#### *Black Mountain Area*

Similar to the Dutchman Pass area, Black Mountain is rugged in nature with rocky soil. There is limited formal access to the area; however, many recreationists access the area on foot from adjacent neighborhoods in the City of Henderson. There are several unofficial social trails that have been created over time without BLM approval. Current use of these trails consists primarily of hiking, with smaller use levels of mountain biking and horseback riding as well. While it is now a prohibited recreation activity, OHV use still occurs, mainly along the East-West Power Line Road and through the Eastern Avenue extension to the Black Mountain Communication Site Road.

Overall, use in the Black Mountain area is low, but specific numbers are unknown. Overall demand for dispersed recreational use in the area is expected to increase as the population of the Las Vegas Valley, and the City of Henderson specifically, continues to grow. In the Black Mountain area, the City of Henderson is currently planning the Anthem East Trails project that will provide 10 miles of trail. This project will connect the City of Henderson with the Anthem Trail in Sloan Canyon NCA.

#### *Hidden Valley Area*

The Hidden Valley area encompasses the southern half of Sloan Canyon NCA, including the North McCullough Wilderness Area and the Petroglyph Management Area. The North McCullough Wilderness encompasses the Sloan Canyon Petroglyph Site, as well as a broad desert basin that is surrounded by portions of the North McCullough Range, which delineates the wilderness boundary.

Overall, the North McCullough Wilderness Area receives low levels of dispersed recreational use, primarily because of its rugged terrain and limited vehicle access to its boundary. There are opportunities for wildlife watching, hunting, camping, hiking, and horseback riding. Some of the more popular destinations include Sutor and Hanna Peaks, the North McCullough escarpment, and the Sloan Canyon Petroglyph Site. As noted in Chapter 2, equestrian use is not permitted in the Petroglyph Management Area. Currently, a cable fence at the north entrance to the main Petroglyph Canyon deters equestrian (and motorized) users from accessing this area. Access to the south entrance of the Petroglyph Canyon is unmarked and not physically restricted, but still not permitted.

While OHV use is illegal in the wilderness area, some use still occurs in Hidden Valley near the southern access to the Sloan Canyon Petroglyph Site. OHV access in other areas of the wilderness is naturally deterred by rugged terrain and rocky soils.



Small portions of NCA lands lay outside the North McCullough Wilderness on the west, south, and east boundaries. In these areas, minor amounts of recreational target shooting and OHV use occur. There are also limited amounts of dispersed camping and wildlife-watching opportunities. Access to the wilderness and this perimeter area is limited to a few routes, which lie mostly outside the NCA boundary.

Visitation to the Sloan Canyon Petroglyph Site increased following the designation of the NCA and wilderness, with large parties, including organized hiking groups, frequenting the site. Based on limited monitoring in 2003-2004, preliminary visitor estimates indicate approximately 5-10 persons accessing the Sloan Canyon Petroglyph Site per weekday, and 15-20 persons on weekend days. Outside the wilderness, limited visitor use observation indicates moderate levels of OHV use, hiking, and occasional camping.

### **3.4.2 WILDERNESS AND SPECIAL MANAGEMENT AREAS**

In 1964 Congress passed the Wilderness Act, legally designating certain federal lands as Wilderness Areas in order to ensure that increasing population and expanding settlement did not modify all areas within the United States (The Wilderness Act, P.L. 88-577). According to the Wilderness Act, designated wilderness is:

...Recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which 1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; 2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation (Sec. 2(c), P.L. 88-577).

BLM wilderness areas must be managed to be affected primarily by the forces of nature, with the imprint of human work substantially unnoticeable: to maintain the area's outstanding opportunities for solitude or primitive and unconfined recreation,; and to protect any ecological, geological, or other features of scientific, educational, scenic, or historical value which the area may contain (BLM 1983). The BLM has defined three primary objectives for wilderness management with the overarching goal being preservation of wilderness character: naturalness, solitude, and special features. Naturalness includes allowing ecosystems to function naturally; allowing fire, insects, and disease to play a natural role; to allow resources previously altered by human influences to return to their natural condition; and define limits of acceptable change for a wilderness area. The objective of solitude is that BLM maintains and enhances the area's outstanding opportunities for solitude by providing natural settings with few reminders of human activity or civilization, and by providing opportunities for relatively few contacts with other visitors. The goal of special features encompasses the idea that BLM will maintain the unimpaired ecological, geological, and other features of scientific, educational, scenic, or historical value found in wilderness areas (1983).

The North McCullough Wilderness, which was designated by Congress on November 6, 2002, is located entirely within the Sloan Canyon NCA. The wilderness area encompasses approximately 14,765 acres. The eastern boundary of the wilderness follows the crest of the escarpment, the base of which forms the eastern edge of Sloan Canyon NCA. The volcanic features that rim Hidden Valley predominantly define the western boundary. The northern boundary of the wilderness crosses the Sutor Hills, Sloan Canyon, and a large basin that

contains the Sloan Canyon Petroglyph Site, as well as other notable physical features, including Sutor and Hanna Peaks. The interior of the wilderness is defined by an approximately 2-mile wide valley bisecting the prominent ridgeline to the east, from the Sutor Hills. Elevations in the wilderness range from 2,850 feet at the lower end of the central valley to 5,058 feet at the ridgeline of the McCullough Range.

The outstanding quality of the wilderness values present in the North McCullough Range were a key consideration in its designation as wilderness. Overall, the North McCullough Wilderness appears natural. However, a few signs of human use were introduced into the environment before the area's designation and are still visible. These include a few two-track vehicle routes that have been closed, a rock and mortar dam, dug well, and a wildlife water development (guzzler).

Although the North McCullough Wilderness is in proximity to a large urban area, portions of the wilderness outside the Petroglyph Management Area possess ample opportunities for solitude. Low levels of visitor use, a lack of trails and other developments, and topography that provides natural screening from the adjacent urban area contribute to this feeling of solitude. A lesser degree of solitude is available within the Petroglyph Management Area, which is the heaviest visited area within the wilderness. The primeval character of the entire wilderness is essentially intact, except for the occurrence of some introduced plants, primarily annual grasses.

Although motorized use within Sloan Canyon NCA is prohibited, some unauthorized use still occurs, as people attempt to gain access to the wilderness through routes approaching from the northwest in the Sloan Canyon area and the southwest from Hidden Valley. These routes access Sloan Canyon and the wash leading to the Sloan Canyon Petroglyph Site. Overall, unauthorized vehicular access into the wilderness is discouraged by the rugged and rocky terrain; however, a small amount of unauthorized motorized use has occurred in the southern Hidden Valley area near the access to the Sloan Canyon Petroglyph Site. Currently, no formal trails, trailheads, or associated developments are adjacent to or within the wilderness. Cross-country hiking is allowed throughout the wilderness, except for the Petroglyph Management Area and its north access where hikers must stay on designated trails. The entire wilderness is available for cross-country equestrian use, except for the Petroglyph Management Area.

As is described in Section 3.5.1, Recreation, generally the wilderness receives low levels of dispersed recreational use, primarily due to the rugged terrain and limited access improvements. Recreational opportunities include wildlife watching, hunting, camping, hiking, and horseback riding. The majority of recreationists use the wilderness as part of a visit to the Sloan Canyon Petroglyph Site. Visitation to the Sloan Canyon Petroglyph Site has increased following the designation of the NCA and wilderness.

The Petroglyph Management Area, located within the North McCullough Wilderness, is designated for day use only, with fires, camping, and nighttime use prohibited (refer to Map 2 for the location and boundaries of the Petroglyph Management Area). To minimize impacts on wilderness characteristics and natural resources of the area, visitation within the Petroglyph Management Area will be limited once adequate NCA infrastructure is in place.

Once residential development on the northern and western sides of the NCA is complete, the Sloan Canyon Petroglyph Site will be just a short distance from a large urban population. To manage the potential high number of visitors, to protect the sensitive cultural and natural resources, and to protect wilderness characteristics, specific management actions were developed in the 2006 RMP. Relevant management actions are listed below (the following

measures have been excerpted in part from the 2006 RMP; please refer to the RMP for the full description of each measure):

- Visitors to the Petroglyph Management Area during periods of high use, such as weekends and holidays, must join a BLM-sponsored tour. No more than one guided group of no more than 20 people are allowed in the Petroglyph Management Area at one time. **(WLD 4)**
- During periods of lower use (such as weekdays), visitors may go to the Petroglyph Management Area unaccompanied by a BLM-sponsored guide if they obtain a permit. A total of no more than 25 permits per hour will be issued for self-guided tours. **(WLD 5)**
- Access to and use of the Petroglyph Management Area is confined to the canyon bottom and a limited number of side trails. **(WLD 6)**
- The main access to the Petroglyph Management Area will be controlled through a visitor center located near the NCA boundary at the northern end of the Sloan Canyon wash. Rangers and other BLM staff or designated personnel will patrol the Petroglyph Management Area for visitors entering from points other than the visitor center, and will either deny access based on visitation levels or issue a visitation permit. **(WLD 7)**
- Use of the Petroglyph Management Area is limited to the visitor center's operational hours, which will be determined by BLM before the center is opened. Exceptions may be allowed only under special circumstances and with the approval of the Sloan Canyon NCA manager. **(WLD 8)**

### 3.4.3 CULTURAL RESOURCES

Archaeological evidence suggests that resources within the NCA may have been used for nearly 7,000 years (BLM 2006).

The entire NCA contains cultural resource sites, although certain areas have higher site density. The Class I cultural resources inventory (a literature review) identified 54 known archaeological sites in and around the Sloan Canyon NCA (BLM 2005). Eighty-five percent (85%) of these are prehistoric sites and the remaining 15 percent are historic sites. Patterns from the Class I inventory completed in November 2003 led to an expectation of low site densities throughout the NCA, outside of Sloan Canyon itself (Duke et al. 2003 in BLM 2005).

The centerpiece of the NCA is the Sloan Canyon Petroglyph Site, one of the most notable cultural resources in southern Nevada (BLM 2005). More than 400 rock art panels with nearly 1,200 designs represent native cultures dating from the Archaic to Historic era (Pers. Comm. Boatwright 2009).

In the summer and fall of 2008, BLM Archaeologists surveyed all of the proposed trail alignments and the Area of Potential Effects (APE).

By virtue of a literature review and field survey, and under the BLM-State Protocol Agreement between BLM and the Nevada State Historic Preservation Office (September 30, 2009) for implementing the National Historic Preservation Act (NHPA), the BLM has determined that there are eight sites located in the vicinity of Alternatives B, C, and D. Four of these sites are National

Register-eligible historic properties near or within the trail corridors (Table 3-7). Each of these sites is prehistoric in nature, representing episodic settlement and subsistence practices dating from at least 1,000 years ago. The most significant of these sites is the Sloan Canyon Petroglyph Site, which contains over 400 rock art panels and is a listed historic property on National Register of Historic Places.

**Table 3-7. Sites located within the APE.\***

Site	Site Designation	Site Type	Eligibility Criteria**	Agency Determination***
1	26CK-8636	Lithic Scatter	Not Eligible	--
2	26CK-8638	Rock Shelter	Not Eligible	--
3	26CK-8639	Rock Shelter	Eligible: "d"	No Effect; route will be aligned away from site.
4	26CK-8640	Rock Ring	Not Eligible	--
5	26CK-8641	Rock Shelter	Eligible: "d"	No Effect; route will be aligned away from site.
6	26CK-8642	Rock Rings/Lithic Scatter	Eligible: "d"	No Effect; route will be aligned away from site.
7	26CK-8643	Quarry Site	Not Eligible	--
8	26CK-2240/2621	Sloan Canyon Petroglyph Site	Eligible: c,d	No Effect; no trail construction.

Notes: Site locations are not provided.

\*The APE for this project is defined as those areas extending approximately 100 feet to either side of each trail centerline. Where rock shelters or other significant cultural resources might have been found in relatively close visual proximity, the APE was expanded to include an investigation of these possible features/sites. This was no more than about 500 meters from the centerline of any given trail.

\*\*National Register of Historic Places (NRHP) eligibility criteria (from 36 CFR 60.4, Criteria for Evaluation) is defined as:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- a) that are associated with events that have made a significant contribution to broad patterns of our history; or
- b) that are associated with the lives of persons significant in our past; or
- c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- d) have yielded, or may likely to yield, information important in prehistory or history.

\*\*\*The Agency Effect Determination in accordance with the NHPA & BLM/State Protocol Agreement. Note that the trail in the Sloan Petroglyph Canyon Special Management Area has been previously reviewed and evaluated under Section 106 of NHPA during the development and finalization of the Sloan Canyon National Conservation Area Resource Management Plan (RMP) & Environmental Impact Statement. It was also at this time that the Sloan Petroglyph Canyon trail was formally designated. The current undertaking does not provide for any trail construction in Sloan Petroglyph Canyon; e.g. there will be "no effect" to this resource.)

In addition to contacting the Nevada State Historic Preservation Office (SHPO) regarding the effect determination, consultations were held with affected federally recognized Native American tribes, as described in Section 1.7.3, to determine the presence absence of properties possessing significance to tribal religious beliefs, or practices, and cultural affiliation. Eleven tribes from the Southern Nevada region were identified by the BLM as potentially having concerns about the proposed project. All of these tribes were contacted and invited to participate in one of three BLM-Tribal Coordination meetings held at three different locations in

2008. The comments from these meetings reflected a variety of opinions and concerns. These centered on three topics: general support for the project, the identification of trail routes that would avoid or minimize effects to wildlife, and cultural and aesthetic resources. Although properties possessing significance to the tribes are known to exist in the area, no issues were raised with the proposed project.

### 3.4.4 VISUAL AND AESTHETIC RESOURCES

The scenic resources of the Sloan Canyon NCA are one of the reasons for its designation, and the internal areas of the NCA and North McCullough Wilderness offer remote wilderness character and views, as well as wildlife and cultural resource viewing. The steep desert mountains of the NCA are a visual amenity for the urbanized areas of the southern Las Vegas Valley, particularly for residents of the City of Henderson, which lies directly north of the NCA. When viewed from the urban areas, the mountains of the NCA appear unaltered and the landscape is considered a highly scenic backdrop (BLM 2004).

Sloan Canyon NCA and the North McCullough Wilderness have been evaluated and classified using BLM's Visual Resource Management (VRM) system (see Figure 2.9 in BLM 2006). This system is a method used to assign visual resource classes to public lands for two purposes, "(1) an inventory tool that portrays the relative value of the visual resources, and (2) a management tool that portrays the visual management objectives" (BLM 2007b). The wilderness area is classified as VRM I, with a management objective to preserve the existing character of the landscape. The majority of the remainder of the NCA is classified as VRM II, with a management objective to retain the existing character of the landscape. Some portions of the NCA, including the northeast area and two small sections on the west side, are classified as VRM III, with a management objective established to partially retain the existing character of the landscape while allowing a moderate level of change.

The BLM evaluates lands under its jurisdiction based on a system described in the Visual Resource Management Handbook H-8410-1 (BLM 2007b). A comprehensive Visual Resource Inventory of the Sloan Canyon NCA was completed in 2004.

The existing character of the NCA landscape is highly scenic, but also includes visual detractors, such as the presence of vegetatively denuded game; single track, social, and illegal OHV trails and roads; highly visible overhead electric transmission lines that cross the NCA as well as skirt along the periphery; communication towers; abandoned mines; and in some locations, litter and vandalism along the periphery of the NCA. Water guzzlers for wildlife are also located on the NCA, but have been camouflaged to minimize their visual impacts. Most of the central sections of the NCA and wilderness areas have been minimally affected by human uses, but do contain power lines and communication towers, or views towards them. For example, Black Mountain area towers are visible from most locations in the Dutchman Pass and Black Mountain areas. Similarly, overhead electric transmission lines are visible from nearly all locations in the Dutchman Pass area. Areas have been classified as VRM III where concentrations of human uses have had a negative effect on the visual resources of the NCA.