

Arrow Canyon Wilderness Draft Wilderness Management Plan



and Environmental Assessment

April 12, 2013

U.S. Department of the Interior
Bureau of Land Management
Nevada State Office
Southern Nevada District Office
Las Vegas Field Office



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and
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2013

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Introduction

Background

In 1964, the United States Congress established the National Wilderness Preservation System through the Wilderness Act (Public Law 88-577; 16 U.S.C. 1131-1136). This law was created to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States. Wilderness designation is intended to preserve and protect certain lands in their natural state. Only Congress, with Presidential approval, may designate lands as wilderness. The Wilderness Act of 1964 defines wilderness characteristics, the uses of wilderness, and the activities prohibited within its boundaries.

Wilderness areas provide a contrast to lands where human activities dominate the landscape. No buffer zones are created around wilderness to protect them from the influence of activities on adjacent land. Wilderness areas are managed for the use and enjoyment of the American people in a manner that will leave them unimpaired for future use and enjoyment as wilderness, for their protection, preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness.

Scope of the Wilderness Management Plan

This Wilderness Management Plan provides the primary management direction for the Arrow Canyon Wilderness. This plan addresses appropriate actions within and immediately adjacent to the wilderness area such as wilderness access and information provided to the public.

Wilderness characteristics are cumulatively identified by the Wilderness Act of 1964 as untrammeled (i.e., unrestrained, unhindered) by man, natural, undeveloped, having outstanding opportunities for solitude or primitive and unconfined types of recreation, and the inclusion of supplementary values. This Wilderness Management Plan preserves the area's characteristics by:

- Identifying the conditions and opportunities for which the wilderness area would be managed.
- Creating specific decisions and actions for managing resources and activities existing in the wilderness.
- Identifying management needs outside of, and immediately adjacent to the wilderness area including signing, staging areas, and access points.

The wilderness management plan is the first half of this document and contains a current comprehensive description of the wilderness and proposed goals, objectives, management decisions and actions that relate to the area as whole. Following the plan is an Environmental Assessment (EA), which fully describes and analyzes potential impacts relating to the proposed management decisions, actions, and the alternatives considered.

This plan is in conformance with the goals, objectives, and decisions analyzed within the scope of the Bureau of Land Management's (BLM) *Record of Decision for the Approved Las Vegas Resource Management Plan and Final Environmental Impact Statement* (Las Vegas RMP) (1998).

This wilderness management plan is in conformance with the decisions analyzed within the following documents:

- Reclamation of Critical Desert Tortoise Habitat in the Las Vegas Field Office (BLM 1999).
- Route Designations for Selected ACECs Located in the Northeast Portion of the Las Vegas BLM District (BLM 2008).
- Issuance of Authorizations to the Nevada Department of Wildlife for Wildlife Water Development Inspection, Maintenance and Repairs within BLM Wilderness Areas in Nevada Environmental Assessment (BLM 2012a).
- Programmatic Environmental Assessment for Restoration in Wilderness (BLM 2012b).
- Arrow Canyon Fuels Reduction and Weed Treatment (BLM 2012c).

Compliance with Laws, Policies, Regulations and State Statutes

The Arrow Canyon Wilderness Management Plan's proposed action and alternative actions are in compliance with the following laws, regulations, statutes, and manuals:

- The Wilderness Act of 1964 (16 U.S.C. §§ 1131-1136, September 3, 1964, as amended 1978).
- The Federal Land Policy and Management Act of 1976 (43 U.S.C. §§ 1701-1782, October 21, 1976, as amended 1978, 1984, 1986, 1988, 1990-1992, 1994 and 1996).
- The Clark County Conservation of Public Land and Natural Resources Act of 2002 (Public Law 107-282).
- The National Environmental Policy Act of 1969 (42 U.S.C. §§ 4321-4347, January 1, 1970, as amended 1975 and 1994).
- The Clean Air Act (42 U.S.C. §§ 7401-7602, December 31, 1970, as amended 1977, 1990, 2004).
- The Endangered Species Act of 1973 (16 U.S.C. §§ 1531-1544, December 28, 1973, as amended 1976-1982, 1984, and 1988).
- Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978).
- Migratory Bird Treaty Act (16 U.S.C. §§ 703-712, July 3, 1918, as amended 1936, 1960, 1968, 1969, 1974, 1978, 1986 and 1989).
- Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds (2001).
- Management of Designated Wilderness Areas (43 CFR Part 6300).
- Recreation Management Restrictions: Occupancy Stay Limitation (43 CFR 8365.1-2[a] and Federal Register Notice NV-930-4333-02).
- Unlawful Manner of Camping Near Water Hole (Nevada Revised Statute 503.660).
- Executive Order 13112: Invasive Species (1999).

- Executive Order 13443: Facilitation of Hunting Heritage and Wildlife Conservation (2007).
- Federal Property and Administrative Services Act of 1949 (40 U.S.C. as amended through Public Law 106–580, December 29, 2000).
- National Historic Preservation Act (Public Law 89-665; 16 U.S.C. 470 as amended through 2000).
- Archaeological Resources Protection Act of 1979, as amended (Public Law 96-95; 16 U.S.C. 470aa-mm).
- Wildlife Management Guidelines (House Report No. 101-405, Appendix B).

Relationship to Manuals and Executive Orders

The proposed action and alternative action are in conformance with the following manuals and executive orders:

- Management of Designated Wilderness Areas (BLM Manual 6340).
- Wilderness Management Plans (BLM Manual 8561).
- BLM Emergency Stabilization and Rehabilitation Handbook H1742-1.
- BLM Integrated Vegetation Management Handbook H1740-2.
- Executive Order 13112: Invasive Species (1999).
- Executive Order 13443: Facilitation of Hunting Heritage and Wildlife Conservation (2007).
- Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds (2001).

Wilderness Overview

The Arrow Canyon Wilderness was added to the National Wilderness Preservation System by the Clark County Conservation of Public Land and Natural Resources Act of 2002 (Public Law 107-282; November 6, 2002). This wilderness encompasses 27,180 acres and is managed in its entirety by the Las Vegas Field Office of the Bureau of Land Management (BLM), Southern Nevada District Office. There are no private inholdings within the wilderness boundary.

The Arrow Canyon Wilderness is located approximately 40 miles north-northeast of Las Vegas just west of Warm Springs in the Moapa Valley and south of Coyote Springs. The wilderness is in the northeast quadrant of Clark County and includes the northern half of the Arrow Canyon Range. Elevation ranges from less than 2,000 feet in Pahranaagat Wash to 5,205 feet at Arrow Peak, the highest point in the Arrow Canyon Range. Most of the area consists of steep terrain with narrow canyons that provide plenty of opportunities for solitude. A non-contiguous section of the wilderness known as Table Mountain is located north of Pahranaagat Wash.

State Route 93 provides access to the western slopes of the Arrow Canyon Range. The eastern slopes of the range are visible from Interstate 15 but are more remote and difficult to access. The northern portion of the wilderness is the most easily accessible. This section is accessible via automobile from State Route 168, which connects State Route 93 on the west to Interstate 15 on

the east. There are several vehicle routes that provide access near the wilderness boundary, two of which are BLM designated routes and are highly used access points—one route travels south from State Route 168 to the wilderness boundary at Table Mountain and the second leads into Arrow Canyon from Warm Springs Road (see Map 1). A portion of the latter route is located within a BLM authorized right-of-way issued to the Moapa Valley Water District for a water pipeline (Case Number N-50866). Map 1 provides an overview of Arrow Canyon Wilderness.

Arrow Canyon Wilderness is an important resource for scientific research and study. Pahrnagat Wash, along the northern boundary of the wilderness, is popular with geologists who come to study the sedimentary layers of limestone, dolomite, sandstone, and shale. Geologic faulting is also visible in the exposed rock of Arrow Canyon. This narrow slot canyon is located at the eastern end of the wash. The canyon is 18 feet wide at its narrowest and showcases the most continuous outcroppings of sedimentary rocks of the Carboniferous and Early Permian formations in North America. In 1996, the International Union of Geological Sciences designated a specific layer in Arrow Canyon as the global reference point for the mid-Carboniferous (Mississippian-Pennsylvanian) boundary.

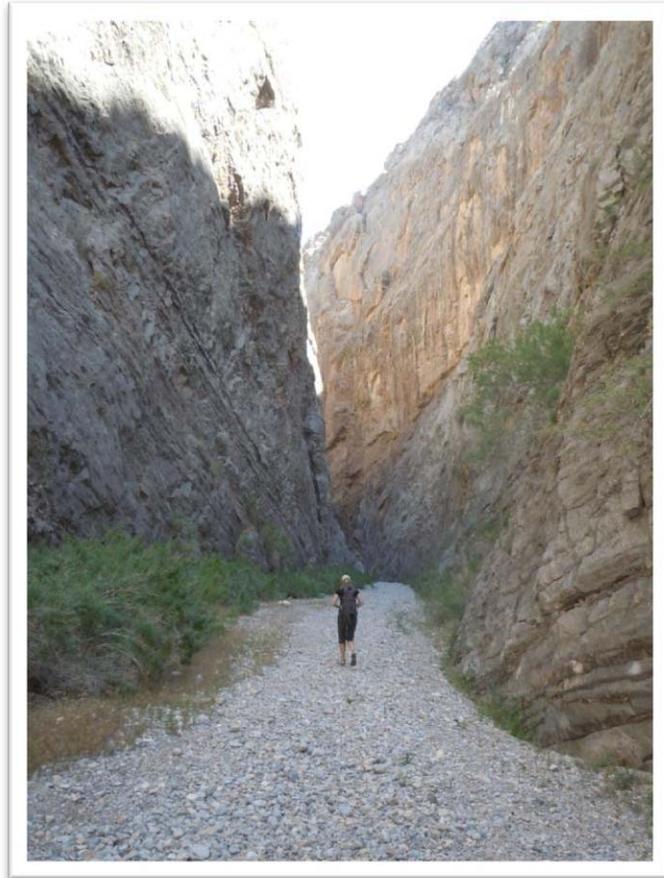
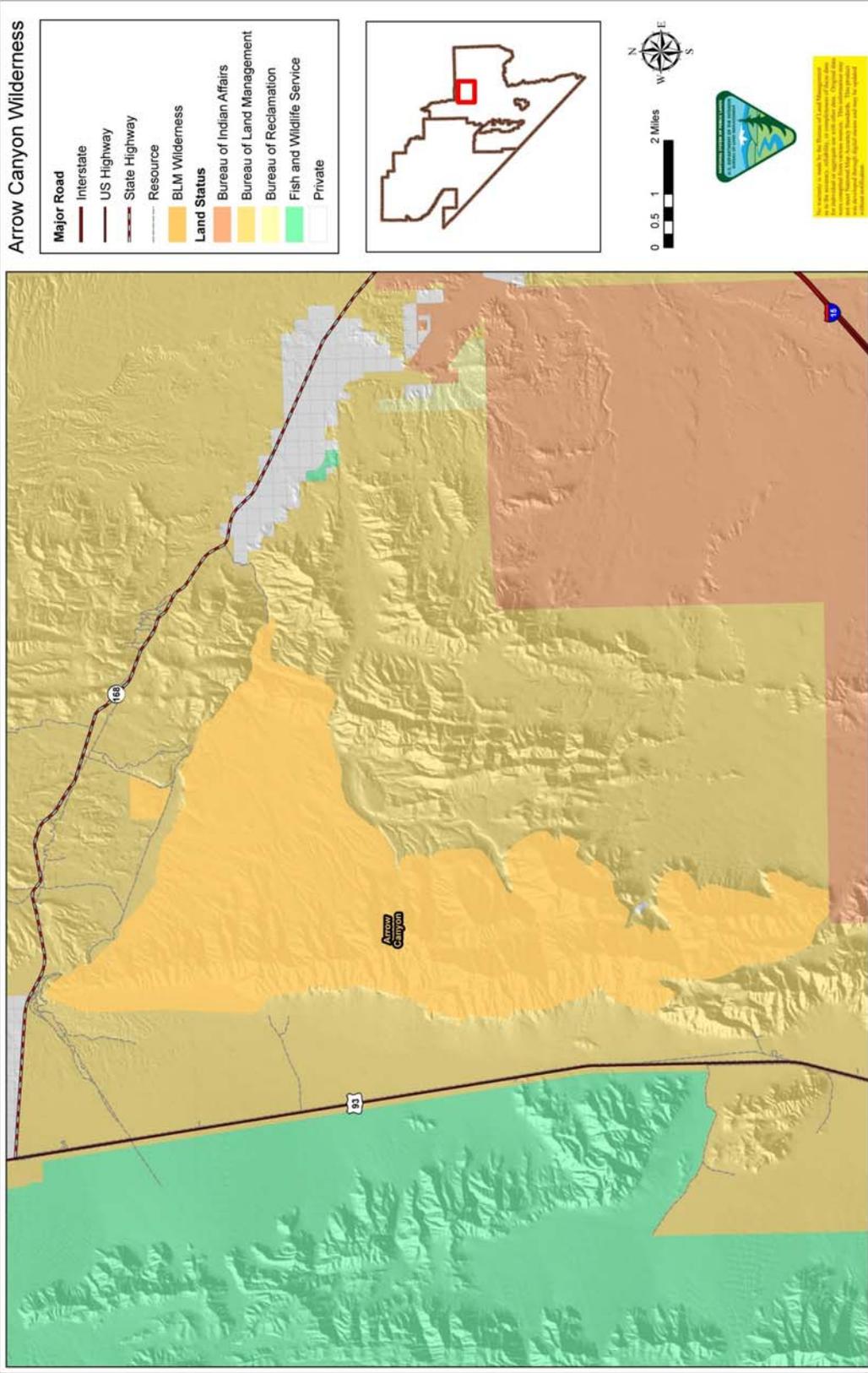


Photo courtesy Nick Walendziak

Slot narrows to 18 feet in Arrow Canyon Wilderness



Map 1. Arrow Canyon Wilderness Overview

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Recreational activities in the wilderness include hiking, backpacking, camping, rock climbing, wildlife viewing, big game hunting, photography, and horseback riding. Most use occurs during the cooler seasons as summer temperatures can easily exceed 100 degrees. At the higher elevations snow is rare but summer monsoonal thunderstorms are common. The canyons quickly fill with floodwaters and natural tanks, or *tinajas*, hold quantities of water that provide sustenance for bighorn sheep and other wildlife. To supplement natural sources, the Nevada Department of Wildlife (NDOW) has constructed one wildlife water development on the eastern slope of the Arrow Canyon Range. NDOW is responsible for maintaining this development.

On the lower slopes and bajadas at elevations below 4,000 feet, vegetation consists primarily of southern desert scrub with creosote bush (*Larrea tridentata*) being the dominant species. Creosote occurs as a distinct community or as an understory species with yucca (*Yucca schidigera*) depending on the elevation. White bursage (*Ambrosia dumosa*) is commonly present with other species including four-wing saltbush (*Atriplex canescens*), and desert holly (*Atriplex hymenelytra*). Various species of cacti include barrel cactus (*Echinocactus polycephalus*), prickly pear (*Opuntia echinocarpa*), and several cholla species (*Opuntia* spp.). At higher elevations blackbrush (*Coleogyne ramosissima*) and Joshua tree (*Yucca brevifolia*) may be found.

Noxious and invasive weeds include tamarisk (*Tamarix* spp.), Scotch thistle (*Onopordum acanthium*), and Sahara mustard (*Brassica tournefortii*), which are designated as Nevada noxious weeds. Invasives such as red brome (*Bromus rubens*) and cheatgrass (*Bromus tectorum*) provide fuel for rapid burning wildfires. Fire has not been a significant ecological factor in this scrub-dominated desert and the presence of these introduced non-native annual grasses has changed the natural fire cycle. As a result, fires burn hotter and faster destroying the native vegetation and causing a long term loss of habitat.

The area's climate and elevation range provide important habitat for a wide spectrum of wildlife. Reptiles include the desert tortoise (*Gopherus agassizii*), Gila monster (*Heloderma suspectum cinctum*), desert banded gecko (*Coleonyx variegatus variegates*), and sidewinder (*Crotalus cerastes*). Desert bighorn sheep (*Ovis canadensis nelsoni*), bobcat (*Lynx rufus baileyi*), and mountain lion (*Felis concolor*) inhabit higher elevations. Avian species include burrowing owls (*Athene cunicularia*) and raptors such as golden eagles (*Aquila chrysaetos*), prairie falcons (*Falco mexicanus*), and ferruginous hawks (*Buteo regalis*).

The Arrow Canyon Wilderness contains portions of three Areas of Critical Environmental Concern (ACECs): Arrow Canyon, Coyote Springs, and Mormon Mesa. The Coyote Springs and Mormon Mesa ACECs were designated in 1998 to preserve critical habitat for the federally listed threatened desert tortoise. The Mormon Mesa ACEC overlies the top third of the Arrow Canyon Wilderness and the Coyote Springs ACEC overlies the western side of the Arrow Canyon Range. The Arrow Canyon ACEC includes the eastern-most portion of Pahrnagat Wash and the narrow slot canyon of Arrow Canyon. This ACEC was designated to provide protection for paleontological values, specifically trackways dating from the Miocene epoch; geological values (the mid-carboniferous boundary); and cultural resource values including prehistoric rock art.

Although the wilderness contains mineral deposits of copper, vermiculite, and gypsum, the ACECs are closed to most forms of mining. The congressional act establishing this wilderness withdrew the area from new mining claims and extractive activities, subject to valid existing

rights. Arrow Canyon Wilderness is closed to cattle grazing following the federal listing of the desert tortoise and the Las Vegas RMP (1998).

A more comprehensive description of the environment is incorporated into the Affected Environment section in the EA following this plan.



Vegetation typical of the Mojave Desert as seen in Side Canyon Wash, Arrow Canyon Wilderness

Wilderness Characteristics

The Wilderness Act of 1964 defines wilderness and mandates the preservation of wilderness character as the primary management direction. Although wilderness character is a complex idea and was not explicitly defined in the act, wilderness characteristics are commonly identified as:

- **Untrammeled**—Area is unhindered and free from modern human control or manipulation.
- **Natural**—Area appears to have been primarily affected by the forces of nature.
- **Undeveloped**—Area is essentially without permanent improvements or human occupation and retains its primeval character.
- **Outstanding opportunities for solitude or a primitive and unconfined type of recreation**—Area provides outstanding opportunities for people to experience solitude or primeval and unrestricted recreation including the values associated with physical and mental inspiration and challenge.

Additionally, the wilderness area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value. These supplemental values are optional wilderness characteristics which need not be present for an area to meet the definition of wilderness.

Wilderness Specific Issues

Issues to be addressed in this wilderness management plan were identified through internal and public scoping. Internal scoping was done via meetings and written communications with BLM resource specialists. Public scoping was conducted in the form of workshops, meetings, written letters, email, and by BLM staff. Public scoping workshops were held at the BLM Southern Nevada District Office conference room on November 8, 2010; at the Moapa Court House on November 9, 2010; and in the Mesquite City Council Chambers on November 10, 2010.

All issues and concerns raised were considered during the development of the range of alternatives described in the EA that follows this plan. Relevant issues identified through public scoping and addressed in this plan are as follows:

Opportunities for solitude or primitive and unconfined recreation

- Non-wilderness type activities in the Pahranaagat Wash area.
- Impacts of recreation use in Arrow Canyon and/or increased human use of the Arrow Range for hiking and camping can disturb bighorn sheep.
- Establishment, maintenance, signing and management of designated or visitor-developed (social) informal trails.
- Designation of vehicle access points to trailheads at the wilderness boundary and parking areas adjacent to the wilderness.
- Kiosks and exhibits providing interpretation and environmental education material as well as signs or bulletin boards offering other information to the public.

- Large groups (e.g., guided tours or geology students from universities) can cause parking, crowding, human waste, and other problems.
- Trash and human waste need to be managed under *Leave No Trace* and Pack-it-In/Pack-it-Out principles as the wilderness is not near any public or commercial service providers.
- Rock climbing, geological specimen collecting, and other activities that concentrate use in one area.

Protecting and enhancing the undeveloped and natural appearance of the wilderness area

- Prevention of motorized trespasses into wilderness.
- Loosening of compacted soil during rehabilitation of existing surface disturbances including decommissioned vehicle routes and mining activities.
- Removal of unnecessary facilities and trash.
- Rehabilitation of closed roads and disturbance from mining or ranching activities.
- Management, access, and maintenance of the historic Civilian Conservation Corps (CCC) dam in Pahranaagat Wash at Arrow Canyon.
- Providing access to the Arrow Canyon CCC dam for any future maintenance needed.
- Graffiti removal in cultural resource areas.
- Restoration of boreholes from previous geological sampling.

Preserving naturalness, primeval character and influence of the wilderness area

- Management of fire including suppression levels.
- Post-fire seeding methods such as using non-native species or using post-fire ground preparation instead of seeding.
- Management of noxious and invasive plant species specifically cheatgrass, red brome, Sahara mustard, tamarisk, and thistles.
- Inventory, monitoring, and research of flora, fauna, paleontological, and archeological resources.
- Protection of springs, *tinajas*, and the water table from the effects of tamarisk, in particular.

Management of nonconforming permitted uses allowed by the Wilderness Act

- Process for emergency operations including retrieval of downed military aircraft.
- Existence of valid mining claims and existing water rights at the time of wilderness designation.
- Fire control.

Management of supplemental values of the wilderness

- Monitoring to adjust management actions.
- Education and interpretation to help visitors understand the wilderness resource.
- Protection of rock art.
- Research of the geology and paleontology.
- Cataloging of rock art and archeological inventory.

Wilderness management

- Possible modifications to plan within a 10-year time frame.
- Overall impact of urbanization including the Coyote Springs Development.

Issues Considered but Not Further Analyzed

Issues beyond the scope of the plan

- Opening former vehicle routes in wilderness to motorized travel—The Wilderness Act prohibits motorized vehicles in wilderness.
- Managing airspace above wilderness—The BLM does not have the authority to manage air space.
- Amending wilderness boundaries—Wilderness boundaries are designated by Congress. New legislation must be enacted to authorize any changes beyond topographical errors.
- Effects of housing developments and increased adjacent population and recreation pressures on wilderness—Buffers are not created around wilderness, therefore, this plan is limited in addressing effects stemming from projects outside of wilderness.
- Search and rescue operations—The Wilderness Act allows access for emergency situations.
- Mining claims and water rights—No new claims and no new water resource facilities are permitted in this wilderness. Claims and rights existing at the time of wilderness designation continue.

Issues addressed through administrative or policy action

- Changes in the functionality of Arrow Canyon Dam—The dam is administered by the Clark County Regional Flood Control District pursuant to Nevada Revised Statutes and plays a critical role in preventing downstream flooding.

Wilderness Management Goals and Objectives

Managing wilderness is guided by four primary goals defined in Appendix 1 of the BLM wilderness management planning manual (BLM Manual 8561). These goals, along with related laws and BLM policies, provide general management direction and are refined into specific objectives. Objectives are statements of desired conditions stemming from current situations and assumptions about the future. Management actions are based on these objectives. This section outlines the goals and objectives that guide this wilderness management plan.

Goal 1

Provide for the long-term protection and preservation of the area's wilderness character under a principle of non-degradation. The area's natural condition, opportunities for solitude,

opportunities for primitive and unconfined types of recreation, and any ecological, geological, or other features of scientific, educational, scenic, or historic value present will be managed so that they remain unimpaired.

Objectives

- Preserve the primeval character and influence of the wilderness by managing fire with the appropriate management response. Allow fire as a natural process of disturbance and succession where the ecosystem is fire-dependent; manage fire where it threatens wilderness character and/or natural ecological conditions or processes; prevent fire where it threatens human life or property.
- Manage wildlife habitat to support healthy, viable, and naturally distributed wildlife populations in an effort to retain the area's natural and primeval character.
- Maintain native plant distribution and abundance by reducing noxious and non-native invasive species in an effort to retain the area's natural and primeval character.
- Protect and preserve the outstanding archaeological and historic resources of the area while allowing visitors to enjoy these resources.
- Maintain existing opportunities for solitude by monitoring those visitor use patterns that trigger the need for management action.
- Maintain or enhance the natural and undeveloped character by removing unnecessary facilities and minimizing or restoring human-caused surface disturbances.
- Remove paint, markings, graffiti, or similar vandalism quickly to prevent proliferations.
- Continue to allow access to important scientific and geological attributes studied worldwide while protecting the resource for future generations of scientists and students. Develop policies that allow study in-situ and in existing collections without further destructive sampling.

Goal 2

Manage the wilderness area for the use and enjoyment of visitors in a manner that will leave the area unimpaired for future use and enjoyment as wilderness. The wilderness resource will be dominant in all management decisions where a choice must be made between preservation of wilderness character and visitor use.

Objectives

- Provide for the use and enjoyment of the wilderness area while maintaining outstanding opportunities for primitive recreation, including solitude, through minimal visitor use regulations and minimal on-the-ground developments.
- Utilize education and interpretation as a proactive approach in managing visitor activities that may impact preservation of the wilderness character.
- Prevent unauthorized motorized/mechanized vehicle travel through the management of vehicle access points.

Goal 3

Manage the wilderness area using the minimum tool, equipment, or structure necessary to successfully, safely, and economically accomplish the objective. The chosen tool, equipment, or structure should be the one that least degrades wilderness values temporarily or permanently. Management will seek to preserve spontaneity of use and as much freedom from regulation as possible.

Objective

- Implement the proposed actions as necessary to meet minimum requirements for the administration of the area as wilderness and to have the least impact on wilderness characteristics.

Goal 4

Manage nonconforming but accepted uses permitted by the Wilderness Act and subsequent laws in a manner that will prevent unnecessary or undue degradation of the area's wilderness character. Nonconforming uses are the exception rather than the rule; therefore, emphasis is placed on maintaining wilderness character.

Objectives

- Allow for special provision land uses determined by the Wilderness Act or the Clark County Conservation of Public Land and Natural Resources Act of 2002 while minimizing developments, degradation to naturalness, and other impacts to wilderness resources.
- Maintain or enhance the natural and undeveloped appearance of the wilderness area by removing unnecessary facilities and minimizing or restoring human-caused surface disturbances.
- Assess potential commercial services in the wilderness area for their economic importance and prevent negative impacts on wilderness characteristics.
- Provide for future repair and maintenance that may be required on the historic flood control dam created by the CCC.
- Allow for maintenance inspection and repair of the wildlife water development in Side Canyon per the statewide Memorandum of Understanding (MOU) with NDOW.

Current Situation and Assumptions

Current local conditions and expectations were identified before developing management actions. Inventory, monitoring, and research would be important aspects to meet the objectives of this plan.

Wildlife

Current Situation: Three ACECs overlie the wilderness. Two of these, Coyote Springs and Mormon Mesa, were created primarily to protect critical habitat for the federally listed

desert. No other federally listed species are present; however, there are several BLM special status species present.

Assumption: One aspect of preserving the wilderness area's natural and primeval character involves the maintenance of healthy, viable, naturally distributed wildlife populations and habitat. It may be necessary to implement management activities to prevent degradation or enhance wilderness characteristics.

Non-Native Invasive Weeds

Current Situation: Preservation of the natural character of the wilderness is currently effected by areas of invasive and noxious weeds such as cheatgrass, red brome, tamarisk, and Scotch thistle. In 1999, a tamarisk treatment left the cut vegetation to discourage vehicle incursions while reducing the fuel build up near cultural resources. Eradication treatments did not continue, however, and this resulted in reinfestations. In addition, the presence of invasive annual grasses has increased the abundance of fine flammable fuels.

Assumption: The establishment of invasive and noxious weeds could impair ecological integrity throughout the system and thus degrade wilderness character. The disruption of native vegetation could alter natural fire regimes. Ongoing management and control treatments may be necessary to restore the natural landscape and water flow for habitat protection and restoration of wilderness values.

Recreation

Current Situation: Arrow Canyon Wilderness is in close proximity to Las Vegas, which was one of the fastest growing urban areas in the United States. This has resulted in an increase in the number of visitors seeking recreational opportunities. User-created paths lead to the summits of Arrow and Hidden peaks in the Arrow Canyon Range and these trails are publicized on the internet. In addition, the climbing community is increasingly interested in the named and bolted routes in Arrow Canyon.

Assumption: As the economy slows and fuel prices increase, people look for recreational opportunities closer to home. Wilderness designation has drawn more attention to this area with the potential to increase visitation. Management activities may be necessary to preserve opportunities for solitude, primitive unconfined recreation, and the future use and enjoyment of the area as wilderness.

Surface Disturbances

Current Situation: Several vehicle routes exist in the wilderness and these routes were legislatively closed although no decommissioning has occurred to return them to a natural vegetative state. One vehicle barrier has been installed. There have been incidences of unauthorized vehicle incursions into the wilderness, specifically off-highway vehicles (OHVs). The barrier and many of the boundary markers have been vandalized. As most of

the Arrow Canyon Wilderness is remote, incursions can go unnoticed for long periods of time before being reported.

Assumption: Action may be necessary to convert closed roads to a natural condition, thereby making them less visible and reducing incidences of vehicle incursions. Unauthorized vehicle use is in violation of the Wilderness Act and may continue resulting in the degradation of wilderness characteristics.

Technical Rock Climbing

Current Situation: Technical rock climbers have established routes in Arrow Canyon including bolting permanent fixed anchors. One published guide lists 51 technical climbing routes in Arrow Canyon in addition to a few routes without permanent anchors. Some of the fixed installations are likely to be at the end of their safe life-span and may need to be replaced or removed. National BLM policy regulates climbing activities in wilderness including the use of drills and fixed anchors.

Assumption: Climbers will continue to seek climbing opportunities in remote and uncrowded locations. Many climbers prefer undeveloped facilities, are self-sufficient, and prepared for wilderness recreation. Climbers may desire to develop new routes in areas where sensitive resources are present. Regulations, procedures, and local policies for permitting and maintaining bolts and other rock climbing enhancements in wilderness may be necessary.



Photo courtesy Nick Walendziak

Example of a permanent fixed anchor comprised of 5-piece bolt and hanger camouflaged with spray paint

Management Strategy

Management strategy for the Arrow Canyon Wilderness is to maintain or improve the natural, near-pristine conditions present today while rehabilitating existing disturbances. There are two factors that will influence how the strategy is designed. First, most of the wilderness consists of remote high steep mountain slopes with difficult access and infrequent use. Second, the Pahranaagat Wash portion that includes Arrow Canyon and the adjacent mesas is relatively easy to access by vehicle, is frequented by visitors, and has a variety of use issues. There is greater potential here for conflicts between user groups as well as people and resource conflicts.

Wilderness Management Actions

Wilderness management actions are based on national wilderness goals, wilderness management objectives, current situations and assumptions, and wilderness-specific issues that were identified through internal and external scoping. All management actions including site-specific proposed actions are described in this plan and in the following environmental assessment. Proposed actions targeted towards fulfilling the purposes of the Wilderness Act and the Federal Land Policy and Management Act (FLPMA) may include:

- Non-native invasive plant species treatments to control tamarisk and other invasive and noxious weeds.
- Restoration of approximately 5 miles of vehicle routes to a single track trail.
- Trail designation of an existing social trail to facilitate public access to popular features while reducing safety hazards and erosion in sensitive areas.
- Developing policies for technical rock climbing including fixed hardware replacement or maintenance.
- Establishment of a formal trailhead and vehicle staging areas adjacent to the wilderness boundary with interpretation and education opportunities.

Resource programs such as Fire Management and Noxious and Invasive Weed Management have activity plans that address management goals for these programs. This wilderness management plan has considered the resources present in the wilderness and any associated management issues and concerns. While this plan does not detail specific resource programs, activity plans have been evaluated to ensure conformity with wilderness management goals and objectives. Management actions including any site-specific actions are described under each wilderness management category along with specific decisions that will guide implementation.

Any ground disturbing activities associated with the following actions would follow the prescriptions in the Las Vegas RMP (1998) and specific restoration requirements. All actions are supplemental to and consistent with wilderness laws, regulations, and policies, which must be consulted further in the event of unforeseen issues.

Management of Small-Scale Surface Disturbances

Disturbances fall into two categories with common characteristics: small-site disturbances including abandoned developments, mining claims, and dispersed campsites; and linear disturbances created by motorized vehicle traffic. All vehicle use in Arrow Canyon Wilderness was prohibited by the enabling wilderness legislation. Vehicle routes approaching the wilderness area are open for travel as determined during the analysis for the area's travel management plan in 2008. A goal of the Wilderness Act is to restore or allow natural processes to restore ground disturbances and human impacts to the environment. Management actions will enhance wilderness characteristics by active restoration and by limiting activities to those that do not involve surface disturbance.

All reclamation activities would be in accordance with the Programmatic Environmental Assessment for Restoration in Wilderness (NV-S010-2012-0062) (BLM 2012b). Reclamation activities in desert tortoise habitat may require consultation with the U.S. Fish and Wildlife Service. The need to repeat reclamation treatments would be addressed on a case-by-case basis.

Actions would include and generally be conducted in the following order as needed following restoration standards for desert tortoise habitat:

1. **Decompaction**—Working the top few inches of the entire disturbed surface to relieve soil compaction. This action would be completed with the use of non-motorized hand tools (soil spades, spading forks, McLeod rakes, pulaskis, shovels, horse-drawn implements, etc.).
2. **Scarifying/pitting**—Loosening and texturizing the impacted, disturbed surface in random locations to better capture water, organic debris, and wind-blown seeds, thereby stimulating natural revegetation. This would be done with non-motorized hand tools.
3. **Recontouring**—Reconfiguring/shaping the route to blend it with the adjacent, relatively undisturbed desert. This would involve the creation of small hummocks and banks where appropriate to mimic the surrounding landscape. Road berms would be collapsed and the soil distributed across the disturbed surface. Vehicle tracks in sandy washes would be raked. This would lessen visual contrasts and provide a surface for natural revegetation. This action would be completed with non-motorized hand tools.
4. **Vertical mulching**—Dead and downed vegetation is “planted” to obscure the visible portions of the disturbance. Additional dead vegetation, rock material and other organic matter may be distributed over the worked surface to decrease visual contrasts, create sheltered sites to aid in natural revegetation, and to add organic debris. Dead and downed vegetation and other material would be gathered by hand from nearby areas.
5. **Erosion control**—Placing sterile weed-free straw bales or creating light terracing or berms to reduce erosion and create barriers to vehicles on steep slopes. This is especially effective on hill climbs. The straw bales break down over time and provide additional organic debris to the reclamation site. Bales would be brought in by foot or horseback to the worksite.
7. **Desert varnish colorant**—Spraying disturbed rock surfaces to simulate the coloration of the surrounding desert varnish. Desert varnish colorants are chemical compounds comprised of manganese, salts, and other ingredients. This substance would be applied

sparingly with the use of a backpack sprayer and only on disturbed rock surfaces that contrast sharply with the surrounding landscape.

8. **Vegetative restoration**—This would involve planting, transplanting and/or seeding as necessary to help stabilize soil, speed overall vegetative recovery, and camouflage evidence of disturbances. All seed would be locally collected from native species and scattered on reclaimed surfaces to accelerate natural revegetation. Native seed from the area would be collected for restoration purposes, following the protocols in the BLM's Seeds of Success program. Weed identification and removal would occur concurrently.

Site-Specific Actions

Linear disturbances

There are 5 miles of linear disturbances from off road vehicle travel including 5 acres of surface disturbance. Restoration and rehabilitation of old routes will reduce the two-track footprint to a single track designated hiking and equestrian trail thus reducing the existing surface disturbance to about 2.05 acres.

Linear disturbances of the closed vehicle route on the mesa would begin with decompaction, scarification, vertical mulching, desert colorant, and possibly vegetative restoration at intersections and along the first hundred yards or to the visual horizon point. Other sections of the closed vehicle route will be allowed to return to a natural state from weathering and natural plant recovery over time. Efforts will continue to restore the old two-track vehicle routes to a designated single-track hiking and horse trail.

The remaining non-designated vehicle routes in the wilderness or ACECs are considered closed and will be allowed to revegetate naturally over time. The process may be accelerated using the methods detailed above in accordance with priorities set by BLM's Southern Nevada District Office restoration program.

Small-site disturbances

Existing paint markings would be removed using the least invasive methods appropriate according to the type of graffiti and the rock type. Techniques range from simply erasing penciled graffiti with soft erasers, or removing chalked graffiti with soft brushes, to poulticing with water (with or without detergents), poulticing with organic solvents or alkali-based paint removers, or applying bleach to remove painted graffiti. In very limited situations, it may mean using very delicate and controlled abrasive means. Successful graffiti removal often requires a combination of cleaning materials and methods (Weaver 1995). No solvent would be used above rock art. If the natural patina is lost during paint removal, an oxidizer such as *Permeon*™ would be applied to restore the patina or slurry (water and dirt/soil of a like color) applied to more closely replicate the color of the surrounding rock. All activities would occur without the use of motor vehicles or motorized equipment.

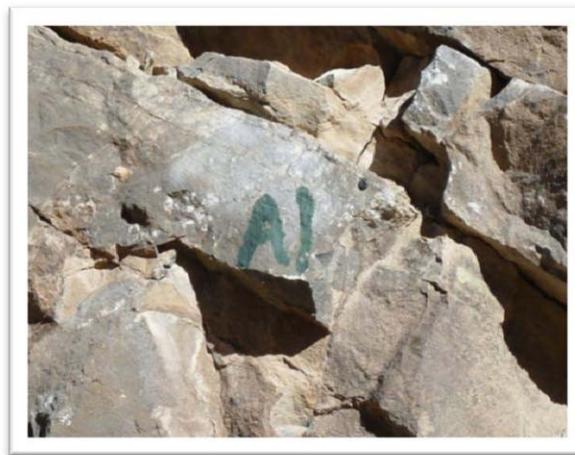


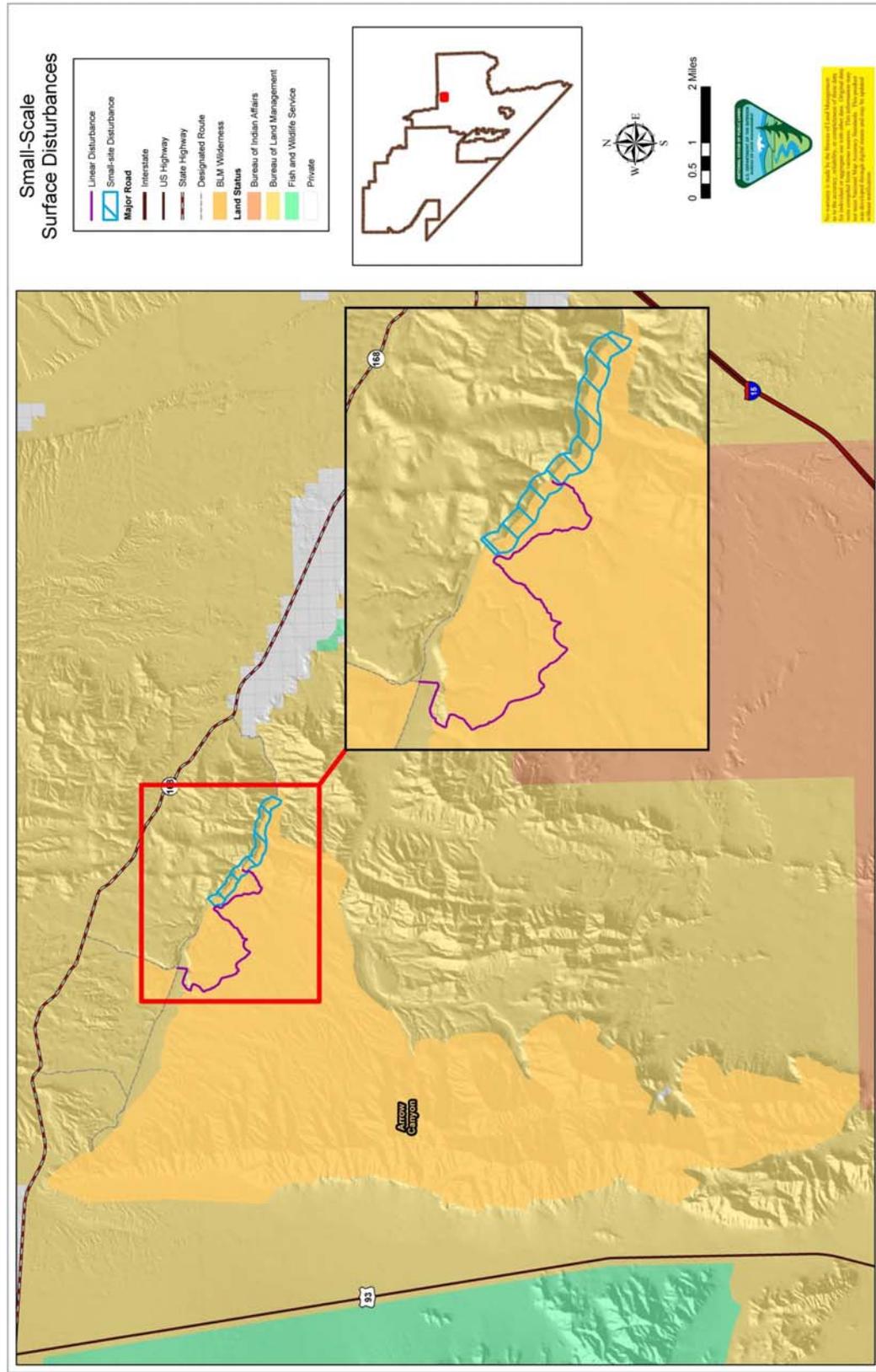
Photo courtesy Sendi Kalcic

Example of paint marking proposed for removal

Scratched and pecked graffiti near rock art panels would be camouflaged with a thin application of slurry (water and dirt/soil of a like color) using non-motorized and non-mechanized equipment. Three to four applications may be necessary in order to achieve the desired color match to the surrounding rock. SHPO and BLM Archeologist would be consulted prior to applications.

Bore holes drilled into the rock of Arrow Canyon indicate that numerous core samples have been removed from the wilderness. All bore holes will be patched and camouflaged with epoxy mixed with rock dust or sand so as to match the color of the surrounding rock.

See Map 2 for locations of small-scale surface disturbances site-specific actions.



Map 2. Small-Scale Surface Disturbances Site-Specific Actions

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Management of Vehicle Access Points and Designation of Staging Areas

Access points are defined as locations along wilderness boundaries where focused entry occurs. Over time, these and other areas used for parking may be impacted to the point at which improvements should be made to protect wilderness character. Vehicle turn-arounds or staging areas would be created at or before the wilderness boundary to prevent vehicles from continuing into the wilderness, to accommodate vehicle parking, and visitation.

Vehicle barriers constructed outside of wilderness would be used where natural obstacles are not adequate to prevent vehicles from crossing into wilderness. Implemented barriers would include the following:

- Wilderness signs, berms associated with turn-arounds, small rocks and/or vegetation placement or restoration.
- Large boulders moved by heavy equipment.
- Posts, logs.
- Fences and/or gates.

Site-Specific Actions

Staging areas

Designate three staging areas in locations adjacent to but outside the wilderness. If desired, install interpretive exhibits; bulletin boards with safety, fire hazard, wilderness uses, and trail directions; and trail registers at these locations to serve the most frequently used portions of the wilderness near Pahranaagat Wash.

- Utilize the area at the intersection of Dead Man Wash and Pahranaagat Wash near Table Mountain as the “Table Mountain” staging area. This location is approximately 0.5 mile south of State Route 168 and would serve wilderness users accessing Pahranaagat Wash between Coyote Springs and the Arrow Canyon Dam. This staging area would involve 0.64 acres of new disturbance.
- Use the location of the Clark County water treatment facility at the Warm Springs entrance approximately 0.25 mile off of State Route 168 for the “Warm Springs” staging area. Currently visitors park along this access road or drive off into the adjacent desert to park or turn around. Restrict parking to this previously disturbed area (3.80 acres) located behind the water treatment facility to screen vehicles from the roads and neighboring homes. This staging area is intended primarily for vehicles (e.g. two-wheel drive, passenger vans) unable to reach the wilderness boundary.
- Should the existing right-of-way (ROW) to the Moapa Valley Water District for water pipeline be relinquished, the BLM would not authorize new ROWs.
- Use the area adjacent to the current post and cable vehicle barrier at the wilderness boundary in Arrow Canyon as the “Arrow Canyon” staging area. Parking would be restricted to this previously disturbed area (0.35 acres).

The Table Mountain and Warm Springs staging areas would be configured to allow parking for horse trailers. The carrying capacity of each staging area would be limited to 0.5 acres

maximum. These staging areas would be defined using boulders, vegetation, and berms in order to minimize the use of post and cable and less natural looking barriers. Earthen and rock berms would be approximately 30 inches high and planted with local native vegetation. In cases where a berm is not practical, a post and cable or post and rail fence will be utilized to delineate the edge of the area of the staging area's disturbance.

Staging area locations are shown in Map 3.

Vehicle barrier

An administrative route outside wilderness that leads from Table Mountain to the west side of Arrow Canyon Dam will be maintained to provide access for fire suppression and response, noxious and non-native invasive weed control, and dam maintenance. Much of this route has been blocked by the expansion of weeds which have impeded access to this section of the wash. As weed treatments are accomplished and restoration is completed, it will be critical to ensure vehicle traffic is restricted to the occasional restoration crew and fire control.

Adjust the end of the designated vehicle route southeast of Table Mountain in Pahranaagat Wash and outside of wilderness to limit traffic to protect natural and cultural resources and wilderness characteristics. Move the route terminus westward approximately 0.25 mile to a place where the Pahranaagat Wash walls are narrow enough to constrict vehicle traffic with installation of vehicle barricade. The vehicle barrier would consist of a post and cable fence with a walk through section as well as a gate or locked cable to provide administrative vehicle access. The fence would be 485.56 feet and comprise approximately 40 square feet of new disturbance. BLM would maintain access keys.

The administrative access route and vehicle barrier are depicted in Map 4.

Management and Designation of Trails

Designated trails will be marked on the ground at trailheads and/or staging areas outside wilderness and displayed on BLM wilderness and recreation maps.

Site specific analysis in compliance with the National Environmental Policy Act (NEPA) must occur before any trails are designated. Analysis should include a cultural resource inventory to comply with Section 106 of the National Historic Preservation Act (NHPA). Visitors traveling off designated trails may create informal paths known as social trails. These informal trails may continue to be used by visitors, however, they will not be marked on the ground, displayed on BLM recreation maps or brochures, or be maintained.

Monitoring for social trails would specifically occur in high use areas, at all vehicle access points, and near former vehicle routes. An inventory of social trails would be maintained and monitored for resource damage.

As social trails are discovered, they would be evaluated for impacts to wilderness character and conformance with the management objectives of this plan. Social trails may be rehabilitated or retained. When a social trail is retained, it may be rerouted following designated trail decisions

as outlined below. If not designated or retained, social trails should be rehabilitated to restore natural conditions.

Trail Standards—Both the designated trails and social trails may be rerouted where they cause or are anticipated to cause damage to wilderness character. Rerouting could also occur if increased traffic causes undue erosion or negative impacts to endangered species or cultural features. Although it is recognized that the natural wilderness environment is inherently dangerous, trails would be rerouted if hazards become unreasonable.

Standard trail building techniques including the following:

- Trail inclines would be no greater than 15 percent otherwise the potential for excessive soil erosion and trail deterioration is high. Very short, steep sections may be retained where reinforcement with native rock would prevent soil erosion. Rolling dips or rock-enforced water bars would be utilized to reduce water caused soil erosion.
- Where trail braiding or duplicate routes exist the most appropriate trail would be selected. The alternate trail(s) would be obstructed and rehabilitated with rock or native vegetation such as in vertical mulching rehabilitation techniques.
- Maintenance should strive to limit trail width to 24 inches, but not exceed 36 inches, except for trail sections along precipices where it may be wider for safety or in washes. Width standards are applied to continuous segments longer than 50 feet. Vegetation may be cleared up to 10 feet high and 4 feet to either side of trail. Where practical, trail may be rerouted to avoid vegetation.
- Trails may also be rerouted to avoid damage to sensitive resources. Inside the wilderness, trails may be marked on the ground with agency identifiable cairns in locations where the trail becomes obscure.

Site-Specific Actions

The Mesa Trail, with an approximate trail length of 5.0 miles, would be designated for hiking and equestrian use. The Mesa Trail will be marked on the ground outside the wilderness boundary at the Table Mountain Staging Area, which would serve as a trailhead. The northern approximately 0.50 miles of the Mesa Trail would be outside of wilderness leading from the Table Mountain Staging Area. The trail would utilize an existing two-track designated vehicle route, then continue onto a section of former vehicle two-track which has undergone some restoration to a natural condition. The remainder of the designated trail would continue south into the wilderness and utilize the former two-track road in wilderness. Minor changes may be made to the existing route in order to meet the listed standards in the “Trail Standards” section. The portion of the Mesa Trail located in the wilderness would be converted to a single track in sections as described earlier in this document. At its southern terminus, the Mesa Trail would connect to the designated Arrow Canyon Trail at Side Canyon Wash.



Closed vehicle route to be designated as the Mesa Trail

The 3.6 mile Arrow Canyon Trail would be designated for hiking and equestrian use from the Warm Springs Staging Area to the Arrow Canyon Dam's east face. The trail would originate at the Warm Springs Staging Area and continue up Pahranaagat Wash, utilizing the existing designated vehicle route, to the Arrow Canyon Staging Area for approximately 1.2 miles, entirely outside of wilderness. The designated trail would proceed west and northwest for approximately 2.4 miles from this latter staging area, through Arrow Canyon narrows (the slot canyon) to end at the eastern side of the historic CCC Arrow Canyon Dam. The section of trail in the wilderness would be located entirely within the wash and follow an existing user-created hiking route.

No trail building, marking, or maintenance would occur on the Arrow Canyon Trail as periodic water flow disturbs the surface of the wash. Due to the nature of the trail, it would not be subject to the "Trail Standards." Hikers would need to adjust their path as the terrain changes after storms.

Designated trails are shown in Map 3.



Existing user-created route would be designated as the Arrow Canyon Trail

Sign Plan

The wilderness boundary would be identified by signs at key locations. These signs would be simple installations (e.g., carsonite posts, permanent carsonites) used to delineate the wilderness boundary.

Directional signs, placed along vehicle routes, would direct visitors to wilderness access points (or staging areas if designated in the future). These signs would also help to both identify legal vehicle routes and eliminate illegal vehicle incursions.

No directional signs or posts would be placed along designated trails within wilderness.

Portal signs would state the name of the wilderness and would be placed where visitors are likely to come into contact with the wilderness boundary. Both directional and portal signs would be larger and more formal than the boundary markers.

Kiosks would be one to three paneled information signs placed at staging areas or access points. These signs would provide regional and local information regarding wilderness, natural and cultural resources, regulatory information, and interpretation. These signs would not direct visitor use toward sensitive resources and in some cases may specifically direct visitors away from sensitive resources. In addition, certain kiosks may include visitor surveys with collection boxes or trail registers.

Signs and kiosks would be installed to adaptively manage for changing needs.

Site-Specific Actions

Two directional signs would be placed off the State Route 168 right-of-way. One sign would be located along the designated vehicle route leading to the Table Mountain Staging Area while the second sign would be located along the designated vehicle route leading to the Warm Springs and Arrow Canyon Staging Areas. Each of the directional signs would require two 1 foot diameter holes 3 to 4 feet deep resulting in 8 square feet (0.0002 acre) of new disturbance.

Two portal signs would be installed at the wilderness boundary: one would be located adjacent to the Mesa Trail while the second would be placed along the Arrow Canyon Trail. Each of the portal signs would require four 1 foot diameter holes 3 to 4 feet deep resulting in 16 square feet (0.0004 acre) of new disturbance.

A kiosk would be installed at both the Arrow Canyon and Warm Springs Staging Areas. The former location is already disturbed while the latter would be restricted to within the new disturbance created by the proposed staging area.

See Map 3 for site-specific sign locations.

General Recreation Management

A variety of primitive and unconfined types of recreational activities are likely to occur in Arrow Canyon wilderness. Some management actions that would be initiated in response to recreational impacts include:

- Public outreach and education in *Leave No Trace* principles to encourage minimum impact practices.
- Provide information to the public on non-wilderness recreational opportunities in the region.

Hunting and trapping—are permitted in the wilderness, subject to applicable State and Federal laws and regulations.

The creation or construction of permanent blinds in Arrow Canyon wilderness is not allowed (43 CFR 6302.20[f]). Portable or pop-up blinds may be temporarily allowed for hunting, photography, wildlife observation and similar purposes for a period of fourteen (14) days if they are carried in and out and do not require the disturbance or destruction of native soil, rock, or vegetation. Campsite tents, camping equipment and blinds left unattended after 14 days would be considered abandoned property and would be subject to removal by the BLM (43 CFR 8365.1-2[b]) and subject to disposition under the Federal Property and Administrative Services Act of 1949, as amended (40 U.S.C. 484[m]). It is recommended that anyone who brings a portable blind or camping tent into Arrow Canyon wilderness should mark the equipment with the

following information: name, address, phone number, the date the blind was placed, and the dates the blind will be unattended or unoccupied.

Geocaching—Traditional geocaching and letterboxing is currently prohibited according to national policy and are removed when encountered; visitors wishing to participate in this activity would be directed to locations outside wilderness. Virtual geocaches would be an accepted activity if they do not cause excessive and destructive traffic in sensitive habitat and resource areas.

Recreational horseback riding—and use of pack stock animals would be permitted both on and off trail. Other than incidental browsing, riding and pack stock animals may only be fed with packed-in, certified weed-free feed.

Geological study, rock and fossil collecting and geological sampling—Gathering of scientific information would continue to be addressed through the BLM permitting process and permitted in accordance with 43 CFR 6302.16 and 2920.2-2. Collection of invertebrate fossils would be allowed for non-commercial purposes. Vertebrate fossils (animals with backbones) and their tracks, or trackways, are protected by law and collecting is not permitted.

Geological study and examination by educational institutions is an identified appropriate use of the internationally known and important earth science study area of Arrow Canyon. Non-destructive and non-consumptive activities such as geological field trips, biological surveys, cultural surveys, and other studies that enhance the ability of the BLM to protect and manage the wilderness area are allowable uses.

Policies for management of studies, collection, and sampling include:

- Group sizes for field trips would not exceed 20 people.
- Access to the area would be restricted to the designated routes off of State Route 168, avoiding private lands. Vehicles would park at the designated staging areas outside of Arrow Canyon Wilderness. Access into Arrow Canyon Wilderness would be by foot and stock and methodologies for gathering information would utilize non-motorized and non-mechanized tools.
- The number of vehicles would be kept to a minimum, carpooling to the extent practical as parking is limited.

Geological sampling in Arrow Canyon Wilderness may be permitted if carried out according to the following policies:

- An application must be submitted to the BLM detailing the purpose of geological sampling including a justification for collecting in Arrow Canyon Wilderness.
- Samples are to be collected with hand tools only, such as a rock or sledge hammer, and chisel.
- Sample locations are to be collected either near the ground or high enough to be out of view from the ground level, so as to not attract attention.

- Sample sizes are to be not bigger than needed to conduct required analysis; typically sample sizes range from small rock chips to fist sized rocks.
- Painting of rocks or the establishment of permanent markers or improvements is prohibited.
- Sampling would not be allowed within 50 feet of rock art.
- Any archaeological and historical sites, including but not limited to petroglyphs, ruins, historic building, and artifacts or vertebrate paleontological materials (including fossil trackways) discovered through permitted geological sampling are not to be disturbed, must be left in place and the BLM notified.

Cave Resources—are federally protected. Recreational caving and technical rock climbing will be allowed as long as activities do not cause unacceptable impacts to the wilderness. Cavers should follow the most up-to-date decontamination guidance and protocols to reduce the human spread of white-nose syndrome.

Technical Rock Climbing—Climbing routes and previously installed permanent fixed anchors in Arrow Canyon would be limited to those existing at the time of publishing this plan, except for those described for removal in the site-specific actions section, below. Any climbing practices that cause damage such as chiseling or chipping rock, forcibly prying off rock, gluing or otherwise affixing artificial holds on rock, or destroying vegetation to enhance a route are prohibited. No new bolting is allowed in the wilderness, including the Arrow Canyon ACEC. Additionally, climbing and rappelling would be prohibited within 25 feet of rock art panels to protect cultural resources.

Ropes, webbing, draws and other portable equipment would be removed at the end of climbing activities. As with other personal equipment left in the wilderness such as camping and hunting gear, climbing items left more than 14 days would be removed as abandoned property.

Replacement and maintenance of previously installed bolts and permanent fixed anchors except those identified for removal near cultural resources would be permitted as the minimum tool needed to accomplish this particular recreational activity and enjoyment of the wilderness and for visitor safety. Ongoing monitoring may reveal future conditions that would identify specific routes or anchors that would need to be removed for safety reasons or to protect cultural resources or wilderness characteristics. The BLM would consult with the Las Vegas Climber's Liaison Council (LVCLC) for route or anchor removal.

Policies for climbing route bolt replacement in Arrow Canyon Wilderness:

1. Climbers and climber groups would consult and collaborate with the LVCLC for concurrence on proposed bolt replacement and to assist in cataloging protection installation dates, types and material of equipment, compatibility, camouflaging patterns, etc. The LVCLC would work with the American Safe Climbing Association (ASCA) to develop a catalog of bolts replaced in Arrow Canyon. The LVCLC would also use the website www.mountainproject.com to learn about bolts needing replacement and to educate the climbing public about replaced bolts.

2. Replacement (re-bolting) of unsafe bolts will be with new 3/8 inch to 5/8 inch diameter by 2.25 inch to 6 inch long bolts.
3. Generally, new bolts will be of the current accepted standard 5-piece type (i.e., Rawl) or subsequent versions. Stud/wedge bolts may also be used, especially on routes following water streaks due their availability in marine-grade stainless steel (316ss). However, stud/wedge bolts are less suited to areas with softer rock.
4. Adhesive or glue-in bolts are not allowed.
5. Stainless steel bolts generally last longer than carbon steel; however, carbon steel bolts may be better suited to high traffic routes with repeated falls. The LVCLC will specify the materials to be used in the specific instance and location of equipment to be replaced.
6. Any commercially available non-reflective stainless steel bolt hanger should be used with stainless steel bolts. Any commercially available non-reflective plated steel hanger should be used with carbon steel bolts. Dissimilar metals must not be mixed. Hangers must be camouflaged by painting them the color of the surrounding rock.
7. Bolts which may be replaced under this program include those used for protection and for anchor bolts.
8. Replacement will occur only on a 1:1 ratio of bolts removed to those replaced.
9. In instances where the old bolt can be removed, the hole in which it was located would be utilized for the placement of the new bolt. If the bolt can be removed and it is determined that the rock has been weakened by the long term interaction of the rust with the rock, or if there is too much damage to safely re-use the hole, then the hole would be patched and camouflaged.
10. All old bolt holes would be patched with epoxy and camouflaged with rock dust so as to match the color of the surrounding rock.
11. If the old bolt cannot be removed and/or damage to the rock may occur as a consequence of removal, the old bolt would be cut off with a hand saw so that it is flush with the rock or (preferably) sheared off below the rock surface.
12. Bolts should be tightened appropriately with considerations given to rock hardness.
13. Minimum specifications of the new hardware installed should be followed to determine the location of the new hole if one must be hand drilled.
14. No new bolt placement is authorized (i.e., retro-bolting), only replacement of existing bolts as they wear.
15. All new bolts in wilderness would be replaced by hand drill only. No mechanized, motorized, electric or gas drills are allowed in Arrow Canyon.
16. New bolts should be located such that it does not change the mental or physical character of the original route.
17. For the purposes of mitigating social impacts, bolt replacers would select times so as not to interfere with other visitors and wilderness user groups.
18. All trash must be packed out following bolt replacement as with other *Leave-No-Trace* practices promoted by climbers and other users of the wilderness.

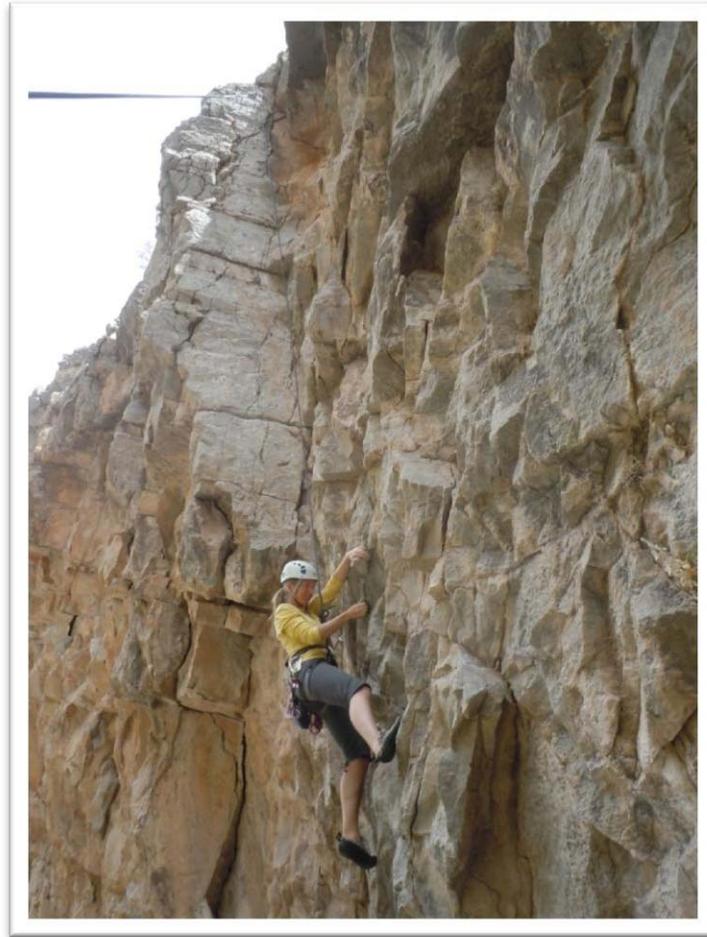


Photo courtesy Nick Walendziak

Technical rock climbing in Arrow Canyon Wilderness

Camping—Backcountry camping is allowed. Occupying a campsite would be allowed for up to 14 days. Should a visitor wish to camp longer than 14 days, their camp must be relocated a minimum of 25 miles from the previous site (43 Code of Federal Regulations 8365.1-2(a), Amended 1993). If monitoring shows that the 14-day stay limit is leading to unacceptable resource impacts, site stay limits of less than 14 days could be implemented.

Campfires would be allowed except under fire hazard restrictions. Visitors would be permitted to collect dead and downed fuel for personal campfires during their trip. *Leave No Trace* camping techniques would be encouraged through literature, at trailhead displays and at BLM-sponsored *Leave No Trace* public workshops.

If more than two campsites as identified by the presence of a campfire rock rings are located within a quarter mile of each other, the least impacted site would be restored to a natural condition to minimize additional camping disturbance. Campsites closer than 300 feet to water sources would also be removed in compliance with state regulations. Recreational uses such as camp stoves or campfires must use extreme caution. Interpretive and educational efforts should emphasize the dangers of fire.

Site-Specific Actions

Technical Rock Climbing

Protection bolts would be removed from an unnamed climbing route in an area known as “Radio Wall” in Arrow Canyon. This steep climbing route is within a cave west of a route called “Last Train to Mexico” and is within 50 feet of a cultural site. The bolts would be removed with hand tools and bolt holes patched with epoxy and camouflaged with rock dust so as to match the color of the surrounding rock. The topmost bolted anchors may be left in place in order to safely rappel off the route following removal.

The general location of the route to be removed is within the “Small-site Disturbance” legend item as depicted on Map 2.

Management for Visitor Use

The majority of this wilderness area currently provides outstanding opportunities for solitude. Large groups inquiring about recreational opportunities would first be directed to locations outside of wilderness while small groups may be directed to specific locations within wilderness. If the wilderness character of solitude becomes degraded, the following management actions in order of priority may be initiated:

- Educate visitors concerning *Leave No Trace* recreation ethics to reduce conflict with other visitors.
- Provide information to the public on non-wilderness recreational opportunities in the region.
- Establish a group size limit.
- Further reduce the group size limit for activities.
- Establish an area quota.
- A combination of the above methods.
- Plan revision with additional public input to reassess these standards and/or implement more direct controls.

Protection of Archeological Resources and Historic Properties

In addition to federal laws, protection of cultural resources for all BLM SNDO resource programs is guided by the State Protocol Agreement between the BLM and the Nevada State Historic Preservation Office (SHPO) (2012d) and the BLM Nevada Cultural Resource Inventory General Guidelines (2012). No undertakings will be authorized prior to compliance with Section 106 of the National Historic Preservation Act and consultation with the SHPO, Native American tribes, and other interested parties.

Protection of archaeological resources from damage by wilderness visitors may be accomplished with the minimum necessary on-the-ground action. Resources would be monitored to determine conditions. If monitoring reveals that damage is occurring to cultural resources, a BLM SNDO District Wilderness Specialist and Archaeologist would work together to develop a management

strategy for preventing further damage, including but not limited to education, signage, and natural barriers.

For protection of cultural resources adjacent to heavy fuel loads, vegetation may be removed to protect rock art or other features from fire. Rock art is threatened when the rock expands and spalls from exposure to heat. Protection of rock art from fires could include, for example, covering the panels with a fire blanket. Revegetation with native species such as desert willow would help not only restore a natural scene to Arrow Canyon but could help screen vulnerable cultural sites from view. This would be accomplished before fire season and with the use of hand tools. Resource protection and enhancement work would be completed by trained cultural resource specialists.

Every attempt would be made for protection of artifacts in place. If artifacts are discovered in designated trails, social trails, or other areas of recreational use, the trail may be re-routed, or alternate preservation or protection actions may be taken after consultation with the Nevada SHPO according to the standard process followed by the SNDO.



Photo courtesy, Sendi Kalcic

Petroglyphs in Arrow Canyon Wilderness

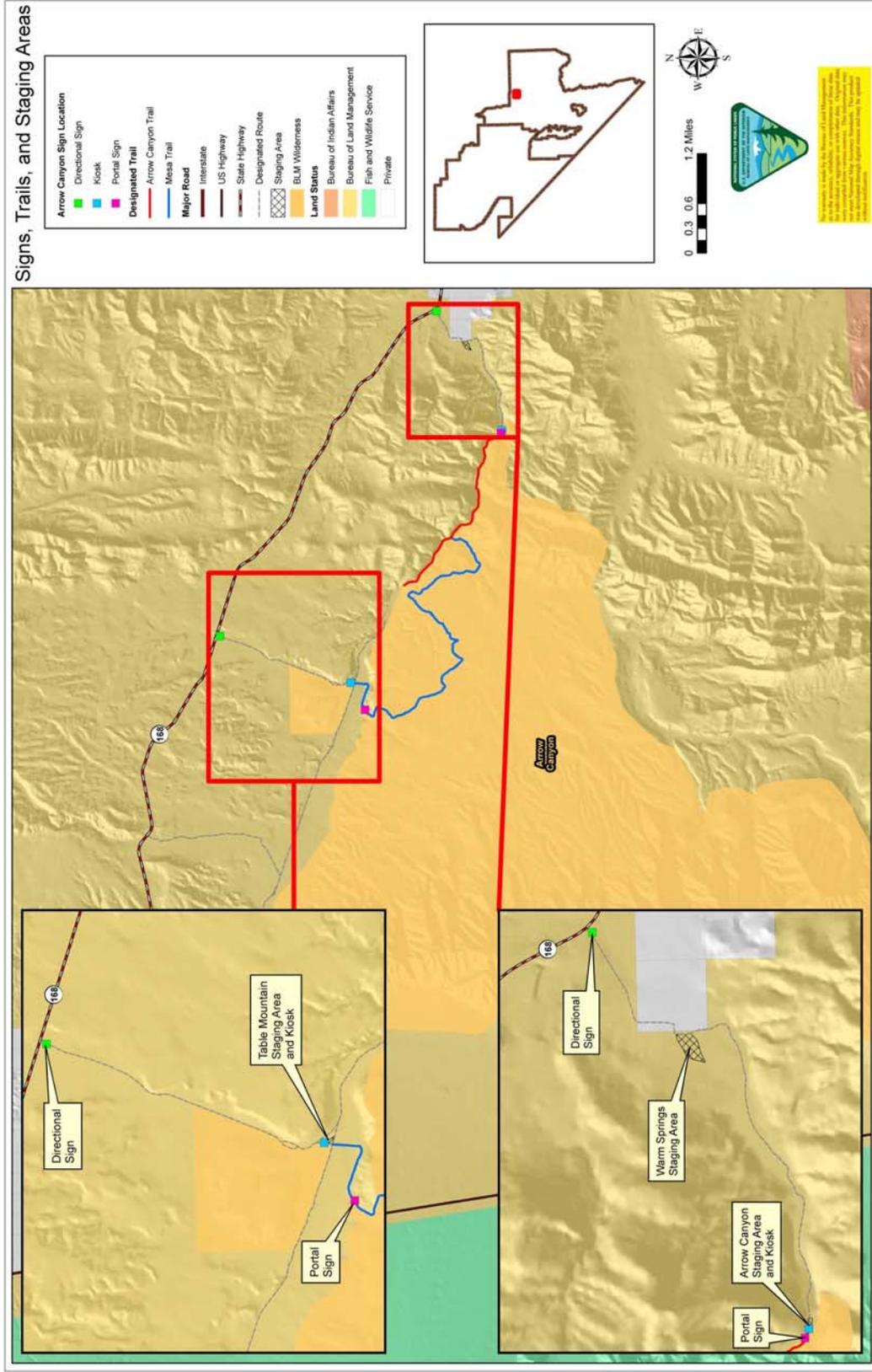
Management of the Arrow Canyon Dam—This stone masonry structure was built in early days of the Civilian Conservation Corps (CCC) and in 2010 was determined eligible for listing in the National Register of Historic Places. The dam is owned and operated by the BLM and is designed to slow floodwaters in Pahrangat Wash to provide soil conservation and to protect the communities downstream. It is comprised of a mid-level drainage culvert, downstream apron, and stilling pond. A study and report commissioned by the BLM State Hydrologist concluded it would not be practical to remove the dam (Choi 2007).

Over the life of this plan, it may be necessary to implement activities to inspect, maintain, and repair the Arrow Canyon Dam. Inspection is the act of viewing or examining all components of the dam to determine integrity and proper functioning. Maintenance is the act of retaining all

components of the dam in a good condition and repair is the act of restoring all components of the dam to a good or sound condition. Maintenance could include removal of silt and clearing of clogging vegetation. Repairs, at times, may also require replacement of portions of the dam. Replacement is the physical substitution or reconstruction of any or all components of the dam. Replacement could include reconstruction of rock and mortar, apron, or culvert. Repairs and replacement must remain in the existing footprint of present disturbance. The footprint of disturbance is defined as the edge of disturbance created by previous construction or installation of the dam, otherwise referred to as the existing footprint. New construction is the act of building or assembling all of the new components of the dam and includes redesign, reconfiguration, or alteration of the components or the capacities outside of the present disturbance of the existing dam.

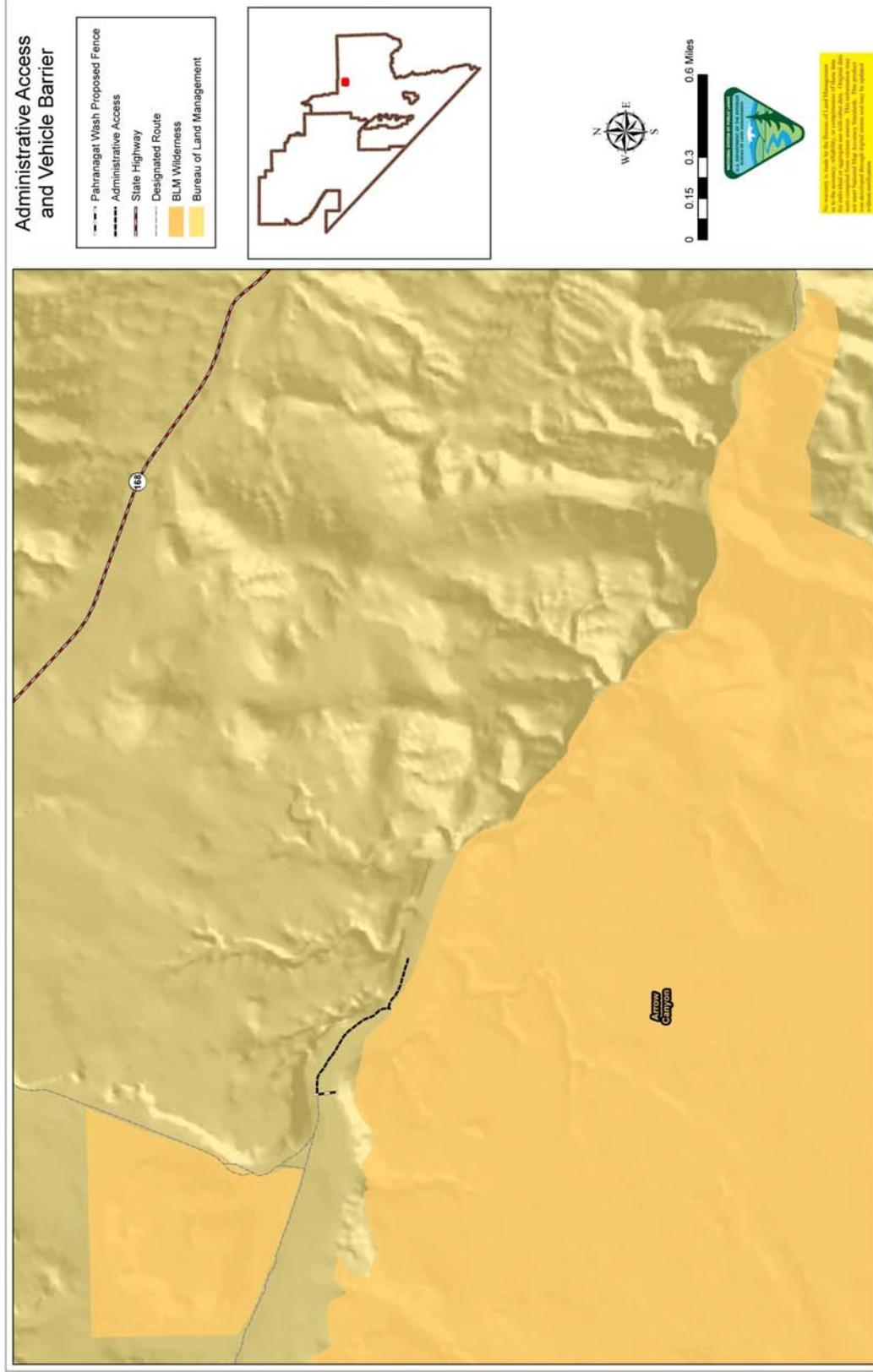
The dam would be retained in situ and continue to be administered by the BLM. Administrative access for motorized vehicles would be confined to the proposed vehicle route outside of wilderness in Pahrangat Wash; this route is east of the proposed vehicle barrier upstream of the dam. Travel within the wilderness would be by foot and stock.

Inspections, maintenance and repairs would occur in the existing footprint using the minimum activity and tool necessary excluding Wilderness Act Section 4(c) prohibited uses (i.e., motor vehicles, motorized equipment, mechanical transport), as judged by the BLM in coordination with a Southern Nevada District Archaeologist to meet management objectives. Inspections, maintenance and repairs that would involve Wilderness Act Section 4(c) prohibited uses would require a subsequent MRDG and site-specific NEPA analysis. Additionally, new construction or any repairs or replacements which would go outside the existing footprint would require a subsequent MRDG assessment and site-specific NEPA analysis.



Map 3. Sign Plan, Designated Trails, and Staging Areas Site-Specific Actions

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Map 4. Management of Vehicle Access Points Site-Specific Actions

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Vegetation Restoration

The objective of vegetation management is restoration of the native plant community. Projects would be designed to foster the resiliency of indigenous and endemic vegetation communities and restore wilderness ecosystem function, naturalness, and the land's unique characteristics. This would be accomplished by addressing issues that challenge the Mojave Desert ecosystem functions. For example, the introduction of non-native species including annual grasses and tamarisk has altered natural water flow. Non-native plants often out-compete natives and change the natural fire regime. Temporary structures, such as exclosure fences or cages to protect plants from herbivory, could be permitted when their presence would contribute to the long term enhancement of wilderness character.

Native revegetation projects with objectives that fall within the bounds of maintaining or improving wilderness character would be considered including:

- Seeding with native species that would out-compete non-natives especially in areas previously treated for noxious and non-native invasive weeds.
- Planting of native trees, shrubs and groundcovers to reduce the effects of weeds being dispersed into wilderness during floods.
- Re-establishing biological crusts to reduce erosion and facilitate native species germination.

Noxious and Non-Native Invasive Weeds

The management objective is to sustain only native species in this wilderness. Noxious weeds in Nevada are classified by the Nevada Department of Agriculture and the Plant Protection Act (2000) administered by the United States Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS). Current noxious and invasive weed infestations in the Arrow Canyon Wilderness include: red brome (invasive), cheatgrass (invasive), Sahara mustard (noxious), Scotch thistle (noxious) and tamarisk (noxious). A recent invasion of thistles has been noted in Pahrnagat Wash. Environmental Assessment DOI-BLM-NV-S010-2012-0059 (BLM 2012c) may be referenced for treatment of tamarisk and thistles in the upper Pahrnagat Wash area of Arrow Canyon Wilderness. Fire adapted red brome and cheatgrass provide abundant fuel for fast moving ground fires.

Different management techniques may be required for each weed species based on effectiveness as determined by plant biology, minimum tool requirements, and impact to the wilderness resource. When weeds are found, the emphasis would be placed on controlling small infestations with the potential to spread and displace native plants. Treatments for large infestations would be considered separately. Seeding and transplant projects would follow the decisions presented in the Emergency Stabilization and Rehabilitation (ES&R) section for post-fire revegetation and the preceding "Vegetation Restoration" section decisions. BLM weed management protocols would guide the use of herbicides. Treatments would be prioritized in the following order although it is likely that treatment combinations would be necessary in some situations:

1. Manual removal with hand tools if weeds could be controlled or eradicated without regrowth; or without creating soil disturbances that would promote the expansion of secondary weed species; and where infestations are small enough to be managed by hand.
2. Herbicides applied by backpack or using equipment carried in by pack animals where manual removal is not effective.
3. Biological control agents approved by the USDA-APHIS where infestations are of such size that eradication by manual removal or herbicides is not feasible. Current possibilities pertinent to this ecosystem are insects such as the introduced tamarisk beetle which can help control tamarisk.
4. Herbicides applied aurally or with motorized equipment where impacts could be controlled and quickly rehabilitated and where the infestation is of such size that herbicide could not be effectively applied without motorized equipment.
5. Reseeding/revegetation of treated areas preferably with native species of local genetic stock following BLM restoration/rehabilitation program policies as well as the decisions outlined under the ES&R heading.
6. Alternative treatments would be considered.

Wildlife Management

Over the life of this plan it may be necessary to implement wildlife management activities to prevent degradation to or enhancement of wilderness characteristics by promoting healthy, viable, and more naturally distributed wildlife populations and the habitats to support such populations. Activities within Arrow Canyon Wilderness would be conducted in conformance with the current (2012; Supplement No. 9) and subsequent BLM-NDOW MOU and guided by Clark County Conservation of Public Land and Natural Resource Act (2002), which may include the occasional and temporary use of motorized vehicles or tools. The following three sub-categories are related to wildlife management activities.

Wildlife Water Developments—The Clark County Conservation of Public Lands and Natural Resource Management Act (2002) permits existing and future structures and facilities for wildlife water development projects in wilderness. Wildlife water developments are authorized if the structures and facilities will enhance wilderness values by promoting healthy, viable, and more naturally distributed wildlife populations and the visual impacts can reasonably be minimized to meet BLM Visual Resource Management Class I objectives. Proposals would be considered for construction of new developments, which may allow motorized and/or mechanized equipment if deemed necessary by the MRDG and future additional site-specific NEPA analysis.

Proposals would be considered for removal of the existing wildlife water development, which may allow motorized and/or mechanized equipment if deemed necessary by the MRDG and future additional site-specific NEPA analysis.

Inspection, Maintenance, and Repairs—Activities related to the existing Full Curl (aka Arrow #3) big game wildlife water development would continue as authorized in the Decision Record for Environmental Assessment DOI-BLM-NV-L030-2012-003 (BLM 2012a) entitled “Issuance of Authorizations to Nevada Department of Wildlife for Wildlife Water Development Inspection,

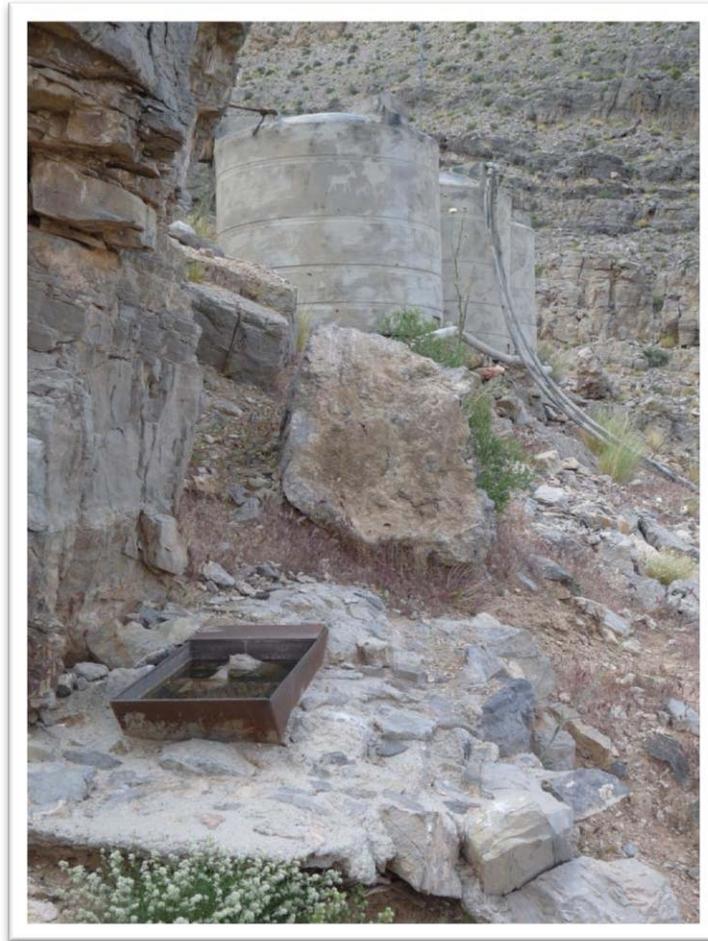
Maintenance, and Repairs within BLM Wilderness areas in Nevada.” Any repairs or replacements which would go outside the existing footprint of present disturbance would be considered new construction. New construction would require a subsequent public notification, MRDG, and site-specific NEPA analysis.

Collar Retrieval—From time to time the NDOW may submit requests for use of a helicopter in the wilderness areas in order to retrieve data from Very High Frequency (VHF)/GPS telemetry collars which have dropped off study animals or from animals which have died. In locating remotely situated study animals or dropped collars, opportunities to retrieve telemetry collars are usually discovered while performing aerial survey using helicopter where direct line of site detection of signals from transmitters are optimal. Once a collar’s location is determined, its retrieval by aircraft assistance is usually unnecessary. However, in rare instances, NDOW may need to land a helicopter in remote wilderness locations using a helicopter as there is a narrow window of time to retrieve the collar before its location signal ceases and significant data stored in the collar is effectively lost. Furthermore, if animal mortality is involved, speedy access to the animal to perform a necropsy would provide additional information on the species.

The NDOW would notify the BLM SNDO Wilderness Specialist any time they are requesting a helicopter for collar retrieval. The Wilderness Specialist would then evaluate the location and brief the District Manager who would authorize the use of a helicopter if any of the following criteria apply:

- Collar retrieval is requested between the months of May-September or the day time high will be over 100°F as extreme heat would limit the distance that could be covered on foot safely.
- Collar is located more than five miles from a vehicle access point or helicopter landing zone outside of wilderness.
- Extreme elevation gain and loss to access the collar location.
- Collar is located on a cliff and technical rock climbing gear or rappelling is needed to retrieve the collar.

Emergency Actions—Actions include those requiring immediate attention due to unanticipated natural or human-caused circumstances (e.g., flood, vandalism, sick animal), that directly and immediately jeopardize the survival of fish and wildlife under the NDOW’s jurisdiction. As intended in the BLM-NDOW MOU (2012; Supplement No. 9), at the time of an action requiring immediate attention, NDOW would be permitted to select the minimum tool needed to accomplish the task. NDOW is then required, as soon as possible after the action, to notify the BLM of the action taken, vehicles or equipment used and duration of the activity.



Full Curl (Arrow #3) big game wildlife water development

Wildlife Relocation—According to the BLM-NDOW MOU (2012; Supplement No. 9), wildlife transplants (i.e., removal, augmentation, or reintroduction of wildlife species) may be permitted if determined necessary to perpetuate or recover a threatened or endangered species or to restore populations of native (including sensitive) species eliminated or reduced by human influence. Locations outside of wilderness boundaries would be utilized first and if not available relocation would be implemented in a manner compatible with preserving wilderness characteristics of the areas. Transplant projects including monitoring require advance written approval from the BLM if the action involves ground-disturbing activities, motorized methods, and/or temporary holding and handling facilities. The BLM would provide review to NDOW on all releases near the wilderness area. Release of wildlife on public lands would be in conformance with BLM Manual 1745 (Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife and Plants, 1992) and the BLM-NDOW MOU (2012; Supplement No. 9). MRDG and site-specific NEPA analysis would occur for proposed actions.

If motorized or mechanized means are authorized, staging would occur outside the wilderness boundary. When feasible, project implementation would occur during periods when visitor use is low (for example, weekdays). In order to inform visitors of impending activity, relocation dates would be posted on the BLM website two weeks in advance.

Wildlife Damage Management—To maintain the area’s natural character, wildlife damage management may be necessary to protect federally listed threatened or endangered species, candidate species, declining species, and reintroduced native wildlife species and to prevent transmission of diseases or parasites affecting wildlife and humans. Activities would use the minimum amount of control necessary to resolve wildlife damage problems. Acceptable control measures include lethal and non-lethal methods, however, toxicants and M-44 devices (sodium cyanide) are prohibited. Activities would be conducted on foot and may include the use of pack stock. Use of motorized vehicles, motorized equipment, and/or mechanical transport must be approved by the BLM on a case-by-case basis. Activities would be approved by the BLM and conducted in conformance with the BLM-APHIS MOU (2012) and BLM Manual 6340 (Management of Designated Wilderness Areas). Wildlife damage management is only conducted at the request of federal, state, or local agencies, private organizations, and individuals.

Fire Management Objectives and Guidelines

The Fire Planning Handbook (H-9211-1) sets the national framework for management of fire and addresses such subjects as emergency functions within wilderness, provisions for control of fire, insects, and diseases. Fire management objectives in the wilderness area would be structured in accordance with the Southern Nevada District Fire Management Plan (FMP). A fire response would be developed following the initial report for wildland fires in the planning area. A fire response would include a range of specific actions such as monitoring, confinement, initial attack and suppression/extinguishment, or wildfire suppression with multiple strategies, and may include use of motor vehicles, mechanized equipment and retardant. A fire response would be determined for each wildland fire based on site factors, including fuel loading and fire behavior, protection of natural and cultural resources, and the circumstances under which a fire occurs. Response must ensure the safety of firefighters, the public, and protection of private property. The BLM fire program’s goal for fuel management is to use an integrated vegetation management approach to protect and preserve the wildland urban interface (WUI) watersheds, communities at risk, wildlife habitat, cultural resource values, and wilderness values.

The Arrow Canyon Wilderness falls within the Southern Nevada Fire Planning Unit. There are four fire management units (FMUs) that overlie the wilderness and adjacent planning area.

Table 1. Fire Management Units in the Planning Area

<i>FMU Type</i>	<i>FMU Number</i>	<i>FMU Name</i>
Special Management Area – Tortoise	NV-050-02	Tortoise ACEC North
High Value Habitat – Tortoise	NV-050-01	Tortoise Moderate Density
WUI – Watershed	NV-050-11	Virgin – Muddy – Meadow
Wildland Urban Interface	NV-050-09	Moapa – Overton

The low elevation, desert shrub habitat, and riparian portions of these FMUs constitute high suppression priority Threatened and Endangered (T&E) species values. Strategies, objectives, and constraints identified within the FMP will be followed such as using minimum impact suppression tactics as appropriate.

Fire Suppression Guidelines—

- A Resource Advisor would be dispatched to all fires occurring in or threatening Arrow Canyon Wilderness.
- Use of motorized equipment would only be used in the wilderness if the fire is threatening human life, property, or wilderness characteristics. The District Manager must approve the use of heavy equipment in all cases.
- Within wilderness, motorized ground vehicles used in fire suppression efforts would remain on closed vehicle routes unless fire is threatening life, property, or wilderness characteristics.
- Sling loading materials into or out of wilderness using a helicopter would be kept to a minimum.
- Temporary helibases, staging areas, and fire camps will be located outside the wilderness, unless authorized by the District Manager.
- Use of retardant must be approved by the District Manager. If retardant is not approved, water may be dropped from aircraft as authorized by the Incident Commander without additional authorization.
- Landing of helicopters would be kept to a minimum and would only occur in existing openings not requiring additional manual clearing.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST).
- Hand crews may use conventional hand tools and with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction.
- A *Leave No Trace* policy would be used in the wilderness. All evidence of human activity must be removed to the maximum extent possible.
- Noxious weeds will be controlled in conformance with the Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control decisions.

The desert shrub ecosystem is not fire adapted. Currently, fires are fueled by non-native invasive species and noxious weeds. Annual species such as red brome increase fire intensity, the rate of spread, and fire frequency, which are the characteristics of an annual grass fire cycle. This in turn displaces native vegetation and further promotes invasive species. The annual grass fire cycle can perpetuate and intensify itself, thereby seriously reducing native vegetation and wildlife habitat. Wildfire management priorities include maintaining habitat by managing fire size to minimize the fire spread. Wildfire is a significant factor in “habitat destruction, degradation, and fragmentation” of desert tortoise habitat as identified in the Desert Tortoise Recovery Plan (1994).

Fire Prevention—Fire prevention measures can include but are not limited to education and outreach to user groups, posting of fire restrictions and prevention messages, and enforcement of fire restrictions.

Fuel treatments that preserve, protect, or enhance wilderness values; WUI watersheds; cultural resources; and wildlife habitat may be considered. MRDG and site-specific NEPA analysis would occur for proposed actions including, but not limited to:

- Aerial (helicopter) application of herbicide fuel breaks
- Backpack application of herbicide fuel breaks
- Mechanized equipment utilized for vegetation treatments

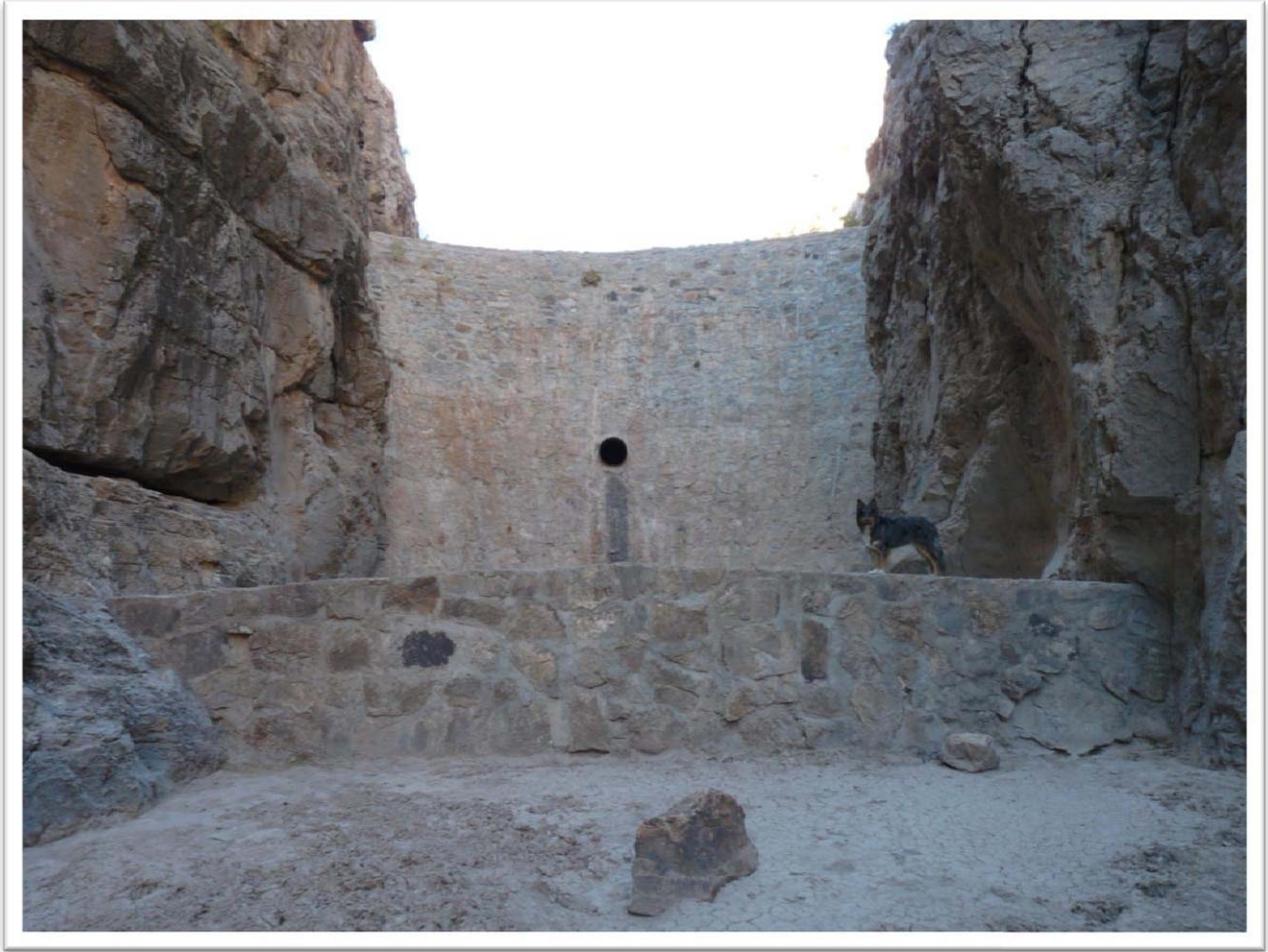
- Prescribed fire
- Use of chainsaws
- Use of utility terrain vehicles (UTVs)

Emergency Stabilization and Rehabilitation Activities—If a fire should occur in Arrow Canyon Wilderness, the BLM may initiate a plan for Emergency Stabilization and Rehabilitation (ES&R) activities within the short time frame permitted after fire suppression is accomplished. Following site specific assessments and planning, ES&R activities may be undertaken in accordance with current Department of Interior policy (620 DM 3 Wildland Fire Management Burned Area Emergency Stabilization and Rehabilitation) and BLM policy (H-1742-1 Burned Areas Emergency Stabilization and Rehabilitation Handbook).

ES&R Objectives and Strategies:

Should a fire occur that produces damage necessitating approval of an ES&R project, the approved post-fire proposal would define the location, size, intent and other parameters of the project before restoration begins. In general ES&R is intended to restore plant productivity on disturbed areas of the public lands; and where feasible, rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities. Natural recovery by native plant species is preferable to planting or seeding, however when ES&R is utilized, management would strive for optimum species diversity by seeding or planting with native species, preferably of local genetic stock.

- In desert tortoise habitat, conduct all activities in accordance with the current or subsequent plan for Reclamation of Critical Desert Tortoise Habitat in the Las Vegas Field Office (1999).
- Rehabilitation and restoration would be conducted in accordance with this wilderness management plan.
- If suppression efforts require off-road vehicle operations, then replant and camouflage those portions of disturbance visible within ¼ mile from the wilderness boundary.
- Use native species in seeding and/or re-planting treatments.



Historic Civilian Conservation Corps dam in Arrow Canyon

Management of Environmental Education and Interpretation

Interpretive information regarding resources and recreation opportunities in wilderness would be located on kiosks at three proposed staging areas outside of the wilderness, in brochures, on BLM recreation maps, on the BLM website, and in the public room of the Southern Nevada District Office.

Wilderness-specific maps will include wilderness area descriptions, designated trails, interpretive information, as well as wilderness ethics and *Leave No Trace* principles. When feasible, the BLM would collaborate with other agencies and non-government organizations (NGOs) in the presentation of basic information, including authors of media or guide books.

Commercial Service Restrictions

Section 4(c) of the Wilderness Act prohibits commercial enterprises (e.g., mining, mineral leasing, timber harvesting, etc.) within wilderness. Section 4(d)(6) of the Wilderness Act allows commercial services within wilderness areas “to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas.”

Commercial guiding would be permitted for:

- Hunting.
- Hiking, backpacking, photography.
- Academic organizations whose primary purpose is wilderness or environmental education, or geological, biological, or ethnographic study.
- Organizations whose service is primarily for the support of people with disabilities.
- Technical rock climbing.

All commercial services would be permitted through the appropriate permitting regulations, such as a BLM Special Recreation Permit (SRP). Hunting outfitters and guides will be subject to SRP stipulations. Regulations for guides and outfitters would be in conformance with the Wilderness Act and the Clark County Conservation of Public Lands and Natural Resources Act. Limits on the number of commercial guides may be implemented if monitoring identifies excessive impacts to wilderness character or resources.

Research

Non-destructive and non-consumptive research proposals investigating indigenous plant communities, wildlife, geological resources, cultural resources, and the human dimensions of wilderness would be considered. Proposals must contribute to the enhancement of wilderness character or the improvement of wilderness management. All proposals would be subject to the restrictions of the enabling legislation and the MOU between BLM and NDOW (2012; Supplement No. 9), as well as appropriate actions outlined in this wilderness management plan.

Research proposals that do not contribute to the improved management of the area as wilderness would not be permitted if they can be accomplished outside of wilderness and/or cannot be conducted in a manner compatible with the preservation of the wilderness environment.

Research and other studies must be conducted without use of motorized equipment or the construction of temporary or permanent structures. Exceptions may be approved for projects that are essential to managing the wilderness area when no other feasible alternatives exist. Such use must be necessary to meet the minimum requirements for administration of the area as wilderness and must not degrade wilderness character. A site-specific NEPA analysis would have to be prepared for authorization of any research.

The Code of Federal Regulations Part III, 43 CFR section 6302.16 provides that for scientific information gathering in a wilderness area –

- Similar research opportunities must not be reasonably available elsewhere.
- The activity must be compatible with wilderness preservation and pertinent BLM management plan.
- Any ground disturbance must be minimized and restored.
- BLM must authorize the studies before any activities begin.

Structures, Installations and Other Human Effects or Disturbances

BLM staff and volunteers monitoring wilderness would be given instructions on identifying human effects that are considered unattended personal property or refuse. Personal property not associated with an active camp would be removed by BLM personnel and temporarily held at the Southern Nevada District Office. If possible, the owner of the personal property would be contacted. The BLM would remove geocaches and if a virtual geocache identifies a sensitive site (such as cultural or biological), the sponsor would be asked to remove the cache from the internet.

Cultural resources would be left in situ unless protection measures are insufficient and excavation or data recovery is deemed appropriate. Treatment measures would not be implemented prior to compliance with Section 106 of the NHPA and consultation with the SHPO, Native American tribes, and other interested parties.

If mine adits or shafts are discovered, they may be closed in order to promote wilderness character and public safety using conforming actions such as hand tools, foam plug, and dynamite filling. NEPA and MRDG analyses may be required for certain non-conforming actions. If mine adits or shafts are proposed for closure, bat and cultural surveys would be conducted. Mining sites determined to be historic may be preserved following site-specific MRDG and NEPA analysis.

Military Operations

The northern portion of Arrow Canyon Wilderness is within the Department of Defense Airspace Consultation Area. Flyovers from nearby Nellis Air Force Base and flights to and from Creech

Air Force Base and the Nevada Test and Training Range are frequent. Procedures for handling military operations would distinguish between non-emergency and emergency situations. Non-emergency incidents might include such activities as the release of low-level flares, the recovery of aircraft parts, or the salvage of non-operational ordnance. Emergency situations include the retrieval of downed aircraft, the rescue of pilots, or the recovery of live ordnance. Non-emergency military actions may be approved on a case-by-case basis following NEPA and MRDG analysis for activities in wilderness. Military training exercises will not be located within the wilderness.

Emergency military actions involving prohibited uses identified in Section 4(c) of the Wilderness Act (1964) (e.g. motorized vehicles and mechanized equipment, mechanical transport, landing of aircraft etc.) will be permitted within wilderness without prior analysis, assessment, or authorization provided the Commanding Officer or delegated representative at Nellis Air Force Base notifies the BLM Southern Nevada District Manager at the onset of the emergency or immediately thereafter.

Monitoring Program

The BLM Implementation Guide to Monitoring Attributes of Wilderness Character (2010) and future iterations prescribes a monitoring effort based on the statutory requirements of The Wilderness Act of 1964. Managers are directed to “preserve wilderness character.” Though never explicitly defined, wilderness character is circumscribed in the Act by four qualities required of wilderness areas, and a fifth quality which includes values the Act says “may” be present. The qualities of wilderness character are described as:

- **Untrammeled**—Area is unhindered and free from modern human control or manipulation.
- **Natural**—Area appears to have been primarily affected by the forces of nature.
- **Undeveloped**—Area is essentially without permanent improvements or human occupation and retains its primeval character.
- **Outstanding opportunities for solitude or a primitive and unconfined type of recreation**—Area provides outstanding opportunities for people to experience solitude or primeval and unrestricted recreation including the values associated with physical and mental inspiration and challenge.
- **Unique / Supplemental Values**—Wilderness areas may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Monitoring is associated with specific wilderness characteristics and tracks the outcome of proposed activities on the quality of wilderness character. The impacts of a single activity may affect multiple qualities of wilderness character. Monitoring can improve understanding of an activity’s effects whether intentional or unintentional. Unauthorized activities will also be captured under the monitoring system.

The following outline describes the measures the BLM will use to assess changes in each indicator. These indicators will be used to answer questions in order to determine the trends in each quality of wilderness character. The outline follows this structure:

Untrammeled

What are the trends in actions that control or manipulate the “earth and its community of life” inside wilderness?

Actions authorized by the Federal land manager that manipulate the biophysical environment.

- Number of authorized actions and persistent structures designed to manipulate plants, animals, pathogens, soil, water, or fire.
- Percent of natural fire starts that are manipulated within the boundaries of the wilderness.

Actions not authorized by the Federal land manager that manipulate the biophysical environment.

- Number of unauthorized actions.

Natural

What are the trends in terrestrial, aquatic, and atmospheric natural resources inside wilderness?

Plant and animal species and communities.

- Status of native biological communities.
- Abundance and distribution of non-indigenous species.
- AUMs of livestock use inside wilderness.

Physical resources.

- Visible air quality, based on average deciview and sum of anthropogenic fine nitrate and sulfate.
- Ozone air pollution based on concentration of N100 (episodic) and W126 (chronic) ozone exposure affecting sensitive plants.
- Acid deposition, based on concentration of sulfur and nitrogen in wet deposition.

What are the trends in terrestrial, aquatic, and atmospheric natural processes inside wilderness?

Biophysical processes.

- Departure from natural fire regimes, averaged over the wilderness.

Undeveloped

What are the trends in non-recreational development inside wilderness?

Non-recreational structures, installations, and developments.

- Index of physical development for authorized or pre-designation structures and developments.

Inholdings.

- Area and existing or potential impact of inholdings.

What are the trends in mechanization inside wilderness?

Use of motor vehicles, motorized equipment, or mechanical transport.

- Type and amount of administrative use (but not law enforcement or emergency use) of motor vehicles, motorized equipment, and mechanical transport.
- Proportional use of motor vehicles, motorized equipment, and mechanical transport in law enforcement or emergency responses.

- Type and amount of use of motor vehicles, motorized equipment, or mechanical transport not authorized by the federal land manager.

Solitude or Primitive and Unconfined Recreation

What are the trends in outstanding opportunities for solitude inside wilderness?

Remoteness from sights and sounds of people inside the wilderness.

- Amount of visitor use.
- Area of wilderness affected, and severity of effect, from travel routes inside the wilderness.

Remoteness from occupied and modified areas outside the wilderness.

- Area of wilderness affected, and severity of effect, from developments that are near the wilderness.

What are the trends in outstanding opportunities for primitive and unconfined recreation inside wilderness?

Facilities that decrease self-reliant recreation.

- Type and number of agency-provided recreation facilities.
- Type and number of user-created recreation facilities.

Management restrictions on visitor behavior.

- Type and extent of management restrictions.

Unique / Supplemental Values

What are the trends in cultural resources inside wilderness?

Loss of cultural resources.

- Severity of disturbances to cultural resources.

What are the trends in species of concern inside wilderness?

Status of plant and animal species of concern.

- Index of the status of indigenous species that are listed, or are candidates for listing, as threatened or endangered.

Monitoring of Site-Specific Actions

Additional monitoring would occur for the following site-specific actions located outside of the wilderness and associated with the attached Environmental Assessment in order to ensure that wilderness character is protected and that undue impacts to other resources are not occurring as a result of the proposed actions:

- Success of weed treatments in Pahranaagat Wash adjacent to wilderness.
- Use of administrative access route and gate into dam maintenance area.
- Use of staging areas at wilderness entry sites.
- Effectiveness of sign plan.

Plan Evaluation

This management plan will be revised when the management actions prescribed no longer meet the wilderness management objectives or when a change in the existing situation warrants revised management. The need for revision would be reviewed every five years and if the decision is made to revise the plan, then it will be accomplished with public participation. Minor revisions such as typographical or cartographical errors may be made by inserting an errata sheet.

Plan Implementation Sequence

The following list shows the priority sequence for accomplishing the management activities proposed in this plan. The implementation schedule could be altered based on funding and staff availability.

Ongoing Activities

- Maintaining boundary signs.
- Monitoring visitor uses, natural resources, trail conditions, and wilderness character.
- Inspecting climbing bolts for wear and possible replacement.
- Monitoring the effectiveness of signs and possible removal or repair.
- Monitoring staging areas for use and maintenance.
- Dissemination of visitor information.
- Issuing and monitoring permit activities such as commercial tours, educational/school visits, and geological study/sampling.
- Removing graffiti and repair of vandalism.
- Posting temporary signs for example fire prevention, safety and conservation messages.

Site-Specific Projects

The EA associated with this plan will analyze the following projects:

- Archaeological, botanical, and BLM Special Status Species surveys or clearances as needed to support plan implementation.
- Reclamation of former vehicle routes, bore holes, paint, and graffiti.
- Removal of rock climbing bolts.
- Construction of designated trails.
- Sign and kiosk installation.
- Staging area construction.
- Construction of vehicle barrier for administrative access point.
- Treatment of tamarisk and smaller noxious weeds.

Subsequent NEPA Analysis

Changing conditions and potential future proposals not fully described and analyzed in the associated EA would be reviewed for conformance with the management decisions and actions in this wilderness management plan. Additional NEPA analysis would be completed as necessary.

**U.S. Department of the Interior
Bureau of Land Management**

Environmental Assessment

**Arrow Canyon Wilderness Management Plan
DOI-BLM-NV-S010-2011-0099-EA**

April 12, 2013

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Background Information

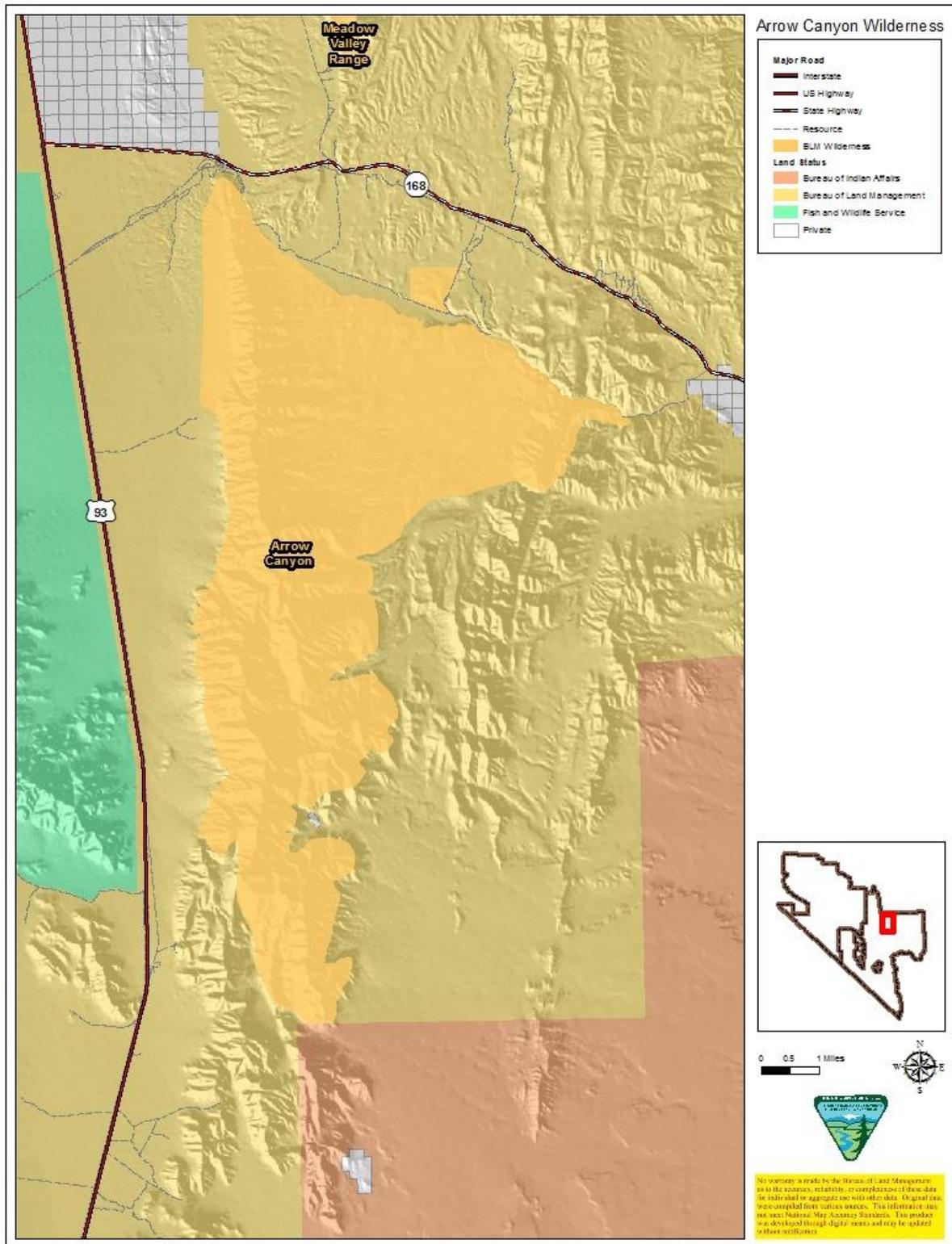
Introduction

The BLM Southern Nevada District Office proposes to develop and implement a Wilderness Management Plan (WMP) for the Arrow Canyon Wilderness. This wilderness is located 40 miles northeast of Las Vegas just west of Warm Springs and includes the northern half of the Arrow Canyon Range. Most of the area consists of steep terrain with narrow canyons that provide plenty of opportunities for solitude. Encompassing 27,180 acres, this wilderness is managed in its entirety by the Las Vegas Field Office of the Bureau of Land Management (BLM), Southern Nevada District Office. Map 5 provides an overview of Arrow Canyon Wilderness.

The United States Congress established the National Wilderness Preservation System to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States. Wilderness designation is intended to preserve and protect certain lands in their natural state. Only Congress, with Presidential approval, may designate public lands as Wilderness. The Wilderness Act of 1964 identifies wilderness uses and prohibited activities. Although wilderness character is a complex idea and is not explicitly defined in the wilderness Act, wilderness characteristics are commonly described as:

- **Untrammeled** – area is unhindered and free from modern human control or manipulation.
- **Natural** – area appears to have been primarily affected by the forces of nature.
- **Undeveloped** – area is essentially without permanent improvements or human occupation and retains its primeval character.
- **Outstanding opportunities for solitude or a primitive and unconfined type of recreation** – area provides outstanding opportunities for people to experience solitude or primeval and unrestricted recreation, including the values associated with physical and mental inspiration and challenge.

In addition, the wilderness areas may contain ecological, geological, or other features of scientific, educational, scenic, or historical value. These supplemental values are optional characteristics that need not be present for an area to meet the definition of wilderness.



Map 5. Overview of Arrow Canyon Wilderness

Purpose and Need

The purpose of a wilderness management plan is to preserve the area's wilderness characteristics by (1) identifying the conditions and opportunities that will be managed within wilderness; (2) creating specific guidelines for managing wilderness resources and activities; and, (3) identifying management needs outside of and immediately adjacent to the area over an approximately ten-year span.

The need for the proposed actions stems from the Wilderness Act of 1964, which mandates that the primary management direction is to preserve wilderness character, and BLM Manual 8561, Wilderness Management Plans, which states that a wilderness management plan must be prepared for each BLM-administered wilderness. The proposed actions would create specific guidance to achieve this mandate.

Relationship to Planning

This WMP has been analyzed within the scope of the Las Vegas Resource Management Plan (RMP) and has been found to be in conformance with the goals, objectives, and decisions of the Record of Decision (BLM 1998).

BLM planning regulations (43 Code of Federal Regulations 1610.3.2[a]) require that BLM resource management plans be consistent with officially approved plans of other federal, state, local, and tribal governments to the extent those plans are consistent with federal laws and regulations applicable to public lands. Although this regulation does not apply to other official plans created after the land use plan is implemented, the BLM strives for management decisions to be consistent with other official plans.

Compliance with Laws, Policies, Regulations and State Statutes

The proposed actions and alternative actions are in compliance with the following:

- The Wilderness Act of 1964 (16 U.S.C. §§ 1131-1136, September 3, 1964, as amended 1978).
- The Federal Land Policy and Management Act of 1976 (43 U.S.C. §§ 1701-1782, October 21, 1976, as amended 1978, 1984, 1986, 1988, 1990-1992, 1994 and 1996).
- The Clark County Conservation of Public Land and Natural Resources Act of 2002 (Public Law 107-282).
- The National Environmental Policy Act of 1969 (42 U.S.C. §§ 4321-4347, January 1, 1970, as amended 1975 and 1994).
- The Clean Air Act (42 U.S.C. §§ 7401-7602, December 31, 1970, as amended 1977, 1990, 2004).
- The Endangered Species Act of 1973 (16 U.S.C. §§ 1531-1544, December 28, 1973, as amended 1976-1982, 1984, and 1988).
- Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978).

- Migratory Bird Treaty Act (16 U.S.C. §§ 703-712, July 3, 1918, as amended 1936, 1960, 1968, 1969, 1974, 1978, 1986 and 1989).
- Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds (2001).
- Management of Designated Wilderness Areas (43 CFR Part 6300).
- Recreation Management Restrictions: Occupancy Stay Limitation (43 CFR 8365.1-2[a] and Federal Register Notice NV-930-4333-02).
- Unlawful Manner of Camping Near Water Hole (Nevada Revised Statute 503.660).
- Executive Order 13112: Invasive Species (1999).
- Executive Order 13443: Facilitation of Hunting Heritage and Wildlife Conservation (2007).
- Federal Property and Administrative Services Act of 1949 (40 U.S.C. as amended through Public Law 106-580, December 29, 2000).
- National Historic Preservation Act (Public Law 89-665; 16 U.S.C. 470 as amended through 2000).
- Archaeological Resources Protection Act of 1979, as amended (Public Law 96-95; 16 U.S.C. 470aa-mm).
- Wildlife Management Guidelines (House Report No. 101-405, Appendix B).

Relationship to Manuals and Executive Orders

The proposed actions and alternatives are in conformance with the following manuals and executive orders:

- Management of Designated Wilderness Areas (BLM Manual 6340).
- Wilderness Management Plans (BLM Manual 8561).
- BLM Emergency Stabilization and Rehabilitation Handbook H1742-1.
- BLM Integrated Vegetation Management Handbook H1740-2.
- Executive Order 13112: Invasive Species (1999).
- Executive Order 13443: Facilitation of Hunting Heritage and Wildlife Conservation (2007).
- Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds (2001).

Scoping and Public Involvement

Public scoping was conducted in the form of workshops, meetings, written letters, email, and by BLM staff. Public scoping workshops were held at the BLM Southern Nevada District Office conference room on November 8, 2010; at the Moapa Court House on November 9, 2010; and in the Mesquite City Council Chambers on November 10, 2010. Internal scoping was done via meetings and written communications with BLM resource specialists

Issues

Issues addressed in this EA were identified through internal and public scoping during the development of the wilderness management plan. For details, see the Wilderness Specific Issues

section on page 9 of the WMP.

All resources considered or analyzed in this EA are displayed in Table 2. All issues and concerns received through internal and external scoping that relate to wilderness resource conditions were considered during the development of the alternatives. Certain issues and concerns were judged outside the scope of this analysis and were not considered further.

Description of the Proposed Action and the No Action

Management strategy for the Arrow Canyon Wilderness is to maintain or improve the natural, near-pristine conditions present today while rehabilitating existing disturbances. Two factors influence how the strategy was designed. First, most of the wilderness is remote comprised of steep mountain slopes that are difficult to access; use here is infrequent. Second, the portion of Pahranaagat Wash that includes Arrow Canyon and the adjacent mesas is relatively easy to access by vehicle, is frequented by visitors, and has a variety of use issues. There is greater potential here for conflicts between user groups as well as people and resource conflicts.

Proposed Action

The Wilderness Management Plan (WMP), detailed in the first half of this document, is proposed for implementation and is the *Proposed Action*. It consists of the following Wilderness Management Plan actions that relate to either specific resources or resource programs administered by the BLM Southern Nevada District Office. These resources are briefly described in the Environmental Assessment (EA) with reference to the detailed descriptions contained within the WMP. Certain Wilderness Management actions contain site-specific proposed actions. The rest outline general guidelines for each non-wilderness resource program operating within the wilderness. Although the plan would not administer these resource programs, resource activity plans are evaluated to ensure conformity with laws, management goals, and objectives for this wilderness area.

No Action

The *No Action* alternative briefly describes what would occur within each resource program if a wilderness management plan were not adopted. This alternative provides a baseline for comparison. In general, however, the management plan identifies wilderness related constraints for non-wilderness resource programs that may operate within wilderness. Most of these constraints would still occur without adopting the plan.

Wilderness Management Plan Actions

Management of Small-Scale Surface Disturbances

Proposed Action

Disturbances fall into two categories with common characteristics: (1) small-site disturbances including abandoned developments, mining claims, and dispersed campsites; and (2) linear disturbances created by motorized vehicle traffic that are largely denuded of vegetation. All vehicle use in Arrow Canyon Wilderness is prohibited by the enabling wilderness legislation. Vehicle routes approaching the wilderness area are open for travel as determined during the analysis for the area's travel management plan in 2008. A goal of the Wilderness Act is to restore or allow natural processes to restore ground disturbances and human impacts to the environment. Management actions will enhance wilderness characteristics by active restoration.

All reclamation activities would be in accordance with Programmatic Environmental Assessment for Restoration in Wilderness (NV-S010-2012-0062). The need to repeat reclamation treatments would be addressed on a case-by-case basis. Approved methods for decommissioning former vehicle routes and rehabilitating small-scale surface disturbances in desert tortoise habitat would occur in the following order: decompaction, scarifying/pitting, recontouring, vertical mulching, erosion control, desert varnish colorant, and vegetative restoration. The WMP provides a detailed description of these methods and site-specific actions for restoration of linear and small-site disturbances on page 17.

No Action

Based on routine monitoring, reclamation activities would occur as necessary on a case-by-case basis in accordance with Programmatic Environmental Assessment for Restoration in Wilderness (NV-S010-2012-0062). Current laws, policies, and guidelines would be followed without the guidance of a comprehensive WMP.

Management of Vehicle Access Points and Designation of Staging Areas

Proposed Action

Access points are defined as locations along wilderness boundaries where focused entry occurs. Vehicle turn-arounds or staging areas would be created at or before the wilderness boundary to prevent vehicles from continuing into the wilderness, to accommodate vehicle parking, and visitation. Vehicle barriers constructed outside of wilderness would be used where natural obstacles are not adequate to prevent vehicles from crossing into wilderness. In addition, the WMP provides a detailed description on site-specific locations actions for staging areas and vehicle barriers on page 22.

No Action

Visitors would be able to park their vehicles and access wilderness from any public point outside of the wilderness boundary. No vehicle staging areas or vehicle barriers would be designated or defined to direct recreational use to more desirable and suitable access points. Current laws, policies, and guidelines would be followed without the guidance of a comprehensive WMP.

Management and Designation of Trails

Proposed Action

The proposed action provides direction for current and future management of both designated trails and social trails.

The WMP provides a detailed description, including Trail Standards and site-specific actions for designated trails starting on page 23.

No Action

A total of 1.7 miles of designated vehicle routes would continue to be available as informal trails. A total of 6.9-miles of existing former vehicle routes would be treated as social trails and be reclaimed according to existing BLM policy. These paths would not be displayed or described on BLM maps or brochures. Current laws, policies, and guidelines would be followed without the guidance of a comprehensive WMP.

Sign Plan

Proposed Action

The proposed action outlines general direction for future sign placement, types of signs and site-specific actions for placing directional signs, portal signs, and one kiosk. Detailed information is provided in the WMP on page 26.

No Action

Only wilderness boundary markers would be installed and maintained. The wilderness boundary would be identified by signs at key locations. These signs would be simple installations (e.g., carsonite posts, permanent carsonites) used to delineate the wilderness boundary. Current laws, policies, and guidelines would be followed without the guidance of a comprehensive WMP.

General Recreation Management

Proposed Action

A variety of primitive and unconfined types of recreational activities are allowed in Arrow Canyon Wilderness including hiking, camping, hunting, trapping, virtual geocaching (national policy prohibits physical geocaching in designated wilderness), recreational horseback riding, geological study, recreational caving, and technical rock climbing. Other non-destructive and non-consumptive activities that enhance the ability of the BLM to protect and manage the wilderness area such as geological field trips, biological surveys, cultural surveys, and other studies would be allowed. Site-specific actions for removal of protection bolts from an unnamed climbing route are also addressed. Policies for management related to these activities are detailed on page 27 of the WMP.

No Action

No specific management actions would be taken regarding general recreational activities allowed in wilderness. Campsites would not be moved or rehabilitated. Current laws, policies, and guidelines would be followed without the guidance of a comprehensive WMP.

Management for Visitor Use

The majority of this wilderness area currently provides outstanding opportunities for solitude. Large groups inquiring about recreational opportunities would be directed to locations outside of wilderness while small groups may be directed to specific locations within wilderness. If the wilderness character of solitude becomes degraded, management actions outlined on page 32 of the WMP would be initiated.

No Action

No specific management actions would be taken to manage visitor use. Current laws, policies, and guidelines would be followed without the guidance of a comprehensive WMP.

Protection of Archaeological Resources and Historic Properties

Proposed Action

In addition to federal laws, protection of cultural resources for all BLM SNDO resource programs is further guided by the Cultural Resource Inventory General Guidelines (2012) and the State Protocol Agreement between the BLM and the Nevada State Historic Preservation Office (as amended 2010). The proposed management plan will not alter the management of archaeological resources and historic properties and provides specific direction for inspection, maintenance, and repair of the Arrow Canyon Dam. Specific guidelines for the protection of cultural resources are found in the WMP on page 32.

No Action

Management of archaeological resources and historic properties would be similar to the *Proposed Action*, except for inspection, maintenance and repair of Arrow Canyon Dam. All laws protecting these resources would apply such as the Archaeological Resources Protection Act of 1979 and the National Historic Preservation Act of 1966. In addition, current policies, and guidelines would be followed without the guidance of a comprehensive WMP.

Vegetation Restoration

Proposed Action

Projects would be designed to (1) foster the resiliency of indigenous and endemic vegetation communities; and (2) restore wilderness ecosystem function, naturalness, and the land's unique characteristics. Temporary structures, such as enclosure fences, could be permitted when their presence would contribute to the long-term enhancement of wilderness character. Native

revegetation and restoration projects with objectives that fall within the bounds of maintaining or improving wilderness character would be considered based on the guidelines outlined in the WMP on page 39.

No Action

Current laws, policies, and guidelines would be followed without the guidance of a comprehensive WMP.

Noxious and Non-Native Invasive Weeds

Proposed Action

The management objective is to sustain only native species in this wilderness. Management emphasis in Arrow Canyon Wilderness would be placed on controlling small infestations with the potential to spread and displace native plants. Treatments for large infestations as defined by the BLM Southern Nevada District Weeds Coordinator would be considered separately. The detailed description, including treatment methods, is found in the WMP starting on page 39.

No Action

Wilderness would be treated as a hands-off natural area and whatever processes of species change that occur through incoming new plants would be allowed to occur naturally without human intervention. Federally and State listed noxious weeds would be treated on a case-by-case basis as per the SNDO Noxious Integrated Weed Management Plan. Current laws, policies, and guidelines would be followed without the guidance of a comprehensive WMP.

Wildlife Management

Proposed Action

Management of wildlife is the responsibility of the Nevada Department of Wildlife (NDOW) whereas management of wildlife habitat is the responsibility of the BLM. Over the life of this plan it may be necessary to implement wildlife management activities to prevent degradation or enhance wilderness characteristics by promoting healthy, viable, and more naturally distributed wildlife populations and/or their habitats. Detailed guidelines are found in the WMP starting on page 40. Categories related to wildlife management are as follows:

- Wildlife Water Developments
- Inspection, Maintenance, and Repairs
- Collar Retrieval
- Emergency Actions
- Wildlife Relocation
- Wildlife Damage Management

No Action

A comprehensive wilderness management plan would not guide wildlife related management categories. Activities within these wilderness areas would be conducted in conformance with the current (2012; Supplement No. 9) and subsequent BLM-NDOW Memorandum of Understanding (MOU) and guided by the Clark County Conservation of Public Lands and Natural Resources Act of 2002, as well as BLM-APHIS MOU (2012) and BLM Manual 6340 (Management of Designated Wilderness Areas). Current laws, policies, and guidelines would be followed.

Fire Management Objectives and Guidelines

Proposed Action

Fire management objectives in the wilderness would be structured in accordance with the 2004 Southern Nevada District Fire Management Plan (FMP) and the WMP. If the FMP is updated over the life of this plan, the new policies would be followed. Following a fire, Emergency Stabilization and Rehabilitation activities may be undertaken in accordance with current Department of Interior policy (620 DM 3 Wildland Fire Management Burned Area Emergency Stabilization and Rehabilitation) and BLM policy (H-1742-1 Burned Areas Emergency Stabilization and Rehabilitation Handbook). Detailed guidelines are found in the WMP starting on page 43. Categories related to fire management are as follows:

- Fire Suppression Guidelines
- Fire Prevention
- Emergency Stabilization and Rehabilitation Activities

No Action

Fire management activities would occur without the guidance of a comprehensive wilderness management plan. Fire management objectives in the wilderness area would be structured in accordance with the Southern Nevada District Fire Management Plan (FMP).

Management of Environmental Education and Interpretation

Proposed Action

On and off site general interpretive information regarding natural and cultural resources and recreation opportunities in wilderness would be located on informational signs adjacent to and outside of wilderness, in brochures, on BLM recreation maps, and at the BLM Southern Nevada District Office website and Public Room. Detailed guidelines for general interpretive information regarding natural and cultural resources and recreation opportunities in wilderness are found in the WMP on page 47.

No Action

The BLM developed a wilderness public education plan for programs related to wilderness. This plan would be implemented without the guidance of a comprehensive wilderness management

plan specific to Arrow Canyon.

Commercial Service Restrictions

Proposed Action

Section 4(c) of the Wilderness Act (1964) prohibits commercial enterprises within wilderness, with the exception of those commercial services listed in Section 4(d) of the Wilderness Act. Details on commercial uses allowed in wilderness, including guide services, are found in the WMP starting on page 47.

No Action

Current laws, policies, and guidelines would be followed without the guidance of a comprehensive WMP.

Research

Proposed Action

Research proposals investigating indigenous plant communities, wildlife, geological or cultural resources, and the human dimensions of wilderness would be considered. Detailed guidelines regarding appropriate research proposals and subsequent approval within wilderness are found in the WMP starting on page 47.

No Action

Scientific research proposals would be considered that adhere to current laws, policies, and guidelines, but would be implemented without the guidance of a comprehensive wilderness management plan.

Structures, Installations and Other Human Effects or Disturbances

Proposed Action

BLM staff and volunteers monitoring wilderness would be given instructions on the identification of human effects that would be considered unattended personal property or refuse. Unattended personal property not associated with an active camp, including geocaches, would be removed by BLM personnel, and temporarily held at the appropriate BLM office. Detailed guidelines regarding this category are found in the WMP starting on page 48.

No Action

Current laws, policies, and guidelines would be followed without the guidance of a comprehensive wilderness management plan.

Military Operations

Proposed Action

Military training exercises occurring on the ground would not be located within the Arrow Canyon Wilderness. Guidelines for handling military operations would distinguish between emergency and non-emergency situations. Non-emergency incidents include release of flares, recovery of aircraft parts or retrieval of non-operational ordnance. Emergency situations include downed aircraft or pilot and some classes of live ordnance. Detailed guidelines for potential military operations are found in the WMP starting on page 48.

No Action

Current laws, policies, and guidelines would be followed without the guidance of a comprehensive wilderness management plan. The Las Vegas RMP management direction SS-3-a.f states that BLM will not authorize military maneuvers within the Mormon Mesa and Coyote Springs ACECs. That would remain in effect under the No Action alternative.

Additional Action Alternatives

Other Action Alternatives

No other action alternatives were needed to address unresolved conflicts concerning uses of available resources.

Alternatives Considered but Eliminated from Analysis

No other alternatives were considered for this WMP.

Affected Environment and Environmental Consequences

Introduction

The scope of this Environmental Assessment (EA) analysis comprises Arrow Canyon Wilderness and areas immediately adjacent to and outside of the wilderness. The planning area is located in Clark County in the Mojave Basin and Range ecoregion. The BLM's NEPA Handbook (H-1790-1) requires that all EAs address specific resources or concerns of the human environment. The list of elements contained in the handbook has been expanded by BLM Instruction Memoranda and Executive Orders. These items along with the rationale for including or not including them in this analysis are listed in Table 1. Resources not adversely affected will not be considered further in this document.

Resources/Concerns Considered for Analysis

The following items have been evaluated for the potential for impacts to occur — either directly, indirectly, or cumulatively — due to implementation of the *Proposed Action*. Consideration of some of these items ensures compliance with laws, statues, or Executive Orders that impose certain requirements upon all Federal actions. Other items are relevant to the management of public lands in general, and to the BLM Southern Nevada District in particular. Following the table, each analyzed item is organized into two parts: Affected Environment and Environmental Consequences.

Table 2. Resources/Concerns Considered for Analysis

<i>Resource/Concern</i>	<i>Issue(s) Analyzed? (Y/N)</i>	<i>Rationale for Dismissal from Analysis or Issue(s) Requiring Detailed Analysis</i>
Air Quality	N	Proposed actions would not increase air pollutant concentrations.
Cultural Resources	N	All ground disturbing activities will be subject to National Historic Preservation Act (1966) Section 106 review and SHPO consultation as per BLM Nevada's implementation of the State Protocol Agreement for Cultural Resources. All proposed activities and disturbances must avoid cultural resources. Prior to any proposed ground disturbing activities, all project areas will be inventoried to identify possible cultural resources. A cultural resources inventory needs assessment (CRINA) form would be completed and recommendations would be followed.
Environmental Justice	N	No minority or low-income groups would be disproportionately affected by high and adverse health or environmental effects.

Resource/Concern	Issue(s) Analyzed? (Y/N)	Rationale for Dismissal from Analysis or Issue(s) Requiring Detailed Analysis
Fire Management	Y	Fire management actions may affect wilderness character.
Fish and Wildlife (General)	Y	No fish present. Proposed actions, including designation of trails, trailheads, and staging areas, may impact individual animals.
Floodplains	N	Resource present but not impacted by proposed actions.
Forest and Rangeland Health	N	The Mojave/Southern Great Basin Resource Advisory Council sets the standards and guidelines for this resource. The proposed actions do not impact this guidance. The range and wild horse programs are responsible for adhering to the Council's standards and guidelines for rangeland health.
Grazing Uses	N	Grazing is not permitted within this Wilderness.
Invasive Non-Native Plant Species (includes noxious weeds)	Y	Surface disturbances from route rehabilitation may increase the potential to spread noxious and invasive weeds. Mitigation measures may reduce the potential to spread weeds.
Land Uses	N	Designation of wilderness, not this wilderness management plan, affects land uses.
Lands with Wilderness Characteristics	N	The proposed action is located in areas that were re-inventoried for the Las Vegas RMP Revision, portions of which were found to have wilderness characteristics. However, no LWC use allocation exists within the current RMP and therefore the resource is not present.
Migratory Birds	Y	Proposed action involving surface disturbing activities may impact migratory birds.
Mineral Resources	N	Arrow Canyon Wilderness is withdrawn from new mining claims.
Native American Religious Concerns	N	No concerns raised at this time.
Paleontological Resources	N	No known localities of high scientific value are known. The proposed action does not conflict with the BLM's Las Vegas Resource Management Plan (1998).
Recreation Uses	Y	The designation of trails and staging areas, placement of signs/kiosks, and potential for additional regulations may affect recreational use of these areas.
Special Designations other than Designated Wilderness	Y	Staging areas and sign/kiosk placement may occur within ACECs (areas of critical environmental concern).

Resource/Concern	Issue(s) Analyzed? (Y/N)	Rationale for Dismissal from Analysis or Issue(s) Requiring Detailed Analysis
Special Status Animal Species (Federally Protected and BLM Sensitive Species)	Y	Individual special status animal species may be impacted by the proposed actions.
Special Status Plant Species (Federally protected and BLM Sensitive Species)	Y	If unexpected special status plants are discovered during plan implementation, mitigation measures would be taken. Proposed action may impact undiscovered individual plants.
Vegetation/Soils/Watershed	Y	Weed management and route decommissioning may affect small areas of vegetation. Soils would not be destroyed or removed and watershed function would not be adversely affected. Vegetation communities would be improved with the implementation of the WMP.
Vegetative Resources (Forest or Seed Products)	N	The Wilderness Act does not allow forest or seed products to be sold from within the wilderness resource. It is not feasible to track and determine individual gathering impacts.
Visual Resource Management (VRM)	N	The proposed action is consistent with Visual Resource Management (VRM) Class I objectives for wilderness. The proposed action would not be visible from any road and the level of change to the landscape is low.
Wastes, Hazardous or Solid	N	No wastes are anticipated.
Water Quality, Drinking/Ground	N	Does not affect; herbicides used for tamarisk eradication are approved for use in aquatic areas.
Water Resources (Water Rights)	N	BLM is subject to State of Nevada water rights laws.
Wetlands/Riparian Zones	N	Implementing the standard operating procedures stated in the <i>Record of Decision for the Vegetation Treatments Using Herbicides on BLM lands in 17 Western States Programmatic EIS (2007)</i> will prevent impacts.
Wild Horses	N	No Herd Management Areas are present.
Wilderness	Y	Proposed actions seek to maintain, restore, or enhance wilderness character.

Mandatory Items Analyzed

Fire Management

Affected Environment

The role of wildlife fire is considered an essential ecological process in areas where the ecosystems evolved in the presence of fire. However, much of Arrow Canyon Wilderness evolved without broad-scale fires. Because much of the area is not fire adapted, the common fire response will be to prevent and suppress fires.

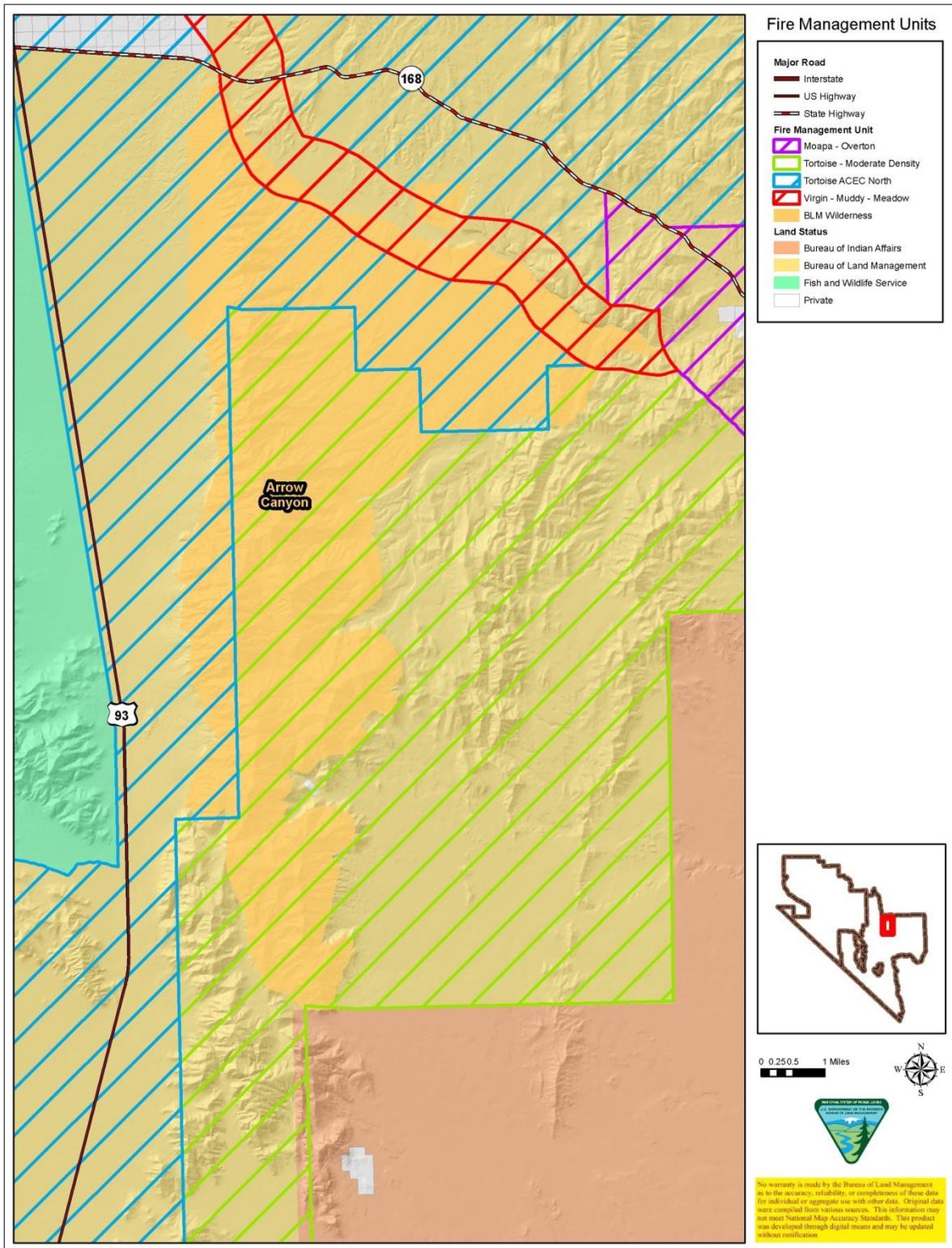
Changes in vegetation accumulating over almost a century and a half in the Mojave region have been substantial. In general, these changes are characterized by decreases in perennial shrubs, grasses, and native annuals and an increase in non-native annuals such as red brome (*Bromus rubens*). Continuous stands of non-native annuals provide fuel, which can carry fire over large areas. Historically, fires were small or infrequent over vast areas of the Mojave region, and because native desert plants did not evolve with large fires and are not adapted to it, they are usually killed by a moderate to high-intensity fire. The increasing incidence and severity of fires in the Mojave region are already converting desert shrublands into ephemeral grasslands.

Much of the area is identified as moderate or better density desert tortoise habitat. The desert tortoise is identified as a threatened species under the Endangered Species Act (ESA). Allowing natural fires to occur is likely to contribute to the loss of habitat and native vegetation and promote invasive annual grass species, which can lead to increased fire frequency and an annual grass fire cycle. Changes to the native vegetation components can be detrimental to the desert tortoise for a number of reasons. First, these reptiles require perennial shrubs for cover from the intense solar radiation in the desert. Second, perennial grasses are important secondary food sources for the desert tortoise in many areas. Third, recurring fires and competition from non-native annuals may reduce the abundance and diversity of native forbs, which are key food sources of the tortoise. Finally, major fires fragment desert tortoise habitat; fires also kill desert tortoises because they have no adaptive behavior mechanism to flee fire.

Four fire management units (FMUs) overlap the planning area. These areas are depicted in Map 5. The primary goals for the FMUs are to employ fire suppression strategies to protect Threatened and Endangered (T&E) species and their habitat. . The Fire Regime Condition Class is a numerical rating that represents the degree of departure from the historical fire regime and vegetation conditions or, in other words, fire frequency and severity. The majority of the wilderness is characterized by Fire Regime Condition Class 2 with some portions rated as Class 3. The following are the associated Fire Regime class definitions:

- *Fire Regime Condition Class 2*: “Fire regimes on these lands have been moderately altered from their historical range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified in these lands. To restore their historical fire regimes, these lands may require some level of restoration as through prescribed fire, mechanical or chemical treatments, and the subsequent reintroduction of native plants.”

- *Fire Regime Condition Class 3*: “These lands have been significantly altered from their historical range. Because fire regimes have been extensively altered, risk of losing key ecosystem components from fire is high. Consequently, these lands verge on the greatest risk of ecological collapse. To restore their historical fire regimes before prescribed fire can be utilized to manage fuel or obtain other desired benefits these lands may require multiple mechanical or chemical restoration treatments, or reseeded.”



Map 6. Fire Management Units that Overlap the Planning Area

The majority of these ecosystems are not fire adapted. Fires are now fueled by the presence of non-native annual species such as red brome and tamarisk, which increase fire intensity, rate of spread, and fire frequency. Non-native annual grasses burn more frequently and at larger scale than the native vegetation and perpetuate themselves through the annual grass fire cycle. Red brome is a fine flashy fuel which allows fires to spread rapidly and grow large quickly. Annual grass grows and cures early and is available as fuel longer than most native vegetation. Annual grass fills in the native vegetation interspaces creating a continuous fuel bed, which allows more area to burn.

Invasive species tend to return in higher densities after fire leading to an unnatural fire regime, loss of native plant species, and overall, a less diverse vegetation community (Howard 2006). Habitat protection will continue to be a critical challenge unless native vegetation communities can be preserved, protected, and restored to the area.

Environmental Consequences

Impacts of Proposed Action

The *Proposed Action* follows the current FMP which is tiered to the Resource Management Plan. The WMP updates wildland management in the FMP for the related Fire Management Units to include fuels treatments under an integrated vegetation management strategy that includes preservation and protection of habitat and wilderness values. Enhancing fire prevention, mitigation, and education will help prevent human caused fires.

Impacts from fire management actions in desert tortoise (*Gopherus agassizii*) habitat would be minimized by following the special Fire Management Actions for desert tortoise habitat in Chapter 3 of the BLM Las Vegas Resource Management Plan and EIS (1998). The suppression tactics used to limit impacts and prevent the spread of fire may have short-term impacts to wilderness character, but would enhance the natural characteristics of wilderness in the long-term. Limiting fire size through fire suppression will help protect and preserve native vegetation communities and desert tortoise habitat.

Impacts from fire management activities include visual impacts from suppression activities. Localized impacts to vegetation may occur if motorized access is granted for a specific fire. Soil disturbance may also occur during line construction. However, minimum impact suppression tactics (MIST) guidelines would be followed in an effort to minimize impacts to wilderness character as outlined in the Fire Management Plan. Actions deemed necessary by the Incident Commander for public and firefighter safety could cause short-term impacts to resources such as vegetation and wildlife.

Fuel treatments can reduce the risks of unwanted wildland fire by increasing fire suppression effectiveness and help preserve and protect values at risk such as vegetation desirable for wildlife habitat. Short-term impacts to wilderness values and character are possible. Specific treatment impacts would be evaluated on a case by case basis and would follow the SNDO Noxious Weed Plan, Integrated Weed Management, the BLM's noxious and invasive weed classification system (which is described in the BLM Manual 9015 Integrated Pest Management) and BLM Handbook

H-1740-2 (Integrated Vegetation Management Handbook). Treatment methods would be evaluated for compatibility with minimum tool and wilderness values.

Increased fire prevention through public outreach, education, prevention messages, posting fire restrictions and fire restriction enforcement will help reduce human caused fires.

Post-fire Emergency Stabilization and/or Rehabilitation seeding or planting treatments, if successful, would benefit wilderness by restoring natural vegetation communities or establishing a less fire-prone community if non-native species are approved.

Fire management planning may be altered in order to protect cultural resources.

Impacts of No Action

The No Action Alternative would not alter the current fire management program and would continue to limit fuels management activities with respect to the Noxious Integrated Weeds Management Plan for the related Fire Management Units. Fire mitigation and education activities would remain at current levels.

Fish and Wildlife (General)

Affected Environment

Wildlife species characteristic of the Mojave Desert are supported by the diverse habitat types found in the planning area. The area's climate and elevation range provide important habitat for a wide spectrum of wildlife. General species are those which are not already covered under the Migratory Bird Treaty Act or the Special Status Species list. Common animal species include reptiles such as the desert banded gecko (*Coleonyx variegatus variegates*), speckled rattlesnakes (*Crotalus mitchelli pyrrhus*), common kingsnake (*Lampropeltis getula*), western long-nosed snake (*Rhinocheilus lecontei*), and Mojave Desert sidewinder (*Crotalus cerastes cerastes*). Carnivores include ringtail (*Bassariscus astutus*) in the canyons and mountain lion (*Felis concolor*) which inhabit higher elevations. Small mammals include deer mice (*Peromyscus* spp.), Merriam's kangaroo rat (*Dipodomys merriami*), and valley pocket gopher (*Thomomys bottae*). Common bird species that may occur within the planning area, not already protected by the Migratory Bird Treaty Act or listed as include the house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*) and rock dove (*Columba livia*).

Hunting and trapping are permitted in wilderness subject to applicable State and Federal laws and regulations. Arrow Canyon is within the Nevada Department of Wildlife (NDOW) hunt unit 244. Small game and furbearers include black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), kit fox (*Vulpes macrotis*), bobcat (*Lynx rufus baileyi*), and coyote (*Canis latrans*). Nongame species of mammals, reptiles, and birds are diverse and provide the prey base for the predators of the area.

No fish species are found within the planning area.

Upland game species primarily consist of Gambel's Quail (*Callipepla gambelii*) and Chukar Partridge (*Alectoris chukar*).

Gambel's Quail— This quail is native to the Mojave Desert and the southern portion of the Great Basin. While their primary diet consists of leaves, grasses, and seeds, insects may be eaten during the nesting season. Water is a limiting factor and population numbers fluctuate during drought years; however, small game wildlife water developments help stabilize populations (Brown et al. 1998).

Chukar Partridge— This species from the pheasant family was introduced from Pakistan as an upland game bird. The chukar is found on rocky hillsides or open and flat desert with sparse grassy vegetation. Seeds are the primary diet although chukars will forage on some insects (Christensen 1996).

Environmental Consequences

Impacts of Proposed Action

Ground-disturbing methods relating to fire management activities, emergency stabilization and rehabilitation, route decommissioning, installation of signs, staging areas and pullouts, and trail maintenance activities could have localized, short term impacts on the behavior and movement of individuals. According to the *Record of Decision for the Vegetation Treatments Using Herbicides on BLM lands in 17 Western States Programmatic EIS* (2007), the herbicides used for tamarisk and Sahara mustard treatments “are not likely to impact” when applied at typical application rates.

Following Best Management Practices in accordance with the Las Vegas Field Office's Resource Management Plan (1998) would minimize impacts to resident birds stemming from ground disturbing activities such as restoration of decommissioned routes, vegetation restoration, fire management, or weeds treatments. In the long-term, route decommissioning may help restore formerly disturbed vegetation communities associated with former vehicle routes, thus providing a less fragmented landscape for wildlife.

Recreational use may create temporary localized impacts to wildlife through displacement of individual animals; however, the recreational experience may also be improved through increased opportunities to observe wildlife if restoration projects are successful. Increased pedestrian, equestrian, vehicle traffic to access points, and installation of signs has the potential to introduce invasive non-native plants, including noxious weeds.

The introduction of invasive grasses and shrubs may be the biggest challenge to wildlife in the project area. As a consequence, habitat could be impacted through decreased plant species diversity, increased fire frequency, and lack of water resources. At higher elevations or near springs, wildlife densities and competition may increase.

Impacts of No Action

In general, the impacts would be the same as the *Proposed Action* because fire management, emergency stabilization, and rehabilitation are guided by their specific resource programs and may still occur in wilderness. Vehicles pulling off designated routes and parking in undesignated areas would continue, resulting in habitat disturbance and possible widening of parking areas. Route restoration, installation of signs, staging areas, and trail maintenance would not occur; therefore, no impacts from these actions would take place.

Migratory Birds

Affected Environment

Many migratory and resident bird species likely occur in the Arrow Canyon Wilderness. Additional species not listed here may also be present. Common Neo-tropical migrant bird species occurring in the project area include black-throated sparrow (*Amphispiza bilineata*), lesser nighthawk (*Chordeiles acutipennis*), ash-throated flycatcher (*Myiarchus cinerascens*), and Brewer's sparrow (*Spizella breweri*). Common resident bird species include cactus wren (*Campylorhynchus brunneicapillus*), verdin (*Auriparus flaviceps*), and black-tailed gnatcatcher (*Polioptila melanura*).

Under the Migratory Bird Treaty Act of 1918 and subsequent amendments (16 U.S.C 703-711) it is unlawful to take, kill, or possess migratory birds. A list of protected bird species can be found in 50 C.F.R. §10.13. The list for birds protected under this regulation is extensive and the project site has potential to support many of these species, including the BLM sensitive species the western burrowing owl (*Athene cunicularia*). Typically, the breeding season is when these species are most sensitive to disturbance, which generally occurs from March 15 through July 30.

Migratory birds, including the western burrowing owl, may be present in the planning area. The following mitigation measures will be adhered to:

1. To prevent undue harm, habitat-altering projects or portions of projects should be scheduled outside bird breeding season. In upland desert habitats and ephemeral washes containing upland species, the season generally between March 15th-July 30th.
2. If a project that may alter any breeding habitat has to occur during the breeding season, then a qualified biologist must survey the area for nests prior to commencement of construction activities. This shall include burrowing and ground nesting species in addition to those nesting in vegetation. If any active nests (containing eggs or young) are found, an appropriately-sized buffer area must be avoided until the young birds fledge.

Environmental Consequences

Impacts of Proposed Action

Ground-disturbing methods relating to fire management activities, emergency stabilization and rehabilitation, route decommissioning, installation of signs, staging areas and pullouts, and trail maintenance activities could have localized, short term impacts on the behavior and movement of individuals. According to the *Record of Decision for the Vegetation Treatments Using*

Herbicides on BLM lands in 17 Western States Programmatic EIS (2007), the herbicides used for tamarisk and Sahara mustard treatments “are not likely to impact” when applied at typical application rates.

Following Best Management Practices in accordance with the Las Vegas Field Office’s Resource Management Plan (1998) would minimize impacts to migratory birds stemming from ground disturbing activities such as restoration of decommissioned routes, vegetation restoration, fire management, or weeds treatments. In the long-term, route decommissioning may help restore formerly disturbed vegetation communities associated with former vehicle routes, thus providing a less fragmented landscape for wildlife.

Recreational use may create temporary localized impacts to wildlife through displacement of individual animals; however, the recreational experience may also be improved through increased opportunities to observe wildlife if restoration projects are successful. Increased pedestrian, equestrian, vehicle traffic to access points, and installation of signs has the potential to introduce invasive non-native plants, including noxious weeds.

The introduction of invasive grasses and shrubs may be the biggest challenge to wildlife in the project area. As a consequence, habitat could be impacted through decreased plant species diversity, increased fire frequency, and lack of water resources.

Impacts of No Action

In general, the impacts would be the same as the *Proposed Action* because fire management, emergency stabilization, and rehabilitation are guided by their specific resource programs and may still occur in wilderness. Route restoration, installation of signs, staging areas, and trail maintenance would not occur; therefore, no impacts from these actions would take place.

Invasive Non-Native Plant Species (includes Noxious Weeds)

Affected Environment

Noxious and non-native invasive weeds are frequent obstacles to managing native plant communities in the Mojave Basin and Range ecoregion. Non-native invasive species are defined by Executive Order 13112 as “an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Alien refers to a species that did not evolve in the environment in which it is found. Noxious weeds are any plant designated by a Federal, State, or County government as injurious to public health, agriculture, recreation, wildlife, or property (Sheley, Petroff, and Borman 1999).

Noxious weeds in Nevada are classified by the Nevada Department of Agriculture and the Plant Protection Act (2000) administered by the United States Department of Agriculture’s Animal and Plant Health Inspection Service (APHIS). *Category A* weeds are weeds that are generally not found in, or that are limited in distribution, throughout the State. Such weeds are subject to active exclusion from the State, active eradication wherever found, and active eradication from the premises of a dealer of nursery stock. *Category B* weeds are weeds that

are generally established in scattered populations in some counties of the State. Such weeds are subject to active exclusion where possible and active eradication from the premises of a dealer of nursery stock. *Category C* weeds are weeds that are generally established and generally widespread in many counties of the State. Such weeds are subject to active eradication from the premises of a dealer of nursery stock.

Malta starthistle (*Centaurea melitensis*) is a Class A noxious weed in the State of Nevada is primarily found along the eastern edge of Pahranaagat Wash (upstream of Arrow Canyon Dam). Malta starthistle is an annual plant that reproduces by seed. It has a yellow flower, is spindly and no more than 12 inches tall in the project area.

Scotch thistle (*Onopordum acanthium*) is classified in the State of Nevada as a *Category B* noxious weed and is concentrated within areas of the Pahranaagat Wash, upstream of Arrow Canyon Dam) where tamarisk was previously removed. Scotch thistle in the project area often reaches more than six feet tall and has long thorns along its stems and leaves, making manual control challenging.

Sahara mustard (*Brassica tournefortii*) is classified in Nevada as a *Category B* noxious weed and has been documented in the Arrow Range and Arrow Canyon Wilderness. It is a drought-tolerant winter annual that prefers sandy soils and is most abundant in lower Mojave Desert scrub habitat. Up to 16,000 seeds can be produced from self-pollinating flowers. These seeds are spread by dried plants breaking off and tumbling across the ground. This invasive is of great concern because it grows faster than native forms, competes with native shrubs for water and light, and in areas of dense growth can become an unnatural fire hazard in dry years. Infestations are rapidly increasing northward through Clark County, Nevada.

Tamarisk (*Tamarix spp.*) is classified in Nevada as a *Category C* noxious weed. There are several documented infestations near Arrow Canyon in Pahranaagat Wash and its tributaries. There are 54 known species of tamarisk, which are native to North Africa, the Mediterranean, and the Middle East. Tamarisk is fire adapted, each plant can produce up to 500,000 wind-blown seeds, the leaves and flowers contain few nutrients for wildlife, and it tends to grow in riparian areas or where water is near the surface. Native aquatic systems are disrupted because of long tap roots that are capable of intercepting deep water tables and increased salinity of the surrounding soil after leaves drop. In turn, native species such as willow and mesquite are displaced leaving poor habitat and forage for wildlife. After burning or cutting, tamarisk can resprout making it difficult to eliminate thus requiring follow-up treatments (Plant Conservation Alliance 2009).

Red brome (*Bromus madritensis spp. rubens*) is an invasive, annual grass present in large areas at various densities throughout the planning area. It can be found in blackbrush (*Coleogyne ramosissima*), creosote bush (*Larrea tridentata*), and creosote bush-saltbush (*Atriplex spp.*)-blackbrush vegetation communities. Red brome flourishes in areas with weak competition from native plants and can grow on all types of topography. It is considered poor forage for cattle and wildlife due to its very short growing season and can potentially injure browsing animals.

Compared to areas with native vegetation, red brome-dominated landscapes have increased fire frequency and intensity due to the abundant and persistent fine fuels that promote hot, fast

fires. Whereas dead native annual species may only persist on the landscape up to one year, dead red brome stems and blades can last up to two years. Fires generated from red brome are hot enough to burn large shrubs such as creosote bush especially if fuel accumulation is present at the base of the shrub, and can burn small shrubs such as white bursage (*Ambrosia dumosa*) (Howard 2006). There are currently no large-scale programs to manage or eradicate red brome (Simonin 2001).

Cheatgrass (*Bromus tectorum*) is currently only found in a few areas at low density. This invasive annual grass displaces native perennial shrub, grass, and forb species because of its ability to germinate quicker and earlier than native species, thus outcompeting natives for water and nutrients. It can also grow at higher elevations. Cheatgrass is adapted to recurring fires that are perpetuated in part by the fine dead fuels that it leaves behind. In general, native plants have a difficult time thriving in these altered fire regimes.

Guidance in managing invasive species is provided by the 2006 BLM/LVFO Noxious Weed Plan.

Environmental Consequences

Impacts of Proposed Action

In general, the management actions outlined in this plan apply best management practices and standard operating procedures that focus on preventing the spread of weeds by vectors such as vehicles or equipment. Weed treatment procedures within the area would be clearly defined and compatible with limiting or eliminating noxious and invasive weeds. Designated staging areas and designated trails could be infested by weeds through vehicle or human transport.

Invasive annual grass treatment procedures would be clearly defined in the *Proposed Action* of any future site-specific NEPA analysis. This may enhance the ability of the BLM to control, contain, or eliminate certain invasive grasses within the area and prevent an annual grass fire cycle which could further harm the native vegetation in the area. If post-fire Emergency Stabilization and Rehabilitation activities should fail, then noxious and invasive weeds may increase in burned areas. If efforts are successful, however, then post-fire weed establishment or expansion would be minimized or stopped.

The continued presence and anticipated increase of recreational activities, including camping, hiking, and horse packing, may contribute to the spread of noxious and invasive species as a result of trampling of native species and the possibility of spreading noxious and invasive seeds into wilderness. Pack stock and animals used for recreational horseback riding would be fed with packed-in, certified weed-free feed, decreasing their contribution to weed infestation problems and the impact of incidental recreational horse browsing on vegetation.

Rehabilitation of small-scale disturbances would include methods such as decompaction, scarifying, and pitting soil that may stimulate the growth of noxious and invasive weeds. Future approved vegetation restoration projects may cause small, local disturbances that could increase local noxious and invasive weed populations. Allowable motorized access could occur through emergency stabilization and rehabilitation, wildlife management, or fire-management; such

access may cause disturbances that encourage weed establishment, or may introduce additional weeds into the wilderness.

Herbicides could come into contact with and impact non-target plants through drift, runoff, wind transport, or accidental spills and direct spraying. Potential impacts include mortality, reduced productivity, and abnormal growth. However, implementing the associated SOPs outlined in the Record of Decision for the Vegetation Treatments Using Herbicides on BLM lands in 17 Western States Programmatic EIS (2007) will minimize or eliminate these risks.

Federally and State listed noxious weeds would continue to be treated on a case-by-case basis as per the SNDO Noxious Integrated Weed Management Plan. The BLM's noxious invasive weed classification system and the BLM Integrated Vegetation Management Handbook would be consulted in setting priorities for noxious weed control.

Impacts of No Action

Wilderness that is treated as a hands-off natural area, allowing whatever processes of species change to occur through incoming new plants without human intervention is likely to degrade wildlife habitat and increase wildland fire. Wildland fire is a significant factor in degrading natural, native vegetation and can result in the loss in ecosystem function and related wildlife habitat. Over time through repeated wildfires, most native Mojave Desert vegetation may be eliminated further degrading desert tortoise habitat. In addition, an increase in invasive annuals, tamarisk, or other unnatural fuel loads increases the potential for fires, as fire conditions are present year round. Natural lightning-caused fires are common during the monsoon season historically peaking in July.

Weed introduction from individuals hiking and from vehicles using wilderness boundary roads may occur. Compared to the *Proposed Action*, weed treatment would be sporadic and would not occur in a timely manner. Additionally when weeds are found site-specific NEPA analysis would not be guided by the treatment options and priorities outlined in the *Proposed Action*, further slowing response times for weed treatments.

Recreation Uses

Affected Environment

The planning area is an hour and a half drive from Las Vegas. Year round recreation use is possible although visitation may be limited in the summer when temperatures surpass 100°F. Although the amount of annual visitation is unknown, the numbers are growing based on reports from local residents and an increasing mention of Arrow Canyon on internet web sites.

Recreational activities include hiking, camping, technical rock climbing, nature study, and hunting. Scarcity of water may limit some activities such as horseback riding and backpacking; the lack of on-site water sources requires a more self-sufficient traveler. OHV use outside the wilderness and that provide access to the area is limited to designated routes. Seasonal fire restrictions may limit or curtail recreational uses such as camping. The rugged peaks, cliffs,

mesas, bajadas and remote canyons offer destinations for hikers and climbers. There are undesignated and unmaintained trails to the summits of the highest peaks of the Arrow Canyon Range near Arrow Peak, which provide opportunities for rock scrambling. Less difficult hiking opportunities can be had on the bajadas of the wilderness' eastern outer edges. Although prohibited, several physical geocaches are known to exist in the wilderness and BLM policy is to remove them when found.

Permits are required for organized groups such as universities and tours, and there are group size limits to maintain solitude and wilderness characteristics. To date, no requests for commercial services within wilderness have been received. The only camping restriction is the 14-day stay limit. New campsites must be moved 25 miles from the previous camp.

The majority of this wilderness area provides the opportunity to experience a sense of remoteness and isolation. There are numerous draws, ravines, rocky outcrops, ridges, and canyons that create secluded locales. The seclusion, the amount of acreage, and low visitation throughout a majority of Arrow Canyon Wilderness combine to provide outstanding opportunities for solitude. Visitation appears to be highest in the northern portion of the planning area, particularly in the vicinity of Pahrangat Wash where vehicle access is easy and therefore solitude may be reduced. The flat topography, sparse vegetation, and periodic sights and sounds of vehicles in adjacent lands, and aircraft flying overhead may decrease the experience and expectation of solitude.

Environmental Consequences

Impacts of Proposed Action

The *Proposed Action* includes (1) the designation of two hiking trails leading to and within the wilderness, totaling approximately 8.6 miles; (2) the creation of vehicle staging areas with barriers; and, (3) the installation of signs and kiosks. The *Proposed Action* would provide hiking opportunities while protecting sensitive resources by concentrating impacts in specific areas. The designation of the trails would focus on stabilizing the tread surface and minimizing erosion in fragile areas as well as diverting traffic away from sensitive resources. This focus is based upon a need to maximize visitor safety and resource protection in the more heavily used sections of the wilderness. Off-trail travel would not be impacted. The experience of visitors seeking a more primitive and unconfined form of recreation would be decreased slightly by the designating trails however, opportunities for solitude would remain extensive.

Solitude and wilderness character are increased for wilderness users in Pahrangat Wash and the surrounding area by moving motorized traffic back towards the vehicle parking and staging area and trailhead at the Table Mountain entrance to Arrow Canyon Wilderness. This will reduce the compaction and erosion of soils in the riparian environments where soft soils are primarily sand and alluvium. It will also improve habitat for wildlife as a portion of Pahrangat Wash will be restored to its natural water flow allowing vegetation to recover as vehicle scars are restored. The *Proposed Action* restricts vehicles and human activities in areas of desert tortoise habitat.

The risk of human caused fires is always possible but would be minimized by having hikers and

campers start at a designated staging area posted with visitor use information including the risk of fire danger. Strict enforcement of fire restrictions — when enacted — is required. Outreach through public wilderness education and fire prevention programs may reduce human caused fires. For example, educating wilderness users that burning camp refuse in the Mojave can easily start fires is likely to reduce or eliminate this practice. Interpretation efforts would be aimed at ensuring wilderness visitors are well prepared for entering the desert environment and knowledgeable about how to protect both resources and themselves in Arrow Canyon Wilderness.

Recreational activities may be impacted by temporary closures of areas as a result of fire suppression activities, emergency stabilization and rehabilitation, and herbicide treatments of invasive non-native and noxious weed treatments. Recreational use may create temporary localized impacts to wildlife through displacement of individual animals. Increased pedestrian, equestrian, vehicle traffic (to staging areas), and installation of signs has the potential to introduce invasive non-native plants including noxious weeds. The creation of vehicle staging areas and sign installations would create small, localized disturbances within marginal desert tortoise habitat and to vegetation and soils.

Impacts of No Action

Impacts to recreation and wilderness resources may be more severe. No trails would be designated; however, miles of former vehicle routes would be available for hiking and equestrian use. The lack of designated trails may increase opportunities for recreationists seeking a primitive and unconfined type of recreation and increased opportunities for solitude; however, the absence of designated trails may result in numerous informal hiking paths, which may increase disturbance to vegetation and soils and cultural resources.

There would be no vehicle staging area, barrier construction, or sign/kiosk installation thereby eliminating any short-term localized impacts to vegetation and soils. The absence of these amenities may, however, result in widespread impacts to resources from motorists creating their own staging areas and possibly driving into wilderness. The lack of signs and kiosks providing information, resource interpretation, and education may also reduce visitors' experience and protection of the wilderness resource.

Special Designations other than Designated Wilderness

Affected Environment

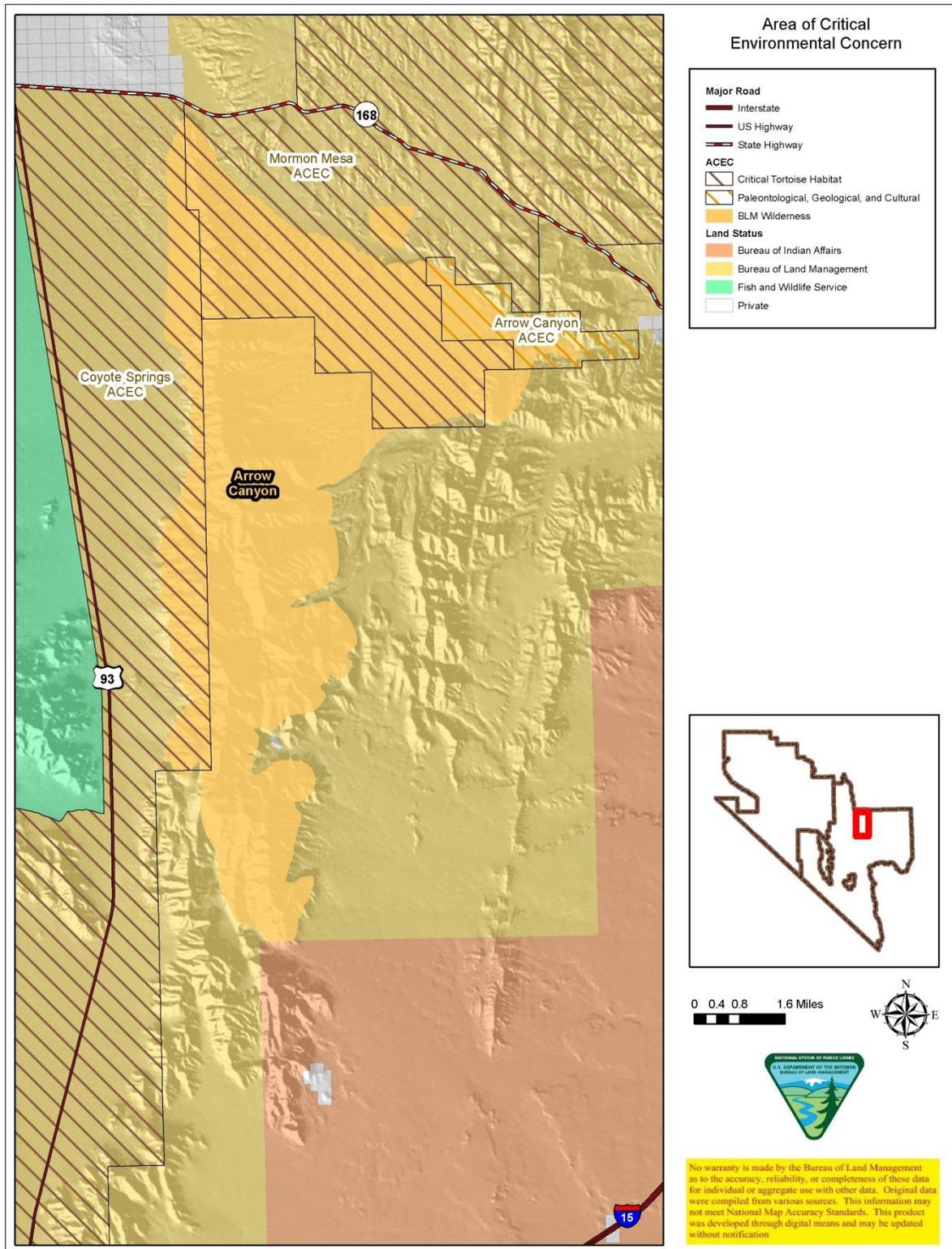
Areas of Critical Environmental Concern (ACECs)

Three ACECs — Mormon Mesa, Coyote Springs, and Arrow Canyon — overlap the planning area. ACECs were designated as a result of mandates from section 202(3)(c) of the Federal Land Policy and Management Act of 1976 (FLPMA) and refer to geographical areas within lands administered by the BLM that require special measures to protect sensitive cultural, physical, or biological resource values. Management of ACECs seeks to eliminate or minimize competing or conflicting land uses. Within these ACEC boundaries, grazing allotments have been closed; this is not an active Wild Horse and Burro Herd Management Area and there would be a zero population size; areas are managed as right of way (ROW) avoidance regions; and habitat

restoration is a top priority.

The Mormon Mesa and Coyote Springs ACECs were created primarily to protect critical habitat for the federally listed desert tortoise. The Mormon Mesa ACEC extends south from the Meadow Valley Range Wilderness in Lincoln County, crosses State Highway 168, and includes almost all the Arrow Canyon Wilderness around Pahrangat Wash, Table Mountain, Arrow Canyon, and the mesas, bajadas, and northernmost portion of the Arrow Canyon Range. The Coyote Springs ACEC extends east across State Highway 93 to include the western face of the northern section of the Arrow Canyon Range.

The Arrow Canyon ACEC was designated to protect paleontological, geological, and archaeological resources (fossil trackways, mid-carboniferous boundary stratotype, and petroglyphs). This ACEC is located within northeast portion of the planning area which includes Arrow Canyon and Pahrangat Wash. Map 6 shows the ACEC boundaries.



Map 9. Area of Critical Environmental Concern within the Planning Area

Environmental Consequences

Impacts of Proposed Action

Impacts to the ACECs from the construction of staging areas would be minimal (less than 2 acres). Designation and delineation of staging areas would reduce future habitat disturbance from unregulated parking. Weed management and restoration of decommissioned former vehicle routes would be beneficial to the overall habitat condition in these ACECs. Fire management objectives utilize practices that minimize the loss of desert tortoise cover and hinder the spread of non-native invasive annual grasses. Area closures due to seasonal fire risk may be considered. Overall, however, fire management activities are likely to protect and preserve habitat in these ACECs.

Impacts of No Action

The staging areas, signs, and pullouts would not be installed; therefore, impacts from construction and maintenance would not occur. Informal creation of parking areas would continue to occur along designated routes, resulting in habitat disturbance and possible widening of routes as parking areas become denuded. This may result in the introduction and/or spread of non-natives including noxious weeds.

Special Status Animal Species (Federally Protected and BLM Sensitive Species)

Affected Environment

In addition to species federally protected under the Endangered Species Act, Nevada BLM Special Status Species include fish and wildlife that are classified as protected under Nevada Revised Statute (NRS) 501.110. Further, Nevada BLM includes sensitive species, which are defined as taxa that are not federally or State protected. It is BLM policy to provide the same level of protection for sensitive species as for federal candidate species (BLM 2008b). The manual states, “BLM shall implement management plans that conserve candidate species and their habitat and ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed.”

Mojave Desert Tortoise — The only federally listed species in the project area is the Mojave desert tortoise (*Gopherus aggasizii*). The Mojave population of desert tortoise (west of the Colorado River) was listed by the United States Fish and Wildlife Service (USFWS) as threatened in 1990. This long-lived species inhabits creosote bush–burro bush or creosote bush–Joshua tree vegetation types in the eastern Mojave Desert where they forage primarily on perennial grasses and forbs. Mating can occur anytime between March and October, after which this species goes into brumation (hibernation). It takes about 5 years before the carapace (shell) hardens, thus the young are extremely vulnerable to predation. Sexual maturity is reached between 10 and 15 years. Primary threats include habitat loss, livestock grazing, raven predation, and disease.

Desert Bighorn Sheep — Arrow Canyon Wilderness provides year round habitat for the desert bighorn sheep, which is a BLM Special Status Species. One of four desert subspecies (*Ovis canadensis*) found in North America, this bighorn prefers rough, rocky, and steep terrain; require freestanding water in the summer months or during drought; they mainly eat grasses, shrubs, and forbs (BLM 2008b). One big game wildlife water development is located in the wilderness and was constructed prior to wilderness designation specifically to support this species. Portions of the planning area contain year-round habitat for the desert bighorn.

In the Nevada Natural Heritage database, several Nevada BLM Special Status and Sensitive wildlife species, such as desert bighorn sheep, burrowing owl, golden eagle, ferruginous hawk, prairie falcon, and banded Gila monster, have been documented within the planning area. However, this may not represent actual species present because extensive surveys within the wilderness and adjacent land have not been conducted. It is possible that various other BLM special status and sensitive species may be discovered in the future within the planning area.

Table 3 lists each Nevada BLM special status and sensitive wildlife species that may occur in the planning area.

Table 3. Special Status Animal Species that may occur in the Planning Area

<i>Special Status Animal Species</i>	<i>Scientific Name</i>
Mojave Desert Tortoise	<i>Gopherus agassizii</i>
Banded Gila Monster	<i>Heloderma suspectum cinctum</i>
Desert Glossy Snake	<i>Arizona elegans eburnata</i>
Mojave Desert Sidewinder	<i>Crotalus cerastes cerastes</i>
Common Chuckwalla	<i>Sauromalus ater</i>
Golden Eagle	<i>Aquila chrysaetos</i>
LeConte's Thrasher	<i>Toxostoma lecontei</i>
Loggerhead Shrike	<i>Lanius ludovicianus</i>
Bendire's Thrasher	<i>Toxostoma lecontei</i>
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>
Burrowing Owl	<i>Athene cunicularia</i>
Prairie Falcon	<i>Falco mexicanus</i>
Ferruginous Hawk	<i>Buteo regalis</i>
American Peregrine Falcon	<i>Falco peregrinus anatum</i>
Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>

<i>Special Status Animal Species</i>	<i>Scientific Name</i>
Western Parastrellus	<i>Pipistrellus hesperus</i>
Pallid Bat	<i>Antrozous pallidus</i>
Long-eared Myotis	<i>Myotis evotis</i>
Allen’s Big-eared Bat	<i>Idionycteris phyllotis</i>
Small-footed Myotis	<i>Myotis ciliolabrum</i>
Fringed Myotis	<i>Myotis thysanodes</i>
Cave Myotis	<i>Myotis velifer</i>
California Myotis	<i>Myotis californicus</i>
Yuma Myotis	<i>Myotis yumanensis</i>

Environmental Consequences

Impacts of Proposed Action

Ground-disturbing activities relating to fire management practices, emergency stabilization and rehabilitation and vegetation management; restoration of decommissioned routes; and the installation of signs, and staging areas could have localized, short term impacts on the behavior and movement of individuals. Ground-disturbing activities related to fire management practices will most likely create new disturbance and could kill or injure tortoises. If herbicides are used in tortoise habitat further consultation is required.

The potential for impacts to the federally listed desert tortoise will be reduced by following the best management practices in accordance with the Las Vegas Field Office RMP (1998). Additional consultation may be required to carry out activities discussed in the *Proposed Action*.

Human caused fires such as an escaped campfire impact habitat. Compliance and enforcement of fire restrictions are required when restrictions are in place. Additionally wilderness education and fire prevention programs may help reduce the risk of human-caused fire starts.

Following best management practices in accordance with the Las Vegas Field Office RMP (1998) would minimize impacts to special status species stemming from ground disturbing activities such as decommissioned route vegetation restoration, fire management, or weeds treatments. In the long-term, route restoration of former vehicle routes may help restore disturbed vegetation communities thus providing a less fragmented vegetative landscape for wildlife.

Invasive grasses and other non-native plants and animals compete for space and water and may be one of the greatest challenges to special status or sensitive species in the wilderness. Many non-natives are more drought and fire tolerant than natives. The habitat that Nevada BLM

special status and sensitive wildlife species depend upon could be impacted through decreased plant species diversity, increased fire frequency, and lack of water resources.

Impacts of No Action

Site-specific actions such as restoration of former vehicle routes, installation of signs, and staging areas would not occur; therefore no impacts from these actions would take place. Without the staging areas and the associated interpretation and education exhibits, the visitor may not know about threats to native species or dangers of desert survival and fire.

Any future wildlife activities such as augmentation or installation of wildlife water developments would have to undergo site-specific NEPA analysis.

Special Status Plant Species (Federally Protected and BLM Sensitive Species)

Affected Environment

Nevada BLM Special Status Species include plant species that are designated by the BLM Nevada State Director and are managed by the BLM under BLM Manual 6840.06E. This list includes species that are federally listed, and candidate species under the Endangered Species Act and plant species declared by the State Forester Firewarden to be threatened with extinction pursuant to Nevada Revised Statutes (N.R.S.) 527.260-.300.

In the Nevada Natural Heritage Database, the only documented BLM sensitive plant species within the planning area is the white bearpoppy (*Arctomecon merriamii*). This may not represent the actual species present, however, because extensive surveys within the wilderness and adjacent land have not been conducted. It is possible other BLM sensitive plant species may be discovered within the planning area.

The Las Vegas buckwheat (*Eriogonum corymbosum var. nilesii*) is a genetically unique subspecies of buckwheat located in southern Nevada with the potential to occur within Arrow Canyon Wilderness. In 2005, populations of this buckwheat were found in the Coyote Springs Valley on BLM lands and within the Coyote Springs Development near the intersection of State highways 93 and 168 adjacent to the northwest corner of the wilderness. Its habitat partially overlaps with the Nevada State listed (critically endangered) Las Vegas bear poppy. Table 4 displays other potential special status plant species that may occur in the planning area based on habitat characteristics.

Table 4. Special Status Plant Species that may occur in the Planning Area

<i>Special Status Plant Species</i>	<i>Scientific Name</i>
Las Vegas Bearpoppy	<i>Arctomecon californica</i>
White Bearpoppy	<i>Arctomecon merriamii</i>
Threecorner Milkvetch	<i>Astragalus geyeri var. triquetrus</i>

<i>Special Status Plant Species</i>	<i>Scientific Name</i>
Halfring Milkvetch	<i>Astragalus mohavensis var. hemigyris</i>
Las Vegas Buckwheat	<i>Eriogonum corymbosum</i>
Clokey Buckwheat	<i>Eriogonum heermannii var. clokeyi</i>
Blue Diamond Cholla	<i>Opuntia whipplei var. multigeniculata</i>
Sticky Ringstem	<i>Annulocaulis leiosolenus</i>
Sticky Buckwheat	<i>Eriogonum vicidulum</i>

Environmental Consequences

Impacts of Proposed Action

Destruction of individual undiscovered plants could occur from activities relating to fire management. No other proposed activities in in the planning area would intentionally cause harm to any special status plant species.

Human-caused fires such as an escaped campfire may impact habitat. Compliance and enforcement of fire restrictions are required when such restrictions are in place. Wilderness education and fire prevention programs may help reduce the risk of human-caused starts.

Impacts of No Action

Without the designation of staging areas and installation of educational and interpretive information, it is less likely that visitors would be educated about the fire dangers to the Mojave environment.

Vegetation/Soils/Watershed

Affected Environment

Arrow Canyon Wilderness and adjacent land in the planning area are located in the Mojave Basin and Range ecoregion (Mojave Desert). In 1999 the Southwest Regional Gap Analysis Project (SWReGAP) was initiated and mapped landscape features over a five-state region (Arizona, Colorado, Nevada, New Mexico, and Utah) including ecological systems that are grouped into vegetation patterns (Lowry et al. 2005). Table 5 displays the ecological system and percent of each within the wilderness area based on SWReGAP information. This information is also depicted in Map 7.

Table 5. Ecological Systems within Arrow Canyon Wilderness by Percentage of Cover

<i>Ecological System</i>	<i>Percentage of Cover</i>	<i>Acres</i>
Mojave Mid-Elevation Mixed Desert Scrub	10.81	2,978.22
Sonora-Mojave Creosotebush-White Bursage Desert Scrub	50.62	13,943.00
North American Warm Desert Bedrock Cliff and Outcrop	38.12	10,500.20
Sonora-Mojave Mixed Salt Desert Scrub	0.12	33.33
North American Warm Desert Playa	0.00	0.78
North American Warm Desert Wash	0.02	4.82
Inter-Mountain Basins Semi-Desert Shrub Steppe	0.27	75.13
Invasive Southwest Riparian Woodland and Shrubland	0.04	10.38
North American Arid West Emergent Marsh	0.00	0.75

Mojave Mid-Elevation Mixed Desert Scrub

This ecological system is generally found in the eastern and central Mojave Desert and on lower piedmont slopes in the transition zone into the southern Central Basin and Range ecoregion. The vegetation in this ecological system is diverse. Characteristic species include blackbrush (*Coleogyne ramosissima*), eastern Mojave buckwheat (*Eriogonum fasciculatum*), Mormon tea (*Ephedra nevadensis*), Mojave yucca (*Yucca schidigera*), and Joshua tree (*Yucca brevifolia*). Grass species may include Indian ricegrass (*Achnatherum hymenoides*), Sandberg bluegrass (*Poa secunda*), or big galleta (*Pleuraphis rigida*).

Sonora-Mojave Creosotebush-White Bursage Desert Scrub

This desert scrub system is characteristic of the broad valleys, bajadas, plains, and low hills in the Mojave and lower Sonoran deserts. Creosotebush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) are typically the dominant species, but many shrubs may co-dominate or form sparse understories in any given area. Associated species include four-wing saltbrush (*Atriplex canescens*), desert holly (*Atriplex hymenelytra*), brittlebrush (*Encelia farinose*), Mormon tea (*Ephedra nevadensis*), ocotillo (*Fouquiereria splendens*), water jacket (*Lyceum andersonii*) and beavertail cactus (*Opuntia basilaris*). The understory is typically sparse but may be seasonally abundant with short-lived wildflowers. Herbaceous species such as sandmat (*Chamaesyce* spp.) and woolygrass (*Dasyochloa pulchella*), and desert trumpet (*Eriogonum inflatum*) are common.

North American Warm Desert Bedrock Cliff and Outcrop

This vegetation pattern is found from subalpine to foothill elevations and includes barren and sparsely covered terrain (generally less than 10% plant cover) consisting of steep cliff faces with scree and talus slopes, narrow canyons, and smaller rock outcrops. There is a diverse suite of species including teddybear cholla (*Opuntia bigelovii*), various succulent species, and lichens.

Sonora-Mojave Mixed Salt Desert Scrub

This ecological system consists of extensive open-canopied shrublands of typically saline basins in the Mojave and Sonoran deserts. Stands often occur around playas. Substrates are generally

fine-textured, saline soils. Vegetation is typically composed of one or more *Atriplex* species such as fourwing saltbush (*Atriplex canescens*) or cattle saltbush (*Atriplex polycarpa*) along with other species of *Atriplex*. Species of *Allenrolfea*, *Salicornia*, *Suaeda*, or other halophytic plants are often present to codominant. Graminoid species may include alkali sacaton (*Sporobolus airoides*) or saltgrass (*Distichlis spicata*) at varying densities.

North American Warm Desert Playa

This system is composed of barren and sparsely vegetated playas (generally <10% plant cover) found across the warm deserts of North America, extending into the extreme southern end of the San Joaquin Valley in California. Playas form with intermittent flooding, followed by evaporation, leaving behind a saline residue. Salt crusts are common throughout, with small saltgrass beds in depressions and sparse shrubs around the margins. Subsoils often include an impermeable layer of clay or caliche. Large desert playas tend to be defined by vegetation rings formed in response to salinity. Given their common location in wind-swept desert basins, dune fields often form downwind of large playas. In turn, playas associated with dunes often have a deeper water supply. Species may include iodinebush (*Allenrolfea occidentalis*), *Suaeda* spp., saltgrass (*Distichlis spicata*), common spikerush (*Eleocharis palustris*), *Oryzopsis* spp., *Sporobolus* spp., *Tiquilia* spp., or *Atriplex* spp. Ephemeral herbaceous species may have high cover periodically.

North American Warm Desert Wash

This ecological system is restricted to intermittently flooded washes or arroyos that dissect bajadas, mesas, plains and basin floors throughout the warm deserts of North America. Although often dry, the intermittent fluvial processes define this system, which are often associated with rapid sheet and gully flow. This system occurs as linear or braided strips within desert scrub- or desert grassland-dominated landscapes. The vegetation of desert washes is quite variable ranging from sparse and patchy to moderately dense and typically occurs along the banks, but may occur within the channel. The woody layer is typically intermittent to open and may be dominated by shrubs and small trees such as catclaw acacia (*Acacia greggii*), splitleaf brickellbush (*Brickellia laciniata*), desertbroom (*Baccharis sarothroides*), desert willow (*Chilopsis linearis*), Apache plume (*Fallugia paradoxa*), burrobrush (*Hymenoclea salsola*), singlewhorl burrobrush (*Hymenoclea monogyra*), little walnut (*Juglans microcarpa*), *Prosopis* spp., smoketree (*Psoralea argemonea*), desert almond (*Prunus fasciculata*), littleleaf sumac (*Rhus microphylla*), Mexican bladdersage (*Salazaria Mexicana*), or greasewood (*Sarcobatus vermiculatus*).

Inter-Mountain Basins Semi-Desert Shrub Steppe

This ecological system occurs at lower elevations on alluvial fans and flats with moderate to deep soils. This semi-arid shrub steppe is typically dominated by grass species (greater than 25% cover) with an open shrub layer. Characteristic grasses include Indian ricegrass (*Achnatherum hymenoides*), saltgrass (*Distichlis spicata*), and needle-and-thread grass (*Hesperostipa comata*). Woody species include four-wing saltbrush (*Atriplex canescens*), Greene's rabbitbrush (*Chrysothamnus Greenei*), winterfat (*Krascheninnikovia lanata*), and broom snakeweed (*Gutierrezia sarothrae*).

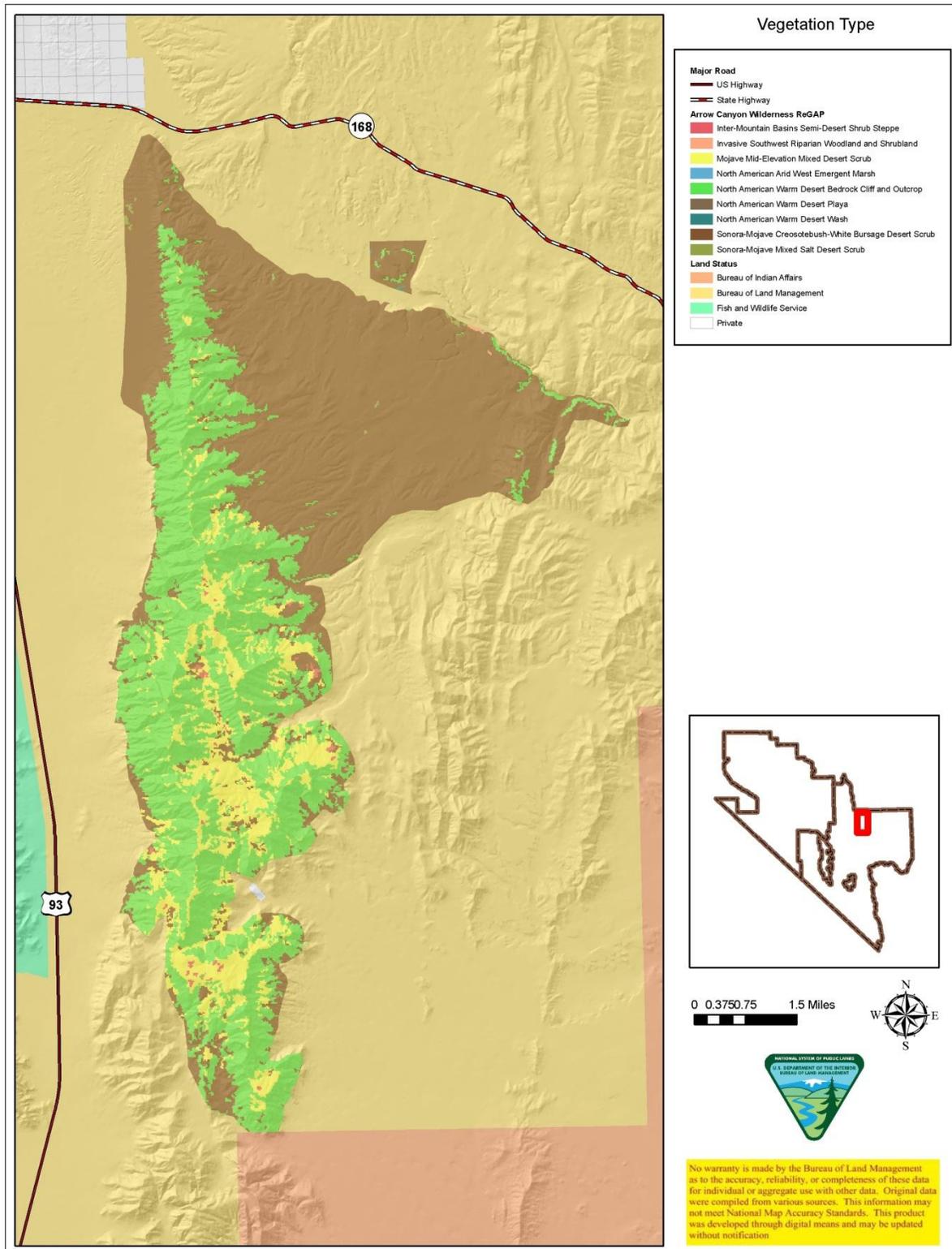
Invasive Southwest Riparian Woodland and Shrubland

This ecological system is dominated by Tamarisk (*Tamarix* spp.) and includes the Semi-Natural

Temporarily Flooded Shrubland Alliance and Russian olive (*Elaeagnus angustifolus*) Semi-Natural Woodland Alliance.

North American Arid West Emergent Marsh

This widespread ecological system occurs throughout much of the arid and semi-arid regions of western North America. Natural marshes may occur in depressions in the landscape (e.g., ponds, kettle ponds), as fringes around lakes, and along the mainstem and backwater channels of slow-flowing streams and rivers. Marshes are frequently or continually inundated, with water depths up to 2 meters. Water levels may be stable, or may fluctuate 1 meter or more over the course of the growing season. Marshes have distinctive soils that are typically mineral, but can also accumulate organic material. Soils have characteristics that result from long periods of anaerobic conditions in the soils (e.g., gleyed soils, high organic content, redoximorphic features). The vegetation is characterized by herbaceous plants that are adapted to saturated soil conditions. Common emergent and floating vegetation includes species of bulrushes (*Scirpus* spp.), cattails (*Typha* spp.), rushes (*Juncus* spp.), pondweeds (*Potamogeton* spp.), smartweeds (*Polygonum* spp.), and pond lilies (*Nuphar* spp.). This system may also include areas of relatively deep water with floating-leaf plants such as duckweed (*Lemna* spp.) and submergent and floating plants such as water milfoil (*Myriophyllum* spp.), hornwort (*Ceratophyllum* spp.), and waterweed (*Elodea* spp.).



Map 8. ReGAP Vegetation Type within Arrow Canyon Wilderness

Environmental Consequences

Impacts of Proposed Action

The total area of disturbance stemming from the three staging areas would be less than four acres and is located outside the wilderness boundaries. These actions are proposed for relatively disturbed surface areas; therefore, there would be nominal impacts to vegetation communities. Vehicle barriers would also be constructed to prevent unauthorized vehicles from entering the wilderness. This would limit impacts to vegetation.

Small amounts of vegetation outside the wilderness may be temporarily impacted along an administrative access route used by authorized vehicles during future emergency stabilization and rehabilitation, wildlife/vegetation management, or fire management actions. Small areas of vegetation could be disturbed or destroyed if vegetation is removed to protect sensitive cultural resources, such as prehistoric rock art, from wildland fire.

Reclaiming decommissioned (closed but not yet restored or revegetated) routes would reduce or eliminate further unauthorized incursions. New plant growth would also enhance the vegetation communities in proximity to these former routes.

Human-caused fires such as an escaped campfire may impact habitat. Compliance and enforcement of fire restrictions are required when restrictions are in place. Additionally wilderness education and fire prevention programs may help reduce the risk of human-caused starts.

Approved research on native plant communities, vegetation restoration projects, and monitoring could lead to improved vegetation communities within the wilderness.

Impacts of No Action

Altered vegetation communities may persist or further degrade impacting wildlife habitat and increasing the frequency and severity of wildfires. The degradation of vegetative communities from continued motorized trespass and poor wilderness ethics could result if an administrative access route is not designated, staging areas and pullouts are not constructed, and education and interpretive signs are not posted.

Wilderness

Affected Environment

Wilderness is an area designated by Congress and defined by the Wilderness Act of 1964 as a place that (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; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. The Wilderness Management Plan

addresses management of the 27,530 acres of the Arrow Canyon Wilderness. Wilderness characteristics are described as: *untrammelled, natural, undeveloped, and having outstanding opportunities for solitude or primitive and unconfined recreation.*

Untrammelled

A trammel is a modern human control or manipulation that hinders and restricts the components or ecological processes functioning within wilderness. Activities that would qualify as trammels include manual removal and herbicide use on for non-native invasive weed species and fuels reduction in upper Pahranaagat Wash followed by restoration with native plant species, and removal of vegetation due to former livestock grazing, installation and maintenance of one big game wildlife water development, the presence of Arrow Canyon Dam, cutting back vegetation from cultural sites, vehicle incursions, and mine adit in Side Canyon Wash.

Natural

Arrow Canyon Wilderness appears to be substantially free from the effects of modern civilization, having been primarily affected by the forces of nature; its primeval character is mostly preserved. Some changes to the native vegetation composition have occurred, including the introduction of the non-native invasive weeds such as red brome, cheatgrass, tamarisk, Sahara mustard, scotch thistle, and malta starthistle. Non-native chukar partridge may be present.

Undeveloped

The wilderness area has few authorized or pre-designation permanent improvements or other evidence of modern human presence or occupation, most of which are located within the Pahranaagat Wash. Structures and installations include Arrow Canyon Dam, one big game wildlife water development, mine adit, unauthorized motor vehicle use and spray paint graffiti by the general public, authorized geologic bore hole sampling, a temporary acoustic monitoring station, and authorized use of motorized equipment for non-native invasive weed treatments and fuels reduction.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation

The wilderness area provides outstanding opportunities for people to experience solitude and primitive, unconfined recreation. Jagged peaks and ridges, rugged escarpments, and narrowly carved canyons in the area provide excellent opportunities for solitude. The rugged terrain, steep rock faces, and shallow caves provide for primitive recreation opportunities such as hiking, camping, technical rock climbing, hunting and trapping, horseback riding, and nature study. No designated trails currently exist within the wilderness, though an unknown number of single track social trails and former vehicle routes persist, which could be used for travel by recreationists upon discovery. Otherwise people and stock are allowed to move freely throughout the wilderness. Permanent fixed anchors for technical rock climbing and physical geocaches are the only known user-developed recreation amenities, No other trail markers or signs, major trail features, campsites, or developments are known to exist.

Management restrictions currently in place reflect those in existing laws, policies, and guidelines including standard agency-wide restrictions on seasonal campfires special recreation permits, and the 14-day stay limit for camping.

Environmental Consequences

Impacts of Proposed Action

Untrammelled

Under this alternative, activities considered trammels would continue in the wilderness. These trammeling activities include the control of fire, emergency stabilization and rehabilitation after fires, hazardous fuels and weed reduction treatments followed by vegetation restoration, programmatic restoration in wilderness, and inspection, maintenance and repair of one big game wildlife water development. Additional trammels include inspection, maintenance, and repair of the Arrow Canyon Dam, additional guidance for non-native invasive weed treatments and restoration of small-scale surface disturbances. Although considered trammels, these activities are expected to enhance the natural character of the wilderness. Education and interpretation plans and information on signs and kiosks may decrease instances of unauthorized trammeling by the general public.

Natural

The natural and primeval character of the wilderness would be maintained or enhanced under the *Proposed Action*, which would provide direction for the control of non-native invasive weeds, fire management actions, and emergency stabilization and rehabilitation. This would reduce the potential for conversion to and dominance of non-native invasive weeds. Restoration and rehabilitation of former vehicle routes and social trails would improve this character by reestablishing native vegetative plant communities. Designation and establishment of vehicle barriers, staging areas, and designated hiking and equestrian trails would direct visitors in ways that would prevent degradation of natural resources and prevent widespread impacts to vegetation and soils.

Undeveloped

The *Proposed Action* provides for management direction on inspection maintenance and repair of the Arrow Canyon Dam within the existing footprint excluding prohibited uses. Removal of small-site disturbances such as existing spray paint markings, graffiti and bore holes would be completed with non-motorized equipment, thus improving the undeveloped character. Conversion of former vehicle routes and social trails to designated hiking and equestrian trails and restoration would improve the undeveloped character. Occasional use of a helicopter for collar retrieval may occur and would minimally impact undeveloped character though this would be temporary and localized. Actions would continue to occur as authorized within existing NEPA documents such as use of motor vehicles and motorized equipment for annual inspection, maintenance and repair of one big game wildlife water development, use of motorized equipment for fuels reduction weed treatments, and improvement of undeveloped character through programmatic restoration in wilderness.

Outstanding Opportunities for Solitude and Primitive, Unconfined Recreation

Opportunities for primitive and unconfined recreation will remain outstanding throughout the majority of the wilderness. The *Proposed Action* would designate two trails totaling 6.9 miles of within the wilderness, while an additional 1.7 miles would connect to the aforementioned from the adjacent non-wilderness lands. By designating trails, visitation may increase in those areas

thus limiting the ability to find solitude; however, the proposed locations of the designated trails are in known areas of scenic and recreational opportunities. Over time, an increase in use would be expected in these areas even without trail designations. Trail designations would utilize former vehicle routes or user-created trails, and convert these to single-track trails as necessary, creating a direct benefit to the undeveloped character. This is the minimum necessary to provide recreational opportunities while protecting natural resources by directing the majority of visitors away from sensitive locations thereby preventing more widespread impacts. The *Proposed Action* prohibits placement of new permanent fixed anchors and removes protection bolts from one climbing route. This would reduce expansion of non- structural recreation sites while allowing for replacement of existing bolts, both of which would preserve current opportunities for primitive recreation.

The *Proposed Action* provides minimal restriction on recreation including the use of portable blinds and geological study, rock and fossil collecting and geological sampling. Technical rock climbing restrictions on climbing and rappelling within 25 feet of rock art and new bolts are a negative impact to unconfined recreation, however may benefit solitude and undeveloped character by limiting expansion of climbing areas within the narrows of Arrow Canyon where visitor use is high and encounters are unavoidable. Additional restrictions on recreation may be implemented if monitoring indicates new damage to natural resources is occurring. Education and interpretive information at staging areas outside of wilderness may improve solitude by providing methods to minimize impacts to other visitors. Vehicle barriers and staging areas located away from the wilderness boundary may improve opportunities for solitude in those locations by improving the ability for visitors to escape the sights and sounds of others. Requiring weed free feed for stock and party size restrictions for certain activities would constrain recreationists engaged in those activities but would help maintain naturalness and solitude, respectively.

Impacts of No Action

Untrammelled

Impacts occurring to this wilderness characteristic would continue to the same extent as under the *Proposed Action*. These trammeling activities include control of fire, emergency stabilization and rehabilitation of vegetation after fires, and methods used to control non-native invasive plants including noxious weeds, programmatic restoration in wilderness, and inspection, maintenance and repair of the big game wildlife water development. New activities that could create trammels and improve natural character would be considered on a case-by-case basis.

Natural

This character would not be enhanced as under the *Proposed Action* in that invasive non-native plants including noxious weeds would remain and may spread in portions of the wilderness. Limited actions may be taken in fire management and emergency stabilization and rehabilitation to prevent further conversion of native to non-native vegetation communities. The lack of designated trails may cause impacts in new areas to resources such as vegetation and soils. Restoration and rehabilitation of former vehicle routes and social trails would not occur and therefore improvement of this character would be hindered. Negative impacts to naturalness would continue under the *No Action* without the designation and establishment of vehicle

barriers, staging areas, and designated hiking and equestrian trails to direct visitors in ways that would prevent degradation of natural resources and prevent widespread impacts to vegetation and soils.

Undeveloped

Impacts are similar in the *No Action* alternative with regards to previously authorized actions under existing NEPA including use of motor vehicles and motorized equipment for annual inspection, maintenance and repair of one big game wildlife water development, use of motorized equipment for fuels reduction weed treatments, and improvement of undeveloped character through programmatic restoration in wilderness. The *No Action* would not address removal of small-site disturbances such as existing spray paint markings, graffiti and bore holes would be completed with non-motorized equipment, and therefore these negative impacts would persist. Inspection, maintenance, and repair of the Arrow Canyon Dam would not occur except as determined on a case-by-case basis. Temporary use of helicopters for collar retrieval would not be authorized and therefore negative impacts would not occur. Increased negative impacts would occur to undeveloped character without a policy for placement of new permanent fixed anchors resulting from the creation of new routes. Without the management of access points, vehicle and vehicle barriers, vehicle incursions would likely continue at current levels or increase.

Outstanding Opportunities for Solitude or Primitive, Unconfined Recreation

Opportunities for primitive and unconfined recreation would remain outstanding throughout the wilderness. There would be no trail designations or interpretive signs provided, which may continue to deter some people from visiting the wilderness. Former vehicle routes and social trails would be available for use by visitors, though negative impacts to wilderness values and resources may result from increased disturbance to soil, ground, cover, and vegetation. This alternative does not provide for methods to restore former vehicle routes or user-created trails and therefore positive improvements to this character would not occur. Placement of new permanent fixed anchors and climbing near cultural sites would continue without approval of a comprehensive wilderness plan, resulting in increased expansion of non-structural recreation sites and negative impacts to cultural resources. Further, no authorizations for replacement of existing permanent fixed anchors would occur, which would not meet the minimum necessary to address visitor safety. Lack of educational and interpretive information may indirectly decrease solitude as visitors would not gain knowledge on methods to minimize impacts to other visitors. Allowing visitors to park near the wilderness boundary may decrease the ability for visitors to escape the sights and sounds of others.

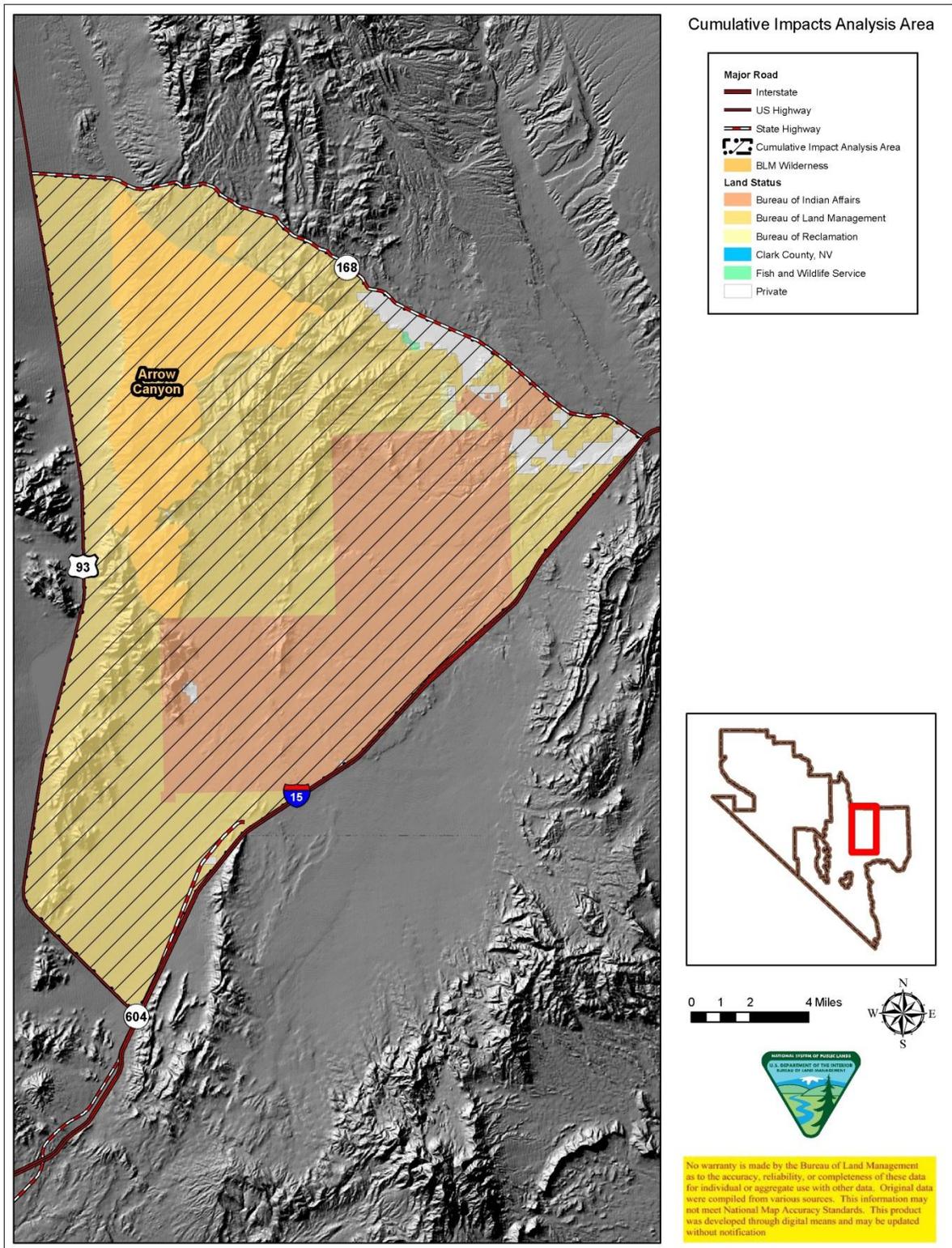
No trails designations would occur to degrade this character; however lack of trails in popular areas may result in continued degradation of natural and cultural resources. Short-term impacts to solitude would not occur from the use of helicopters or motorized equipment during wildlife management activities, emergency military operations, or search and rescue efforts. No restrictions would be in place for recreational activities aside from those identified in existing laws, policies, and guidelines. Additional management direction would be addressed on a case-by-case basis.

Cumulative Impacts

The purpose of the cumulative impacts analysis for the *Proposed Action* is to evaluate the combined, incremental effects of human activity within the scope of the project. The Council on Environmental Quality (CEQ) regulations define scope and state that connected actions, cumulative actions, and similar actions should be included in the impact analysis (40 CFR 1508.25). The planning area is within a limited geographic range consisting of Arrow Canyon Wilderness and lands immediately adjacent to the wilderness through which access occurs. Therefore, the scope of the cumulative impacts analysis will be restricted to actions within an area bounded by three major roads. A depiction of the cumulative impacts analysis area is found on Map 8. The area is bisected from north to south by the Arrow Canyon Range, which serves as a major geographic feature. The CEQ formally defines cumulative impacts as follows:

...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

In addition, according to the 1997 CEQ Handbook *Guidelines for Assessing and Documenting Cumulative Impacts*, the analysis can be focused on those issues and resource values identified during scoping that are of major importance. The relevant issues identified during scoping for the *Proposed Action* relate to the following: fire management, fish and wildlife, migratory birds, non-native invasive weeds, recreation uses, special designations other than designated wilderness, special status animal and plant species, and impacts to wilderness character.



Map 9. Arrow Canyon Wilderness Management Plan Cumulative Impacts Analysis Area

Past Actions

Prehistoric rock art and habitation sites indicate a human presence here before settlers arrived in the local area. Few small reservoirs remain as evidence of past grazing use; however grazing allotments have been closed within ACECs to benefit desert tortoise. In 2007, the BLM completed route designations for selected ACEC's. This planning process resulted in an OHV designated route transportation network and road closures with subsequent restoration with native vegetation. One weed treatment has been conducted to reduce tamarisk infestations within Pahranaagat Wash. Suppression of wildland fires occurred in 2005 and 2010. OHV and motorcycle races (e.g., Mint 400) have occurred in the eastern portion of the analysis area. RS2477 routes remain available for vehicle use. A number of wildlife water developments have been constructed to benefit big and small game wildlife populations. These actions have also allowed small game and big game species to expand their range into unoccupied habitat with an increase in numbers.

Public land sales have occurred, resulting in expansion of development in the Moapa area. A Programmatic EIS for Solar Energy Development has been approved, which includes designation of the Dry Lake Solar Energy Zone (SEZ).

Present Actions

The analysis area encompasses many land uses occurring on public and private land. Recreation use includes OHV and motorcycle races on public lands. Within Pahranaagat Wash, a weed treatment and fuels reduction project is underway to eliminate several species of non-native invasive plants. Another weed treatment has been completed along the Muddy River in conjunction with installation of three fish barriers to protect native species and ongoing restoration with native plants. Restoration is underway at Perkins Pond, located on land administered by Clark County, involving fence installation, pond lining, establishing native riparian plants, and introducing relict leopard frogs. NDOW annually conducts wildlife water development inspection, maintenance, and repairs on big and small game wildlife water developments. One barrier fence was constructed within Pahranaagat Wash and downstream of Arrow Canyon which functions to restrict OHV use.

Throughout the analysis area, numerous rights-of-ways have been authorized and allowed establishment of water facilities, material sites, transmission lines, substations, monitoring wells, electrical monitoring sites, water pipelines, communication sites, NDOT roads, fences and material sites, Southwest Intertie Project corridor, access roads, RS2477 roads, kiosk signs, Union Pacific Railroad, solar generation facility (K Road), microwave towers, telephone line, Recreation and Public Purposes leases, evaporation and ash ponds, meteorological site, powerlines, and a radio repeater site. It is assumed that the right-of-ways for these actions will persist.

Reid Gardner coal plant was constructed and is currently in operation on private land within the analysis area. Solar projects and associated facilities have been proposed for construction within the Dry Lake SEZ. The Moapa Solar project is proposed on land administered by the Bureau of Indian Affairs. Construction of the Southwestern Intertie Project is currently underway.

Reasonably Foreseeable Future Actions

Within the analysis area, reasonably foreseeable future actions include: translocation of desert tortoises throughout the species range, suppression of wildland fires, construction of solar energy facilities within the Dry Lake SEZ, OHV and motorcycle races. The Las Vegas RMP is currently undergoing a revision and therefore overarching land use allocations in the analysis area may change in the future.

Fire Management

During the construction phase of any future actions, the potential for human-caused fires would increase; however, the BLM objective regarding fire management is to manage wildland and prescribed fires as a tool in treating vegetation communities and watersheds. The primary goal of the fire management units in the area of analysis is to preserve and protect habitat and wilderness values. Given that the area is not fire adapted, the fire response will typically consist of fire suppression to minimize the loss of desert tortoise habitat through reducing the size of any fires that do occur. Additional outreach efforts and education of user groups regarding fire prevention may occur, which could lead to less human-caused fires.

Fuels projects will seek to reduce non-native fuel loads to minimize wildland fire risk and protect resources such as important cultural resources or desert tortoise habitat. Post-fire projects would seek to maintain native plant species and wildlife habitat reducing the spread of fire-prone plant species including invasive grasses.

Fish and Wildlife

The *Proposed Action* would not contribute to cumulative impacts to fish populations as none are found within the planning area. Implementation of the *Proposed Action* is part of a long-term plan to protect, preserve, and improve the wilderness character of the area. Specifically, treatment of non-native invasive weed species, restoration, fire management, and ES & R actions are designed to improve the natural character of the wilderness, contributing to other efforts to restore, enhance, or create habitat which are utilized by diverse wildlife species throughout their life cycles. Wildlife management activities, designated trails, staging areas, vehicle barriers, and environmental education and interpretation would indirectly contribute to other efforts to minimize habitat loss and disturbance to individual animals. The *Proposed Action* and other habitat restoration and species reintroduction projects within the analysis area would result in cumulatively beneficial impacts to wildlife, maintaining and improving habitat in which these species can flourish and resulting in greater habitat complexity, diversity, and productivity. These projects would result in an overall increase in the availability, and ultimately the quality of habitats.

Invasive Non-Native Plant Species

Weeds have the potential to increase in distribution and abundance from any future actions during construction phases. Increases in flammable or combustible species such as red brome or tamarisk may increase the risk of fires. Best management practices and vegetation treatments seek to reduce the spread of fire-prone plant species including invasive grasses. The *Proposed Action* would disturb a very small area compared to other proposed projects. A

robust weed management program would decrease the potential for weed populations to exist within the planning area. In addition, best management practices and standard operating procedures would be followed that focus on preventing the spread of weeds by vectors such as vehicles or equipment; thereby contributing negligible effects to the overall cumulative impact of the potential spread of noxious and non-native invasive weeds.

Migratory Birds

Implementation of the *Proposed Action* is part of a long-term plan to protect, preserve, and improve the wilderness character of the area. Specifically, treatment of non-native invasive weed species, restoration, fire management, and ES & R actions are designed to improve the natural character of the wilderness, contributing to other efforts to restore, enhance, or create these types of vegetation communities in which migratory birds utilize for their life cycles. The *Proposed Action* and other habitat restoration projects within the analysis area, would result in cumulatively beneficial impacts to migratory birds, maintaining and improving habitat in which these species can flourish and resulting in greater habitat complexity, diversity, and productivity. These projects would result in an overall increase in the availability, and ultimately the quality of habitats.

Recreation Uses

Recreational opportunities within the area of analysis are varied, but primarily consist of OHV use, either limited to roads, trails, and dry washes or restricted to designated trails within ACECs. Within wilderness boundaries, however, motorized recreation is prohibited. Pedestrian and equestrian access is not limited. Other recreation opportunities within the analysis area include hiking on designated trails and cross-country, camping, equestrian use, hunting, trapping, target shooting, nature study, collection of natural resources (e.g, rocks, and fossils). The Moapa Valley Wildlife Refuge offers various interpretive and educational events throughout the year. Technical rock climbing is known to occur only within Arrow Canyon while the extent of caving opportunities is presumed to be very low. Implementing the *Proposed Action* would develop staging areas, construct vehicle barriers, and install signs near high use access areas. The *Proposed Action* would also designate two hiking and equestrian trails, manage technical rock climbing and bolting, and establish group size limits for specific activities in order to enhance the visitor experience while maintaining opportunities for solitude and primitive forms of recreation in other areas. Depending upon a visitor's point of view, the *Proposed Action* could either enhance or detract from the overall recreation experience. Overall, the *Proposed Action* enhances or maintains recreational opportunities in wilderness, therefore, it would not incrementally add to the cumulative effects on recreation.

Special Designations Other than Designated Wilderness

Two ACECs are partially located within the analysis area. They include Coyote Springs ACEC and Mormon Mesa ACEC which were designated for the protection of desert tortoise critical habitat. A third Arrow Canyon ACEC, is located wholly within the analysis area and is designated to protect a combination of paleontological, geological, and cultural values. Special designations may be affected by future actions but the impacts would be offset by mitigation measures. Individual tortoises may be affected negatively by the displacement or disruption of normal behavior patterns due to implementation of the *Proposed Action*. In addition, some of these projects and actions could increase vehicle traffic and competition among any displaced

individuals for habitat.

Implementation of the *Proposed Action* is designed to preserve and protect resources through construction of staging areas, construction of vehicle barriers, management of technical rock climbing and bolting, and general recreation management guidelines. Site-specific actions are designed to avoid negative impacts, but should resources be discovered during implementation, mitigation would occur. The potential exists for cumulative impacts to cultural, geological, and paleontological resources within the analysis area as a result of future development including additional large scale solar projects and transmission lines. However, the *Proposed Action* enhances or maintains special designation values and therefore does not incrementally add to the cumulative effects.

Implementation of the *Proposed Action* is part of a long-term plan to protect, preserve, and improve the wilderness character of the area. Specifically, treatment of non-native invasive weed species, restoration, fire management, and ES & R actions are designed to improve the natural character of the wilderness, contributing to other efforts to restore, enhance, or create these types of vegetation communities in which migratory birds utilize for their life cycles. The *Proposed Action* and other habitat restoration projects within the analysis area, would result in cumulatively beneficial impacts to migratory birds, maintaining and improving habitat in which these species can flourish and resulting in greater habitat complexity, diversity, and productivity. These projects would result in an overall increase in the availability, and ultimately the quality of habitats.

Special Status Animal and Plant Species

Special status species may be affected by future actions but the impacts would be offset by improvements in population protection and management under the *Proposed Action*. Individual wildlife may be affected negatively by the displacement or disruption of normal behavior patterns due to construction, project operations and maintenance, and site rehabilitation stemming from future actions. In addition, some of these projects and actions could increase vehicle traffic, human and wildlife conflicts, and competition among any displaced individuals for habitat.

Some of these actions may also decrease forage quality, quantity, and composition. Overall, the *Proposed Action* would disturb a very small area separate from other future project areas. Following the reasonable and prudent measures and associated terms and conditions for the desert tortoise would minimize or negate affects to individual tortoises from staging area, vehicle barrier construction, fire management, and weed treatments. In addition, the *Proposed Action* would result in minor habitat loss in ACECs. Overall, the cumulative impact to special status species within analysis area would be minimal. The *Proposed Action* would involve restoration of former vehicle routes which would improve habitat.

Wilderness Character

Implementation of the *Proposed Action* is part of a long-term plan to protect, preserve, and improve the wilderness character of the area. By law, no buffer zones are created to protect wilderness from the influence of activities on lands outside of wilderness boundaries. Wilderness character may be diminished by future actions occurring on lands surrounding Arrow Canyon

Wilderness, but the *Proposed Action* has no administrative authority to prevent these impacts. Inspection, maintenance, and repair of Arrow Canyon Dam, non-native invasive weed treatments and restoration activities may increase the number of trammels, however, the goals are to restore natural vegetation communities and processes that support wilderness character. Education and interpretation efforts and sign planning is designed to reduce instances of trammeling activities by the general public. Restoration and rehabilitation of disturbances, management, and establishment of vehicle barriers, staging areas, and designated hiking trails would direct visitors in ways that would prevent degradation to natural resources. Trail designations may impact the undeveloped character of wilderness, but would enhance opportunities for solitude in other portions of the wilderness; therefore, the long-term cumulative effects to overall wilderness character would not occur or would be negligible.

Conclusion

The overall direction of wilderness management is to preserve wilderness characteristics. In combination with past and present actions, and those that are reasonably foreseeable in the future, the *Proposed Action* does not add substantially to cumulative impacts.

Mitigation

No additional mitigation measures have been identified to reduce or eliminate effects of the *Proposed Action*. Rather, measures and practices have already been incorporated as design features of the *Proposed Action*. Monitoring of wilderness is a component of the Las Vegas Field Office *Wilderness Program*. Monitoring tracks the outcome of proposed activities on all wilderness characteristics, not just the one specific character that the activity was primarily intended to address. The Wilderness Management Plan contains a detailed monitoring section starting on page 50.

Tribes, Individuals, Organizations, or Agencies Consulted

A public notification will be posted on the Southern Nevada District Office website when this Environmental Assessment is completed, the Decision Record /Finding of No Significant Impact is signed and a 30-day appeal period initiated.

A Notice of Proposed Action (NOPA) was mailed to known interested parties in October of 2010. The first internal scoping meeting was held at the Southern Nevada District Office's Las Vegas Field Office on November 3, 2010 with a first interdisciplinary meeting. Public scoping workshops were held at the SNDO on November 8, 2010; the Moapa Court on November 9, 2010 and at the Mesquite Council Chambers on November 10, 2010.

A site visit to Arrow Canyon was conducted on March 3, 2011 to discuss issues related to technical rock climbing. Attendees included Jason Keith of the Access Fund and John Wilder of the Las Vegas Climber's Liaison Council who provided technical expertise.

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Appendix A. Acronyms and Abbreviations

ACEC	Area of Critical Environmental Concern
ARPA	Archaeological Resources Protection Act of 1979
BLM	Bureau of Land Management
BLM-APHIS MOU	Master Memorandum of Understanding between the U.S. Department of the Interior Bureau of Land Management and the U.S. Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services (BLM MOU WO-230-2012-05)
BLM-NDOW MOU	Memorandum of Understanding between the Bureau of Land Management and the Nevada Department of Wildlife, Regarding Wildlife Management in Nevada BLM Wilderness Areas (BLM MOU 6300-NV930-0402)
CCC	Civilian Conservation Corps
DAT	District Archeological Technician
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ES&R	Emergency Stabilization and Rehabilitation
FMP	Fire Management Plan
FMU	Fire Management Unit
FRCC	Fire Regime Condition Class
GPS	Global Positioning System
HCP	Habitat Conservation Plan
LVCLC	Las Vegas Climber's Liaison Council
MFP	Management Framework Plan
MIST	Minimum Impact Suppression Tactics (Fire)
MRDG	Minimum Requirements Decision Guide
NDOW	Nevada Department of Wildlife
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966
RMP	Resource Management Plan
ROW	Right-of Way
SAD	Suppression Activity Damage
SNDO	Southern Nevada District Office (BLM)
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
USDA—APHIS	United States Department of Agriculture, Animal and Plant Health Inspection Service
USFWS	United States Fish and Wildlife Service
WMP	Wilderness Management Plan

Appendix B. Glossary

Annual. Completing the life cycle in one growing season or single year.

Archaeological Resource. Any material remains of past human life or activities of archaeological interest that are more than 50 years old.

Archaeological Site. The locations of past human activity, occupation or use, identifiable through inventory, historical documentation or oral history

Bajada. Spanish word for descent or slope (canyons and washes). In the southwest United States it is used to describe a conjunction of alluvial fans from several drainages where they make a larger fan.

Catastrophic Wildfire. A fire event causing notable ecosystem or societal damage as a result of heavy fuel loads and an unnatural fire regime

Cherry Stem. A dead-end road or feature that forms a portion of a wilderness boundary and that remains outside the Wilderness.

Decommissioned Route. Vehicle tracks closed to travel in previous travel management plan public process, no longer used by vehicles, awaiting restoration/rehabilitation/revegetation.

Designated Route. Designated Routes are those open to motorized travel. Public lands are classified as either open, limited, or closed to off-road vehicles. Designations are based on the protection of the resources of the public lands, the promotion of the safety of all the users of the public lands, and the minimization of conflicts among various uses of the public lands through a public process creating a Travel Management Plan.

Endemic. A species native to only the specific location under consideration.

Fire Regime. The characteristics of fire in a given ecosystem, such as the frequency, predictability, intensity, and seasonality of fire.

Former Vehicle Route. A road used by motorized vehicles prior to wilderness designation that was closed to motorized or mechanical use by the designation of the area as wilderness.

Indigenous. A plant or animal native to the location being considered.

Invasive. Describes a species, which takes over a new habitat where it was not previously found, often to the detriment of species that were there before.

Mesa. Spanish word used for tableland or flat expanse of landscape in the southwest United States.

Minimum Tool Requirement. The concept of minimum requirement comes from Section 4 (c)

of the Wilderness Act of 1964. “Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...”

Noxious Weed. Any plant designated by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property.

OHV. Off-highway vehicle.

Perennial. Active throughout the year, or living for many years.

Primeval. At or from the ancient original stages in the development of something.

Solitude. A quality of quiet remoteness or seclusion in places from which human activity is generally absent.

Untrammelled. Not limited or restricted, unrestrained by man. Not hobbled.

Weed. A plant that is out of place in a particular environment or habitat.

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