CHAPTER THREE
AFFECTED ENVIRONMENT

Chapter 3 describes the environmental resources in the WEMO Planning area that could be affected by implementation of the WMRNP and plan amendment actions for livestock grazing. Chapter 3 describes resources, resource uses, special designations, and other important topics (i.e., public health and safety, social and economic considerations, and environmental justice conditions) that may be impacted by the WMRNP. "Resources" include air, climate change, soil, water, vegetative communities, wildlife and plant species, as well as cultural and visual resources. "Resource uses" include livestock grazing, minerals, recreation management, transportation and public access, and lands and realty. "Special designations" include Areas of Critical Environmental Concern (ACECs), Desert Wildlife Management Areas (DWMAs), wilderness areas, Wilderness Study Areas (WSAs), and areas inventoried for wilderness characteristics.

Information and data used to prepare this chapter were obtained from the California Desert Conservation Area (CDCA) Plan, the 2006 WEMO FEIS, and various Bureau of Land Management (BLM) planning and National Environmental Policy Act (NEPA) documents. This would also include grazing allotment specific environmental assessments (EAs) prepared for the renewal of grazing permits and leases. Information and data were also collected from many other related planning documents and research publications prepared by various federal and state agencies, and from private sources pertaining to key resource conditions and resource uses found within the project area. The purpose of this chapter is to provide a description of affected resources and BLM program areas within the existing environment of the planning area, which will be used as a baseline to evaluate and assess the impact of the WMRNP and grazing alternatives described in Chapter 2. Descriptions and analyses of the impacts of the WMRNP are presented in Chapter 4, Environmental Consequences.

3.1 Analysis of the Management Situation

This section describes how transportation and grazing are currently managed in the WEMO Planning area, with an emphasis on the historical evolution of the route network and grazing and the transportation management and grazing policies in response to legislation, resource conflicts, land uses, and social and economic conditions. This section summarizes how resources and land uses have influenced the development of the transportation network and livestock grazing practices in the Planning Area, and how they have resulted in the current transportation network and management policies for that network and livestock grazing in the West Mojave Planning Area. The specific resources, land use needs, and social and economic conditions that may be affected by the transportation network alternatives, including livestock grazing are presented throughout the resource-specific subsections of Chapter 3.

3.1.1 Current Management Direction

3.1.1.1 Legislation and Policies

Federal Land Policy and Management Act (FLPMA)

The BLM's planning process is governed by FLPMA (43 USC 1712) and 43 Code of Federal Regulations (CFR) 1600. FLPMA requires Land Use Plans (LUPs) to be developed, maintained and when appropriate, to be revised to provide for the use of the public lands. In development and revision of land use plans BLM is required to use multiple use and sustained yield principles, achieve integrated consideration of physical, biological, economic, and other sciences, rely on present inventories of the public lands and their resources and values, consider the present and potential use of the public lands, comply with applicable pollution control laws, and consider the policies of state, local and tribal land use plans. As required by FLPMA, public lands must be managed in a manner that protects the quality of public land resources, and that provides for outdoor recreation and human occupancy and use (43 USC 1701(a)(8)).

FLPMA specifically addresses transportation and motorized vehicle access, as well a livestock grazing. In addition to the Congressional Declaration of Policy, 43 USC 1701, noted above, Part 6 and Part 7 of Title V, authorizes the issuance of rights-of-way for use of the public lands. Title VI of FLPMA, which established the CDCA, specifies that the use of all California desert resources can and should be provided for in a multiple use and sustained yield management plan, to conserve resources for future generations, to provide for the present and future use and enjoyment, particularly outdoor recreation uses, including the use, where appropriate, of off-road recreational vehicles (OHV) (43 USC 1781).

Executive Orders No. 11644 and 11989

In 1972, Presidential Executive Order No. 11644 established the first uniform policies regarding OHV use on public lands. Each land management agency was directed by this Order to issue directions as to which trails and areas were open for OHV use and which were not. The Order required that OHV use be monitored to assess and minimize associated impacts. The requirements of the Order were implemented by BLM in 43 CFR 8342.1. Executive Order 11989 (42 FR 26959, May. 24, 1977) amended Executive Order 11644 (37 FR 2877, Feb. 8, 1972) by requiring that off-road vehicle areas or trails be closed immediately if an agency determines that the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat, or cultural or historic resources.

Federal Regulation 43 CFR 8342.1

The CDCA Plan's motorized-vehicle access element was amended (1982 Plan Amendment Three, approved May 17, 1983) to conform with 43 CFR 8342.1, which states:

"The authorized officer shall designate all public lands as either open, limited, or closed to off-road vehicles. All designations shall be 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; and in accordance with the following criteria:

- Areas and trails shall be located to minimize damage to soil, watershed, vegetation, air, or other resources of the public lands, and to prevent impairment of wilderness sustainability.

- Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats.
- Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.
- Areas and trails shall not be located in officially designated wilderness areas or primitive areas. Areas and trails shall be located in natural areas only if the authorized officer determines that off-road vehicle use in such locations will not adversely affect their natural, esthetic, scenic, or other values for which such areas are established."

Wilderness Act of 1964 and Omnibus Bill of 2009

The Wilderness Act of 1964 established the National Wilderness Preservation System. Wilderness as defined by the Act is "an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions" for the benefit of present and future generations (Wilderness Act, 1964).

The 2009 Omnibus Public Land Management Act of 2009 added more than two million acres of wilderness, more than 1,000 miles of Wild and Scenic Rivers, and established new National Parks, conservation areas, national heritage areas, national trails, and national monuments. The bill created new water conservation, habitat restoration, and land management programs, and gave formal recognition to the 26 million acre National Landscape Conservation System (NLCS) encompassing BLM's National Monuments, Conservation Areas, Wilderness and Wilderness Study Areas, Wild and Scenic Rivers, and Scenic and Historic Trails.

The WEMO Planning area includes areas designated as wilderness, as well as legislatively designated Wilderness Study Areas (WSA). In addition, the Mojave River in the planning area includes segments that have been determined to be eligible Wild and Scenic Rivers. Other lands in the planning area have not been designated as wilderness or WSA, but retain wilderness characteristics. These various lands are discussed in Section 3.11.

BLM Travel and Transportation Management Guidance

In recent years, BLM has developed substantial guidance to facilitate the integration of comprehensive travel and transportation management planning into land use planning. Travel and Transportation Manual 1626 (MS-1626, July 14, 2011), forms the backbone of this guidance. Many of these developments were in the form of Instruction Memorandums (IMs), which only have temporary applicability until their provisions are formally incorporated into a BLM Manual or Handbook. A summary of the recent IMs and Handbooks is as follows:

- H-1601-1, Land Use Planning Handbook, Appendix C, Part D. Comprehensive Trails and Travel Management. March 11, 2005.
- Technical Note 422. Roads and Trails Terminology. November 2006. Implemented in IM 2006-173, dated June 20, 2006.

- IM 2007-030. Clarification of Cultural Resource Considerations for OHV Designation and Travel Management. December 22, 2006.
- IM-2012-067. Clarification of Cultural Resource Considerations for Off-Highway Vehicle Designations and Travel Management. February, 10, 2012.
- IM 2008-014. Clarification of Guidance and Integration of Comprehensive Travel and Transportation Management Planning in the Land Use Planning. October 25, 2007.
- H-8342-1, Travel and Transportation Management Handbook. March 16, 2012.

Livestock Grazing

Within the West Mojave Planning Area, domestic livestock grazing is managed under the authorities contained in the Taylor Grazing Act of 1934, FLPMA, NEPA, Endangered Species Act of 1973 (ESA), the Public Rangelands Improvement Act of 1978 and the CDCA Plan of 1980, as amended. Within the grazing regulations, 43 CFR Part 4100 are specific guidance for the administration of livestock grazing on the public lands.

The Consolidated Appropriations Act of 2012, specifically address livestock grazing in the California Desert Conservation Area. This Act allowed for the donation of grazing permits and leases back to BLM and make the land available for mitigation by allocating the forage to wildlife use consistent with any applicable Habitat Conservation Plan, Section 10(a)(1)(B) permit, or Section 7 consultation under the ESA.

The Continuing Resolutions authorized by Congress over the past few years have contained language specific to livestock grazing concerning grazing permit and lease renewals, the trailing of livestock acress public lands, the administrative review process, grazing transfers and changes in the mandatory terms and conditions.

Other Agencies

No other federal, state, or local agencies have specific jurisdiction over motorized vehicle use and livestock grazing on public lands. The National Highway Traffic Safety Administration (NHTSA) has established Federal Motor Vehicle Safety Standards (FMVSS) for motor vehicles, and these, along with California state regulations established by the Department of Motor Vehicles (DMV), California Air Resources Board (CARB), and California Highway Patrol (CHP), govern the types of vehicles that may be used on highways. In addition, the route network established for the WEMO Planning area must be consistent with the networks established in the adjacent areas by considering “edge-fitting,” in which open routes in the WEMO Planning area would link with open routes in adjacent areas, and the same would occur for closed routes. Within the West Mojave Planning Area, the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) have issued biological opinions that have contained terms and conditions which direct BLM’s livestock grazing program on matters concerning the conservation and recovery of special status species and their habitats.

3.1.1.2 CDCA Plan

General Description

The BLM administers approximately 3.1 million acres of public lands within the WEMO Planning area. Management is guided by the BLM's California Desert Conservation Area Plan, adopted in 1980 and amended on numerous occasions since then. Congress specifically directed the BLM to prepare the CDCA Plan under the Federal Land Policy and Management Act of 1976. Finding that the California desert and its resources, "including certain rare and endangered species of wildlife, plants and fishes" are "seriously threatened by air pollution, inadequate Federal management authority, and pressures of increased use, particularly recreational use," Congress stated that "the use of all California desert resources can and should be provided for in a multiple use and sustained yield management plan to conserve these resources for future generations, and to provide present and future use and enjoyment, particularly outdoor recreation uses, including the use, where appropriate, of off-road recreational vehicles." To accomplish this, BLM was directed to prepare a plan for the "management, use, development, and protection of public lands within the California Desert Conservation Area" (of which the western Mojave Desert comprises the northwestern third). The plan would "take into account the principles of multiple use and sustained yield in providing for resource use and development, including, but not limited to, maintenance of environmental quality, rights of way, and mineral development."

The goal of the Motorized-Vehicle Access Element of the CDCA Plan is to provide a system and set of rules governing access to the CDCA by motor vehicles. Specific objectives included are:

- Provide for constrained motorized vehicle access in a manner that balances the needs of all desert users, private landowners, and other public agencies.
- When designating or amending areas or routes for motorized vehicle access, to the degree possible, avoid adverse impacts to desert resources.
- Use maps, signs, and published information to communicate the motorized vehicle access situation to desert users. Be sure all information materials are understandable and easy to follow.

In addition to the goals stated in the Motorized Vehicle Access Element, other elements of the CDCA Plan address access needs for various desert uses, as follows:

- The Recreation Element cited access to recreational opportunities using motorized vehicles as being among the most important recreation issues in the desert, and ensuring that access routes necessary for recreation are provided is a primary consideration of the recreation program.
- The Geology, Energy, and Mineral Element requires that BLM continue to provide access and opportunities for exploration and development on public lands which are accessed or have potential for:
  - i) Critical mineral resources (national defense; 50+% importer; net importer)
  - ii) Potential energy resources (geothermal, oil, gas, uranium, and thorium)
  - iii) Minerals of local and State importance (sand & gravel, limestone, gypsum, iron, specialty clays, zeolites)

- The Energy Production and Utility Corridors Element specifies that the Plan will provide space not only for communications sites, but for associated infrastructure such as access roads. In addition, this element allows for the development of renewable and other energy production and transmission facilities, each of which requires access.

The Livestock Grazing Element states that currently and historically, livestock grazing has been and continues to be a significant use of renewable resources on public lands in the California Desert. The goals of the element are:

- Use range management to maintain or improve vegetation to meet livestock needs and to meet other management objectives sit forth in this plan.
- Continue to use the Californa Desert for livestock production to contribute to satisfying the need for food and fiber from public land.
- Maintain good and excellent range condition and improve poor and fair range condition by on condition class, through the development and implementation of feasible grazing systems or Allotment Management Plans (AMPs). Adjust livestock grazing use where monitoring data indicate chamges are necessary to meet resources objectives.

Area Designations

BLM's planning regulations (43 CFR 8341) require that all public lands be designated as "open," limited," or "closed" to OHV use. Within designated "open" areas, all types of vehicle use are permitted anywhere in the area, subject to operating regulations and vehicle standards provided in 43 CFR 8341 and 8342. Within "closed" areas, all OHV use is prohibited. Within "limited" areas, individual roads, primitive roads, and trails can be designated as "open," "closed," or "limited," and BLM must establish permitted types or modes of travel, time or season of use, allowable vehicle types, authorization or permit requirements, and other types of user limitations. OHV area designations are LUP decisions, as opposed to implementation decisions. Specific route designations within area designations are implementation level decisions.

The CDCA Plan adopted landscape-level Vehicle Access designations, presented in Map 10 of the Plan. The Vehicle Access designations were made commensurate with the multiple-use class (MUC) designation for each area. The three Vehicle Access Designations are "open areas", "closed areas", and "limited areas". Vehicle use in open areas was approved subject to restrictions by the operating regulations and vehicle standards described in 43 CFR 8341 and 8342. Closed areas included all public lands within designated wilderness areas, and other specified areas closed by the CDCA Plan or specific activity-level management plans. Page 76 of the CDCA Plan (1999 reprint) in Table 8 and for four listed areas immediately before the table, includes areas designated as closed prior to the CDCA Plan which remain closed under the CDCA Plan, and will remain closed under the Plan unless modified by subsequent implementing action. Table 9 includes significant sand dune areas or dry lake beds which have either been opened or closed under the CDCA Plan (CDCA Plan, p.78, 1999 reprint).

Within the limited areas, the CDCA Plan stated that "Limited" vehicle access means that motorized-vehicle access is allowed only on "routes of travel". At the minimum, use will be restricted to existing routes of travel. BLM would work with the public to determine which routes needed to be closed or limited in some other way, in consideration of the criteria listed in 43 CFR 8342.1.

Route Designations

The designation of individual roads, primitive roads, and trails are addressed as an implementation level plan tiered from the LUP. These decisions can be developed as stand-alone TMPs, or can be incorporated into activity management plans,

The CDCA Plan provided the following definitions for open, closed, and limited routes.

- Open Route. Access on the route by motorized vehicles is allowed. Specific uses with potential for resource damage or significant conflict with other use may require specific authorization.
- Closed Route. Access on route by motorized vehicles is prohibited except for: (1) fire, military, emergency or law enforcement vehicles when used for emergency purposes; (2) combat or combat support vehicles when used for national defense purposes: (3) vehicles used for official purposes by employees, agents, or designated representatives of the federal government or one of its contractors. Use must be consistent with the multiple use guidelines for that area.
- Limited Route. Access on route is limited to use by motor vehicles with respect to number of vehicles, type of vehicles allowed, time or season of vehicle use, permit or license requirements, and speed limits.

The definition of limited routes is further defined in the 2012 TTM Handbook (H-8342-1) to include consideration of types or modes of travel; identification of roads, primitive roads, and trails; time or season of use; types of vehicles (OHV, motorcycle, ATV, high clearance, etc.); authorizations or permits for vehicles or users; and BLM administrative use only or other types of limitations.

Implementation Strategies in CDCA Plan

The CDCA Plan specified on-the-ground implementation of the OHV Area designations made in the Plan, as follows:

- Open areas were signed and identified on maps for public distribution. In open areas that abut private lands, BLM encourages users to avoid unauthorized use through the use of signs, brochures, on-site personnel, and placement of permanent kiosks. Signs and maps also indicate locations of military land boundaries.
- Closed areas were signed to prevent unauthorized use, and identified on publicly available maps.
- For Limited areas, BLM developed considerations to be used in designating individual routes in Multiple Use Class (MUC) L and M areas.

Plan Amendments Relevant to TTM

The CDCA Plan has been amended several times since 1980 to authorize designations of areas and routes for OHV use. BLM's planning regulations (43 CFR 8341), as mandated by Executive Order 11644, require that all public lands be designated as "open," limited," or "closed" to OHV use. Within "open" areas, all types of vehicle use are permitted anywhere in the area, subject to operating regulations and vehicle standards provided in 43 CFR 8341 and 8342. Within "closed" areas, all OHV use is prohibited. Within "limited" areas, individual roads, primitive roads, and

trails can be designated as "open," "closed," or "limited," and BLM must establish permitted types or modes of travel, time or season of use, allowable vehicle types, authorization or permit requirements, and other types of user limitations.

Numerous CDCA Plan amendments since 1980 have added or modified specific route designations within the "limited" areas in the planning areas. These designations occurred through a West Mojave-wide effort in the middle 1980s, during the preparation of ACEC plans beginning in the 1980s, and during a mid-1990s pilot project at Ord Mountain. These efforts designated 3,266 miles of open routes within the planning area, and are described in more detail below.

1985-87 Off-Road Vehicle Designations

BLM conducted a field and map inventory of OHV routes on public lands throughout the planning area in the mid-1980s and, based upon that inventory, identified a network of open motorized vehicle access routes. BLM personnel inventoried and evaluated existing routes of travel. Information from existing maps and aerial photos was supplemented by field checks. This information was then utilized to create a known route inventory that primarily consisted of known "two-track" routes (i.e. "single-track" motorcycle routes were generally not part of the inventory). Public meetings were conducted and members of the public also reviewed these route inventories. Criteria for determining which routes were to remain open was based upon public access needs, recreational values and resource conflicts. Following public meetings, decisions to designate the route network were announced.

On August 21, 1985, BLM published a Notice in the Federal Register titled Off-Road Vehicle Designation Decisions; Ridgecrest Resource Area, CA (Federal Register, Vol. 50, No. 182). Two years later, on June 19, 1987, BLM published Federal Register notice titled Off-Road Vehicle Route Designation Decisions for the California Desert District (CDD), Barstow Resource Area (Federal Register, Vol. 52, No. 118, p. 23364); and, on September 22, 1987 BLM published a Federal Register notice titled Off-Road Vehicle Route Designation Decisions for the California Desert District, Barstow Resource Area (Federal Register, Vol. 52, No. 183, p. 35589). These notices designated 2,949 miles of OHV routes on public lands as open routes.

Some of the lands which were acquired after the 1985-1987 inventory were evaluated in subsequent ACEC Plans or the 2006 WEMO Plan. However, other lands acquired after 1987 were not included in the 2006 WEMO Plan baseline. Those lands were included in the 2012 inventories, and are part of the reason for the increase in the baseline from approximately 7,000 miles in 2006 to approximately 15,000 miles for the current SEIS.

Resource Protection Off-Road Vehicle Designations

Since 1980, many BLM ACEC have identified motorized vehicle access networks through public lands, collectively identifying 317 miles of open routes. Table 3.1-1 lists these plans, together with the date the route network in each was developed.

Table 3.1-1. Pre-WEMO ACEC Route Networks and Principal Recreation Activities

ACEC Name	Size (Acres)	Year	Route Status	Principal Recreation Activities
Afton Canyon	8,830	1989	26 mile designated route system	Camping, vehicular touring, equestrian, rock hounding, recreational mining on outside edges of area.
Amboy Crater National Natural Landmark	639	NA	One access route to parking area.	Geologic exploration, rock hounding
Barstow Woolly Sunflower	19,079	1982	Mapped routes excluded; vehicles excluded From NW ¼ of Section 11; T11N; R6W	Non-vehicular dependent: Hiking, botanizing
Bedrock Springs	786	1987	Mapped designated route system	Access to prehistoric values and Northern portion of the Golden Valley Wilderness Area
Big Morongo Canyon	24,934	1982 and 1996	Mapped designated route system; Routes designated in 2002 Coachella Valley Plan Amendment	Hiking, wildlife viewing, picnicking
Black Mountain	51,261	1988	26-mile designated route system	OHV recreation and touring, equestrian riding, hiking, camping, prehistoric and historic interpretation, recreational mining on northeastern fringe of area, wilderness recreation, in the southcentral Black Mountain subregion.
Calico Early Man Site	834	1984	Mapped designated route system	OHV touring, hiking, camping, prehistoric and historic interpretation, located in the southern portion of the Calico Mountains Subregion.
Christmas Canyon	3,445	NA	No route designation because most of ACEC is within Open area	OHV recreation and touring, historic interpretation. Located in Spangler Hills OHV area and China Lake Naval Weapons Center.
Cronese Basin	8,469	1984	Mapped designated route system	OHV touring, bird-watching, wildlife viewing, in the center of the Cronese Lake Subregion.
Desert Tortoise Research Natural Area	22,230	1988	Designated closed to vehicular use; protected by perimeter fence	Hiking, wildlife viewing, shooting, located in the southwestern portion of the Rands Subregion.

Table 3.1-1. Pre-WEMO ACEC Route Networks and Principal Recreation Activities

ACEC Name	Size (Acres)	Year	Route Status	Principal Recreation Activities
Fossil Falls	1,630	1986	Designated route system	OHV touring, prehistoric appreciation. Located at north end of Sierra subregion.
Great Falls Basin	9,539	1987	Mapped designated route system	OHV touring, picnicking, bird-watching, wildlife viewing. Located just north of Trona.
Harper Dry Lake	485	1982	Mapped designated route system; all routes within 100 yards of marsh vegetation closed.	OHV touring, bird-watching, equestrian riding. Located southwest of Black Mountain Wilderness Area in the Harper Lake Subregion.
Jawbone/Butterbretd	147,832	1982	133 mile designated route system	OHV touring, bird-watching, wildlife watching, rock-climbing. Located in the Jawbone subregion.
Juniper Flats	2,387	1988	Mapped designated route system	Equestrian riding, OHV recreation and touring, access to Deep Creek hot springs. Located north of San Bernardino Mountains, in the western portion of the Juniper Flats Subregion.
Last Chance Canyon	5,135	1982	Designated route system	OHV recreation and touring, historic appreciation, wildlife viewing. Located south of El Paso Mountains Wilderness Area.
Manix	2,907	NA	None	Paleontological and historic interpretation, OHV touring. Located at the western boundary of the Afton Subregion.
Mojave Fishhook	637	1990	Designated route system	OHV touring, botanizing
Rainbow Basin	4,103	1991	30 mile designated route system	Camping, OHV touring, equestrian riding, hiking, geologic, paleontological and prehistoric interpretation. Located in the southwestern portion of the Coolgardie subregion.
Red Mountain Spring (formerly Squaw Spring)	718	1987	Mapped designated route system; area closed to vehicular travel	Prehistoric and historic interpretation. Located in northern portion of Red Mountain subregion.

Table 3.1-1. Pre-WEMO ACEC Route Networks and Principal Recreation Activities

ACEC Name	Size (Acres)	Year	Route Status	Principal Recreation Activities
Rodman Mountains Cultural Area	6,208	NA	Routes outside Rodman Mtns. Wilderness were designated as part of Ord-Rodman Plan	OHV touring and recreation, cultural interpretation, hiking, wilderness recreation. Located in the southern portion of the Rodmans Wilderness in the Newberry Rodmans Subregion
Rose Springs	838	1985	Routes designated closed	Hiking, wildlife viewing, prehistoric interpretation, hunting. Located in north end of Sierra subregion.
Sand Canyon	2,583	1989	Specific route closures	Hiking, wildlife viewing, bird-watching, hunting, cultural interpretation. Located in southern end of the Sierra subregion.
Short Canyon	754	1990	Most of the ACEC routes are closed because they are within wilderness	Hiking, botanizing, wildlife viewing, bird-watching, hunting. Located in Sierra subregion, borders Owens Peak Wilderness.
Soggy Dry Lake Creosote Rings	184	1982	All vehicular routes closed to protect unique vegetation	Botanizing, hiking. Located just south of Johnson Valley OHV area in the Johnson Valley Subregion.
Steam Well	41	1982	Designated route system; All routes closed with inclusion of ACEC in the Golden Valley Wilderness Area	Prehistoric and historic interpretation. Located in southwest edge of Golden Valley Wilderness area.
Trona Pinnacles	4,058	1989	Designated route system	Sightseeing, commercial filming, OHV touring, geologic interpretation. Located in South Searles subregion.
Western Rand Mountains	31,102	1994	128 mile designated route system	OHV touring and recreation. Applied to ACEC and surrounding lands. Located in the Rand Subregion
Whitewater Canyon	13,973	1982	Designated route system	OHV touring, wildlife viewing, hiking.

Ord Mountain Pilot Off-Road Vehicle Designations

In 1995, the BLM undertook a pilot project within the Ord Mountain area to test methods to acquire an inventory of routes of travel. A pilot digital aerial photograph was used together with GIS digitizing equipment to identify 549 miles of existing routes of travel in the area. From this

inventory, BLM identified alternatives, analyzed impacts in an environmental assessment, and adopted a network for the area in a 1995 decision record.

WEMO 2003 Western Mojave Desert Off-Road Designation Project

The 2006 WEMO Plan was prepared through the collaborative effort of city, county, state, and federal agencies which had jurisdiction over lands within the region. To support the development of the 2006 WEMO Plan, these agencies and local jurisdictions cooperated with more than 100 non-governmental organizations (NGOs) including businesses, environmental groups, and user groups. Representatives of the agencies, jurisdictions, and the NGOs comprised the West Mojave Supergroup. In November 1999, the West Mojave Supergroup established four task groups to develop components of the WEMO Plan. Of these, Task Group 2 was developed to address the Motorized Vehicle Access Network.

To assist Task Group 2 and the route designation process, two subcommittees were formed: a field survey advisory group and a route designation technical committee. As the task group process evolved, certain issues would emerge that would result in considerable public interest or controversy, including the design of the motorized vehicle access network. When this occurred, public information meetings were held throughout the desert on an irregular basis. About a dozen of these meetings, attended by a total of approximately 250 persons, were held during the task group process. Many persons who first became involved through these meetings later joined one or another of the task groups.

Between September 2001 and March 2002, thirteen field crews inventoried nearly 8,000 miles of motorized vehicle access routes within the western Mojave Desert. Both four wheel drive and motorcycle crews participated in the survey. Routes were recorded using global positioning system (GPS) technology. The nature of the route (graded gravel, good dirt, motorcycle trail) was recorded, and nearly two dozen types of pertinent desert features mapped (including campsites, mines, trailheads, and water sources). This information was transferred into the planning team's digital GIS library. In addition, data collected by BLM field survey crews in 1985 and 1987, and during the preparation of BLM management plans for ACECs between 1980 and the late 1990s, was digitized and stored in the GIS database. This data was supplemented by data digitally collected from aerial photography taken in 1995 and 1996, and covering most public lands within the planning area.

In the 2001 and 2002 field inventory, BLM conducted its route inventory of the most environmentally sensitive areas (in terms of biological resources) to make some route specific adjustments to the 1985 and 1987 CDCA amendments. The 2001 and 2002 field inventory was conducted in 10 of the 21 subregions identified in the 2003 planning effort. A description of these field-surveyed sub-regions is provided in Table 3.1-2.

Table 3.1-2. Off-Road Vehicle Designation Subregions

Sub Region	Principal Recreation Activities	Route Mileage Designated Open 1985-87	Route Mileage 2001 Route Inventory	Comments
Coyote	Rock hounding, off-highway touring/sightseeing, mining.	178	411	Calico Early Man Archaeological Site, Cronese Lakes ACEC, and Soda Mountains Wilderness Study Area. OHV recreation relatively light. Most OHV activity occurs in southwestern sectors.
El Mirage	OHV, recreational mining	49	267	El Mirage OHV recreation area borders sub region to the south. Area of more historic use than current use. Once more popular for races which have since shifted to the Open Areas. Edwards bowl in the western sector popular as a motorcycle area creates some conflicts with adjoining private property owners. Shadow Mountain once very popular with motorcyclists. Use now restricted due to conflicts with hamlet of Shadow Mountain to the south. Bajadas north of Shadow Mountain have been found to have higher than average desert tortoise sign.
El Paso	OHV use, rock hounding, shooting/hunting.	324	465	Last Chance Canyon ACEC and El Paso Mountains Wilderness abut the sub region. Very mountainous area universally popular for a variety of visitor types including jeepers, motorcyclists, miners, campers, rock hounders, equestrians, historical explorers and upland game hunters
Fremont	OHV use, shooting/hunting, rock hounding, equestrian riding, hiking, recreational mining.	214	582	Contains Barstow Woolly Sunflower ACEC, Harper Dry Lake ACEC, and the Black Mountain Wilderness. Northern hilly sectors very popular longstanding MC area; Gravel Hills and Hamburger Mill northwest of Fremont Peak known for long-term historical use. Bajada areas in the southern sectors not nearly as popular as the above-described areas to the north. Bajadas areas in the south and central sector known for historically high populations of desert tortoise.
Kramer	OHV use/dual sport, rock hounding, shooting/ hunting	254	642	Mining and homestead site established in the late 19th and early 20th century exists in the area, some of which may have historical significance.

Table 3.1-2. Off-Road Vehicle Designation Subregions

Sub Region	Principal Recreation Activities	Route Mileage Designated Open 1985-87	Route Mileage 2001 Route Inventory	Comments
Middle Knob	OHV touring/sightseeing, camping, hiking, hunting	N/A	91	Cultural resources are significant in the sub region. Contains biological values of special concern, including habitat for desert tortoises.
Newberry-Rodman	Equestrian, OHV touring, sightseeing, dual sport, rock hounding, mining	142	210	Sub region contains the Newberry Mountains Wilderness, the Rodman Mountains Wilderness and the adjoining Rodman Mountains ACEC. Rock art and cultural sites are within the sub region.
Ord	Recreational mining, OHV touring/ sightseeing	38	549	The historic Ord Mountain Road and the Daggett Wash Road are accessible by four-wheel drive vehicles and motorcycles (OHV/dual sport). The Stoddard Valley OHV Recreation Area to the west and the Johnson Valley OHV area to the southeast of the sub region provide for OHV/dual sport activities.
Red Mountain	OHV touring/sightseeing, shooting hunting, OHV/ dual sport, hiking, equestrian riding, mining.	234	733	The Grass Valley Wilderness is partly contained in the sub region and the Golden Valley Wilderness borders the sub region to the north. These bajada areas in the central west sector west of Cuddeback Lake, are known for historically high populations of desert tortoise and extremely high historical mining activity.
Ridgecrest	Hiking, equestrian OHV/dual sport	106	328	The Rademacher Hills trails open to the hiking, jogging, horseback riding and mountain biking.
Superior	OHV/dual sport, rock hounding, camping, mining.	396	668	Contains the Rainbow Basin National Natural Landmark ACEC. The Black Mountain Wilderness lies to the west of the sub region and the Calico Mountains lie to the south east of the sub region.

The updates to eight of these subregions along with minor revisions to the 1985-87, and ACEC Off Road Vehicle designations served as the basis for the evaluation in BLM's 2003 Environmental Assessment and Decision Record for the Western Mojave Desert Off-Road Vehicle Designation Project. The minor revisions occurred in the North Searles and El Mirage subregions, Black Mountain ACEC along with edge matching efforts at 25 locations to align the ACEC, 1985-87, and 2002 designation boundaries. For the El Paso Mountains and Ridgecrest subregions the existing 1985-87 network was adopted until completion of a collaborative planning effort that with

local jurisdictions and the general public. Upon completion of this collaborative effort and NEPA analysis the route network will be amended.

The purpose of the 2003 Western Mojave Desert Off-Road Vehicle Designation Project was to update the existing West Mojave route designations, and to adopt the revised route network as a component of the CDCA Plan, while the 2006 WEMO Plan was under development. The 2003 Designation Project evaluated four route network alternatives developed to meet enhanced ecosystem protection and enhanced recreation objectives. The resulting Record of Decision selected Alternative A, which was based on the existing route designations, modified to incorporate a revised network within desert tortoise critical habitat and other sensitive resource areas. That network, totaling 5,098 mile of routes, served as the basis for the route network alternatives evaluated in the 2006 WEMO Plan.

3.1.1.3 2006 WEMO Plan

The route designations adopted in the 2003 route designation effort were then considered as the baseline for the No Action Alternative in the development of the 2006 WEMO Plan. The baseline was then subjected to minor modifications and a field survey in one additional subregion—Juniper Flats. The EIS for the 2006 WEMO Plan evaluated seven alternatives which addressed various use restrictions, using the findings in the 2003 route designation effort as a point of departure. With respect to travel management, the use restrictions on the routes varied among the 2006 WEMO FEIS alternatives, but the overall mileage of the network did not vary. The proposed network evaluated in the 2005 WEMO FEIS consisted of the 2003 network with modifications in specific areas. The Record of Decision (ROD) adopted the FEIS proposed action with minor modifications, resulting in the 5,098 mile network of the 2006 WEMO Plan.

Vehicle Access Decisions in 2006 WEMO ROD

In 2006, the BLM approved a comprehensive amendment covering the WEMO Planning area of the CDCA. Key elements of the CDCA Plan that were updated for the WEMO Planning Area include the Wildlife Element, the Vegetation Element, the Grazing Element, the Recreation Element, and the Motor Vehicle Access Element.

The vehicle route network approved in the 2006 WEMO Plan was based on the 2003 vehicle route network, with the following modifications:

- The mileage of non-motorcycle routes in higher density tortoise population areas was decreased from 439 miles to 384 miles;
- The mileage of vehicle routes within ACECs was reduced from 427 miles to 406 miles; and
- Within the Juniper subregion, a redesigned vehicle access network of 73 miles of open routes and 25 routes that would be limited to use by single-track vehicles (motorcycles) replaced the 152 miles of open routes that had been adopted in 2003.

Overall, the 2006 WEMO Plan included modification of the vehicle management decisions, including OHV route designations, on more than 3 million acres of public land within the CDCA. The ROD for the 2006 WEMO Plan approved the designation of 5,098 miles of motorized vehicle routes.

The 2006 WEMO Plan Amendment approved a total of 12 separate decisions, each affecting multiple geographical areas with the planning area. Most of the decisions focused on establishment or adjustment of ACECs for biological resources and changes to multiple use classes to reflect an increased resource protection balance. The specific decisions related to Motorized Vehicle Use and route designations made in the 2006 WEMO ROD, are as follows:

- Decision 5: Recommendations made in the 1994 Rand Mountains-Fremont Valley Management Plan were adopted, including adoption of the proposed motorized vehicle access network to be managed with an educational permit system.
- Decision 6: The motorized vehicle access network in the Afton Canyon Natural Area was adopted.
- Decision 9: The motorized vehicle access network in the remainder of the planning area was adopted, and included minor modifications of the 2003 route network, a redesign of the Juniper subregion, and route closures in the Lane mountain milkvetch ACEC, Barstow woolly sunflower ACEC, the Mojave monkeyflower ACEC, and the Red Mountain subregion. The approved network also included the opening of a 9-mile undesignated route east of Haiwee Reservoir, and establishment of competitive "C" routes northeast of the Spangler Hills Open Area.
- Decision 10: The Stopping, Parking, and Camping Section of the CDCA Plan Motorized Vehicle Access Element was modified to incorporate restrictions within DWMAs, including limiting camping to previously existing disturbed camping areas adjacent to open routes and limiting stopping and parking to within 50 feet of the centerline of open routes.
- Decision 11: The portion of the Barstow to Vegas Race Course within the WEMO Planning area was deleted.
- Decision 12: The use of the Stoddard Valley to Johnson Valley Connector was modified to establish a connector route, and to delete its availability for competitive speed events.

In addition to decisions that were proposed in the 2005 EIS, the 2006 ROD made modifications as a result of resolution of protests. These modifications included specific changes to route designations in the Red Mountain, Ord, Newberry Rodman, Fremont, and Juniper Subregions, and in Stoddard Valley. The specific routes designations are listed in the 2006 ROD.

The 2006 WEMO ROD also continued the administrative closure affecting 26 miles of selected dirt roads in a 17,000-acre area of the Rand Mountains, in order to allow time to complete work necessary to implement an educational program and permit system for recreational users.

The following seven management prescriptions for motorized vehicles (designated as "MVs" in the FEIS) were proposed as take avoidance measures:

- Open Routes (MV-1): Routes designated open would be available for a variety of uses including commercial, recreational, casual access, and non-competitive permitted uses. No motorized vehicles would be allowed to travel off of designated routes, except in emergency situations, or with the explicit permission of the BLM, or as specifically noted below.
- Speed Limits (MV-2): With respect to speed limits on unimproved roads, current law would apply. Basic Speed Law (38305) of the 2001 Vehicle Code, Traffic Laws states: "no

person would drive an off-highway motor vehicle at a speed limit greater than is reasonable or prudent and in no event at a speed which endangers the safety of other persons and property."

- Speed Regulators (MV-3): Within DWMAs, there is no proposal to install speed regulators; however, if monitoring or studies show that certain unimproved roads are causing increased tortoise mortality, the BLM will consider ways, including speed regulators, to reduce or avoid that mortality.
- Washes (MV-4): On public lands, motorized vehicle travel in washes would be allowed only in those washes that are designated as "open routes" and signed as appropriate.

Livestock Grazing Decisions in 2006 WEMO ROD

The 2006 WEMO Plan Public Land Livestock Grazing Program contained a total of 29 management perscriptions (LG). Key additions to the CDCA Plan Livestock Grazing Objectives made in the 2006 WEMO Plan that are not proposed for change are listed below. The adoption of regional standards and guidelines are dependent upon approval by the Secretary of the Interior.

1. Adopt and Implement Regional Standards of Rangeland Health and Guidelines for Grazing Management in the West Mojave Planning area, consistent with 43 CFR 4180 et.seq., and Conform Grazing Activities to the Standards.
2. Discontinue livestock grazing in DWMA allotments that are voluntarily relinquished and reallocate all of the AUMs from livestock forage to wildlife use and ecosystem functions, upon compliance with the terms identified in the land use plan. Voluntarily relinquished allotments would be unavailable for grazing.
3. Further limit livestock grazing in DWMAs and other sensitive areas within the WEMO Planning area. Specific elements of this objective include elimination of ephemeral cattle grazing, substantial limitation of sheep grazing within DWMAs and other sensitive areas (see pages 2-131-133 of the 2005 WEMO FEIS), elimination of ephemeral and temporary non-renewable (TNR) permit authorizations for cattle allotments within DWMAs, and increasing ephemeral forage production requirements before livestock turnout in other desert tortoise habitat. Livestock grazing would continue on the Valley Well Allotment.

Finally, the WEMO 2006 ROD incorporates the terms and conditions of the Biological Opinion (BO) issued on January 9, 2006 by the U.S. Fish and Wildlife Service (USFWS) and amended by the USFWS on November 30, 2007 to minimize impacts from the livestock grazing program.

3.1.1.4 Post WEMO Changes to Vehicle Access Management

In August 2006, a lawsuit was filed challenging the route designation process used in the 2006 WEMO Plan and the route designations resulting from the analysis of impacts in the 2006 WEMO Plan. In January 2011, a United States District Court for the Northern District of California (the Court) order remanded the 2006 WEMO ROD to the BLM. The Court issued a Summary Judgment order on September 28, 2009, and a Remedy Order on January 28, 2011. The Remedy Order remanded the 2006 WEMO ROD to the BLM and directed the BLM to amend the CDCA Plan and reconsider route designation throughout the WEMO Planning area, among other things.

The specific issues related to route designation that were remanded for re-evaluation are as follows:

- Sufficiency of the No Action Alternative: According to the Court's Summary Judgment order, the 2005 EIS did not sufficiently explain that the routes contained in the No Action Alternative (inclusive of post-1980 routes), was larger than both the 1980 and 1985-1987/ACEC networks, and was smaller than the 2001-2002 inventoried network. In addition, the discussions of the No Action network throughout the EIS were not consistent. Some specific examples were raised, including Table 3-58 and Table 4-45. Instead of alternatives being compared only to the No Action Alternative, they were also compared to the 1985-1987 network, the 2001-2002 inventory, and the 2003 EA network. The Court stated that a single No Action network needs to be defined, described, and then used as the basis for comparison for all impacts.
- Inclusion of post-1980 routes in alternatives: In its discussion of "limited" areas, the CDCA Plan states that ". . . use will be restricted to existing routes of travel." The Court noted that this statement is problematic in that BLM did not have an inventory of the routes that existed in 1980. The Court interpreted this language to prohibit the designation of any routes as "open" or "limited" that did not exist before 1980. The Summary Judgment order does state that BLM can designate additional routes that did not exist in 1980 (Summary Judgment Order, Pg. 36, lines 13-16). However, to do so, BLM must amend the language that restricts the network to pre-1980 routes. That amendment would need to be done in accordance with NEPA and FLPMA, and would have to explain why inclusion of post-1980 routes is justified.
- Criteria Used for Route Designations: The Court ruled that the BLM's rational for making their route designations was not complete, and did not address the requirements of 43 CFR 8342.1. The Court also cited specific resources (soils, cultural resources, Unusual Plant Assemblages and riparian areas, Mojave fringe-toed lizard, and air quality) for which analyses were not complete, and needed to be re-visited.
- Reasonable Range of Alternatives: The Court ruled that the 2005 WEMO FEIS's inclusion of the same route network in each of the evaluated HCP alternatives violated NEPA.

These decisions of the Court provide an additional framework in which the current effort to establish a route network must be developed.

Also, the Court left the following specific issues related to travel management, the route network and livestock grazing in place during remand:

- Provisions allowing for grazing allotments to be voluntarily relinquished, certain areas to be designated as not available for grazing, and any subsequent decisions to relinquish or retire grazing allotments;
- The restrictions on motorized vehicle stopping, parking, and vehicular camping;
- The deletion of the portion of the Barstow to Vegas Race Course within the WEMO Planning area;
- All routes that were closed in the ROD remain closed;
- The policy that all routes should be considered closed unless signed "open;"

- Allowable use of OHVs on the route network that are not "street legal;" and
- Route designations made in the Juniper Flats, Wonder Valley, and Edwards Bowl areas.

Specific route network-related issues that were vacated by the Court include:

- Adoption of the route network in the Rand Mountain-Fremont Valley Management Plan;
- Adoption of the route network in the Afton Canyon Natural Area; and
- Establishment of a connector route in the Stoddard Valley to Johnson Valley Corridor.

As specific mitigation measures ordered to be implemented during remand, BLM was required to do the following:

- Provide the Court with a detailed Implementation Plan;
- Update all BLM-produced and available maps to include accurate and up-to-date route information, including a statement regarding restriction of motorized use to "open" routes only;
- Provide the Court with a monitoring plan to determine compliance with route closures and whether new illegal routes were being created;
- Perform additional monitoring regarding air quality, Mojave fringe-toed lizard and its habitat, and riparian areas and Unique Plant Assemblages;
- Provide a plan for maintenance of the open route network;
- Provide a plan for additional enforcement capability; and
- Provide quarterly progress reports.

3.1.1.5 Other Recent Policy and Planning-Related Post 2006 WEMO Developments

Since the 2006 WEMO ROD, the public lands included within the planning area have been subject to additional BLM planning efforts and CDCA Plan amendments. These changes are part of the baseline conditions. In addition, post-WEMO implementation activities have been undertaken. Major efforts are summarized as follows:

- BLM has completed renewal evaluations, including Environmental Assessments (EAs) and rangeland health assessments, for 28 grazing allotments within the planning area since 2006. Also, several allotments have been voluntarily relinquished since the 2006 WEMO Plan was completed. The EAs all evaluated route designation and OHV use within each allotment as part of their cumulative analysis. Also, several of the EAs specified that the allotments had been modified and, in some cases, voluntarily relinquished, as part of the 2006 WEMO Plan. The specific information related to the allotments is presented in Section 3.7 of this Draft SEIS.
- In 2012, Congress passed and the President signed the 2012 Appropriations Act (Public Law 112-74, 125 Stat. 1048, Dec 23, 2011). This Act provided that the Secretary of the Interior "shall accept the donation of any valid existing permits or leases authorizing grazing on public lands within the California Desert Conservation Area. With respect to each permit or lease donated under this paragraph, the Secretary shall terminate the grazing

permit or lease, ensure a permanent end (except as provided in paragraph (2)), to grazing on the land covered by the permit or lease, and make the land available for mitigation by allocation the forage to wildlife use consistent with any applicable Habitat Conservation Plan, section 10(a)(1)(B) permit or section 7 consultation under the Endangered Species Act of 1973". Under this authority, two allotments have been donated within the WEMO Planning area—Lava Mountain and Walker Pass Common Allotments. Consistent with the 2012 Appropriations Act, the permanent relinquishment of these two allotments has been accepted, grazing allotment boundaries were updated, and AUMs were reallocated from livestock forage to wildlife use and ecosystem functions. The CDCA Plan will be conformed to reflect these changes.

- Activity-specific route designations: BLM land throughout the WEMO Planning area continues to be available for, and subject to, permit and ROW applications for a variety of activities, as are allowable under BLM regulations and the CDCA Plan. These applications include solar, wind, and energy transmission projects; installation and operation of communications towers and pipelines; access to mining operations and exploratory activities, and permitted recreation events. Most projects require access for project construction and operation, and this access often needs to be provided in whole or in part, through construction and authorization of new routes.
- In July 2012, BLM and the Department of Energy (DOE) published the Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States, which included consideration of the WEMO Planning area in California. The PEIS ROD designated lands within the WEMO Planning Area as either exclusions areas or variance areas. Exclusion areas are unavailable for utility-scale solar energy development. The BLM considers any application for utility-scale solar energy development within variance areas after following a process outlined in the PEIS ROD. The PEIS considered the potential impact of solar development on the National Historic Trail System, and on routes of travel. The PEIS noted that solar development may require closure of designated OHV routes. In response to these impacts, the PEIS proposed design features to mitigate impacts, including rerouting roads around solar developments, and considering replacement of acreage for lost recreational opportunities.
- The California Desert Renewable Energy Conservation Plan (DRECP) is a landscape-level planning effort currently underway in California, and was released as a Draft Plan/DEIS in September, 2014. The DRECP covers approximately 22.5 million acres of federal and nonfederal land in the Mojave and Colorado (Sonoran) Deserts in southern California. The DRECP is a Habitat Conservation Plan in accordance with the Endangered Species Act and a Natural Communities Conservation Plan in accordance with the California Natural Communities Conservation Planning Act. The purpose of the DRECP is to advance state and federal species and ecosystem conservation goals, while also facilitating the timely permitting of renewable energy projects. The DRECP includes a potential amendment to the CDCA Plan and other BLM land use plans. Through this potential land use plan amendment, BLM is proposing to use the DRECP to identify priority areas for renewable energy development called Development Focus Areas (DFAs), to include other renewable energy types other than solar including wind and geothermal), to modify the PEIS's solar energy zones (SEZs), and/or to identify additional exclusion areas. Although the DRECP includes potential amendment of the CDCA Plan, existing land use plan decisions remain

in effect during an amendment until the amendment is completed and approved (BLM Land Use Planning Handbook H-1601-1; March 2005 page 47).

- Lands are being inventoried to identify those with wilderness characteristics. While the original Wilderness Act did not apply to the BLM, with the passage of FLPMA in 1976, Congress directed the BLM to inventory, study, and recommend those public lands under its administration that should be designated as wilderness. The BLM's authority to conduct wilderness studies and to establish new Wilderness Study Areas (WSAs) expired in 1991, pursuant to Section 603 of FLPMA. However, in accordance with Section 201 of FLPMA, the BLM is required to maintain an inventory of public lands under its jurisdiction and determine those lands inventoried for wilderness characteristics outside of WSA or units of the National Wilderness Preservation System. This process is further described below in section 3.11.2 Lands Inventoried for Wilderness Characteristics.

3.1.2 Area Profile

The remainder of Chapter 3 describes the affected environment of the BLM-administered public lands within the WEMO Planning area as it relates to the West Mojave Route Network Project (WMRNP) and livestock grazing in Section 3.7. A complete description of the resources can be found in the CDCA Plan and EIS, as well as the 2005 WEMO FEIS, both of which are incorporated by reference (40 CFR 1502.21). The following subsections summarize how resource conflicts, land uses, and social and economic conditions have contributed to the development of the transportation network and travel management policies in the area.

In general, the existing route network, most of which was in place before 1980, was primarily developed in response to land use needs and social and economic factors. It was only after FLPMA, the Wilderness Act, NEPA, the Endangered Species Act, and other resource-focused legislation and policies were implemented that resource conflicts became a factor in development of the transportation network and travel management policies. In recent years, further development of the transportation network and travel management policies has represented an attempt to strike a balance between protecting resources and serving land use and social needs.

3.1.2.1 Resources

Resource conflicts in the WEMO Planning area have been, and continue to be, considered in the development of the transportation network, travel management policies, and the management of livestock grazing in the following ways:

- NEPA analysis and carrying capacities identified in the CDCA Plan;
- Broad-scoped, region-wide amendments to conserve plant and animal species and their habitats and to prevent future listings, including establishment of DWMAs and ACECs;
- Broad-scoped, region-wide analysis of the transportation network; and
- NEPA analysis of route-specific proposals associated with applications for land uses.
- Grazing prescriptions contained in the 2005 WEMO FEIS.
- Rangeland Health Assessments and allotment specific EAs.

Section 3.1.1.2 above discusses the original CDCA Plan, and subsequent amendments, which established OHV Open Areas, route designations, an implementation framework Motorized Vehicle Access Objectives and the management of livestock grazing. Each of these was considered within the overall framework of the CDCA Plan Goals, which were to provide for the use of the public lands and resources of the CDCA in a manner which enhances wherever possible, and does not diminish, on balance, the environmental, cultural, and aesthetic values of the desert and its productivity.

The CDCA Plan has undergone three regional amendments to protect biological resources, including the Northern and Eastern Mojave (NEMO) amendment of 2002, Northern and Eastern Colorado (NECO) amendment of 2002, and the WEMO Plan amendment of 2006. Specifically, the 2006 WEMO Plan was a cooperative, interagency effort to provide a regional biological strategy to conserve plant and animal species and their habitats and to prevent future listings, and an efficient, equitable, and cost-effective process for complying with threatened and endangered species laws. These Plan amendments, including the WEMO Plan, have been used as mechanisms to establish DWMAs and ACECs to protect sensitive biological, cultural, and other resources. Each of these amendments has evaluated current and future land uses, including OHV, other recreational uses, and livestock grazing for their potential to impact those resources, and placed constraints on those uses in order to protect resources.

Also discussed in Section 3.1.1.2 above, BLM has implemented several efforts since 1985 to analyze and update the transportation network within a specific region within WEMO, or across WEMO as a whole. These included the 1985-87 Off-Road Vehicle Designations, the ACEC Plan designations, the Ord Mountain Pilot Off-Road Vehicle Designations, the WEMO 2003 Western Mojave Desert Off-Road Designation Project, and the 2006 WEMO Plan itself. The Ord Mountain Pilot Project and 2003 Off-Road Designation Project were both analyzed in EAs which considered resource impacts associate with the selected route networks. Similarly, the 2006 WEMO Plan considered the existing network within the framework of the resource-protection goals of the Plan.

In addition to these regional-scale efforts, resource conflicts associated with access are also considered on a route-specific basis when applications for proposed land uses are evaluated. In considering these applications, BLM is required by NEPA to evaluate impacts to sensitive resources, as well as alternatives which can avoid, reduce, or mitigate impacts.

Regional-scale efforts to address conflicts between livestock grazing and other resources have also been considered in allotment specific EAs prepared between 2006 through 2013. These EAs are required to fully process grazing permit and lease renewals. A rangeland health assessment was conducted on all active grazing allotments with the planning area to determine if fallback standards and guidelines were being achieved. If it was determined that an applicable fallback standard or guideline was not being achieved, BLM is required to develop management actions that would achieve the fallback standard or guideline or make postivie progress in the achievement of an applicable fallback standard or guideline. This type of information was analyzed in those allotment specific EAs. BLM issued proposed and final grazing decisions (see 43 CFR 4160) that stipulated the terms and conditions for the management of livestock grazing on public land within the West Mojave Planning Area and elsewhere within the CDCA.

3.1.2.2 Land Uses

Land uses in the WEMO Planning area which require transportation access include grazing operations and access to range improvement, energy, mining, and communications facilities. In general, the effect of land use applications is to expand the transportation network by implementing new routes for access to the specific sites. For land uses which occur in a limited area, such as solar energy plants or mines, the access need is usually limited to a single new route to connect the proposed facility to a local highway. Other proposed land uses, such as wind farms or communication sites, can involve a large number of individual sites scattered over a large area, each site requiring its own access. Finally, several potential land uses, including transmission lines and pipelines, are linear in nature, and can require implementation of a single new route that is tens or hundreds of miles long. In general, the locations of the proposed facilities are driven by the availability of a resource at that location, such as a specific mineral deposit, topographic position, or solarity. As a result, the configuration of the resulting route network is partially driven by the locations of these resources, with limited options available to avoid specific resources.

For these land use projects, the project-specific NEPA analyses consider resource-specific impacts of the proposed site access as well as the facility itself. In fact, the CDCA Plan specifically designated utility corridors to accommodate linear projects in order to minimize proliferation and resource impacts, including impacts associated with their associated access routes. In cases where implementation of a new route cannot be avoided, these NEPA analyses consider alternative route locations or use limitations to avoid, reduce, or mitigate impacts.

3.1.2.3 Social and Economic Conditions

The route network in the WEMO Planning area has also been developed in response to social and economic factors, including locations of population and employment centers, and the resulting need for recreational opportunities. The major factor in the development of the motorized vehicle access network in the region has been growth in both population and employment opportunities in the Victor Valley, Barstow, and Ridgecrest. Historically, the WEMO Planning area has served as a transportation corridor for rail and highway access between the Los Angeles area, a major port and population center, and the remainder of the country. The crossing of the planning area by Interstate Highways I-15 and I-40 not only supports the interconnection between Los Angeles and the rest of the country, but has provided impetus for localized population growth and employment in communities adjacent to these highways.

As population has grown in these areas, the need for transportation access to recreational opportunities for these people has also grown. The access needs include routes to access specific recreational locations such as parks and camping and hiking areas, as well as routes to support OHV-focused activities.

Since the CDCA Plan was approved in 1980, the livestock industry in the California Desert has undergone major decline, especially in the last 10 years. Grazing operations on public land within the planning area are generally small family operations. As the permittee or lessee ages and is less able to run their grazing operation stocking rates typically decline. Unless a younger family member or partner is capable of maintain the grazing operation stocking rates decline, maintenance of range improvements suffers and usually no new range improvements are developed. This trend has been especially hard on the sheep industry. Very few sons or daughters follow in their parents'

footsteps and continue the family sheep operations. Overall, the AUMs that BLM authorizes have decreased from its peak of nearly 40,000 AUMs in 1992 to less than 2,000 in 2013.

The cattle and sheep markets have also experienced substantial fluctuations over the past 30 years. These markets have a great deal of influence on family incomes and fluctuations in stocking rates. The overall costs of running a grazing operation has nearly doubled over the past 30 years while market returns have been fairly static along with BLM grazing fees.

3.2 Air Quality

3.2.1 Climate

The West Mojave (WEMO) Planning area is a desert characterized by hot summer temperatures (average daily highs above 100 degrees Fahrenheit) and low annual precipitation (approximately 5 inches). Snow can occur during the winter. Probably more important than the averages is the extreme variability in the weather. Daily temperature ranges of 40 degrees can occur. Precipitation extremes are also common; variations of 80 percent in annual precipitation can occur. Summer thunderstorms can drop more precipitation on a site in one event than the mean annual precipitation for that location. High winds can occur. Peak wind velocities above 50 miles per hour (MPH) are not uncommon and winds of 100 MPH occur every year.

Temperature: Extremes of temperature are common in the planning area. Below or near freezing temperatures are common at most weather stations. Seven of thirteen stations have average low temperatures below freezing in December and January. El Mirage has the lowest average temperatures in the planning area and Twentynine Palms has the highest average temperatures. Average daily temperature variation is 29 degrees for all stations. Seasonal variations are high. Ridgecrest, for example, has recorded highs of 118 degrees and lows of 0 degrees since the mid-1980s.

Precipitation: Deserts are noted for their low rainfall and the Mojave Desert is no exception. The blocking nature of the mountains on the western and southern boundaries of the desert results in a rain shadow on the desert side of the mountains where precipitation is far less than on the coastal side. Weather patterns and their resulting precipitation follow the seasonal wind patterns and changes. This results in winter precipitation generally arriving from the southwest and spreading eastward across the desert. Winter precipitation volumes normally are the highest in the western Mojave Desert and diminish toward the east. This is illustrated in the mean precipitation for western locations such as Lancaster and Mojave (over 6 inches) and eastern cities such as Twentynine Palms (4 inches).

All of the weather stations in the planning area receive some of their precipitation as snow. The total average snowfall ranges from under one inch in Trona to over three inches at Haiwee Reservoir and Lancaster.

A cyclic weather phenomenon called the El Nino brings increased precipitation to portions of the eastern Pacific Rim. This is especially true in the western Mojave Desert. Weather Bureau records indicate that there have been 23 El Nino years since 1931. These 23 years represent approximately 1/3 of the years, but on the western edge of the desert, those years account for 65 percent of the precipitation. This east to west variability is also reflected in the pronounced east to west difference in the influence of the El Nino years. In Twentynine Palms, for example, only 44 percent of the precipitation falls in El Nino years as opposed to 65 percent along the western edge of the desert.

During the summer the western edge of the Mojave Desert is heavily influenced by the dry southwest airflows resulting in typically very dry weather. The influence of the southwest winds diminishes toward the eastern Mojave Desert. This results in a more continental influence and its resulting monsoonal weather patterns. This is illustrated by comparing Randsburg (along the western edge of the planning area) with Needles (in the eastern Mojave). In Randsburg, only two percent of the Julys and six percent of Augusts have more than 1 inch of precipitation. By

comparison, in Needles, more than 1 inch of monthly precipitation falls in sixteen percent of the Julys and twenty-seven percent of the Augusts. Even sites within the eastern portion of the planning area (such as Twentynine Palms) average more precipitation in July and August than they do in January and February.

The consistent occurrence of two wet seasons in the eastern portion of the planning area is reflected in the vegetation. There is a distinction between plants having most of their photosynthetic activity during the late spring and summer (warm season plants) and plants having most photosynthetic activity during the winter (cool season plants). The vegetation in the eastern Mojave Desert includes warm season plants such as Mojave yucca (*Yucca schidigrea*), galleta grass species (*Pleuraphis spp.*), and others in addition to the cool season plants. The warm season plants are absent from the western edge of the desert. The break between the warm season area and the cool season area follows a north south line along the Mojave River and just west of Harper Dry Lake. The cool season areas are the Indian Wells and Searles Valleys south through the Antelope Valley and east to near the Mojave River.

Extreme variability is another characteristic of the precipitation. Some locations such as Mojave have a mean precipitation of 6.06 inches and a standard deviation of 4.04 inches. This means that the normal precipitation ranges from a low of 2.02 inches to 10.10 inches. This is an 80 percent variation in precipitation volumes.

The annual precipitation cycle in the Mojave Desert shows two distinctive patterns that approximately divide the region along the 117°W meridian, which is near Barstow, California (USGS Fact Sheet 117-03, Hereford, R, et al.). A biseasonal pattern prevails at 90% of the weather stations used to collect data that lie east of 117°, whereas a winter-dominant pattern is typical of 70% of the stations lying west of 117°. In both cases, May and June are consistently dry, accounting for less than 5% of annual rainfall. October through April precipitation of the winter dominant pattern accounts for 82% of the annual total, whereas the biseasonal pattern accounts for 66%. During the warm months of July through September, 13 and 29% of the annual total falls in the winter-dominant and bi-seasonal patterns, respectively.

Cool-season precipitation is the most important and extensive source of rain in the desert region. Rainfall is widespread and of relatively long duration during the cool season. Warm-season precipitation results largely from convective precipitation in the form of thunderstorms. Although rather infrequent, the most dramatic precipitation source is tropical cyclones and hurricanes (often referred to as chubascos) that drift across the region from off the coast of Baja California. These typically occur late in the warm season and are accompanied by widespread and severe flash flooding. The extent and magnitude of warm-season rainfall strongly influences the distribution of desert vegetation. The relative abundance of cacti, many yuccas, agaves, and agave-like plants is much greater where warm-season rainfall is abundant (Rowlands, 1995)

Drought: When precipitation is below average, it is considered a drought. The Palmer Drought Severity Index (PDSI) has become the semi-official drought index. The PDSI uses precipitation and other moisture data to develop a dryness index. The index uses “0” as normal for a site and negative numbers to indicate severity of a drought and positive numbers to indicate excess moisture. A minus 4 is considered a severe drought. The NOAA Drought Information Center has used instrument data in combination with tree ring data to construct a table of PDSI for the period of 1700 to 1995. One of the sites for which data has been collected is just east of Barstow. Using

that data in combination with other PDSI data, it is apparent that a drought occurred from 1951 through 1979 which was the longest in modern times and the most severe in the last 300 years.

3.2.2 Air Quality Regulatory Framework

Emissions limitations are imposed upon sources of air pollutants by rules and regulations promulgated by the federal, state or local agencies. Mobile sources of air pollutants and exhaust from off-road equipment are managed by federal and state agencies through emission performance standards and fuel formulations requirements. Portable sources and temporary activities that cause emissions of air contaminants are also managed through federal, state and local programs. This section summarizes the applicable regulations related to the Proposed Project.

3.2.2.1 Federal Oversight

The Environmental Protection Agency (EPA) implements and enforces the requirements of most federal environmental laws. EPA Region 9 administers federal air programs in California. The Clean Air Act (CAA), most recently amended in 1990, provides EPA with the legal authority to regulate air pollution from stationary and mobile sources. The EPA has authority over conformity issues in areas that do not meet federal air quality standards, and federal land managers have review authority over new projects that may affect federal Class I areas as defined in 40 CFR 51.166.

General Conformity

The General Conformity Rule (40 CFR 51 Subpart W, 40 CFR Part 93 Subpart B) requires federal agencies to ensure that actions taken by those agencies conform to the applicable State Implementation Plan (SIP). General Conformity regulations apply only to direct and/or indirect emissions caused by the actions that occur in areas designated as non-attainment or maintenance areas with respect to the National Ambient Air Quality Standards (NAAQS). If the applicable emissions exceed de minimis thresholds outlined in the General Conformity Rule, then the federal agency prepares a General Conformity Determination for public comment. The General Conformity Determination outlines the methodology by which proposed emissions would conform to the SIP, such as:

- Emissions that are specifically identified and accounted for in the SIP; or
- Emissions that are fully offset or employ a similarly enforceable measure that creates emissions reductions so that there is no net increase in emissions.

Green House Gas Under the Clean Air Act: Public Health and Welfare

On April 2, 2007, in Massachusetts versus EPA, 549 US 497 (2007), the Supreme Court found that Green House Gases (GHGs) are air pollutants covered by the CAA. The Court held that the EPA must determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. After an examination of the available scientific evidence on the causes and impacts of current and future climate change as well as other effects of GHGs, the EPA concluded that the science compellingly supports a positive endangerment finding for both public health and welfare. The EPA relied heavily upon the major

findings and conclusions from assessments of the United States Climate Change Science Program (now United States Global Change Research Program), and the Intergovernmental Panel on Climate Change. The EPA proposed this endangerment finding after considering both observed and projected future effects of climate change, key uncertainties, and the full range of risks and impacts to public health and welfare occurring within the United States.

On December 7, 2009, the EPA found that GHGs in the atmosphere threaten the public health and welfare of current and future generations, and that the combined emissions of CO_2, CH_4, N_2O, and HFCs from new motor vehicles and motor vehicle engines contribute to the atmospheric concentrations of these key GHGs and hence to the threat of climate change.

3.2.2.2 State Regulation

California Health and Safety Code § 41700

The Health and Safety Code prohibits the discharge of air pollutants that cause injury, detriment, nuisance or annoyance to the public. The air quality management districts implement this requirement through their local rules.

California Clean Air Act, California Health and Safety Code § 42300 et seq.

The California CAA of 1988 provides for air quality planning and regulation beyond and independent of federal regulations. The California Air Resources Board (CARB) is the state's lead air quality agency and adopts standards for the CAAQS, some of which are more stringent than the NAAQS. CARB is responsible for the attainment and maintenance of NAAQS and CAAQS, oversees the operation of local air quality districts, and is responsible for motor vehicle air pollution control. CARB also assists the individual air districts with air quality monitoring as well as planning activities such as performing air pollutant emission inventories and air quality modeling.

Under delegation from the EPA, CARB and the individual air districts have the primary authority for managing air quality in California.

CARB Off-Road Mobile Sources Emissions Reduction Programs

The California CAA mandates that CARB achieves the maximum degree of emission reductions from all off-road mobile sources in order to attain the state ambient air quality standard. Off-road mobile sources regulations target construction equipment as a major source targeted for reductions to achieve NOx, VOC, CO and PM_{10} exhaust standards. CARB implements control measures to reduce diesel particulate matter emissions as well as NOx from existing off-road diesel equipment, fleet emission targets for new vehicles, and specific limits on emissions from classes of vehicles, including red-sticker and green-sticker off road vehicles.

Local Air Basins

The WEMO Planning area falls within portions of three different air basins. These are the Great Basin Valleys Air Basin (GBVAB), the Mojave Desert Air Basin (MDAB), and the Salton Sea Air Basin (SSAB) (see Figure 3.2-1). The Great Basin Valleys Air Basin includes all of Inyo and Mono Counties. The Mojave Desert Air Basin includes the desert portions of Kern, Los Angeles, San Bernardino Counties and the Palo Verde Valley portion of Riverside County. The Salton Sea Air Basin includes the Coachella Valley portion of Riverside County and Imperial County. The

United States Environmental Protection Agency (USEPA) breaks these air basins into planning areas based upon various emission problems or watershed boundaries.

Air Quality Management Districts

The management and enforcement of the air quality standards falls on several different jurisdictions. The USEPA has the primary responsibilities under the Federal Clean Air Act (CAA). The USEPA has delegated a number of responsibilities to the states and in most cases, also regional air quality management districts. The WEMO Planning area falls within five different regional air districts (see Figure 3.2-2):

- The desert portions of San Bernardino County and the Palo Verde Valley portion of Eastern Riverside County are within the Mojave Desert Air Quality Management District (MDAQMD).
- Inyo and Mono Counties are within the Great Basin Unified Air Pollution Control District (GBUAPCD).
- The Antelope Valley Portion of Los Angeles County is in the Antelope Valley Air Quality Management District (AVAQMD).
- The Coachella Valley portion of Riverside County is within the South Coast Air Quality Management District (SCAQMD).
- The eastern (desert) portion of Kern County is within the East Kern Air Pollution Control District (EKAPCD).

3.2.3 Air Quality Standards

The CAA and the California Clean Air Act contain the primary provisions relating to air quality. Among the most important provisions are the sections relating to the establishment of the National and State Ambient Air Quality Standards, non-attainment areas, the development of state implementation plans (SIP), prevention of significant deterioration (PSD), air toxics and federal general conformity. The USEPA and the California Air Resources Control Board have issued rules to implement the federal and California Clean Air Acts.

The federal and state Clean Air Acts regulate certain forms of pollution under three main categories. These are criteria pollutants, air toxics, and global warming and ozone-depleting gases. There is also regulation of a more general category of emissions that reduce visibility. These come under the titles of regional haze, prevention of significant deterioration (PSD), and visibility reducing particulates (VRP).

The definitions used in determining whether or not an area meets air quality standards are found in the federal and state Clean Air Acts and their associated ambient air quality standards. Criteria pollutants are defined as those pollutants for which the federal and state government have established ambient air quality standards, or criteria, for concentrations in order to protect public health. Under the federal Clean Air Act, the USEPA has established National Ambient Air Quality Standards (NAAQS) for seven criteria pollutants (ozone, respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), carbon monoxide, nitrogen dioxide, lead and sulfur dioxide). These pollutants are described below.

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particulate Matter (PM) pollution consists of very small aerosol and solid particles floating in the air. PM is a mixture of materials that can include smoke, soot, dust, salt, acids, and metals. Some PM, such as pollen, is naturally occurring. PM_{10} refers to particles less than or equal to 10 microns in diameter and $PM_{2.5}$ refers to particles less than or equal to 2.5 microns in diameter.

Ozone (O_3)

In the presence of ultraviolet radiation, both nitrogen oxides (NO_x) and volatile organic compounds (VOCs) go through a number of complex chemical reactions to form ozone. The entire WEMO Planning area is designated as non-attainment for the state ozone standard.

Carbon Monoxide (CO)

CO is primarily a byproduct of motor vehicle exhaust, which contributes more than two-thirds of all CO emissions nationwide. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. These emissions can result in high concentrations of CO, particularly in local areas with heavy traffic congestion. Other sources of CO emissions include industrial processes and fuel combustion in sources such as boilers and incinerators. Despite an overall downward trend in concentrations and emissions of CO, some metropolitan areas still experience high levels of CO.

Nitrogen Dioxide (NO_2) and Nitrogen Oxides (NO_x)

Nitrogen dioxide is a reddish brown, highly reactive gas that is formed in the ambient air through the oxidation of nitric oxide. NO_x, the generic term for a group of highly reactive gases that contain nitrogen and oxygen in varying amounts, plays a major role in the formation of ozone, particulate matter (PM), and acid rain. NO_x emissions result from high-temperature combustion processes such as vehicle exhaust emissions and power plants. Home heaters and gas stoves can also produce substantial amounts of NO_2 in indoor settings. The majority of the NO_x emitted from combustion sources is in the form of nitric oxide (NO), while the balance is mainly NO_2. NO is oxidized by O_3 in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content, such as coal or heavy fuel oils, can emit very large amounts of SO_2 when combusted. Sources of SO_2 emissions come from every economic sector and include a wide variety of fuels in gaseous, liquid and solid forms.

These standards are used to classify all areas as to whether they are in attainment, in non-attainment or are unclassified for any of the NAAQS. California has established California Ambient Air Quality Standards for the same federal criteria pollutants plus an additional four pollutants (visibility reducing particulates, sulfates, hydrogen sulfide, and vinyl chloride).

The Ambient Air Quality Standards for California are almost entirely stricter than the federal standards (see Table 3.2-1).

Table 3.2-1. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]	Federal Standards (NAAQS)[2]	
			Primary	Secondary
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	--	--
	8-hour	0.07 ppm (137 µg/m^3)	0.075 ppm[4] (147 µg/m^3)	Same as primary
PM_{10}	24-hour	50 µg/m^3	150 µg/m^3 [5]	Same as primary
	Annual	20 µg/m^3	--	--
$PM_{2.5}$	24-hour [3]	--	35 µg/m^3 [6]	Same as primary
	Annual	12 µg/m^3	12 µg/m^3 [7]	Same as primary
Carbon Monoxide (CO)	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	--
	1-hour	20 ppm (23 µg/m^3)	35 ppm (40 mg/m^3)	--
Nitrogen Dioxide (NO_2)	Annual	0.030 ppm (57 µg/m^3)	0.053 ppm[9] (100 µg/m^3)	Same as primary
	1-hour	0.18 ppm (339 µg/m^3)	0.10 ppm[10] (188 µg/m^3)	Same as primary
Sulfur Dioxide (SO_2)	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (for certain areas)[10]	--
	3-hour	--	--	0.50 ppm (1300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)[11]	--
Lead	30-Day	1.5 µg/m^3	--	--
	Quarterly	---	1.5 µg/m^3 (for certain areas)[12]	Same as primary
	3-Month	---	0.15 µg/m^3 [12]	Same as primary
Sulfates	24-hour	25 µg/m^3	--	--
Hydrogen Sulfide (H_2S)	1-hour	0.03 ppm (42 µg/m^3)	--	--
Visibility Reducing Particles (VRP)	8-hour	See Note 13	--	--
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	--	--

Table 3.2-1. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]	Federal Standards (NAAQS)[2]	
			Primary	Secondary

Sources: CARB 2012a, CARB 2012b
Notes:
ppm = parts per million
ppb = parts per billion
$\mu g/m^3$ = micrograms per cubic meter
PM_{10} = Particulate matter less than 10 microns
$PM_{2.5}$ = Particulate matter less than 2.5 microns

(1) Standards for ozone, CO, SO_2 (1 and 24 hour), NO_2, PM_{10}, $PM_{2.5}$, and VRP are values that are not to be exceeded. All others are not to be equaled or exceeded.
(2) Short-term standards (averaging times of 24 hours or less) for CO and SO_2 are not to be exceeded more than once per year.
(3) Standard attained when expected number of days/year with maximum hourly average concentration above standard is equal to or less than one.
(4) Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
(5) Not to be exceeded more than once per year on average over 3 years.
(6) 98th percentile, averaged over 3 years.
(7) Annual mean, averaged over 3 years.
(8) 3-year average of weighted annual mean concentrations.
(9) Annual Mean.
(10) Based on the 3-year average of the 99th percentile of the yearly distribution of 1-hour daily maximum concentrations.
(11) The 3-year average of the 99th percentile of the daily maximum 1-hour average must not exceed 75 ppb.
(12) Standard is based on rolling 3-month average.
(13) Extinction coefficient of 0.23 per kilometer --- visibility of 10 miles or more due to particles when relative humidity is less than 70 percent

Conformity Determination

The classification of an area as a federal non-attainment area brings an additional requirement for federal agencies. Section 176(c) of the Clean Air Act (CAA), as amended (42 U.S.C. 7401 et seq.), and regulations under 40 CFR, part 93, subpart W, state that "no department, agency or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve any activity which does not conform to an applicable implementation plan." This means that under the CAA 176(c) and 40 CFR, part 93, subpart W, (general conformity rules), federal agencies must make a determination that proposed actions in federal non-attainment areas conform to the applicable State Implementation Plan (SIP) before the action is taken.

3.2.4 Existing Air Quality

Much of the time, air quality in the western Mojave Desert is good. There are, however, times that localized areas have not met air quality standards due to locally generated and/or transported in pollutants. Fugitive dust is the most pervasive air pollutant in the WEMO Planning area and includes both PM_{10} and, to a lesser degree, $PM_{2.5}$ components. Fugitive dust pollution in the desert is aggravated by frequent high-wind events, and can be further intensified by prolonged dry conditions and fires, which can also substantially reduce visibility.

Several studies have looked at the ozone pollution problem in the desert areas. The studies show that the peak ozone levels do not correspond to the peak temperatures and ultraviolet (UV) levels, but are occurring much later in the day indicating that the ozone is being formed upwind and is being transported into the area from its sources by the prevailing winds. The South Coast Air Basin and the San Joaquin Valley Air Basin to the west of the WEMO Planning area are both federal non-attainment areas for ozone and are major sources of the wind-transport ozone pollution in the desert.

Heavily impacted areas by ozone transport include the Victorville-Barstow area, the Antelope Valley, and Joshua Tree National Park.

Due to the restrictions for the use of high sulfur fuels, reduction in gasoline and diesel sulfur contents, and reduction in SO_2 emissions from other industrial sources (such as refineries), SO_2 pollution is no longer a major air quality concern in most of California including the WEMO Planning area.

Non-Attainment Areas

Areas that are classified as non-attainment by the USEPA are required to prepare and implement a State Implementation Plan (SIP) that identifies and quantifies sources of emissions and presents a comprehensive strategy to control and reduce locally generated emissions. Attainment status by air basin and air district is provided in Table 3.2-2.

Air quality degradation and ambient air quality standard exceedances in the planning area have been episodic in nature. High PM_{10} concentrations that violated the National Ambient Air Quality Standards peaked in the early 1990s. In recent years, good monitoring data has led to reclassification requests to the USEPA for most of the region. Implementation of dust control rules and controls on a number of critical sources have led to reductions in PM_{10} concentrations. The number of violations of the NAAQS for ozone have declined, but violations have continued. Rules establishing controls for ozone precursor emissions have been implemented, but overwhelming transport of pollutants from the South Coast Air Basin and the San Joaquin Valley Air Basin continually impacts the desert.

Table 3.2-2. Attainment Status by Air Basin and Air District

Air Basin	Air Quality District	Pollutant	Planning Area Name	Federal Designation	State Designation
GBVAB	GBUAPCD	PM_{10} (federal)	Owens Valley	Severe Non-attainment	N/A
		PM_{10} (federal)	Coso Junction	Attainment	N/A
		PM_{10} (state)	GBVAB	N/A	Non-attainment
		Ozone (state)	Inyo County and Mono County	N/A	Non-attainment
		All others	GBVAB	Unclassified/ attainment	Unclassified/ Attainment

Table 3.2-2. Attainment Status by Air Basin and Air District

Air Basin	Air Quality District	Pollutant	Planning Area Name	Federal Designation	State Designation
MDAB	EKAPCD	PM_{10} (federal)	Indian Wells Valley	Attainment/ Maintenance	N/A
		PM_{10} (federal)	Kern River/Cummings Valley	Serious Non-attainment	N/A
		PM_{10} (state)	MDAB	N/A	Non-attainment
		Ozone (federal)	Eastern Kern County*	Non-attainment	N/A
		Ozone (state)	MDAB	N/A	Non-attainment
		All others	Eastern Kern County	Unclassified/ attainment	Unclassified/ Attainment
	MDAQMD	PM_{10} (federal)	Searles Valley	Moderate Non-attainment	N/A
		PM_{10} (federal)	Mojave Desert	Moderate Non-attainment	N/A
		Ozone (federal)	Mojave Desert modified	Non-attainment	N/A
		Ozone (state)	MDAB	N/A	Non-attainment
		$PM_{2.5}$ (state)	Mojave Desert modified	N/A	Non-attainment
		Hydrogen Sulfide (state)	Searles Valley	N/A	Non-attainment
		PM_{10} (state)	MDAB	N/A	Non-attainment
		All others	MDAQMD Wide	Unclassified/ attainment	Unclassified/ Attainment
	AVAQMD	Ozone (federal)	Mojave Desert modified	Non-attainment	N/A
		PM_{10} (state)	MDAB	N/A	Non-attainment
		Ozone (state)	MDAB	N/A	Non-attainment
		All Others	MDAB	Unclassified/ attainment	Attainment

Table 3.2-2. Attainment Status by Air Basin and Air District

Air Basin	Air Quality District	Pollutant	Planning Area Name	Federal Designation	State Designation
SSAB	SCAQMD	PM_{10} (federal)	SSAB	Moderate Non-attainment	N/A
		Ozone (federal)	SSAB	Non-attainment	N/A
		PM_{10} (state)	SSAB	N/A	Non-attainment
		Ozone (state)	SSAB	N/A	Non-attainment
		$PM_{2.5}$ (federal)	SSAB	Moderate Non-attainment	N/A
		$PM_{2.5}$ (state)	SSAB	N/A	Non-attainment
		NO_2 (state)	SSAB	N/A	Non-attainment
		All others	SSAB	Unclassified/ attainment	Attainment

N/A – The planning areas for the Federal and State standards are not directly comparable. Therefore, the attainment status for the Federal and State standards are listed in separate rows in this table.

Particulate Matter and the Planning Area

Much of the particulate matter that causes pollution in the area is locally generated and transported. Relatively coarse PM_{10} particles are considered respirable particulates because they are of sufficiently small size that they can be inhaled into the nose, throat and/or lungs. PM_{10} can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NO_x, sulfur oxides (SO_x), VOCs, and ammonia, given the right meteorological conditions, can form PM in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted, but are formed through complex chemical reactions in the atmosphere.

Fine $PM_{2.5}$ particles are the largest threat to health because they tend to deposit in the air sacks of the lungs. In addition, these finer particles often result from precursor emissions, many of which are toxic or carcinogenic and may not be locally generated. The USEPA has established new NAAQS standards for $PM_{2.5}$ emissions. These fine particles have been implicated as an increased health risk and consist of chemical compounds that mostly result from combustion processes. $PM_{2.5}$ is derived mainly from either the combustion of materials, or from precursor gases (SO_x, NO_x, and VOCs) through complex reactions in the atmosphere. $PM_{2.5}$ consists mostly of sulfates, nitrates, ammonium, elemental carbon, and a small portion of organic and inorganic compounds.

Human activities that contribute to the PM_{10} emissions include combustion sources such as stack emissions, diesel exhaust and smoke from prescribed fire and wild fire, fugitive dust sources such as construction and demolition activities, off highway vehicle (OHV) travel, unpaved public roads and parking lots, industrial activities, OHV open areas, large-scale concentrated livestock grazing

operations and military activities. The combustion sources tend to produce smaller particulates (less than 5 microns) while fugitive sources tend to produce larger particulates (larger than 5 microns).

With respect to the federal PM_{10} standard, the WEMO Planning area now includes areas that are designated as in non-attainment, attainment, and unclassified/attainment. The portions of the planning area in the MDAQMD and SCAQMD areas are designated as non-attainment, as is Owens Valley in the GBUAPCD area. Of these non-attainment areas, USEPA has classified three areas within the WEMO Planning area as formal PM_{10} Planning areas. The three current federal planning areas are: the Owens Valley PM_{10} Planning Area, the Trona PM_{10} Planning Area, and the San Bernardino County PM_{10} Area. The Owens Valley planning area is one of five serious federal non-attainment PM_{10} planning areas in the nation.

The original Searles Valley PM_{10} Planning Area abutted the Owens Valley PM_{10} Planning area on the north and included Rose Valley, Indian Wells Valley, and Searles Valley. The USEPA split the federal non-attainment area into three separate non-attainment areas based upon the county lines. These three new federal non-attainment areas were called the Coso Junction, the Indian Wells Valley, and the Trona PM_{10} non-attainment areas. Of these, Coso Junction in the GBUAPCD was redesignated as attainment/maintenance in 2010, and Indian Wells Valley in the EKAPCD was redesignated as attainment/maintenance in 2003.

Emission sources identified in the SIP include construction/demolition, public unpaved roads, paved roads, mobile sources, unplanned fires, public disturbed areas, fuel combustion (cogeneration boiler and stacks at Trona), fugitive dust from mining activities, primarily on Searles lakebed, industrial roads, agricultural fields, and military activities. In 1990 there were an estimated 3.98, 4.76 and 9.18 tons/day of PM_{10} emissions in the Coso Junction, Indian Wells Valley, and Trona non-attainment areas respectively.

Activities on BLM lands are estimated to contribute 8 percent of the total PM_{10} emissions in the Trona non-attainment area. The primary source of BLM emissions is OHV activity and unpaved road travel in the Spangler Hills Open Area and surrounding areas. The Trona PM_{10} SIP targets the BLM emissions for a 20 percent reduction. The East Kern APCD and Mojave Desert AQMD have developed rules to implement their respective SIP obligations. Current monitoring data has not indicated any recent exceedances of the NAAQS in any of these three non-attainment areas. As a result, documents have been prepared for these three areas requesting a reclassification from non-attainment to attainment/maintenance, and the Coso Junction and Indian Wells Valley areas were subsequently reclassified.

The USEPA classified the San Bernardino County desert area as a PM_{10} non-attainment area on January 20, 1994. The Mojave Desert AQMD prepared a "Particulate Matter (PM_{10}) Control Strategy Plan" and submitted it to the state for inclusion into the state SIP. The USEPA disapproved the plan and returned it to the Mojave Desert AQMD for revision. Emission sources identified in the plan included construction/demolition, city and county unpaved roads, travel and wind erosion, paved road entrainment, city and county disturbed areas, and industrial activities. Four BLM open areas (Stoddard Valley, Johnson Valley, Rasor, and El Mirage) are within the non-attainment area and the WEMO Planning area. The draft plan called for BLM to prepare a Dust Control Plan for activities within the core problem portion of the non-attainment area. At the present time there is no approved SIP for the non-attainment area to guide management actions there. Currently, new rules are being drafted to come into compliance with USEPA requirements.

These new rules will likely require BLM to prepare dust control plans for the entire federal non-attainment area.

The remainder of the planning area (AVAQMD, the area of EKAPCD outside of Coso Junction, and the area of GBUAPCD outside of Owens Valley and Indian Wells Valley) is designated as unclassified/attainment. The Antelope Valley Area has recorded levels above the national threshold, but has not been classified as non-attainment. The air quality management district has been working directly with USEPA to successfully reduce the PM_{10} concentration levels and avoid having the Antelope Valley Planning Area designated as a federal non-attainment area. Part of this effort is through the adoption and implementation of rules to control fugitive dust, which constituted a majority of the total PM_{10} emissions.

Overall, as shown in Figure 3.2-3, ambient PM_{10} values in the planning area have been steadily decreasing since 1986. This has been the direct result of federal PM_{10} planning efforts in the Owens and Searles Valley areas, as well as the reductions of local emissions from construction and demolition projects due to increased local regulation.

3.2.5 Air Quality Monitoring

The 2005 WEMO Final EIS included a finding of consistency with the federal Clean Air Act (CAA). The Court's Summary Judgment order vacated this consistency determination because the analysis did not include projections of future levels of OHV use, and because the analysis did not include evaluation of emissions from OHV open areas. In the Remedy Order, BLM was required to perform additional air quality monitoring associated with emissions from OHV open areas.

In response, BLM coordinated with the California Desert Air Working Group (CDAWG), which included the five air districts within the WEMO Planning area, to develop a strategy to comply with the Remedy Order. Each of the five air districts is required to submit an annual report describing their air quality monitoring program and its results to the EPA annually. In 2012, the EKAPCD, MDAQMD, and AVAPCD information was included in the California Air Resources Board (CARB) 2012 Annual Monitoring Network Report for Small Districts in California (CARB 2012c). The GBUAPCD developed an independent report titled 2012 Ambient Air Monitoring Network Plan (GBUAPCD 2012) and the SCAQMD developed the South Coast Air Quality Management District Annual Air Quality Monitoring Network Plan (SCAQMD 2012).

These reports document a network of 46 monitoring stations throughout the WEMO Planning area. The only OHV open area that is not directly monitored within this network in the planning area is Rasor OHV area, which receives relatively light use and contains a higher concentration of larger sand particles. Historically, BLM has coordinated with the air districts in the development of their monitoring networks and through review of air data and reports. For areas identified as non-attainment areas, BLM has participated in the preparation of required implementation plans to ensure that BLM activities, including OHV use, are specifically addressed in the plans and the district rules.

To demonstrate compliance with the Remedy Order, BLM asked the MDAQMD to work with the other air districts and compile the results from the 46 ambient air monitoring stations. The results of this study were reported to BLM in the West Mojave Plan Air Quality Evaluation Report dated April, 2103 (MDAQMD 2013).

The Air Quality Evaluation Report provided detailed information on the locations and operations of the 46 monitoring stations throughout the planning area. Monitoring data included VOCs, oxides of nitrogen (NO_x), carbon monoxide (CO), respirable particulate matter (PM_{10}), fine respirable particulate matter ($PM_{2.5}$), oxides of sulfur (SO_x), and hazardous and toxic compounds (HAPs and TACs). The emissions monitored at the stations include emissions from three categories of sources: stationary sources (such as industrial activity, power generation, and military bases), mobile sources (including on-road vehicles, off-road vehicles, airplanes, and trains), and area sources (small widespread sources such as solvents, fires, and consumer products).

Emissions from OHV use and grazing operations were separately inventoried as a subcategory of the mobile sources. Emissions from OHV Open Areas were indirectly inventoried as area sources, as an element within the subcategories of unpaved road dust and fugitive windblown dust. The monitoring locations include a mix of sites near population centers (neighborhood scale monitors) and in rural areas (regional scale monitors). The neighborhood scale monitors are intended to characterize conditions that may affect nearby populations and for tracking the progress towards attainment of the ambient air pollutant standards. The regional scale monitors evaluate emissions within broad geographic regions and track background levels of ambient air pollutants. The monitoring network meets all federal, state, and local air monitoring requirements, including monitoring impacts to ambient air quality resulting from OHVs and OHV Open Areas.

The total emissions inventory in the planning area, combined using data from each of the five air quality districts, is presented in Table 3.2-3. Figure 3.2-4 presents the relative contributions of the various sources to the emissions inventory.

Table 3.2-3. Emissions Inventory in WEMO Planning Area (Tons per Year)

Type	Category	VOCs	NOx	SO_x	PM_{10}	$PM_{2.5}$
Stationary	Fuel Combustion	0.90	24.02	2.31	5.20	4.02
Stationary	Waste Disposal	0.27	0.07	0.12	0.30	0.07
Stationary	Cleaning and Surface Coatings	6.62	0.00	0.00	0.40	0.38
Stationary	Petroleum Production and Marketing	5.99	0.02	0.00	0.00	0.00
Stationary	Industrial Processes	2.42	55.69	5.83	41.15	17.83
Area	Solvent Evaporation	13.67	0.00	0.00	0.00	0.00
Area	Miscellaneous Processes	5.78	2.43	0.13	221.03	31.84
Mobile	On-Road Motor Vehicles	28.45	135.88	0.22	6.27	5.16
Mobile	Other Mobile Sources	38.31	62.99	0.99	6.00	5.59
Totals from all Sources		**102.41**	**281.10**	**9.60**	**280.35**	**64.89**

Figure 3.2-4 shows that mobile sources (including OHVs) are the largest source of ozone precursor (VOC and NOx) emissions, but are a minor component of SO_x, PM_{10}, and $PM_{2.5}$ emissions. VOC emissions from OHVs are high relative to other sources because their engines do not have catalytic controls, and therefore release unburned fuel in their exhaust. As such, OHV emissions are a significant contributor to VOC emissions, which are a precursor to a regional pollutant (ozone).

The report concluded that OHV Open Areas are not a significant contributor to either total unpaved road dust or fugitive windblown dust subcategories, and are thus not a significant contributor to regional PM_{10} emissions. This is because the disturbed area in the OHV Open Areas

is small relative to the total mileage of maintained and unmaintained unpaved roads and tracks, as well as tens of millions of acres of land disturbed for other uses, much of which is from outside of the planning area.

3.2.6 Sensitive Receptors and Residences

For purposes of impact analysis among route network alternatives, BLM compared the proximity of motorized routes to sensitive receptors. Sensitive receptors were defined as schools and health facilities. The number of sensitive receptors within the WEMO Planning area is presented in Table 3.2-4.

Table 3.2-4. Sensitive Receptors in WEMO Planning Area

Type of Sensitive Receptor	Within ¼ miles of a Route	Within 1 mile of a Route
Public School	12	43
Private School	0	6
Colleges	1	4
Health Facilities	0	7

In the impact analysis in Chapter 4, BLM identified the mileage of motorized routes within various distances of these receptors. The distances evaluated were 0.25 and 1.0 miles from the receptors.

To estimate the impacts to residences, BLM used the "developed area" layer of the vegetation database as a surrogate for areas where residences exist. In the analysis in Chapter 4, mileages of routes within 300 feet of the developed areas were used as a conservative assessment of the potential for air quality impacts to residents.

3.2.7 Climate Change

Climate change is defined as any change in climate over time, whether due to natural variability or as a result of human activity (CCSP 2008). Climate change can interact with other environmental changes to affect biodiversity and the future condition of ecosystems. There is general scientific consensus that climate change is occurring and that human activity contributes to the change. Man-made emissions of greenhouse gases (GHGs) contribute to continued increases in global temperatures. Increases in global temperature cause a reduction in the polar ice caps and increases in sea level, which flood low lying areas of the world. Additionally, climate change shifts rainfall patterns that would cause significant impacts to agriculture and fresh water availability worldwide.

Climate change is defined as the long-term change in the statistical distribution of weather patterns over periods ranging from decades to millions of years (CDM 2011). It is well-documented and widely accepted that the Earth's climate has fluctuated and changed throughout history. Scientific evidence also acknowledges that world climate is currently changing as indicated by increases in global surface temperature, altered precipitation patterns, warming of the oceans, sea level rise, increases in storm intensity, changes in wind patterns, and changes in ocean pH (Bierbaum and others 2007; et al. 2007); Coastal Resources Center, University of Rhode Island and International Resources Group [CRC&IRG] 2009). This is significant because "climate is a dominant factor influencing the distributions, structures, functions, and services of ecosystems" (CCSP 2008).

Based on the results of 21 global climate models that address a scenario (referred to as A1B) in which multiple energy sources, including fossil fuels, continue to be consumed, the conservative forecast for western North America is a linear change in mean temperatures ranging from +2.1 °C to +5.7 °C (+3.8 °F to +10.4 °F) and a linear change in mean precipitation ranging -3 percent to +14 percent through the end of the century (Friggens and others 2012); et al. 2012). Under this scenario, it appears that such changes will be most favorable for the desert scrub vegetation types found in the Mojave, Sonoran, and Chihuahuan deserts, which are all projected to expand (Friggens et al. 2012). Predicting how species distributions and vegetation communities will change is difficult; and to date, very limited modeling to better understand the effect of this change on individual species, including birds, mammal, reptiles, invertebrates, and plants, has occurred. To address the uncertainties of how populations of species adapted to local conditions will respond to a changing climate, Barrows and Murphy-Mariscal (2012) identify the need for a local-scale approach to modeling that takes into consideration the topographic and ecological complexities of a specific management area or species range. And there is now strong indication that recent climatic changes have affected a broad range of organisms with diverse geographical distributions (Walther *et al.* 2002). For example, climate change and drought were not identified as threats to the desert tortoise in the 1994 Recovery Plan, but since that time it has become apparent that the combined effects of global climate change (*i.e.*, increased ambient temperatures and altered precipitation patterns) and drought may become significant factors in the long-term persistence of the species (U. S. Fish and Wildlife, 2011).

In California, maximum, average, and minimum air temperatures have increased over the past century, with the greatest increase seen in minimum temperatures (Anderson and others 2008). Precipitation on the other hand has been highly variable over this period with no statistically significant trend, and it is unknown how climate change could affect the amount, form, and timing of precipitation statewide. In southern California, temperatures are predicted to increase over time. These increases in temperature could result in extended periods of excessive heat and generally drier conditions (Cayan, in Southern California Association of Governments [SCAG] 2009). Several of the more recent climate simulations for southern California suggest that summer temperatures will increase more than those in winter, with the effects felt most significantly in the interior areas of Southern California (Cayan, in SCAG 2009). The combination of higher temperatures and potentially lower annual precipitation rates is likely to increase water demand in urban areas, which will in turn stress areas already affected by limited water supplies.

3.2.7.1 Greenhouse Gases

Gases that trap heat in the atmosphere are often referred to as Greenhouse Gases (GHGs), which are emitted into the atmosphere through natural processes and human activities. GHGs are so named because of their ability to prevent heat from the surface of the earth from escaping to space. There appears to be a close relationship between the concentration of GHGs in the atmosphere and global temperatures. Human-made emissions of GHGs are likely to contribute further to continued increases in global temperatures, with probable impacts including: increased drought, flooding, heat waves and sea rise (Intergovernmental Panel on Climate Change [IPCC] 2007). In addition, global warming can make air pollution worse because warmer temperatures accelerate the formation of ozone and other pollutants.

The principal greenhouse gases contributing to climate-change and resulting from human activity are listed below.

- Carbon dioxide (CO_2) enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). CO_2 is also removed from the atmosphere (or "sequestered") and stored when it is absorbed by plants as part of the biological carbon cycle. This sequestration can be associated with desert plants and biological crusts; thus disturbance of these habitats may cause the release of sequestered CO_2.
- Methane (CH_4) is emitted during the combustion, production and transport of coal, natural gas, and oil. CH_4 emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- Nitrous oxide (N_2O) is emitted during agricultural and industrial activities, as well as from solid waste, and combustion of fossil fuels (in small amounts).
- Fluorinated Gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6), are synthetic, powerful GHGs that are emitted from a variety of industrial processes. GHG emissions from these sources are typically found in refrigerants, fire suppression equipment, and electric switching equipment, respectively. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and halons). These gases are typically emitted in smaller quantities, but are considered as potent GHGs due to very high global warming potentials (GWPs).

Emissions of CO_2 occur largely from combustion of fossil fuels. The major categories of fossil fuels combustion CO_2 sources can be broken into sectors for residential, commercial, industrial, transportation, and electricity generation. The transportation sector includes all motor gasoline and diesel fuel combustion, and the GHG emissions of this sector are not split into activities or uses (i.e., there is no separate estimate for the level of GHG emissions caused by gasoline or diesel fuel combustion-related to construction activities). Other GHG emissions such as CH_4 and N_2O are also tracked by state inventories but occur in much smaller quantities. According to the EPA, the global warming potential of methane is about 25 times that of CO_2 (http://www.epa.gov/ghgreporting/documents/pdf/2013/documents/2013-data-elements.pdf). When quantifying GHG emissions, the different global warming potentials of GHG pollutants are usually taken into account by normalizing their rates to an equivalent CO_2 emission rate (CO_2e).

Many GHGs have lifetimes of decades or even centuries in the atmosphere, so the problem cannot be eliminated quickly. Thus, the problems we are experiencing today do not accurately represent the full effects we may see years from now based on current levels of GHGs (CARB 2009). California and Nevada have demonstrated the willingness to address GHG emissions and global climate change through research, adaptation and inventory reduction.

California is the fifteenth largest emitter of GHGs on the planet, representing about two percent of the worldwide emissions (CARB 2008a). Statewide emissions of GHG are summarized in Table 3.2-5. In response, the California Legislature finds that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment" (California Health and Safety Code, §. 38500, division 25.5, part 1).

Table 3.2-5. California Greenhouse Gas Emissions

Emission Inventory Category	Greenhouse Gas Emissions (million metric tons CO_2e)						
	1990	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Residential	29.7	28.3	29.3	28.1	28.5	28.6	28.4
Commercial	14.4	13.1	13.2	12.7	13.0	13.2	14.7
Industrial[1]	103.0	102.4	97.1	97.2	97.0	100.4	99.4
Transportation	150.7	178.0	181.7	184.3	184.1	183.8	175.0
In-State Electricity Generation	49.0	49.1	57.4	51.8	56.3	55.2	55.1
Agriculture & Forestry	16.9	28.7	29.0	29.2	30.1	28.5	28.2
Other	1.3	12.7	13.6	14.2	14.9	15.3	15.7
Subtotal (without Electricity Imports)	*365.0*	*412.3*	*421.3*	*417.5*	*424.0*	*425.0*	*416.5*
Electricity Imports	61.6	60.8	62.6	59.2	51.4	55.9	61.2
Gross Total	**433.3**	**473.1**	**483.9**	**476.7**	**475.3**	**480.9**	**477.7**
Forestry Sinks	-6.7	-4.3	-4.3	-4.2	-4.0	-4.1	-4.0
Net Total	**426.6**	**468.8**	**479.6**	**472.5**	**471.3**	**476.8**	**473.7**

Sources: CARB 2007, CARB 2010a
CO_2e = equivalent CO_2 emission rate
(1) Includes landfills

GHG emissions in the United States come mostly from energy production. Energy-related carbon dioxide emissions resulting from fossil fuel exploration and use account for approximately three-quarters of the human-generated GHG emissions in the United States, primarily in the form of carbon dioxide emissions from burning fossil fuels. More than half the energy-related emissions come from large stationary sources such as power plants; approximately a third comes from transportation; while industrial processes, agriculture, forestry, other land uses, and waste management make up a majority of the remainder of sources.

Global warming potential is a relative measure, compared to carbon dioxide, of a compound's residence time in the atmosphere and ability to warm the planet. Mass emissions of GHGs are converted into carbon dioxide equivalent (CO_2e) emissions for ease of comparison.

Several regional and local climate plans and GHG reduction initiatives have been under development under the California Air Resources Board's guidance. In addition to these programs, California is involved in the Western Climate Initiative (WCI), a multi-state and international effort to establish a cap and trade market to reduce GHG emissions in the Western United States. WCI adopted a goal of an aggregate reduction of 15 percent below 2005 GHG levels by 2020. It has voluntarily prepared a GHG inventory based on calendar year 2004, as well as a set of rules for Climate Change (Regulation XXVII), including the Southern California Climate Solutions Exchange (Rule 2701), and the Greenhouse Gas Reduction Program (Rule 2702).

3.2.7.2 Forecasts of Impacts of Climate Change in the Local Landscape and Ecology

Changes in flooding frequency and severity have been linked to climate change. Higher intensity storms with increases in rainfall and runoff are forecast under some modeled projections of climate

change in the Southwest. Flood risks are likely to become greater as winter precipitation increases under changing climate conditions.

Under the A1B scenario evaluated in Friggens and others (2012), the temperature changes are expected to be most favorable for the desert scrub vegetation types found in the Mojave, Sonoran, and Chihuahuan deserts, which are all projected to expand (Friggens and others 2012). Changes in precipitation pattern and quantity throughout the Southwest may also impact the potential water supply availability from the Colorado and Mojave Rivers and other surface sources. Concerns about climate uncertainty have resulted in the need to adapt existing flood management and water supply systems in response to changing conditions (Coachella Valley Regional Water Management Group 2010).

One of the forest management strategies, included in the California Water Plan Update 2009, addresses the need to better understand the hydrologic changes that could result from climate change and recommends the establishment of long-term monitoring through the installation of stream gages, precipitation stations, water-quality and sediment monitoring stations, and long-term monitoring wells.

3.3 Geology, Soils, and Water

3.3.1 Geology and Soils

Regional Geologic Overview

The WEMO Planning area is mainly in the Mojave Desert geomorphic province (Mojave Block) of California. The geomorphic provinces do not completely match the bioregional provinces that were used to identify the WEMO Planning area and adjacent planning area boundaries. The Planning area also encompasses a substantial portion of the Basin and Range province to the north and small portions of the Sierra Nevada province to the northwest and the Transverse Ranges to the southwest. The geomorphology of the province is dominated by broad basins filled with sediments eroded from adjacent highlands and mountains, burying the ancient topography. The region may once have been entirely within the Basin and Range province until the Garlock Fault became active in the early to mid-Tertiary Period to create a geographic and climatic boundary. Although Paleozoic- and early Mesozoic-age rocks are present, the desert itself is a Cenozoic-age feature, formed as early as the Oligocene, presumably from movements of the San Andreas and the Garlock faults. During the Pleistocene (Ice Ages), this region of California had a cooler average temperature and lower evaporation rate than at present. While never a wet climate, the Mojave Desert nonetheless once contained many small lakes, and the Mojave River had water flow throughout its length. The majority of the surface in the planning area is covered by Quaternary-age unconsolidated surficial deposits. These deposits consist primarily of alluvial, fluvial, lacustrine and aeolian sediment.

Mojave Desert province has distinct western and eastern portions. The “western Mojave” lies within the wedge where the San Andreas and Garlock faults meet, and is bounded on the east by the Mojave River and a line running northwest from Barstow, San Bernardino County, to Red Rock Canyon, Kern County. Uplifts along the two major fault systems include the El Paso Mountains along the northwest side of the Garlock fault, and the San Gabriel and San Bernardino Mountains to the southwest along the San Andreas fault. The western Mojave Desert consists of great expanses of gentle surface with isolated knobs, buttes, ridges, and locally hilly areas. The eastern Mojave consists of alluvial filled basins (downthrown blocks) between mountain ranges separated by normal faults, but includes thrust-fault emplacement hills and mountains. In the southern half, the mountain ranges have a general northwest trend, whereas in the northern half these features have no consistent orientation. For more detailed geology, the reader is referred to the Geologic Map of California, San Bernardino Sheet (Bortugno and Spittler 1986).

Basin and Range province is a geologic term referring to the structure of Mojave Desert valleys (basins) and mountains (ranges) that are aligned roughly north to south. The province extends from the Wasatch Mountains of Utah to the east side of the Sierra Nevada in California. In this region the earth's crust has been extended (stretched thinner) from east to west, and faults associated with this thinning and stretching generally border mountain ranges in this province. The planning area north of the El Paso Mountains and east of U.S. Highway 395 is part of the Basin and Range province. Basin and Range includes the Coso, Argus, and Slate mountains and their adjacent valleys. The Coso Mountains consist largely of igneous/volcanic rocks, including pumice, basalts, cinders and obsidian, and are tectonically active with frequent, very small earthquakes. The Argus and Slate Ranges are mostly igneous/granitic rocks, with some volcanic rocks and exposures of

limestone formations. Searles Valley is well-known for its deposits of sodium minerals that are the remnant of a Pleistocene lake that once formed the terminus of the Owens River.

Mountain ranges and valleys of the Transverse Range region trend eastward in a pattern essentially transverse to generally northwest-trending features of southern California. The lowlands of the San Bernardino and Los Angeles plains in the southern part of this region rise abruptly northward to the San Bernardino and San Gabriel mountains, respectively, two of the most rugged and highest ranges in southern California. The rock units of the Transverse Range region may be divided into two main groups: (a) crystalline basement complex composed of metamorphic and plutonic rocks; and (b) sedimentary and volcanic rocks. The metamorphic rocks of this complex include, from oldest to youngest: Precambrian gneiss and marble; Precambrian Pelona Schist; Paleozoic meta-sedimentary rocks containing mineralized gold; and marble/limestone; and Pre-Cenozoic rock (Dibblee 1970).

Highly diverse marine and non-marine sedimentary rocks, volcanic and intrusive igneous rocks range from Precambrian to Recent times. Geologic events involve plate collision, metamorphism, and faulting. This diversity of rock types, long history of igneous activity, and the complex structural and geomorphic development of the region have resulted in the formation of a wide variety of mineral assemblages and their concentration to form ore deposits that are present in the planning area.

Soil Functions and Characteristics

Ongoing soil forming processes are evident in desert soils. Several processes are involved in the formation of soils. These processes are the accumulation of organic matter, the formation of and translocation of silicate clay, the accumulation of silica and lime, weathering of parent material, and the formation of desert pavement.

Soils in the desert function to support the ecology of the local area, as well as global carbon balance. With respect to ecology, soil resources form the habitat within which vegetation grows, and in which wildlife finds cover. Vegetation in hot deserts often provides scant wildlife cover from predators and extreme temperatures. Many animal species use desert soils as their principal source of cover and habitat for reproduction and survival. Lizards, snakes, desert tortoises, burrowing owls, rodents, kit foxes, and badgers are some of the desert animals that dwell in soils during a large portion of their lives. With respect to carbon balance, soils not only support carbon sequestration in vegetation and biological soil crusts, but in inorganic form as well. Until recently, soil scientists had underestimated the amount of carbon sequestered in the desert because investigations of soil carbon limited their inquiry to the top one meter of soil and considered only organic carbon (Wang et al., 2010). Soil inorganic carbon, especially in the form of calcium carbonate ($CaCO_3$), results from mineral weathering. Mineral weathering is a major process transforming carbon from the atmosphere and from plants into inorganic carbon sequestered in mineral compounds such as carbonates. Desert soils are the third largest global pool of carbon (Emmerich 2003), most of it stored as inorganic carbon. Soil inorganic carbon tends to be more stable than soil organic carbon over time because inorganic carbon compounds are not available for microbial respiration. Accumulation of inorganic carbon as calcium carbonate in desert soils can create a soil layer known as caliche.

The characteristics of soils which support these functions include grain size and texture, mineral composition, level of compaction, fertility, vegetation cover, presence of biological soil crusts, and

water content. The soil resources of arid lands are important because soils promote microbial and invertebrate growth, and plant growth and nutrient cycling in desert ecosystems. Soil productivity can offset the constraints from lack of water in semi-arid and arid environments of the Mojave Desert. The ability of soil to hold water for long periods is critical to photosynthesis in plants that converts atmospheric carbon through plant water use to add or maintain sufficient aboveground vegetation and belowground root biomass. Plant biomass from naturally fertile soils nourishes terrestrial wildlife and livestock species and furnishes wildlife habitat. Soil degradation occurs when soils lose their capacity to hold moisture and soil nutrients in desert ecosystems. Productivity also enhances the ability of desert soils to store ("sequester") carbon in plants and organic carbon compounds originating from plants but partially decomposed by soil microbes (fungi, bacteria).

Fertility also depends on the availability of soil mineral macronutrients and key micronutrients in desert soils. Low amounts of phosphorus in the soil often limit growth of plants in desert soils, for example. Inputs of nutrients to desert soils come from deposition of minerals, sediments, and organic matter, either from the atmosphere or from water transport. Minerals are important because they bind especially to soil organic compounds for eventual uptake by plants when soil water is sufficient to dissolve the minerals attached to the compounds and transfer dissolved minerals to plant roots.

Desert soils that are fertilized at unnaturally high amounts, however, can create environmental problems. One example is the high deposition of nitrogen onto the surfaces of soils that stems from high amounts of atmospheric nitrogen, which is generated principally by vehicle traffic in the Los Angeles Basin and moving downwind to the West Mojave Desert. Added nitrogen increases the habitat suitability of desert soils for comparatively high-nitrogen consuming plants such as non-native invasive annual grasses. These plants now comprise as much as 90 percent of the annual plant biomass in some areas and subsequently lead to the loss of species-diverse native plant communities and to an unprecedented increase of fire-prone fine fuels in the desert.

A common and important characteristic of soils in the planning area is the presence of biological soil crusts, microorganisms (lichens, algae, cyanobacteria, microfungi), and non-vascular plants (mosses, lichens) that grow on or just below the soil surface. Soil physical and chemical characteristics, along with seasonal precipitation patterns, are largely determined by the dominant organisms comprising the crust. These crusts are primarily important as cover and in stabilization of soil surfaces. In rangelands, biological soil crusts function as living mulch by retaining soil moisture and discouraging annual weed growth. They also reduce wind and water erosion, fix atmospheric nitrogen, and contribute to soil organic matter (Eldridge and Greene, 1994 in USDI, 2001).

Altered soil properties can lead to a variety of cascading effects on other resources, including surface water flow rates and water quality, air quality, biological resources, and human health. Compaction can reduce soil moisture available to vegetation, increase rates of precipitation runoff, and increase erosion (Ouren and others 2007). Any activities, including motorized vehicle use or livestock grazing which may modify soil characteristics have the potential to impact resources, including the ecological and carbon sequestration functions that are supported by the soils. These impacts can occur if the characteristics of the soils are modified, even though the soils remain in place. Soil compaction can occur due to pressure exerted by animals, pedestrians, and/or vehicles. Areas frequently susceptible to soil compaction are motor vehicle routes, developed and undeveloped camping areas, sites for livestock watering, and mine operation sites. A far-reaching impact from vehicular travel on desert soils is soil compaction that results from the force of vehicle

wheels rolling over the soil surface. The degree of soil compaction from vehicular traffic depends in part on soil characteristics such as soil particle size, particle size distribution, organic matter content, soil moisture, and soil structure. Uniform coarse-grained soils tend to be less susceptible to compaction than fine-grained or poorly-graded soils or soils that consist of a diverse range of particle types. In the latter case, smaller particles are more easily wedged among larger particles when compaction force is applied. Compaction reduces the water infiltration and storage capacity of desert soils at the ground surface. Residence time is the average time that rainwater remains at the site where it falls. By infiltrating into a soil and becoming part of the groundwater, water resides on site longer. With compaction, less water infiltrates and more water flows offsite, thus shortening the average amount of time that water remains near where it strikes the ground. A longer residence time for water benefits soil organisms and vegetation at a site. With a shorter residence time for water, the soil has less water available for seed germination and plant growth.

Impacts to the ecological and carbon sequestration functions of soils can also occur if the soils are removed from their location through mechanical displacement, water erosion, or wind erosion. Reduced infiltration leads to increased overland water flow volume during infrequent but often intense desert rainstorms. Added surface water flow during and after a storm more easily overpowers the forces of cohesion and friction holding surface soil particles together. More soil particles downslope of compacted soils are eroded and transported overland as a result. The sediment load increases in the water flow cumulatively downslope and downstream, with potential adverse impacts to water quality. Overland water flow moves to washes and streams as compacted areas upslope shed a greater amount of runoff water than they would if left undisturbed. More water volume also accelerates gully erosion in rills and creeks at “knick” points in the landscape where the slope suddenly increases. The added sediment being transported may cause water quality to decline. More runoff in the water system during rainfall lowers the threshold amount of precipitation needed for flooding to start. At a watershed scale, one cumulative impact of soil compaction from widespread vehicular traffic and the resulting shortened residence time is that flooding becomes more frequent.

Wind erosion of soils is a major issue in the planning area. Most desert soils are much more susceptible to wind erosion after disturbance than in an undisturbed condition. Wind erosion occurs whenever bare, loose, dry soil is exposed to wind of sufficient speed to cause soil movement. This process is accelerated when stabilizing vegetation or crusts have been removed. During a dust storm, the bulk of eroding material from soils moves only a foot or two above the soil surface where it is subject to downwind transport. Two basic processes are involved in wind erosion: detachment and transport. Detachment is the initiation of soil movement and occurs when wind force or the impact of moving particles is strong enough to dislodge stationary soil particles. After detachment, soil particles are subject to transport by wind through the air or along the soil surface until eventually deposited when wind velocity decreases. Wind speeds as low as 21 to 24 km per hour above the soil surface can launch medium-sized particles in soils prone to wind erosion. Medium-sized particles become detached and enter the wind stream momentarily, but then fall back to the ground by force of gravity. Return from saltation causes them to impact other particles of differing sizes and set them into motion. Fifty to 80 percent of total soil movement may result from these particulate collisions. Wind erosion rates for soils may increase as soil properties (e.g., soil bulk density) or vegetative cover change. Erosion potential is magnified when percent slope (steepness) of a site is higher or when slopes are longer. In the planning area, approximately 2.3 million acres of the overall 9.4 million acres have slopes greater than ten percent (Figure 3.3-1).

Erosion by wind has several potential impacts. First, like water erosion, the process removes material that is necessary to support vegetation. Wind erosion is also a major source of PM_{10} air emissions in the region, affecting both local and regional air quality. Wind erosion can also cause dust deposition on vegetation, affecting its growth and availability as forage for wildlife.

In addition to removal of soil from its natural location, water- and wind eroded-soil can have adverse impacts to other resources, including air quality, water quality, and human and ecological receptors.

One disease of potential health concern in California warm deserts is Valley Fever, known medically as coccidioidomycosis, a disease with initially flu-like symptoms caused by inhalation of spores of the fungi *Coccidioides immitis* and *C. posadasii*, both originating in soils. These fungi grow and reproduce in the upper 5 to 20 centimeters of soils. Mature fungal spores can be released into the air during surface disturbing activities. Implementing dust control measures can reduce the risk of infection.

The source of concern for OHV riders in the Californian warm deserts is that the Mojave Desert lies midway between the two focal areas of the disease: the San Joaquin Valley in California and the eastern Sonoran Desert in Arizona. Because OHV riders are mobile travelers, they may visit OHV recreation sites in both those focal areas, as well as OHV sites in the Californian warm deserts. The only way to contract the disease is by inhalation of dust containing fungus spores. The disease does not spread by contagion from person to person.

About ten percent of people exposed to the fungal spores develop severe symptoms of the disease and one percent of people experience the disease spreading to other organs of the body. Motorized vehicular recreation may disturb soils that have naturally high concentrations of the fungal species that cause valley fever and thus increase personal exposure to spores.

A recent study of the Tucson, AZ, area has found that nine percent of soils samples contained valley fever spores. Studies, involving soil scientists, to examine the spectrum of soils in California deserts that are likeliest to host fungus spores are not yet available. However, the NRCS is developing a predictive algorithm to identify soils most likely to present health risks to people. In the San Joaquin Valley, the valley fever fungus appears to be particularly present in saline or alkaline soils.

Public health impacts could also occur from exposure to toxic pollutants present in wind-eroded soils. Most toxic air pollutants have no known safe levels and some may accumulate in the human body from repeated exposures. Some toxic minerals have naturally high concentrations in desert soils or in areas where waste from abandoned mining operations remains on the ground surface. Scientists from the University of Nevada and from the USGS are currently studying the extent and concentrations of dust containing naturally-occurring arsenic, asbestos-like minerals, and perchlorate minerals in the Mojave Desert to determine the risks to people's health.

Two specific mineral types are potentially toxic particulates in desert dusts where OHV recreation takes place: arsenic-containing minerals and minerals that have the pointed, fibrous crystal shape of asbestos. Scientists working in the Mojave Desert in California have found several areas where concentrations of naturally occurring arsenic are high. Owens Lake is, for example, one arsenic hotspot. Areas with motorized vehicular trails passing through abandoned gold and silver mine sites often have an environmental legacy of exposed mine wastes containing elevated levels of toxic metals and metalloids including arsenic. Erionite, an asbestiform mineral, is known to cause

asbestosis and mesothelioma, a kind of lung cancer, in communities in Turkey. At this time, the US EPA does not list erionite as a source of asbestos-related diseases in people. Within the West Mojave planning area, erionite is known from the Hector Mine and vicinity on the south side of the Cady Mountains in San Bernardino County. It usually is found in weathered rock called tuff consisting of volcanic ash. Exposure to erionite fibers comes from natural sources, not industrial sources as is the case with most asbestos exposures. No information about the health risk or exposure to people at erionite sites in the West Mojave Desert is presently available.

Available Soil Survey Information for the Planning Area

Many different kinds of soils and soil map units are found across the planning area. Soil surveys divide soils into soil map units that represent a single dominant or several co-dominant soil series, soil associations, or soil complexes that contain consistent patterns of co-occurring soils in similar topographic settings of the natural landscape. The soils in any one map unit may differ slightly, within limits of variability established in the soil map unit description, from place to place in slope, depth, drainage, and other soil properties. The general map units in the soil surveys have been grouped for broad interpretive purposes.

The San Bernardino County Mojave River Area is comprised of three groups:

- Soils of the Mojave Desert on floodplains, alluvial fans, terraces, and in basins are dominantly in low positions in arid areas and are comprised of seven map units. Slopes are nearly level to strongly sloping. Elevation ranges from about 1,700 feet to about 4,000 feet. Soils are very deep and shallow and are moderately to somewhat excessively drained. The surface layer is sand, loamy sand, loamy fine sand, sandy loam, loam, and clay, and often coarse. Soils are used mainly for irrigated crops, homesite development, wildlife habitat, and livestock grazing. This soils description is predominate in most grazing allotments outside mountainous land forms.
- Soils of the Mojave Desert on old terraces that have a desert pavement and on alluvial fans, foothills, and mountains are dominantly on scattered rock desert uplands on adjacent high terraces in the central and northern parts of the survey area. Elevation ranges from about 1,800 to 4,500 feet. The four mapping units in this group range in depth from very shallow, shallow, moderately deep to very deep. Soils are well drained with the surface layer consisting of gravelly sand, very gravelly sand, cobbly sandy loam, gravelly sandy loam, sandy loam, and loam. Soils are used for wildlife habitat, grazing, and a source of gravel. These are common soils on most grazing allotments but are not the predominant soil associations.
- Soils of the San Gabriel and San Bernardino Mountains on mountains, foothills, alluvial fans, and terraces are gently sloping to steep and range in elevation from 3,400 to 6,200 feet. The four mapping units in this group are moderately deep and very deep and are well drained to somewhat excessively drained. The surface layer is sandy loam or loamy fine sand. Soils are used for wildlife habitat, grazing, home site development, irrigated crops and pasturelands. This is the predominant soil for mountains allotments like Round Mountain and portions of the Rattlesnake Canyon Allotment.

The Southeastern Part of Kern County Soil Survey is comprised of two groups within the WEMO Planning area:

- Soils of the Mojave Desert occupy several different landscapes that range from low basins to high mountain ridges. Seven mapping units are incorporated into this group. Soils are nearly level to very steep, ranging from 2,000 to 4,200 feet elevation and are shallow, deep, or very deep, and well to excessively drained. Surface layers range from sand to clay loam. Soils are used for rangeland, recreation, or wildlife habitat. Where water is available, a few of the soils are used for cropland or home sites. Soil limitations include a high susceptibility to soil blowing of the sand surface layers and excessive erosion hazard due to slopes with inadequate plant cover.
- Soils on the Eastern Foot Slopes of the Sierra Nevada and Tehachapi Mountains are dominantly strongly to very steep with some soils in mountain valleys that are nearly level. Elevation ranges from 2,000 to 8,000 feet. Soils are shallow to very deep and well drained to somewhat excessively drained. Surface layers are gravelly sandy loam, gravelly loam, or sandy loam. The four mapping units in this group are used for woodland, rangeland, recreation, and wildlife habitat. Those soils in the more level mountain valleys are used for irrigated cropland.

Mineral Resources

Known and undiscovered locatable metallic mineral deposits occurring and expected to occur include gold, silver, base metals (copper, lead, and zinc), tungsten and iron. Zones of moderate and high potential for these metals are scattered throughout the planning area, with the exception of the alluvial filled valleys to the southwest where exposures are poor.

The Coso Area and Rand Area within the Red Mountain Wilderness have high potential for leasable geothermal steam resources; these resources have been and are likely to continue to be developed in the Coso Area. The planning area is deemed to have low potential for the occurrence of oil and gas based on a lack of evidence for marine source beds. Searles Lake, Boron, and Koehn Lake contain leasable sodium minerals. In addition, Searles Lake is known valuable for potassium minerals. Dale Lake is prospectively valuable for sodium and, like Koehn Lake, is a past producer.

Saleable minerals consist mostly of construction materials such as crushed and dimension stone, sand, and gravel, in addition to clay used for pond sealant. These deposits are known to occur in many locations throughout the West Mojave. For example, veneer stone is produced from private and public lands at Rand Mountain in Kern County and landscaping rock is produced from private and public lands near Barstow in San Bernardino County. Resources for the schist flagstone at Rand Mountain exist over an area of 640 acres (2.6 square kilometers) (Leszcykowski and others 1993). The estimated wholesale value of the stone produced from public lands is $1.2 million per year ($80 per ton x 15,000 tons) for the Rand schist, and $1.5 million/year for decorative stone near Barstow.

High quality sand and gravel deposits, suitable as aggregate for Portland cement concrete or asphalt concrete, are surprisingly few in number and becoming more difficult to develop because of zoning and environmental restrictions. Many of the sand and gravel potential areas are actually borrow deposits, suitable for fill, road repair work or subbase. By economic necessity, these are located near roads and highways. The average cost of a ton of aggregate doubles if it is hauled 35 miles (Beeby and others 1999).

Common clays occur in the playas and Tertiary-age sedimentary rocks. Whether these deposits have potential for development depends on the proximity to markets and conflicts with other resources. The El Paso Mountains are particularly favorable for the occurrence of pumice and pumicite.

Strategic and Critical Minerals are given special access consideration. These are materials that (1) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national defense emergency, and (2) are not found or produced in the United States in sufficient quantities to meet such needs. A Strategic and Critical Materials Report to Congress is submitted annually by the Department of Defense. The report details the operations of the National Defense Stockpile and includes tables of the subject metals, minerals and materials. Among the 33 items are manganese ore, tungsten ore, lead, silver and zinc, which occur in the WEMO Planning area.

As an example, three zones in the Cady Mountains have high potential for the occurrence of manganese resources, and several hundred tons of ore were produced during the first and second world wars (Wright and others 1953). Manganese is used for hardening steel and the United States has an import reliance of 100 percent, with most coming from Gabon, Brazil, and Australia. Silver is often produced as a byproduct from gold mining. Gold is being mined at Randsburg and has been recently mined in the Mojave gold mining district.

Other unique minerals that are not found on the Strategic and Critical Minerals list have high potential in the planning area. Yttrium minerals may be found at the edge of the Pinto Mountains in Riverside County. The United States imports 100 percent of its yttrium, with most coming from China. There are no satisfactory substitutes for yttrium regarding its use in electronics, lasers and phosphors in color television and computer monitors (Hedrick 2002). Celestite (an ore of strontium) has been on the stockpile inventory in years past, and by far the largest deposits of strontium minerals in California occur in the foothills of the Cady Mountains (Ver Planck 1957). Strontium is used for ceramics, ceramic magnets, and glass, particularly television plate glass because of its ability to block X-rays. It also produces the red flame in pyrotechnics, including ammunition tracers and flares. The United States import reliance on strontium is 100 percent.

3.3.2 Water Resources

The WEMO Planning area is one of the most arid areas in the nation; the potential annual water loss through evapotranspiration exceeds the annual water gain from precipitation even at higher elevations. On the valley floors, evaporation exceeds precipitation by at least 25:1.

Prominent mountain ranges have an important influence on moisture distribution within the planning area. As moist, unstable air masses from the Pacific Ocean rise up the windward slopes of the Southern Sierra, San Gabriel and San Bernardino Mountains, the air is cooled and water vapor condenses and falls as rain, snow, or ice. When these air masses descend the leeward slopes, they become warmer and more stable and thus retain most of the remaining moisture. Consequently, precipitation amounts are much greater on the windward slopes of the mountain ranges, whereas arid conditions prevail leeward of the mountains. This is commonly known as the rain shadow effect. All of the planning area, except the Kelso Creek area, is on the leeward side of these major mountain areas.

Because of the arid nature of the planning area, water is the single most important resource. The presence or absence of a reliable supply of good quality water has determined the pattern of

agricultural, urban, and industrial development and will continue to do so. Groundwater withdrawn by wells furnishes nearly all of the developed water in the WEMO Planning area. Many of the State or federally listed or BLM sensitive species, discussed elsewhere in this document, are dependent upon the presence of groundwater either directly or indirectly for their habitat.

Water Quality Management

Water resources include surface water (including rivers, lakes, streams, springs, wetlands, and vernal pools) and groundwater. Management of water resources includes addressing both water availability and quality. Besides BLM, other agencies involved in management and regulation of water resources in the WEMO Planning area include the EPA, U.S. Army Corps of Engineers (USACE), State Water Resources Control Board (SWRCB), California Department of Fish and Wildlife (CDFW), and pertinent Regional Water Quality Control Boards (RWQCB). Regulations applicable to water resources include the Clean Water Act (CWA), Safe Drinking Water Act (SDWA), Resource Conservation and Recovery Act (RCRA), and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The EPA has granted primacy to the State of California to implement portions of the CWA and SDWA.

The EPA and USACE recently issued draft guidance for determining whether a waterway, water body, or wetland is protected by Sections 404 and 401 of the CWA. The guidance defines "Waters of the US" to include traditional navigable waters, interstate waters, tributaries, adjacent wetlands, and territorial seas. The final guidance reaffirms protection for wetlands that filter pollution and protect communities from flooding, and focuses on protecting smaller waters, including intermittent streams.

California state laws and regulations pertinent to water quality in the WEMO Planning area include the Porter-Cologne Water Quality Control Act, the California Water Code, the California Fish and Wildlife Code, and the California Health and Safety Code. The Porter-Cologne Water Quality Control Act assigns responsibility for water rights and water quality protection to the SWRCB, which in turn directs the RWQCBs to develop and enforce water quality standards. The RWQCBs control and protect water resources by designating uses and establishing water quality objectives. Non-point source pollution is managed through the implementation of measures that reduce, prevent, or eliminate pollutant entry into waters contained in their respective Water Quality Control Plan(s). California's Management Measures for polluted runoff constitute the State's best management practices (BMPs) for controlling non-point source pollution. Fish and Wildlife Code Section 1602 protects the natural flow, bed, channel, and bank of any river, stream, or lake designated by the CDFW in which there is, at any time, any existing fish or wildlife resources, or benefit for the resources. Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state, and requires any person, state, or local governmental agency, or public utility to notify the CDFW before beginning any activity that will:

1. Substantially divert or obstruct the natural flow of any river, stream or lake;
2. Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
3. Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

Preliminary jurisdictional evaluations for "Waters of the State" would be conducted by the project proponent. A final determination of the effects on any Waters of the State is made by CDFW. If

CDFW determines that an action would impact Waters of the State then a Streambed Alteration Agreement would be required, thus maintaining compliance with Section 1602. A Streambed Alteration Agreement is required in the event that the CDFW determines the activity could substantially adversely affect an existing fish and wildlife resource.

BLM cooperates with the SWRCB through a 1993 MOU for Planning and Coordination of Non-point Source Water Quality Policies and Activities, which clarifies each agency's responsibilities related to non-point source water quality issues and activities. The BLM has the authority to implement BMPs, management measures, and non-point source measures to protect, maintain, and improve water quality through this agreement. A Water Quality Management Plan that supports the state's Non-point Source Management Program is currently under development by the BLM California State Office. Currently, BLM manages surface water and groundwater quality to meet state and Federal objectives through the implementation of BMPs, minimizing surface disturbance to wetland and riparian areas, controlling non-point pollutant runoff (sediment), and limiting or restricting development around water sources.

Federal policy defines wetlands as areas that are inundated or saturated by surface water or groundwater at a frequency or duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. BLM Manual 1737, Riparian–Wetland Area Management, includes in this definition marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas (seeps and springs). The manual defines riparian areas as a form of wetland transition between permanently saturated areas and upland areas. BLM's Riparian-Wetland Initiative for the 1990s established national goals and objectives for managing riparian and wetland resources on public lands. The overall objective was to restore riparian and wetland areas so that 75 percent or more were determined to be in Proper Functioning Condition (PFC). Proper Functioning Condition is a qualitative method for assessing the condition of riparian-wetland areas. A PFC assessment refers to a consistent approach for considering hydrology, vegetation, and erosion/deposition (soils) attributes and processes. Conditions of these areas are evaluated by BLM using the Standards for Rangeland Health (see 43 CFR 4180.2) and Proper Functioning Condition consistent with BLM's Riparian Area Management (see BLM Technical References 1737-15 and 16).

3.3.2.1 Groundwater

The majority of groundwater resources in the planning area are associated with the floodplain aquifer along the Mojave River. Precipitation occurring at the headwaters of the Mojave River near Cajon Pass, as well as further south at San Gorgonio Pass, generates the surface water flow in the Mojave River. As it flows more than 150 kilometers (km) east to Afton Canyon, this surface water infiltrates, recharging groundwater in the hydraulically connected basins along the way (Izbicki and others 2007).

Throughout the rest of the planning area, groundwater is also found in unconsolidated alluvial fan deposits, although locally floodplain and lacustrine (lake) beach deposits may yield water to wells. The valleys and basins are generally internally drained, with water from precipitation within the basin recharging the alluvial fan deposits, and then ultimately discharging to the land surface and evaporating within the basin. Groundwater is generally under unconfined, or water table, conditions at the margins of the basins, but as the unconsolidated deposits become finer grained toward the centers of the basins, the water becomes confined.

Dating of the water in the Mojave River floodplain aquifer using tritium and carbon-14 methods indicates that the water is relatively recent. In contrast, groundwater in the regional aquifers in the surrounding mountain and canyons is more than 20,000 years old (Izbicki and Michel 2004), suggesting much lower recharge rates.

Although there are vast quantities of water within the groundwater basins, some of the water is of poor quality. The mineral quality of the groundwater within the WEMO Planning area varies greatly. The geologic setting of the basins directly affects the degree of groundwater mineralization. In general, basins near the source of recharge are less mineralized than those that are more distant.

3.3.2.2 Surface Water

Surface water is very scarce in the WEMO Planning area. Streams that originate high in the surrounding mountains to the west and south may have perennial flow in the higher altitudes; at the lower altitudes and throughout the planning area virtually no water exists in streambeds or riverbeds, except locally after infrequent, heavy cloudbursts. The playas may be covered by water from runoff for as long as two months a year. There are many locally important creeks, springs, and seeps, most of which are associated with the mountain areas.

Very short flow paths generally characterize small local flow systems, usually no more than a few miles in length. Springs connected to these systems are usually located in or near the mountains and have highly variable annual ranges in discharge that respond to the precipitation that year or a few years previous. Discharge waters have small concentrations of dissolved sodium plus potassium and chloride plus sulfate, large concentrations of tritium, and water temperatures that commonly approach average air temperatures. These characteristics imply that the groundwater that feeds the springs is relatively recent, being recharged within a span of less than 70 years.

In contrast, large local flow systems are characterized by inter-basin flow or flow confined to one basin with longer flow paths. Springs connected to these systems have moderate concentrations of the major salts, no significant concentrations of tritium and water temperatures from 50 to 60 degrees Fahrenheit, suggesting a much longer residence time in the aquifer.

Surface water was and is the major transport agent of the rock material from the mountains to the alluvial fans to the valleys. The intense short duration storms result in rapid floodwaters that have enough energy to transport rock material both in the water column and along the beds of the arroyos. Longer duration storms with less intensity still have the energy to transport finer sediment materials. All ephemeral streams in the planning area have naturally high sediment concentrations. Flows from groundwater sources have low sediment concentrations unless runoff water is dominating the flow. Playa water usually has a high concentration of very fine sediment mixed into the column by wind action and varying salt concentrations that depend on the geology of the area.

Mojave River

The most prominent surface water body in the WEMO Planning area is the Mojave River. The Mojave River originates near the southern boundary of the planning area. Major watersheds in the San Bernardino and San Gabriel Mountains contribute to the stream flow in the area. Sheep Creek originates in the San Gabriel Mountains. The West Fork of the Mojave River and Deep Creek originate in the San Bernardino Mountains and are the headwaters of the Mojave River.

The Mojave River flows along the eastern edge of the Cajon Fan. The Cajon Fan is at the southern edge of the Mojave Desert, in the southwestern part of the planning area. It is a broad surface of coalescing alluvial fans and terraces. The Cajon Fan formed from sediment eroded from the San Gabriel and San Bernardino Mountains. The fan extends from the base of the mountains for 10 to 15 miles to the Mojave River east of Hesperia to Adelanto and Mirage Lake. The center part of the upper edge of the Cajon Fan no longer joins the mountains. Tectonic activity in the surrounding area and subsequent erosion has truncated the upper edge to form the Inface Bluffs. Broad washes of the desert, such as the Oro Grande Wash, at one time drained large watersheds and are also truncated at the Inface Bluffs.

The floodplain of the Mojave River is 0.5 to 1 mile wide along most of the river. The soils on the floodplain are nearly level. In some places, such as at Upper Narrows where the river cuts through hard rock, there is no floodplain. East of Barstow, the floodplain and river terraces form the broad Mojave Valley.

The Mojave River has only three major tributaries within the desert – the Fremont Wash, Buckthorn Canyon, and Oro Grande Wash. These tributaries flow only after intense storms.

The water-bearing alluvial deposits of the Mojave River are a major source of groundwater in the planning area. Hard rock formations along the river divide the coarse river deposits into numerous subsurface basins. Water from the river recharges these basins.

The above ground flow of the Mojave River is intermittent in most places. Along most of its course, water flows above ground only after storms. Perennial flows occur near Victorville, in the vicinity of Camp Cady, and in Afton Canyon. In these places hard rock barriers force groundwater to the surface. Other basins in the area from which considerable groundwater is removed are in the area of Lucerne Valley, El Mirage, and Harper Lake.

The amount of water in the Mojave River varies greatly from year to year. As measured at the Forks, it has been more than 300,000 acre-feet one year and less than 10,000 acre-feet another.

The Mojave Water Agency was formed by an act of the State legislature in 1960 to find ways to supplement the natural water supply. The agency has contracts with the State of California that entitle the agency to purchase as much as 50,800 acre-feet of water per year from the California Water Project.

Surface Water Quality

Surface water quality impacts associated with the transportation management system can occur in two primary ways:

- Releases of petroleum fuels from motorized vehicles; and
- Increased sedimentation and erosion due to soil disturbance.

Any use of motorized vehicles on the transportation network can potentially lead to releases of fuels used to power the vehicles. These releases can potentially occur at any location on the network due to vehicle accidents. However, any such releases are expected to be small in volume. Also, given the scarcity of surface water within the planning area, the potential for these releases to enter surface water bodies or otherwise affect sensitive receptors is low. The only exception may associated with auxiliary fuel tanks used at organized events or remote locations. Some motorized vehicle users may carry additional fuel volume in separate tanks in order to re-fuel their vehicles

without having to return to developed areas. In such cases, the potential volume of fuel that could be released would be higher, up to 100 or more gallons. The potential for releases from auxiliary fuel tanks to impact sensitive resources would be directly related to the proximity of the release to those resources.

In the impact analysis in Chapter 4, routes identified as having potential for water quality impacts due to erosion and sedimentation are those which are parallel to, or located within, desert washes. The analysis in Chapter 4 identifies the mileage of routes associated with washes for each of the four alternatives.

Riparian Areas and Springs

Aquatic wetland and riparian habitat occurs within the WEMO Planning area. The primary locations of the riparian areas are along the Mojave River; however, riparian areas occur in other dispersed locations throughout the planning area. Creeks and springs primarily occur in higher elevation mountainous areas. Most creeks and some larger springs and spring complexes in the region support an area of riparian vegetation near the water source and in a linear zone leading downstream from the water source. The extent of these areas is usually limited, as evaporation and infiltration of the water removes it from the surface.

In the Remedy Order associated with the 2005 WEMO Final EIS, BLM was required to perform new PFC Assessments for all springs and seeps in the WEMO Planning area. As of August 2014, BLM has completed a total of 100 PFC assessments in the planning area. Table 3.3-1 lists springs and seeps that were assessed in 2012 through 2014. Additional assessments are continuing:

Table 3.3-1. WEMO Planning Area Proper Functioning Condition Assessments in 2012 through 2014

Sub-Region	Location	Finding
Afton Canyon	Afton Canyon	Functioning At Risk: Channelization
Black Mountain	Opal Spring	Non-Functional. Needs further development to enhance sustainability.
Cronese Lake	Jack Spring	Proper Functioning Condition
Darwin*	Black Spring	Non-Functional
El Paso Mountains	Coffee Can Spring	Proper Functioning Condition
El Paso Mountains	Bob Spring	Functioning At Risk
El Paso Mountains	Shelley Spring	Functioning At Risk
El Paso Mountains	La Moureaux Springs	Proper Functioning Condition
El Paso Mountains	Midway Spring	Proper Functioning Condition
El Paso Mountains	Unnamed	Proper Functioning Condition
El Paso Mountains*	Louise Spring	Proper Functioning Condition
El Paso Mountains*	Sheep Spring 2	Proper Functioning Condition
El Paso Mountains*	Sheep Spring	Proper Functioning Condition

Table 3.3-1. WEMO Planning Area Proper Functioning Condition Assessments in 2012 through 2014

Sub-Region	Location	Finding
El Paso Mountains	Upper Goler Canyon Holland Springs	Proper Functioning Condition
El Paso Mountains	Holland Spring West	Non-Functional
El Paso Mountains	Holland Spring South	Non-Functional
El Paso Mountains*	Petroglyph Spring	Functioning At Risk
Jawbone*	Hoffman Spring	Functioning At Risk
Jawbone*	Cabin Creek	Proper Functioning Condition
Jawbone*	Cortez Creek	Proper Functioning Condition
Jawbone*	Sage Canyon Creek	Functioning At Risk
Jawbone*	Nudist Spring	Proper Functioning Condition
Jawbone*	Boulder Canyon Creek	Proper Functioning Condition
Jawbone*	Sage Canyon Spring	Proper Functioning Condition
Jawbone*	Nicoll Spring	Proper Functioning Condition
Jawbone*	Nicoll Spring North	Functioning At Risk
Jawbone*	Willow Spring	Proper Functioning Condition
Jawbone*	Burning Moscow Spring	Functioning At Risk
Jawbone	Rocky Point (Lower Kelso Creek)	Proper Functioning Condition
Jawbone*	Tanager Spring	Functioning At Risk
Jawbone*	Dove Spring Wash	Non-Functional
Jawbone*	Upper Jawbone Canyon	Proper Functioning Condition
Jawbone*	Kelso Creek	Functioning At Risk
Jawbone*	Lower Dove Wash	Functioning At Risk
Jawbone*	Alphie Canyon	Non-Functional
Jawbone*	Rock Spring	Proper Functioning Condition
Jawbone*	Unnamed Near Burning Moscow Spring	Proper Functioning Condition
Jawbone*	Lower Butterbredt Canyon	Proper Functioning Condition
Jawbone*	Mohawk Buddy Mine Spring (Butterbredt Canyon)	Functioning At Risk
Jawbone*	Butterbredt Spring	Proper Functioning Condition
Jawbone*	Upper Shoemacher Spring	Functioning At Risk
Jawbone*	Williams Spring	Functioning At Risk
Jawbone*	Unnamed Southwest of Cowboy Spring	Proper Functioning Condition
Jawbone*	Hoffman Well	Non-Functional

Table 3.3-1. WEMO Planning Area Proper Functioning Condition Assessments in 2012 through 2014

Sub-Region	Location	Finding
Juniper Flats*	Furnace Spring	Non-Functional: Stop ongoing disturbance
Juniper Flats*	Stone Spring	Proper Functioning Condition
Juniper Flats*	TV Creek	Proper Functioning Condition
Juniper Flats*	Arrastre Creek (VP Mine Reach)	Proper Functioning Condition
Juniper Flats*	Arrastre Creek (Tahiti Falls Reach)	Functioning At Fisk: Rip-rap needed
Juniper Flats*	Cottonwood Creek	Proper Functioning Condition
Juniper Flats*	Round Mountain Spring	Functioning At Risk: Developed
Juniper Flats*	Greenwalt #1	Functioning At Risk: Water developed
Juniper Flats	White Knob Milepost 61 West Spring	Proper Functioning Condition
Juniper Flats	BLM Silver Creek Spring	Functioning At Risk
Juniper Flats	White Knob Milepost 61 East Seep	Functioning At Risk
Juniper Flats	White Knob Milepost 63 Southwest Seep	Functioning At Risk
Juniper Flats	White Knob Milepost 63 Southeast Seep	Functioning At Risk
Juniper Flats	White Knob Milepost 63 Northwest Spring	Functioning At Risk
Juniper Flats	White Knob Milepost 63 Northeast Seep	Functioning At Risk
Juniper Flats	Lower White Knob #1	Functioning At Risk: Salt cedar
Juniper Flats	Lower White Knob #2	Proper Functioning Condition
Juniper Flats	White Knob Tailings Spring	Proper Functioning Condition
Juniper Flats	White Knob 71A	Proper Functioning Condition
Juniper Flats	White Knob 71B	Proper Functioning Condition
Juniper Flats	High Road Spring	Proper Functioning Condition
Morongo Valley	Sherman Shady Spring	Functioning At Risk: Land ownership and earth moving activities
Rattlesnake Canyon	Bighorn Mountain Cherry Stem Spring	Functioning At Risk: Grazing, camping and road encroachment
Rattlesnake Canyon	Burns Spring	Functioning At Risk: Road encroachment. Needs verification.
Rattlesnake Canyon*	Willow Spring	Functioning At Risk: Developed

Table 3.3-1. WEMO Planning Area Proper Functioning Condition Assessments in 2012 through 2014

Sub-Region	Location	Finding
Rattlesnake Canyon*	Vaughan Spring	Functioning At Risk: Water diverted
Rattlesnake Canyon*	Unknown Spring (Section 22)	Proper Functioning Condition
Rattlesnake Canyon	Rock Corral	Functioning At Risk: Water diverted
Rattlesnake Canyon	Hidden Springs (BAR14 – 14)	Proper Functioning Condition
Rattlesnake Canyon*	BAR 14 – 16 (Rattlesnake Seeps)	Functioning at risk: Stable
Sierra Canyon*	5-Mile Canyon – Upper	Proper Functioning Condition
Sierra Canyon*	5-Mile Canyon – Lower	Proper Functioning Condition
Stoddard Valley	SV2630 Riparian	Non-Functional. Need to re-route if feasible.
Stoddard Valley	Quail Spring (Isabelle)	Proper Functioning Condition
Stoddard Valley	Horse Spring	Proper Functioning Condition
Stoddard Valley	Horse Spring Southeast	Proper Functioning Condition
Stoddard Valley	Amaral Spring	Proper Functioning Condition
Red Mountain	RM01 Cuddeback Alkali Well 1	Proper Functioning Condition
Red Mountain	RM02 Cuddeback Alkali Well 2	Functioning at risk
Red Mountain	RM3 Steam Well	Nonfunctional
Coolgardie	BAR14-01	Functioning at risk: Upward trend
Coolgardie	BAR14-02	Functioning at risk: Upward trend
Coolgardie	BAR14-03	Functioning at risk: Stable
Calico Mountain	BAR14-04	Proper Functioning Condition
Coolgardie	BAR14-05	Functioning at risk: Salt cedar
Coolgardie	BAR14-06	Nonfunctional: Collapsed well
Coolgardie	BAR14-07	Nonfunctional: Public hazard
Coolgardie	BAR14-08	Functioning at risk: Stable
Stoddard Valley	BAR14-09 (RZ Spring)	Proper Functioning Condition
Stoddard Valley	BAR14-10 (Stoddard Mtn. Spring)	Proper Functioning Condition
Ord Mountain*	Upper Sweetwater West (BAR14-11)	Proper Functioning Condition
Ord Mountain*	Upper Sweetwater East (BAR14-12)	Functioning at risk: Stable

*In a grazing allotment

In addition to the 100 PFC assessments listed above in Table 3.3-1, BLM conducted PFC assessments while conducting Rangeland Health Assessments on grazing allotments in preparation

of grazing permit/lease renewals. Table 3.3-2 summarizes the assessments that were conducted between 1999 and 2011.

Table 3.3-2. PFC Assessments Conducted on Grazing Allotments

Sub-Region	Location	Findings
Ord Mountain	Lower Sweetwater Spring	Functioning at risk: Upward trend
Ord Mountain	Willow Spring	Functioning at risk: Upward trend
Newberry/Rodman	Kane Spring	Functioning at risk: Upward trend
Ord Mountain	Badger Spring	Nonfunctional: Unable to locate source
Rattlesnake Canyon	Vaughn Spring	Proper Functioning Condition
Rattlesnake Canyon	Lower Rattle Spring	Nonfunctional: Road encroachment & grazing
Rattlesnake Canyon	Mound Spring	Proper Functioning Condition
Rattlesnake Canyon	One Hole Spring	Functioning at risk: Upward trend
Rattlesnake Canyon	Two Hole Spring	Proper Functioning Condition
Rattlesnake Canyon	Rattlesnake Spring	Proper Functioning Condition
Rattlesnake Canyon	Dove Spring	Proper Functioning Condition
Rattlesnake Canyon	Willow Spring	Proper Functioning Condition
Rattlesnake Canyon	Viscera Spring (SBNF)	Functioning at risk: Upward trend

In addition to PFC Assessments, BLM has completed a comprehensive GIS analysis of all springs, as identified on the National Hydrography Dataset (NHD). This compilation included a review of more than 3.1 million acres, and identified 183 springs on BLM public lands. The assessment identified a total of 152 route features that intersected within a 100-meter buffer of these areas. BLM has also awarded a contract to the U.S. Fish and Wildlife Service (USFWS) to complete riparian area mapping of 90 quadrangles at a scale of 1:24,000 within the Barstow and Ridgecrest Field Office areas. This study, not completed at this time, will be used by BLM to further evaluate the ongoing impact of motorized vehicles on riparian areas. Currently, two sites, Burns Spring and the SV2630 riparian area are being directly impacted by the existing WEMO route system (linear features).

In the impact analysis in Chapter 4, BLM evaluated the mileage of routes in close proximity to riparian areas and springs as an indicator of potential impacts from motorized vehicles. To support the analysis, BLM developed a GIS-based inventory of springs and riparian areas throughout the planning area. A total of 436 springs are found in the planning area, as well as approximately 46,600 acres of riparian vegetation. Because 50 feet is the minimum corridor width for routes under any of the alternatives, all riparian areas within 50 feet of a route have the potential to be impacted by motorized vehicle use. Therefore, this distance was considered to be a measurement of how the designated route network might impact Proper Functioning Condition (PFC) of riparian areas throughout the planning area. The analysis also included quantification of the mileage of routes passing within 300 feet of all springs in the planning area. The 300 foot width is the current

allowable stopping and parking distance outside of DWMAs in the planning area, and therefore captures all potentially-impacted springs in the area.

3.4 Biological Resources

This section is tiered to the 2005 WEMO Final EIS (BLM 2005) which provides the primary source of baseline information. Section 3.3 from Chapter 3 of the 2005 WEMO Final EIS (pp. 3-64 to 3-194) provides a general description of biological resources and the natural communities in the WEMO Planning area and is herein incorporated by reference. Applicable supplemental information to the planning area has been summarized in the following sections and additional data or updates have been added as needed. This supplemental information includes updated baseline and species information originally discussed in the 2005 WEMO Final EIS as well as discussions of species which were not previously considered in the 2005 WEMO Final EIS.

3.4.1 Natural Communities

The diversity of vegetation that encompass the planning area supports diverse wildlife species, including desert tortoise (*Gopherus agassizii)*, Mohave ground squirrel (*Xerospermophilus mohavensis)*, golden eagle (*Aquila chrysaetos)*, burrowing owl (*Athene cunicularia)*, Sierran tree frog (*Pseudacris sierra)*, red-spotted toad (*Bufo punctatus)*, and numerous bird and reptile species. Habitat exists for sensitive species such as desert bighorn sheep (*Ovis canadensis nelson)*, Swainson's hawk (*Buteo swainsoni)*, and numerous sensitive bat species associated with old mine features. Diverse year-round resident wildlife species of the canyons include ringtails (*Bassariscus astutus)*, cougars (*Puma concolor)*, bobcats (*Lynx rufus)*, kit foxes (*Vulpes macrotis)*, and grey fox (*Urocyon cinereoargenteus)*.

Within the WEMO Planning area, linkages of habitats for wildlife migration are critical to the conservation of certain species, especially with respect to climate change. These species include the desert tortoise, desert bighorn sheep, and Mohave ground squirrel. The locations of these desert network linkages within the project area are found in Table 3.4-1 and Figure 3.4-1. Included in the planning area is a segment of the Pacific migratory bird flyway for many species of songbirds, shorebirds, and waterfowl; and includes stop-over riparian and wetland habitat. Riparian areas here provide important migratory stop-over habitat for the Federally-listed Least Bell's Vireo and Southwest Willow Flycatcher. This flyway also provides excellent habitat for Golden Eagles and other raptors, with nearby cliffs for nesting and the valley floor for foraging.

Table 3.4-1. Acres of Desert Linkage Networks on BLM Lands within the WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Sum of Acres
Afton Canyon	AC	30227.2
Barstow	BA	5067.8
Black Mountain	BM	40514.9
Broadwell Lake	BL	32615.0
Calico Mountains	CM	36582.1
Coolgardie	CG	54064.1
Cronese Lake	CL	26840.7
El Mirage	EM	10051.6

Table 3.4-1. Acres of Desert Linkage Networks on BLM Lands within the WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Sum of Acres
El Paso	EP	79455.5
Fremont Peak	FP	45653.0
Harper Lake	HL	19022.2
Iron Mountain	IM	11395.4
Jawbone	JB	84225.5
Johnson Valley	JV	50960.4
Juniper Flats	JF	20525.0
Kramer Hills	KH	40133.4
Lancaster	LA	1941.0
Middle Knob	MK	18353.9
Mitchel Mountains	MM	7480.5
Morongo Valley	MV	1835.9
NA	NA	328.7
Needles South	NE	39586.8
Newberry/Rodman	NR	4988.6
North Searles	NS	37822.0
Ord Mountains	OM	26145.1
Pisgah Crater	PC	1417.0
Rands	RA	14618.5
Rattlesnake Canyon	RC	34094.9
Red Mountain	RM	104535.2
Ridgecrest	RI	53580.6
Sierra	SI	47325.0
South Searles	SS	258.3
Stoddard Valley	SV	77262.6
Victorville	VV	3849.8
Wonder Valley	WV	6592.0

3.4.2 Unusual Plant Assemblages

The CDCA recognized areas throughout the CDCA as Unusual Plant Assemblages (UPAs) which are extraordinary based on unusual age, unusual size, unusually high cover density, or disjunction from main centers of distribution. Areas with restricted and discontinuous habitats are also UPAs, and include seeps, springs, and riparian areas, as well as plants growing on restricted substrates such as limestone outcrops or sand dunes. The UPAs are shown in Figure 3.4-2.

3.4.3 Special Status Species

Special status species include those listed as threatened, endangered, proposed, or candidates under the federal Endangered Species Act; BLM Sensitive species; California threatened, endangered, species of concern, and state fully protected; California Rare Plant Rank 1B, and species of concern identified through personal communication with BLM biologists.

3.4.3.1 Plants

A total of 45 special status plant species were identified as potentially occurring within the planning area (BLM 2005, 2013a, b; Dudek and ICF International 2012). These species, their associated habitats, and their potential for occurrence within the study area are summarized in Appendix D, Special Status Species. The potential for each of the 45 species to be affected by the proposed action or alternatives was evaluated for each species based on their known distribution and suitable habitat within the planning area. Based on these evaluations, 16 special status plant species have been determined as not affected by the proposed action or alternatives as discussed in Appendix D, Special Status Species. The remaining 29 species were identified by the locations of element occurrences on BLM lands as determined by the CNDDB and designated Critical Habitat. The total acreage identified as potential occurrence for each of the 29 species by subregion are listed in Table 3.4-2.

Table 3.4-2. Acres of Identified Special Status Plant Species Potential Occurrence on BLM Lands within the WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Species	Potential Occurrence Type	Sum of Acres
Barstow	BA	Mojave monkeyflower	CNDDB	34.3
		Parish's phacelia	CNDDB	0.1
Black Mountain	BM	Barstow woolly sunflower	CNDDB	4.9
		Desert cymopterus	CNDDB	724.1
Broadwell Lake	BL	White-margined Beardtongue	CNDDB	1015.3
Calico Mountains	CM	Mojave monkeyflower	CNDDB	1070.5
		Parish's phacelia	CNDDB	325.5
Coolgardie	CG	Alkali mariposa lily	CNDDB	3.3
		Barstow woolly sunflower	CNDDB	5.0
		Clokey's cryptantha	CNDDB	247.3
		Lane Mountain milk-vetch	CNDDB	2003.9
			Critical Habitat	9887.6
Cronese Lake	CL	Parish's phacelia	CNDDB	579.2
Darwin	DA	Death Valley sandpaper-plant	CNDDB	1425.2
El Paso	EP	Charlotte's phacelia	CNDDB	200.0
		Red rock poppy	CNDDB	176.9
		Red rock tarplant	CNDDB	69.0

Table 3.4-2. Acres of Identified Special Status Plant Species Potential Occurrence on BLM Lands within the WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Species	Potential Occurrence Type	Sum of Acres
Fremont Peak	FP	Barstow woolly sunflower	CNDDB	1835.4
		Desert cymopterus	CNDDB	9.9
Harper Lake	HL	Barstow woolly sunflower	CNDDB	1488.7
		Desert cymopterus	CNDDB	736.7
		Mojave monkeyflower	CNDDB	38.9
		Parish's phacelia	CNDDB	354.1
Iron Mountain	IM	Barstow woolly sunflower	CNDDB	35.2
Jawbone	JB	Charlotte's phacelia	CNDDB	177.9
		Kelso Creek monkeyflower	CNDDB	650.9
		Mojave tarplant	CNDDB	7.5
		Spanish Needle onion	CNDDB	1.4
Johnson Valley	JV	Little san bernardino mountains linanthus	CNDDB	4.9
Joshua Tree	JT		CNDDB	14.8
Juniper Flats	JF	Cushenbury buckwheat	CNDDB	31.6
			Critical Habitat	30.7
		Cushenbury milk-vetch	CNDDB	4.2
			Critical Habitat	8.5
		Mojave tarplant	CNDDB	52.6
		Parish's daisy	CNDDB	52.1
			Critical Habitat	64.2
Kramer Hills	KH	Barstow woolly sunflower	CNDDB	36.9
		Desert cymopterus	CNDDB	4.9
Middle Knob	MK	Bakersfield cactus	CNDDB	0.5
		Charlotte's phacelia	CNDDB	19.0
		Kern buckwheat	CNDDB	23.0
Mitchel Mountains	MM	Barstow woolly sunflower	CNDDB	1.0
		Mojave monkeyflower	CNDDB	125.3
Needles South	NE	White-margined Beardtongue	CNDDB	1752.3
Newberry/Rodman	NR	Mojave monkeyflower	CNDDB	250.5
Ord Mountains	OM	Clokey's cryptantha	CNDDB	4.9
		Mojave monkeyflower	CNDDB	223.7
Pisgah Crater	PC	White-margined Beardtongue	CNDDB	202.9
Rands	RA	Charlotte's phacelia	CNDDB	28.4
		Clokey's cryptantha	CNDDB	1689.3
		Desert cymopterus	CNDDB	0.3
		Red rock poppy	CNDDB	6.9

Table 3.4-2. Acres of Identified Special Status Plant Species Potential Occurrence on BLM Lands within the WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Species	Potential Occurrence Type	Sum of Acres
Rattlesnake Canyon	RC	Cushenbury buckwheat	CNDDB	732.3
			Critical Habitat	389.0
		Cushenbury milk-vetch	CNDDB	153.5
			Critical Habitat	827.3
		Cushenbury oxytheca	Critical Habitat	83.2
		Little san bernardino mountains linanthus	CNDDB	224.4
		Mojave monkeyflower	CNDDB	390.2
		Parish's daisy	CNDDB	288.0
			Critical Habitat	875.4
		Robison's monardella	CNDDB	55.8
Red Mountain	RM	Barstow woolly sunflower	CNDDB	16.3
		Desert cymopterus	CNDDB	1904.3
		Red rock poppy	CNDDB	176.1
Ridgecrest	RI		CNDDB	1809.7
Sierra	SI	Charlotte's phacelia	CNDDB	693.6
		Dedecker's clover	CNDDB	28.8
		Hall's daisy	CNDDB	65.3
		Mojave tarplant	CNDDB	20.8
		Nine Mile Canyon phacelia	CNDDB	245.5
		Owens Peak lomatium	CNDDB	79.4
		Sanicle cymopterus	CNDDB	388.8
		Spanish Needle onion	CNDDB	5.0
Stoddard Valley	SV	Barstow woolly sunflower	CNDDB	855.9
		Mojave monkeyflower	CNDDB	170.4
		Parish's phacelia	CNDDB	394.8
Victorville	VV	Mojave tarplant	CNDDB	0.0
		Short-joint Beavertail Cactus	CNDDB	24.6
Wonder Valley	WV	Little san bernardino mountains linanthus	CNDDB	53.3
		Robison's monardella	CNDDB	82.2

The 29 special status plant species identified as potentially affected by the proposed action or alternatives within the planning area are described in the following section. The majority of the updated summaries of species are based on the Species Accounts prepared for the recent March 2012 draft Desert Renewable Energy Conservation Plan (Dudek and ICF International 2012) baseline biology report. The WEMO Planning area exists within the boundaries of the DRECP

planning area. Additionally, 12 species were not included in the analysis of the 2006 WEMO Plan, but are since considered to potentially occur within the planning area based on recent documentation (Dudek and ICF International 2012) and consultation with BLM biologists. These species include the:

- Bakersfield Cactus
- Clokey's Cryptantha
- Death Valley Sandpaper-plant
- Dedecker's Clover
- Hall's Daisy
- Nine Mile Canyon Phacelia
- Owens Peak Lomatium
- Robison's Monardella
- Ripley's Cymopterus
- Spanish Needle Onion
- San Bernardino Mountains Dudleya
- Tracy's eriastrum

Alkali Mariposa Lily *(Calochortus striatus)*

Background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005).For a general discussion of this species, please refer to Section 3.3.8.1, pp. 3-184 to 3-185 of the 2005 WEMO Final EIS. The supplemental information presented below is based on the species accounts prepared for the recent March 2012 draft Desert Renewable Energy Conservation Plan baseline biology report (Dudek and ICF International 2012) and recent BLM data.

Life History

Alkali mariposa lily grows in seasonally moist alkaline habitats with calcareous sandy soil within Mojavean desert scrub communities (Dudek and ICF International 2012). This species prefers claypans and sand dunes, especially along drainages, in halophytic (associated with saline soils) saltbush scrub (Dudek and ICF International 2012). It has been reported that periodic natural inundation is important to alkali mariposa-lily, however, alkali mariposa-lily has been reported as absent from areas with surface salts or areas with permanent standing surface water (Dudek and ICF International 2012). This species ranges in elevation from 224 to 5,240 feet (Dudek and ICF International 2012).

Some associated species include saltgrass (*Distichlis spicata*), rushes (*Juncus* spp.), sedges (*Carex* spp.), beardgrass (*Polypogon* sp.), dock (*Rumex* sp.), alkali sacaton (*Sporobolus airoides*), beardless wildrye (*Elymus triticoides*), dwarf checkerbloom (*Sidalcea malviflora*), rabbitbrush (*Chrysothamnus* sp.), Baltic rush (*Juncus balticus*), and yellow sweetclover (*Melilotus indicus*) (Dudek and ICF International 2012).

Population Status in the Planning Area

Known distribution data for the alkali mariposa-lily within the WEMO Planning area is depicted in Figure 3.4-3. Within the planning area, the CNDDB identifies approximately 3.3 acres within element occurrences for this species on BLM lands within the subregion Coolgardie (Table 3.4-2 and Figure 3.4-3).

Regulatory Status

The regulatory status for the alkali mariposa lily has been updated from the 2005 WEMO Final EIS (BLM 2005) to eliminate the California Species of Special Concern status (as described in Section 3.3.8.1, pg. 3-185 of the 2005 WEMO Final EIS) and add a BLM sensitive designation.

Alkali mariposa-lily is not Federally or state listed, but is a BLM sensitive species. This species is also a CRPR 1B.2 species. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .2 are "seriously threatened in California, with 20% to 80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). The alkali mariposa-lily has a California Heritage Element Ranking of S2, indicating that it is "imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province" (CDFW 2012b).

Threats

The greatest threat to alkali mariposa-lily is the lowering of water tables through hydrological alternations and water diversions, which alters the seasonally moist alkaline habitat that this species requires. Other threats include urbanization, grazing, trampling, road construction, dumping, and military operations (NatureServe 2011).

Bakersfield Cactus *(Opuntia basilaris var. treleasei)*

The Bakersfield cactus was not included in the 2005 WEMO Final EIS (BLM 2005), but is considered to potentially occur within the planning area based on recent documentation (Dudek and ICF International 2012) and consultation with BLM biologists. The information presented below is based on the species accounts prepared for the recent March 2012 draft Desert Renewable Energy Conservation Plan baseline biology report (Dudek and ICF International 2012).

Life History

Bakersfield cactus is a perennial stem succulent in the cactus family (*Cactaceae*) with low-growing stem segments approximately 9 to 20 centimeters (3.5 to 7.9 inches) long (USFWS 2011c; Jepson Flora Project 2011). It blooms from April to May (CNPS 2011). Though not certain for this variety, some other prickly-pear species require cross-pollination for seedset and many are pollinated by bees. Bakersfield cactus exhibits several features that are characteristic of bee pollination. Flowers are large and showy with a watermelon-like odor, has a long flowering period, and large amount of nutritious pollen from numerous stamens (Jepson Flora Project 2011; Grant and Grant 1979). Flowers of beavertail prickly-pear are commonly visited by beetles and bees, but are pollinated mainly by bees (Grant and Grant 1979).

Bakersfield cactus typically undergoes vegetative reproduction—the production of new plants from sources other than seed—and produces seeds infrequently. Fallen pads can take root. Cactus pads may be dispersed by flood waters. Seed dispersal agents are unknown (USFWS 2011c), but the fruits and vegetative parts of *Opuntia* species in general, such as the spiny cladode (flattened stem resembling and functioning as a leaf), are closely linked with seed dispersal and vegetative dissemination by animals (Reyes-Agüero and others 2006). Bakersfield cactus does not survive prolonged inundation (USFWS 2011c).

Competition with non-native grasses for water is likely the cause of the decline in the number of cactus pads and low rates of reproduction observed in recent population studies at Sand Ridge Preserve (USFWS 2011c). In addition, a decline in pollinators may be partly responsible for the low levels and infrequency of seed set observed (USFWS 2011c). Predation of Bakersfield cactus is unknown though it is not considered a threat to this species (USFWS 2011c). In Mexico, the seed and fruits of other *Opuntia* species are consumed primarily by rodents, but also by harvester ants, birds, and other mammals (González-Espinosa and Quintana-Ascencio 1986).

Bakersfield cactus grows primarily in chenopod scrub, including saltbush scrub; and valley and foothill grassland; and occasionally in cismontane woodland, including blue oak woodland and riparian woodland (CNPS 2011; USFWS 2011c; CDFW 2012b; Jepson Flora Project 2011). Some associated species include California filago (*Filago californica*), yellow pincushion (*Chaenactis glabriuscula*), red brome, and other nonnative annual grasses (USFWS 2011c).

Bakersfield cactus occurs on floodplains, ridges, bluffs and low rolling hills, and flats (USFWS 2011c; CDFW 2012b). Soils are sandy or gravelly with little silt and clay, are low in organic matter, and may contain cobbles or boulders (CNPS 2011; USFWS 2011c); they are granitic and well-drained (CDFW 2012b). Bakersfield cactus ranges from 90 to 1,140 meters (295 to 3,740 feet) (CNPS 2011; CDFW 2012a).

Population Status in the Planning Area

Bakersfield cactus occurs in the Tehachapi Mountain area and the southeastern San Joaquin Valley in Kern County, California (Jepson Flora Project 2011). The historical distribution of Bakersfield cactus was likely more or less continuous east of Bakersfield, from Granite Station south to Comanche Point, east to Caliente, and west to Oildale (USFWS 1998c, 2011). However, it is currently restricted to a limited area of central Kern County near Bakersfield in the southern San Joaquin Valley, where the remaining populations occur in 11 general areas (USFWS 2011c). Approximately one-third of the historical population has been extirpated (USFWS 1998c).

Once likely more or less continuous east of Bakersfield, the current range of Bakersfield cactus consists of scattered fragments of these once larger populations (USFWS 2011c). Of the 46 reported occurrences reported in CNDDB, 8 are extirpated and 1 is potentially extirpated (CDFW 2012b).

Though the total population of Bakersfield cactus was not estimated historically, densely spaced clumps of cactus once covered an estimated area of 2 square miles from the Caliente Creek floodplain onto Sand Ridge (USFWS 2011c). When known sites were inventoried in 1989, fewer than 20,000 clumps of Bakersfield cactus were estimated to remain. Only four areas had populations of 1,000 clumps or more: Comanche Point, Kern Bluff, Sand Ridge, and the area north of Wheeler Ridge (USFWS 2011c). A status survey in 2010 and 2011 was conducted to determine the current state of the historical occurrences of Bakersfield cactus throughout its range (USFWS 2011c; Cypher and others 2011). Based on these surveys which focused on existing CNDDB occurrences, 25 occurrences were confirmed extant, 11 are believed to be extirpated, the status of 3 could not be determined, 2 previously unreported populations were documented, and 6 undocumented translocated populations were identified (CDFW 2012b). Therefore, there is a minimum of 33 extant occurrences (Cypher and others 2011).

Of the six occurrences documented in the CNDDB within the planning area, one is considered historical (i.e., before 1990) with plants that have not been observed since 1934. This occurrence is

mapped approximately 1 mile south of Fram. The historical occurrence in the planning area is the east of the recent occurrences described below. Although the historical distribution has not been well documented, it appears that the variety's range has recently expanded to the southeast considering Bakersfield cactus' southern limit as of 1987 was Comanche Point and its eastern limit was Caliente.

The recent occurrences of Bakersfield cactus reported in the planning area by the CNDDB occur at Oak Creek Pass in the Tehachapi Mountains, and near West Antelope Station and east of Bean Canyon at the foothills of the Tehachapi Mountains (CDFW 2012b). Three of these occurrences are located on private land; ownership of the other two is unknown (CDFW 2012b). These five occurrences are all very new, found in 2009 and 2010, and extend the variety's range southeast since they occur south of Comanche Point and east of Caliente, which were considered range limits in 1987 according to the 5-Year Review (USFWS 2011c).

Known distribution data for the Bakersfield cactus within the WEMO Planning area is depicted in Figure 3.4-4. Within the planning area, the CNDDB identifies approximately 0.5 acre of element occurrences for this species on BLM lands within the Middle Knob subregion (Table 3.4-2 and Figure 3.4-4).

Regulatory Status

Bakersfield cactus is both state and Federally listed as endangered. A recovery plan has been prepared for this species: *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998c). Bakersfield cactus has a CRPR of 1B.1. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .1 are "seriously threatened in California, with over 80% of occurrences threatened/high degree and immediacy of threat" (CNPS 2011). The Ash Bakersfield cactus has a California Heritage Element Ranking of S1, indicating that it is "critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province" (CDFW 2012b).

Threats

Agricultural land conversion, oil development, sand mining, urbanization, off-road vehicle use, proposed flood control basins, telecommunication and electrical lines construction, and possibly wildfires were considered threats to Bakersfield cactus habitat at the time of its listing in 1990 (USFWS 2011c). Currently, the loss and modification of habitat from agricultural conversion and urban, especially residential, development remain the largest threats to Bakersfield cactus (USFWS 2011c). Threats today also include oil development, off-road vehicle use, sand mining, and competition from non-native grasses. In addition, climate change, air pollution (including elevated nitrogen deposition), loss of pollinators, flooding, and loss of genetic diversity have been identified as potential new threats (USFWS 2011c).

Barstow Woolly Sunflower *(Eriophyllum mohavense)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.2, pp. 3-185) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Barstow woolly sunflower is in the aster family (Asteraceae) (Jepson Flora Project 2011). It is an annual herb standing approximately 1 to 2.5 centimeters (0.4 to 1 inch) in height that blooms from March to April or May, then goes to fruit in May (CNPS 2011; Jepson Flora Project 2011; NatureServe 2011). Plants tend to be clumped together. As an annual, germination and establishment of this species depends on the amount and timing of winter and spring rains. There is no information available regarding pollinators, seed dispersal, seed germination, or seedling establishment.

Barstow woolly sunflower prefers sandy or rocky areas within chenopod scrub, Mojavean desert scrub, creosote bush scrub, and also occurs on playas (NatureServe 2011; CNPS 2011; Jepson Flora Project 2011). This species prefers bare areas with little soil that frequently contain a shallow subsurface caliche layer (BLM 2005).

Population Status in the Planning Area

This species is endemic to the west-central portion of California's Mojave Desert (NatureServe 2011; Jepson Flora Project 2011). According to NatureServe (2010), Barstow woolly sunflower is restricted to a range within a 30-mile radius of Barstow in San Bernardino and Kern counties. The species' elevation range extends from 1,640 to 3,150 feet (CNPS 2011). All of the 63 total CNDDB occurrences are in the planning area (CDFW 2012b; see Figure SP-P7 in Appendix B). In 2006, there were approximately 10,600 known Barstow woolly sunflower individuals (NatureServe 2011). Population trends for this species are unknown.

The CNDDB identifies approximately 4,279 acres within element occurrences for this species within the planning area on BLM lands (Figure 3.4-5). The amount of acres identified within each subregion is detailed above in Table 3.4-2. In addition, approximately 19,069 acres has been designated as the Barstow Woolly Sunflower ACEC within the Fremont Peak subregion to protect the plant (Figure 3.4-5).

Regulatory Status

Barstow woolly sunflower is not Federally or state listed, but is a BLM sensitive species. Barstow woolly sunflower has a CRPR of 1B.2. CRPR 1B species are considered “rare, threatened, or endangered in California and elsewhere” (CDFW 2012b). CRPR species with a threat rank of .2 are “seriously threatened in California, with 20% to 80% of occurrences threatened/moderate degree and immediacy of threat” (CNPS 2011). The Barstow woolly sunflower has a California Heritage Element Ranking of S2, indicating that it is “imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province” (CDFW 2012b).

Threats

Threats to Barstow woolly sunflower include energy and subdivision development, sheep grazing, off-road vehicle use, highway and road improvements and building, mining, dumping, and pipeline construction (NatureServe 2011; CNPS 2011). Of these threats, those of primary concern include energy development, sheep grazing, off-road vehicles, and highway improvements (NatureServe 2011). According to NatureServe (2010), several Barstow woolly sunflower sites may be

extirpated, but their status has not been reported to the CNDDB. Currently, only one CNDDB occurrence is recorded as possibly extirpated (CDFW 2012b).

Charlotte's Phacelia *(Phacelia nashiana)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.4, pp. 3-186 and 3-187) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Charlotte's phacelia is an annual herb in the borage or waterleaf family (Boraginaceae) that is endemic to California. Charlotte's phacelia is typically 3 to 18 centimeters (1.2 to 7.1 inches) tall (Jepson Flora Project 2011). Flowering periods have been variously reported between March and June and Charlotte's phacelia can be found in flower by late March at lower elevations (White 2006a; CCH 2011). However, specimens collected by Chester, Kay, and Madore from Borrego Palm Canyon were also flowering in February (CCH 2011).

Some *Phacelia* species, such as Parry's phacelia, are fire-adapted, but it is unknown whether Charlotte's phacelia has any similar adaptation trigger. The habitats occupied by Charlotte's phacelia are frequently open and sparse, and the elevation ranges are higher than other *Phacelia* species, which could suggest that a similar, fire-adapted lineage is not likely (White 2006a). Pollination vectors and seed dispersal remain unknown for the species. Population data collected in a few known locations over time appear to fluctuate widely (CDFW 2012b), and hydrology could be key in both distribution and population size.

Population Status within the Planning Area

Based on the evident taxonomic confusion described in Appendix B, the distribution and extent of Charlotte's phacelia is less clear, and occurrences of Charlotte's phacelia could be more widespread than current records reflect. The records and distribution information in this report address the known locations of populations that have been previously identified as Charlotte's phacelia, including the isolated population in San Diego County.

Charlotte's phacelia is an endemic species that occurs in the desert-facing foothills of the Sierra Nevada and the adjacent El Paso Mountains, in Tulare, Inyo, and Kern counties (White 2006a). Although not mentioned in White (2006a), Charlotte's phacelia also occurs in Anza-Borrego State Park in San Diego County (CCH 2011).

Some population data are known for Charlotte's phacelia, but not much data has been provided regarding the populations status over time. Known distribution data for this species within the WEMO Planning area is depicted in Figure 3.4-6. Within the planning area, the CNDDB identifies approximately 1,119 acres of element occurrences for this species on BLM lands. The amount of acres of potential occurrence for this species within each subregion is detailed above in Table 3.4-2.

The BLM WEMO Final EIS (2005) recommends that further surveys be made to record fluctuations in population estimates at known locations, particularly with respect to the potential effects of grazing. Grazing cattle could play a role in seed dispersal, either through soil disturbance or via the digestive tract (White 2006a).

Regulatory Status

Charlotte's phacelia is not Federally or state listed, but is a BLM sensitive species. Charlotte's phacelia has a CRPR of 1B.2. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .2 are "seriously threatened in California, with 20% to 80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). The Barstow woolly sunflower has a California Heritage Element Ranking of S2, indicating that it is "imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province" (CDFW 2012b).

Threats

Impacts to Charlotte's phacelia from grazing and off-road vehicles are the most frequently noted threats in the CNDDB records (CDFW 2012b). Trampling and collecting by hikers were also listed as threats to populations that occur along trails and within parks and recreational areas. Mining activities were noted as threats in a few locations, and activities and/or expansion of facilities at China Lake Naval Air Weapons Center could also pose a threat to populations near Volcano Peak outside of the planning area and Indian Wells within the planning area.

Clokey's Cryptantha *(Cryptantha clokeyi)*

Life History

Clokey's cryptantha is an annual herb in the borage or waterleaf family (Boraginaceae) that is endemic to California. Clokey's cryptantha is typically 8 to 15 centimeters (3.1 to 5.9 inches) tall (Jepson Flora Project 2013). Flowering period is from April to May (Jepson Flora Project 2013).

Clokey's cryptantha is found on slopes and ridge crests. Substrates may be sandy, rocky, or gravelly (CNPS 2013; Jepson Flora Project 2013). This species is found in desert woodland vegetation communities. The elevation range of Clokey's cryptantha is 3,445 to 5,413 feet amsl (Jepson Flora Project 2013).

Population Status in the Planning Area

Endemic to California (Inyo, Kern, Los Angeles, and San Bernardino Counties) (CNPS 2013) and found in the northwest Mojave Desert and in the north Desert Mountains (Jepson Flora Project 2013). Clokey's cryptantha is broadly distributed in the planning area, found in both the desert near Lancaster, Barstow, Ridgecrest, and Apple Valley, and in the north Desert Mountains, including the Argus Mountains and the Panamint Range (CNPS 2013).

Known distribution data for Clokey's cryptantha within the WEMO Planning area is depicted in Figure 3.4-7. Within the planning area, the CNDDB identifies approximately 1,942 acres of element occurrences for this species on BLM lands. The amount of acres of potential occurrence for this species within each subregion is detailed above in Table 3.4-2.

Regulatory Status

Clokey's cryptantha is not a federal or state listed species (CNPS 2013), but is a BLM sensitive species. Clokey's cryptantha has a CRPR of 1B.2 (CNPS 2013). CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with

a threat rank of .2 are "seriously threatened in California, with 20% to 80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). Clokey's cryptantha has a California Heritage Element Ranking of S2, indicating that it is "imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province" (CDFW 2012b).

Threats

Clokey's cryptantha is threatened by military activities and alteration of fire regimes (CNPS 2013).

Cushenbury Buckwheat *(Eriogonum ovalifolium var. vineum)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.3, pp. 3-186) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Cushenbury buckwheat is in the buckwheat family (Polygonaceae) (Jepson Flora Project 2011). It is a mound-forming perennial herb approximately 1.5 to 2.5 decimeters (5.9 to 9.8 inches) in diameter (Sanders 2003).

A study of the Cushenbury buckwheat's reproduction patterns found it to be an outcrossed species with high levels of diversity, low levels of inbreeding among maternal individuals, and selection against homozygous offspring (Neel and others 2001). The main flowering period is May and June, and fruits ripen in about July and prepare for germination during any summer rains in August and September (Sanders 2003). There can also be later flowering in September. It is probably pollinated by small insects and possibly by generalist flower visitors rather than a specialist (Sanders 2003). A personal communication to Sanders (2003) by Morita indicated that nearly 100 insect species visited flowers, including potential pollinators and plant feeders. Insect taxa visiting flowers included many flies (particularly tachinids), bee-flies (Bombylidae), and smaller species such as chloropids (Sanders 2003). A reintroduction study onto a disturbed site by Mistretta and White (2001) showed about 77% survival from 1991 to 1998 and successful reproduction within 6.6 feet of planting areas. Mistretta and White (2001) suggested that Cushenbury buckwheat does not depend on specialized pollinators or soil microorganisms due to the success of the species at the disturbed site, as well as in botanical gardens. Short dispersals likely are wind-aided, with the dried tepals (a division of the perianth where the petals and sepals are indistinguishable) acting as wings (Sanders 2003). Long-distance seed dispersal by this species has not been directly studied, but buckwheat seeds are thought to be dispersed by birds; however, there is no evidence of long-distance dispersal by Cushenbury buckwheat given its restricted distribution (Sanders 2003). As noted previously, Mistretta and White (2001) documented progeny within 6.6 feet of planting areas and no individuals were found more than 98 feet from planting areas.

The species *Eriogonum ovalifolium* is not well adapted to competing for light due to its low stature, but it competes well on sites with moisture and nutrient deficiencies, wind, and winter cold due to its compact "cushion" habit (Sanders 2003). The dense covering wool on its leaves, which reduces water loss, indicates that moisture and light are not controlling factors for this species. Tall, fast-growing species that may out compete *Eriogonum ovalifolium* for light do not grow well

on limestone sites with nutrient deficiencies and high pH, which interferes with mineral uptake (Sanders 2003).

Cushenbury buckwheat does not appear to tolerate high or continuing levels of anthropogenic or natural disturbance (e.g., washes and canyon bottoms), but has been observed colonizing abandoned haul roads (Sanders 2003). Mistretta and White (2001) were able to successfully reintroduce it to a barren cut slope above a quarry haul road where no habitat enhancements were made other than irrigation the first summer and fall after planting and use of the potting soil mix surrounding the roots of the plantings.

Cushenbury buckwheat is closely associated with carbonate substrates on stable slopes with bedrock outcrops and elevations between about 4,600 and 7,900 feet (Sanders 2003; USFWS 2009d; CDFW 2012b). It has never been found away from carbonate substrates and appears to be more closely associated with limestone than dolomite, but this preference needs confirmation (Sanders 2003). General vegetation communities associated with the species are pinyon-juniper woodland, Joshua tree woodland, and Mojavean desert scrub (CNPS 2011; CDFW 2012b). Sanders (2003) notes that it also has been observed in Jeffrey pine-western juniper woodland. It occurs in open areas on gentle to steep slopes with north or west aspects, little accumulation of organic material, open canopy cover (generally less than 15%), and powdery fine soils with rock cover exceeding 50% (USFWS 2009d). Although it may be locally common, individuals tend to occur in scattered distributions (Sanders 2003), and only about 25% of less than 20 occurrence locations known in 1984 supported more than 1,000 individuals (USFWS 2009d).

Population Status in the Planning Area

Cushenbury buckwheat is endemic to the San Bernardino Mountains in San Bernardino County (USFWS 2009d). However, Sanders (2003) reports a possible, but unconfirmed, small population in the southern Sierra Nevada Mountains (Sanders 2003). The species occurs along the northeastern edge of the San Bernardino Mountains, northwest, north, and east of Big Bear Lake from White Mountain southeast to Mineral Mountain on the north side of Rattlesnake Canyon (Sanders 2003; USFWS 2009d; see Figure SP-P9 in Appendix B).

The estimated population of Cushenbury buckwheat when it was listed in 1994 was estimated to be about 13,000 individuals in fewer than 20 locations, with about 25% of the occurrence supporting fewer than 1,000 individuals (USFWS 2009d). At the time critical habitat was designated in 2002, there were 239 site-specific occurrences of Cushenbury buckwheat (67 FR 78570–78610). However, in the 5-year review in 2009, the USFWS (2009d) indicated that determining population trends was difficult because what constitutes site-specific occurrences has been subjectively defined and surveys efforts have likely increased since its listing in 1994.

The CNDDB identifies approximately 1,184 acres of element occurrences for this species within the planning area (Table 3.4-2 and Figure 3.4-8). The 1,184 acres for this species includes approximately 420 acres of Critical Habitat designated within the planning area (Figure 3.4-8). In addition, approximately 4,357 acres has been designated as the Carbonate Endemic Plants RNA ACEC within the Rattlesnake Canyon subregion to protect the plant (Figure 3.4-8).

Regulatory Status

Cushenbury buckwheat is Federally listed as endangered but is not state listed. A recovery plan addresses this species: *San Bernardino Mountains Carbonate Plants Draft Recovery Plan*

(USFWS 1997b). Cushenbury buckwheat has a CRPR of 1B.1. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .1 are "seriously threatened in California, with over 80% of occurrences threatened/high degree and immediacy of threat" (CNPS 2011). The Cushenbury buckwheat has a California Heritage Element Ranking of S1, indicating that it is "critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province" (CDFW 2012b).

Threats

The main threat to Cushenbury buckwheat when it was Federally listed in 1994 was mining (USFWS 2009d). Other threats at the time included OHV use, a hydroelectric project, and a 115-kilovolt power line proposed for construction through Cushenbury Canyon (USFWS 2009d). About 75% of occupied habitat was under threat as a result of being under claim for mining, in private ownership and subject to mining, or as a result of other disturbances (USFWS 2009d). Mining continues to be the primary threat to the species, but other threats include energy development and OHV use, which can result in direct ground disturbance and dust generation (USFWS 2009d). Further, dispersed target shooting, dispersed camping areas, and fuelwood collection can result in trampling of Cushenbury buckwheat and impact its habitat through ground disturbance or dust creation (USFWS 2009d). Padgett and others (2007) conducted a study examining dust deposition from mining activities and potential effects to Cushenbury buckwheat and other carbonate plant species. This study documented lower photosynthetic activity and less growth for plants near mining activities due to dust. Fire suppression activities can result in ground disturbance through fire line construction, retardant and water drops, and establishment of fire camps (USFWS 2009d). Artificial lighting is also cited as a potential threat due to potential impacts on the behavior of pollinators or seed dispersers, or by altering photoperiod responses (USFWS 2009d).

The specific potential effects of climate change on Cushenbury buckwheat are unknown, but if climate change caused a shift to higher elevations due to warmer and drier conditions, as has occurred with other plant species on the Santa Rosa Mountains of Southern California (Kelley and Goulden 2008), this endemic species could be concentrated in a smaller area and more vulnerable to extinction (USFWS 2009d).

Cushenbury Milk-vetch *(Astragalus albens)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.3, pp. 3-186) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Cushenbury milk-vetch is a member of the legume family (Fabaceae). It is a prostrate annual or perennial plant with stems approximately 2 to 30 centimeters (0.8 to 12 inches) in length (MacKay 2003). Individual plants may be annual or perennial (MacKay 2003; Hickman 1996), but otherwise little is known of its natural history, including reproduction (MacKay 2003). Flowering occurs from late March to mid-June and pods ripen as early as May (MacKay 2003). It is probably pollinated by small bees given flower shape and color (MacKay 2003; USFWS 2009e). It is

unknown whether plants flower and fruit in their first year, how long they live, or what conditions cause them to be annuals or perennials (MacKay 2003). They reproduce by seed and seeds have been shown to have high viability (MacKay 2003). Seeds require scarification (cutting of the outer seed coat) to germinate and may remain dormant in the soil during drought years (MacKay 2003). The length of time seeds can remain viable, the characteristics of seed banks (e.g., size, kinds of seeds), and the type and extent of seed predation and/or dispersal are unknown (MacKay 2003). However, populations increase in response to rainy seasons after droughts, indicating that seed banks persist and seeds remain viable for at least several years (MacKay 2003).

Other than their association with carbonate soils and some other habitat features such as canopy, litter, and slope described in Habitat Requirements, little is known of the life history and ecological relationships of Cushenbury milk-vetch. Pollinators are probably small bees and seeds appear to have high viability and resistance to drought (MacKay 2003). Dispersal mechanisms are unknown. Of particular interest is the factor(s) related to whether individuals are annual or perennial. A factor potentially related to conservation and management of the species is its apparent ability to colonize slightly disturbed sites such as little used roads and long abandoned quarries, but it does not appear to tolerate high or continuing levels of disturbance (MacKay 2003).

Cushenbury milk-vetch is closely associated with carbonate and carbonate-related soils (limestone and dolomite) and outcrops at elevations between 4,000 and 6,600 feet (MacKay 2003). General vegetation communities associated with the species are pinyon-juniper woodland, Joshua tree woodland, and Mojave desert scrub (CNPS 2011). Most occurrences are between 5,000 and 6,600 feet for soils deriving from decomposed limestone (USFWS 2009e). In some cases, the species has been found in carbonate alluvium that was deposited over granitic rocks or has fallen into other soils as a result of a debris slide (MacKay 2003).

Population Status in the Planning Area

Cushenbury milk-vetch is endemic to the San Bernardino Mountains in San Bernardino County (USFWS 2009e). The species occurs along the northeastern end of the San Bernardino Mountains, north and east of Big Bear Lake from a ridgetop just east of Dry Canyon, southeast through Lone Valley, east of Baldwin Lake, and to upper Burns Canyon (MacKay 2003). As of 2002, there were an estimated 103 mapped localities for the species (67 FR 78570–78610). With a few exceptions, it is closely associated with carbonate and carbonate-related soils (limestone and dolomite) and outcrops at elevations between 4,000 and 6,600 feet (MacKay 2003).

The estimated population of Cushenbury milk-vetch when it was listed in 1994 was 5,000 to 10,000 individuals in fewer than 20 locations (USFWS 2009e). At the time the Recovery Plan was prepared in 1997, there were 33 known occurrences of Cushenbury milk-vetch (USFWS 1997b). At the time critical habitat was designated in 2002, there were 239 site-specific occurrences of Cushenbury milk-vetch (67 FR 78570–78610). However, in the 5-year review in 2009, the USFWS indicated that determining population trends was difficult because what constitutes site-specific occurrences has been subjectively defined and survey efforts have likely increased since its listing in 1992.

There are 20 occurrence records from the CNDDB for Cushenbury milk-vetch, 8 of which occur in the planning area (CDFW 2012b). There are three occurrences within the planning area that have been observed prior to 1990 or have an unknown observation date. These occur at the edge of the San Bernardino National Forest along the western boundary of the planning area (CDFW 2012b).

There are five occurrences within the planning area that have been observed since 1990. These occur at the edge of the San Bernardino National Forest along the western boundary of the planning area (CDFW 2012b). These all occur on BLM lands or lands designated BLM/private (CDFW 2012b).

The CNDDB identifies approximately 994 acres of element occurrences for this species within the planning area (Figure 3.4-9). The amount of acres associated with the element occurrences identified within each subregion is detailed above in Table 3.4-2. The 994 acres of potential occurrence for this species includes approximately 836 acres of Critical Habitat designated within the planning area. In addition, approximately 4,357 acres has been designated as the Carbonate Endemic Plants RNA ACEC within the Rattlesnake Canyon subregion to protect the plant (Figure 3.4-9).

Regulatory Status

Cushenbury milk-vetch is Federally listed as endangered but is not state listed. Critical habitat was designated on December 24, 2002 (67 FR 78570–78610). A recovery plan addresses this species, *San Bernardino Mountains Carbonate Plants Draft Recovery Plan* (USFWS 1997b). Cushenbury milk-vetch has a CRPR of 1B.1. CRPR 1B species are considered “rare, threatened, or endangered in California and elsewhere” (CDFW 2012b). CRPR species with a threat rank of .1 are “seriously threatened in California, with over 80% of occurrences threatened/high degree and immediacy of threat” (CNPS 2011). The Cushenbury milk-vetch has a California Heritage Element Ranking of S1.1, indicating that it is “critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province” (CDFW 2012b).

Threats

The main threat to Cushenbury milk-vetch when it was Federally listed in 1994 was mining (USFWS 2009e). Other threats at the time included OHV use, a hydroelectric project, and a 115-kilovolt power line proposed for construction through Cushenbury Canyon (USFWS 2009e). About 97% of occupied habitat was under threat as a result of being under claim for mining, in private ownership and subject to mining, or as a result of other disturbances (USFWS 200e). Mining continues to be the primary threat to the species, but other threats include energy development and OHV use, which can result in direct ground disturbance and dust generation (USFWS 2009e). Further, dispersed target shooting, dispersed camping areas, and fuel wood collection can result in trampling of Cushenbury milk-vetch and impact its habitat through ground disturbance or dust creation (USFWS 2009e). Dust can reduce plant viability by altering soil chemistry and light penetration into the seed banks (USFWS 2009e). Fire suppression activities can result in ground disturbance through fire line construction, retardant and water drops, and establishment of fire camps (USFWS 2009e). Artificial lighting is also cited as a potential threat due to potential impacts on the behavior of pollinators or seed dispersers, or by altering photoperiod responses (USFWS 2009e).

The specific potential effects of climate change on Cushenbury milk-vetch are unknown, but if climate change caused a shift to higher elevations due to warmer and drier conditions, as has occurred with other plant species on the Santa Rosa Mountains of Southern California (Kelley and Goulden 2008), this endemic species could be concentrated in a smaller area and more vulnerable to extinction (USFWS 2009e).

Cushenbury Oxytheca *(Acanthoscyphus parishii var. goodmaniana)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.3, pp. 3-186) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Cushenbury oxytheca is a small annual plant approximately 0.5 to 3 decimeters (2 to 12 inches) in size that germinates in late fall, producing a relatively long taproot and basal rosette of leaves that remain until the inflorescence develops and flowers bloom from May to October (Sanders 2007). Observations suggest that it is pollinated by generalist insects, such as small flies and small beetles (S. Morita, cited in Sanders 2007). Little is known about seed bank, seedling establishment, or population structure (USFWS 2009f).

Other than Cushenbury oxytheca's association with carbonate soils, little is known of the life history and ecological relationships of this species. What is known of its life history is based on personal observations and museum records; little information has been published on the species (Sanders 2007). Gonella and Neel (1995) noted its presence/absence on plots in relation to Cushenbury buckwheat and Cushenbury milk-vetch; generally is does not co-occur with these two species.

Cushenbury oxytheca is an annual herb that generally grows on limestone or a mixture of limestone and dolomite soils. This species is most commonly found on talus slopes within pinyon and juniper woodland (Hickman 1996, p. 886; CNPS 2011; CDFW 2012b; USFWS 2009f). Slope where it occurs are usually steep and almost always on loose scree or talus (Sanders 2007). Habitat preferences include an open canopy structure with little or no accumulation of organic material at the soil surface.

Dominant species within pinyon and juniper woodland include single-leaf pinyon pine (*Pinus monophylla*), Utah juniper (*Juniperus osteosperma*), and more rarely California juniper and western juniper (*Juniperus occidentalis*). Understory species within pinyon and juniper woodland are more variable, but may include mountain-mahogany (*Cercocarpus ledifolius*), Mormon tea (*Ephedra viridis*), Mojave yucca (*Yucca schidigera*), Joshua tree, and brittlebush. Cushenbury oxtheca co-occurs with another carbonate endemic, Parish's daisy (*Erigeron parishii*). Its presence, however, appears to be negatively related to at least two other carbonate soils species that tend to occur on stable slopes. Gonella and Neel (1995) never found Cushenbury oxytheca on sample plots centered on Cushenbury milk-vetch (*Astragalus albens*), but it was fairly regularly found on plots without the milk-vetch. Cushenbury milk-vetch is a species typical of stable, often bedrock, slopes. Cushenbury oxytheca also appears to be negatively correlated with the presence of Cushenbury buckwheat (*Eriogonum ovalifolium* var. *vineum*). However, later surveys conducted by Rancho Santa Ana Botanic Garden for the USFS did find Cushenbury oxytheca growing with Cushenbury milk-vetch and Cushenbury buckwheat in some areas (V. Sosa, cited in Sanders 2007).

Population Status in the Planning Area

Cushenbury oxytheca occurs along the north foot of the San Bernardino Mountains in San Bernardino County on limestone and other carbonate talus slopes (CDFW 2012b; Sanders 2007). The CNDDB and the USFWS species database document 224 occurrences of Cushenbury

oxytheca. The majority of these populations occur within the San Bernardino National Forest. As reported by the USFWS in 2009, Cushenbury oxytheca occupies approximately the same range as it did at listing, which is approximately 500 acres (USFWS 2009f).

Cushenbury oxytheca is a small, annual species of xerophytic habitats that is subject to year-to-year fluctuations in population size as a result of differential rainfall (USFWS 2009f). Further, what is defined as an "occurrence" has been variable and subjective, making it difficult to detect changes in abundance (USFWS 2009f). Due to these factors, population status and trends are difficult to measure. It should also be noted that as increased survey efforts have occurred since the species original listing, there has also been an increase in the number of detected occurrences (USFWS 2009f).

Cushenbury oxytheca is primarily associated with a region of carbonate soils that occur along the northern edge of the San Bernardino Mountains (USFWS 2009f). It has been estimated by Gonella and Neel (1995) that the mining industry has impacted over 1,600 acres of potential habitat for a variety of carbonate-endemic plants; and because Cushenbury oxytheca was not described until 1980, the historical distribution of this species is unknown, except only by inference. One occurrence record with an unknown observation date is recorded in the planning area north of Big Bear City (CDFW 2012b).

Three known recent occurrences of Cushenbury oxytheca occur within the planning area, two north of Big Bear City and one near Butler Peak (CDFW 2012b). Two of these are within the Barstow RA on BLM lands and the other is in an area under private and/or BLM management (CDFW 2012b). Approximately 83 acres of designated Critical Habitat has been identified for this species within the Rattlesnake Canyon subregion (Figure 3.4-10) as detailed above in Table 3.4-2.

Regulatory Status

Cushenbury oxytheca is Federally listed as endangered but is not state listed. Critical habitat was designated on December 24, 2002 (67 FR 78570–78610). A recovery plan addresses this species: *San Bernardino Mountains Carbonate Plants Draft Recovery Plan* (USFWS 1997b). Cushenbury oxytheca has a CRPR of 1B.1. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .1 are "seriously threatened in California, with over 80% of occurrences threatened/high degree and immediacy of threat" (CNPS 2011). The Cushenbury oxytheca has a California Heritage Element Ranking of S1.1, indicating that it is "critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province" (CDFW 2012b).

Threats

According to a variety of sources, the primary threat to Cushenbury oxytheca is limestone mining (CDFW 2012b; Sanders 2007; Hickman 1996). Besides direct impacts, dust and artificial lighting can affect the species through dust impacts on soil chemistry and potential lighting impacts on seedbanks and pollinators and seed dispersers (USFWS 2009f). The USFWS (2009f) reports that 79% of known occupied habitat is currently subject to mining claims. Additional threats are non-native plant encroachment, power line maintenance, a hydroelectric project, and OHVs (CNPS 2011; USFWS 2009f).

Death Valley Sandpaper-plant *(Petalonyx thurberi ssp. gilmanii)*

Life History

Death Valley sandpaper-plant is a perennial subshrub in the loasa family (Loasaceae) that is native and endemic to California. Death Valley sandpaper-plant is typically less than 100 centimeters (39.4 inches) tall (Jepson Flora Project 2013) and flowers from May to June and September to November (Calflora 2013; Jepson Flora Project 2013).

Death Valley sandpaper-plant is found on dunes and in sandy washes (Jepson 2013); and within sagebrush scrub, Joshua tree woodlands, and pinyon-juniper woodlands in the vicinity of Panamint and Death Valleys. Substrates are sandy (CNPS 2013). This species is found in desert dunes and Mojavean desert scrub vegetation communities (CNPS 2013). Elevation range reported as 0 to 3,937 (Jepson 2013) and 853 to 4,741 feet amsl (CNPS 2013).

Population Status in the Planning Area

Native and endemic to California (Inyo and San Bernardino Counties) (CNPS 2013) and found in the North Mojave Desert (Jepson Flora Project 2013). Occurrence within the planning area is limited to Old Ibex Pass and potentially the west side of the Argus Mountains (CNPS 2013).

Known distribution data for Death Valley sandpaper-plant within the WEMO Planning area is depicted in Figure 3.4-11. Within the planning area, the CNDDB identifies approximately 1,425 acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2.

Regulatory Status

Death Valley sandpaper-plant is not a federal or state listed species (CNPS 2013), but is a BLM sensitive species. Death Valley sandpaper-plant has a CRPR of 1B.3 (CNPS 2013). CRPR 1B species are considered “rare, threatened, or endangered in California and elsewhere” (CDFW 2012b). CRPR species with a threat rank of .3 are “not very threatened in California, with less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known” (CNPS 2011).The Death Valley sandpaper-plant has a California Heritage Element Ranking of S2.3, indicating that it is “imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province” (CDFW 2012b).

Threats

Death Valley sandpaper-plant has no known threats (CNPS 2013).

Dedecker's Clover *(Trifolium dedeckerae also Trifolium kingii ssp. Dedeckerae)*

Life History

Dedecker’s clover is a perennial herb in the legume family (Fabaceae) that is endemic to California. Flowering period is from May to July (Calflora 2013).

Dedecker’s clover is found on alpine crests and in rock crevices (Jepson 2013). Substrates are granitic and rocky (CNPS 2013). This species is found in lower montane coniferous forest, pinyon

and juniper woodland, subalpine coniferous forest, and upper montane coniferous forest vegetation communities (CNPS 2013). Elevation range reported as 6,890 to 11,483 feet amsl (CNPS 2013).

Population Status in the Planning Area

Endemic to California (Inyo, Kern, Mono, and Tulare Counties) (CNPS 2013) and found in the southern high Sierra Nevada Mountains and to the east (Jepson Flora Project 2013). Known occurrences within the planning area include Coso Peak north of Ridgecrest and in the foothills adjacent to Sequoia NF from Ridgecrest north to Owens Lake (CNPS 2013).

Known distribution data for Dedecker's clover within the WEMO Planning area is depicted in Figure 3.4-12. Within the planning area, the CNDDB identifies approximately 29 acres of element occurrences for this species on BLM lands within the Sierra subregion (Table 3.4-2).

Regulatory Status

Dedecker's clover is not a federal or state listed species (CNPS 2013), but is a BLM sensitive species. Dedecker's clover has a CRPR of 1B.3 (CNPS 2013). CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .3 are "not very threatened in California, with less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known" (CNPS 2011). Dedecker's clover has a California Heritage Element Ranking of S2.3, indicating that it is "imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province" (CDFW 2012b).

Threats

Dedecker's clover is possibly threatened by mining and grazing (CNPS 2013).

Desert Cymopterus *(Cymopterus deserticola)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.6, pp. 3-187 and 3-188) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Desert cymopterus is in the carrot family (Apiaceae) (Jepson Flora Project 2011). Desert cymopterus is a tap-rooted perennial about 15 centimeters (5.9 inches) in height (Jepson Flora Project 2011). As a taprooted perennial, desert cymopterus does not appear to reproduce vegetatively, but rather reproduces via seeds. Seedling establishment has not been reported for this species. Establishment of new individuals in a population may be infrequent given that many reported desert cymopterus populations are highly dispersed and low density (NatureServe 2011).

Depending on the year, desert cymopterus flowers between early March and mid-May, and may not flower at all in unfavorable years. Poor seed production or seed survival may be a factor in infrequent establishment observed in field studies. Fruits of desert cymopterus are fairly large and do not seem well adapted for dispersal over long distances. Fruits generally seem to fall relatively close to the parent plant. However, the fruits have a marginal wing that may facilitate dispersal by wind. In addition, the fruits mature late in the season, typically after the end of the rainy season, so

they remain dry and light. Therefore, given that wind is relatively common in the open sandy habitats where this species is found, it could easily push the fruits along the soil surface, although the fruits probably don't become airborne (NatureServe 2011).

Because of the annual variability in rainfall, the underground parts of herbaceous desert perennials, including desert cymopterus, must be able to maintain the populations over time with frequent years of reproductive failure; in addition, they must be able to survive prolonged periods of low soil moisture and entire years without aboveground photosynthetic activity (NatureServe 2011). In dry years, desert cymopterus may not produce flowers or fruit and may even remain dormant underground during the usual growing season. In very wet years, however, they may produce flowers and fruits abundantly.

Population sizes appear to vary greatly from year to year, evidently in response to the amount and timing of winter and spring rainfall, making it difficult to determine population trends (NatureServe 2011).

Desert cymopterus grows in Joshua tree woodland, saltbush scrub, and Mojavean desert scrub communities on loose, sandy soils. The sandy soils required by this species occur on alluvial fans and basins, stabilized sand fields, and occasionally sandy slopes of desert dry lake basins (69 FR 64884–64889).

Population Status in the Planning Area

The historical distribution of desert cymopterus ranged from Apple Valley in San Bernardino County northward approximately 55 miles to the Cuddeback Lake basin in San Bernardino County, and westward approximately 45 miles to the Rogers and Buckhorn Dry Lake basins on Edwards Air Force Base in Kern and Los Angeles counties. However, the Apple Valley locations have presumably been extirpated resulting in a current distribution that includes the Rogers Dry Lake, Harper Dry Lake, Cuddeback Dry Lake, and Superior Dry Lake basins (69 FR 64884–64889). This species occurs at elevations from 2,000 to 3,000 feet, and possibly up to 5,000 feet (69 FR 64884–64889; CNPS 2011).

Abundance estimates for each population are usually less than 1,000 plants. However, estimating population size is difficult for a number of reasons. First, occurrences and population size fluctuate widely from year to year in response to climatic conditions, especially on the amount of rainfall. Desert cymopterus is dependent upon frequent spring rains. Furthermore, this species may remain dormant underground as a taproot and may not emerge when there is not enough rainfall, so the number of individuals underground could be greater than the number of individuals aboveground. Also, detectability many be low in years when plants only produce leaves and no inflorescence (NatureServe 2011).

The largest and most robust populations of desert cymopterus occur on Edwards Air Force Base. Seventeen population surveys were performed during a study in 1995, a good year for the species, and population sizes at each location ranged from 1 to 1,929 individuals. In total, 14,093 individuals were counted over an area of 1,465 acres (Tetra Tech 1995, cited in NatureServe 2011).

There are a total of 79 occurrences of desert cymopterus in the CNDDB (CDFW 2012b). There are three CNDDB occurrences from before 1990. Two of these are located in the vicinity of Leuhman Ridge and Kramer Hills near other occurrences of this species. One of these is possibly extirpated and located over 25 miles southeast of other occurrences east of Victorville.

There are 76 recent occurrences (status updated since 1990) that range from south of Buckhorn Lake along the Kern–Los Angeles County boundary north to the Black Hills and Fort Irwin. However, the majority of these occurrences are located on or near Edwards Air Force Base. Those on Edwards Air Force Base and the one occurrence at Fort Irwin are on lands owned by the DOD. Other occurrences on public land include those managed by the BLM in the general vicinity of North Edwards, Harper Lake, and Cuddeback Lake. The remaining nine recent records are either located on private land or the ownership is unknown (CDFW 2012b).

Known distribution data for Desert cymopterus within the WEMO Planning area is depicted in Figure 3.4-13. Within the planning area, the CNDDB identifies approximately 3,380 acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2.

Regulatory Status

Desert cymopterus (*Cymopterus deserticola*) is not Federally or state listed, but is a BLM sensitive species. Desert cymopterus has a CRPR of 1B.2. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .2 are "fairly threatened in California, with 20% to 80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). Desert cymopterus has a California Heritage Element Ranking of S2, indicating that it is "imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province" (CDFW 2012b).

Threats

Desert cymopterus is potentially threatened by habitat alteration and destruction resulting from military activities on Edwards Air Force Base, the expansion of Fort Irwin, oil and gas development, utility construction, renewable energy development, off-road vehicle use, sheep grazing, Land Tenure Adjustment, and urban development (69 FR 64884–64889; CNPS 2011). However, according to the proposed rule (69 FR 64884–64889), the magnitude and relative importance of most of these potential threats were unknown. Grazing by native and non-native herbivores—presumably including mammals, insects, and desert tortoise—is also a threat to this species. This may contribute to the low density, dispersed nature of the majority of reported desert cymopterus populations by limiting the plants' reproductive potential and reducing their vigor (Bagley 2006).

Hall's Daisy *(Erigeron aequifolius)*

Life History

Hall's daisy is perennial herb in the sunflower family (Asteraceae) that is endemic to California. Hall's daisy is typically 10 to 20 centimeters (3.9 to 7.9 inches) tall (Jepson Flora Project 2013). Flowering period is from June to August (Calflora 2013).

Hall's daisy is found on rock ledges and in crevices (Jepson Flora Project 2013). Substrates are granitic and rocky (CNPS 2013). This species is found in broadleafed upland forest, lower montane coniferous forest, pinyon and juniper woodland, and upper montane coniferous forest

vegetation communities. The elevation range of Hall's daisy is 4,921 to 8,005 feet amsl (CNPS 2013).

Population Status in the Planning Area

Hall's daisy is endemic to California (Fresno, Kern, and Tulare Counties) (CNPS 2013) and found in the southern high Sierra Nevada Mountains (Jepson Flora Project 2013). Known within the planning area from only Owens Peak west of Indian Wells, but is more broadly distributed throughout the southern Sierra Nevada Mountains to the north of the planning area (CNPS 2013).

Known distribution data for Hall's daisy within the WEMO Planning area is depicted in Figure 3.4-14. Within the planning area, the CNDDB identifies approximately 65 acres of element occurrences for this species on BLM lands within the Sierra subregion (Table 3.4-2).

Regulatory Status

Hall's daisy is not a federal or state listed species (CNPS 2013), but is a BLM sensitive species. Hall's daisy has a CRPR of 1B.3 (CNPS 2013). CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .3 are "not very threatened in California, with less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known" (CNPS 2011). Hall's daisy has a California Heritage Element Ranking of S2.3, indicating that it is "imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province" (CDFW 2012b).

Threats

Hall's daisy has no known threats (CNPS 2013).

Kelso Creek Monkeyflower *(Mimulus shevockii)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.7, pp. 3-188) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Kelso Creek monkeyflower is a tiny ephemeral winter annual herb in the lopseed family *(Phrymaceae*), which was recently segregated from the figwort family (*Scrophulariaceae*) (Jepson Flora Project 2011; Beardsley and Olmstead 2002). Kelso Creek monkeyflower stands approximately 2 to 12 centimeters (0.8 to 4.7 inches) in height (Jepson Flora Project 2011; Elvin 2006). Kelso Creek monkeyflower blooms from March to May (CNPS 2011). It is unknown whether Kelso Creek monkeyflower is self-sterile or self-fertile (Elvin 2006). Given the relative size of its corolla, the nectar guide patterning, and corolla colors, Kelso Creek monkeyflower is probably outcrossing, and is probably pollinated by small solitary native bees; soft-wing flower beetles (*Trichochrous* sp.) have been observed visiting flowers (Fraga 2007).

It fruits from April to June (Fraga 2007). The fruit is a 0.25-inch capsule that contains more than 100 seeds and is dehiscent at the end and along both sutures (Heckard and Bacigalupi 1986). Although not directly observed, water is a likely seed dispersal mechanism since Kelso Creek monkeyflower occurs in washes (Elvin 2006).

The role of the seedbank is probably very important for the long-term survival of populations. It is known from similar annual *Mimulus* species that even in high rainfall years, some fraction of seed stays dormant and remains in the seed bank (Fraga 2007). Kelso Creek monkeyflower does not germinate at all in drought years. The amount and timing of rainfall affect the number of seeds that germinate, the timing of germination, and the size and longevity of desert annuals (Fraga 2007).

Although Kelso Creek monkeyflower is highly restricted in distribution, it appears to be common where it occurs in years of ample rain (Fraga 2007). It does not appear to have very exacting habitat requirements (Fraga 2007), although there appears to be hundreds of acres of apparently suitable habitat that are unoccupied (Heckard and Bacigalupi 1986). In wet years, Kelso Creek monkeyflower can form carpets on the desert floor, but can be difficult to locate in drier years (CPC 2011).

Kelso Creek monkeyflower hybridizes with its closest relative Tehachapi monkeyflower (*Mimulus androsaceus*) (Audubon 2011; CDFW 2012b). This suggests that the Kelso Creek monkeyflower may have evolved from Cyrus Canyon and spread southward to other locations in the Kern and Kelso Valleys (Audubon 2011).

Kelso Creek monkeyflower occurs predominately in loamy, coarse sands on alluvial fans, dry streamlets, or washes and granitic deposits within Joshua tree or California juniper xeric woodlands (59 FR 50540–50550; Heckard and Bacigalupi 1986). Substrates where Kelso Creek monkeyflower are found are generally granitic or metamorphic, and sandy or gravelly (CNPS 2011). However, the population near Cyrus Flat grows on finer soils developed from metasedimentary rocks (CDFW 2012b; Heckard and Bacigalupi 1986). The California Native Plant Society (CNPS) (2011) reports an elevation range for this species from 800 to 1,340 meters (2,625 to 4,396 feet). However, the CNDDB (CDFW 2012b) includes one occurrence at 4,500 feet. Species strongly associated with Kelso Creek monkeyflower include pygmy poppy (*Canbya candida)*, silver cholla (*Cylindropuntia echinocarpa)*, purple sage (*Salvia dorrii*), golden gilia (*Leptosiphon aureus*), Tehachapi monkeyflower, Fremont's monkeyflower (*Mimulus fremontii*), and white burrobrush (*Ambrosia salsola* var. *pentalepis*) (Heckard and Bacigalupi 1986).

Population Status in the Planning Area

The Kelso Creek monkeyflower is restricted to a very small range, approximately 20 square miles, in the southern Sierra Nevada Foothills and western edge of the Mojave Desert within the Kern River drainage (Jepson Flora Project 2011; Fraga 2007). All 11 known occurrences are in Kern County, the majority southwest of Lake Isabella in the Kelso Creek and Cortez Canyon area, all within an area 5 miles in diameter (CDFW 2012b). Two disjunct occurrences are located in the Cyrus Canyon and Cyrus Flat area northeast of Lake Isabella, over 12 miles northwest of the other populations (CDFW 2012a).

Kelso Creek monkeyflower has probably always been a rare species with a very narrow distribution (Elvin 2006). All known occurrences of Kelso Creek monkeyflower, except one whose exact location is unknown, were last surveyed systematically in 2008 (CPC 2011; CDFW 2012b). In some cases, timing was not optimal for detection of the species. Based on the population estimates made in 2008 and earlier estimates for those that were not visible in 2008, there were at least an estimated 53,400 Kelso Creek monkeyflower individuals throughout its range (CDFW 2012b). However, the population trend is unknown and because this plant is an annual, population sizes may vary greatly from year to year (CDFW 2012b; Fraga 2007). In addition, long-term trends

are difficult to assess since the species was not described until 1986. Plants were extirpated when Lake Isabella was created (CDFW 2012b).

Of the 11 total occurrences of Kelso Creek monkeyflower, 7 are in the planning area. Five of these are in the Ridgecrest RA on lands managed by the BLM (CDFW 2012b). Two are further south on the west and east sides of Kelso Valley and are located partially on BLM lands and partially on private land (CDFW 2012b; 59 FR 50540–50550). There are no historical records (i.e., before 1990) for this species within the planning area. All occurrences have been seen since 2008 and are presumed extant (CDFW 2012b).

Known distribution data for Kelso Creek monkeyflower within the WEMO Planning area is depicted in Figure 3.4-15. Within the planning area, the CNDDB identifies approximately 651 acres of element occurrences for this species on BLM lands within the Jawbone subregion (Table 3.4-2).

Regulatory Status

Kelso Creek monkeyflower (*Mimulus shevockii*) is not Federally or state listed, but is a BLM sensitive species. It was proposed for federal listing in 1994 (59 FR 50540–50550), but the proposal was withdrawn in 1998 when it was determined that the species was not threatened with extinction and therefore did not meet the definition of a threatened or endangered species (63 FR 49065–49075). Kelso Creek monkeyflower has a CRPR of 1B.2. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .2 are "fairly threatened in California, with 20% to 80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). The Kelso Creek monkeyflower has a California Heritage Element Ranking of S2, indicating that it is "imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province" (CDFW 2012b).

Threats

Threats to Kelso Creek monkeyflower have not changed since the 2005 WEMO Final EIS (BLM 2005). The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.7, pp. 3-188) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Kelso Creek monkeyflower is threatened by urbanization, OHV use, agricultural land conversion, road maintenance, cattle grazing, habitat loss from water inundation, fire suppression activities, and competition from non-native species (59 FR 50540–50550; CNPS 2011; NatureServe 2011). The extremely limited distribution of this plant puts it at risk of stochastic extinction events (Elvin 2006).

This species is primarily threatened by the current or potential destruction, modification, or curtailment of its habitat or range. Mobile home and subdivision development and associated grading threaten or have impacted 6 of the 11 occurrences (CDFW 2012b). Cattle grazing, introduction of non-native plant species, and conversion of habitat to orchards have begun to modify the landscape and threaten Kelso Creek monkeyflower occurrences and limited natural habitat (Elvin 2006; CDFW 2012b).

Of the seven occurrences within the planning area, three are entirely on BLM Ridgecrest RA lands, two are partially on BLM Ridgecrest RA lands and partially on private lands, and two are partially on BLM land outside of Ridgecrest RA and partially on private lands (CDFW 2012b). Although occurrences on BLM lands are provided some protection, there are still documented threats to these populations (Elvin 2006). All of the populations on private land are at risk of mobile home or subdivision development. Populations located on BLM lands adjacent to private property are also affected by this threat (Elvin 2006).

The effect that highway and road maintenance has on populations on or adjacent to private property is twofold: improved access has increased development and the additional traffic has created pressure to add or widen roads. At least one population has been bisected by road development. OHV use directly impacts or threatens approximately half of the known occurrences throughout its range (Elvin 2006). At least one population site has been highly disturbed, probably from uncontrolled overgrazing during drought (CDFW 2012b). Water developments and impoundments also potentially threaten this species (Elvin 2006).

Kern Buckwheat *(Eriogonum kennedyi var. pinicola)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.8, pp. 3-189) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Kern buckwheat is a perennial herb in the buckwheat family (Polygonaceae) (CNPS 2011; Reveal 2003). Kern buckwheat stands approximately 0.5 to 1.3 decimeters (2.0 to 5.1 inches) in height (Jepson Flora Project 2011). The species blooms from May to June (CNPS 2011; Jepson Flora Project 2011). The fruit ripens and is dispersed around July. Sexual reproduction in Kern buckwheat is probably both selfing and outcrossing (NatureServe 2011) considering the Federally listed variety *E. k.* var. *austromontanum* produces seeds by self-pollinating and insect-mediated outcrossing (71 FR 67712–67754).

Eriogonum species generally attract small generalist pollinators. Visitors, and potential pollinators, of the species *Eriogonum kennedyi* are small wasps, flies, bees, butterflies, and ants (O'Brien 1980). A small, silvery-white, iridescent butterfly has been observed pollinating this variety (Hare, pers. obs., cited in Sanders and Greene 2006). Kern buckwheat flowers change to red when pollinated suggesting that bees are important pollinators.

Though seed dispersal for this taxon has not been studied, birds may play a role in the dispersal of all *Eriogonum* seeds. Although there is little information available, wind, rain and streams may also act as dispersal agents (Sanders and Greene 2006).

Kern buckwheat appears to share many general ecological characteristics with other varieties of *E. kennedyi*. It occurs in open areas and prefers full sunlight, appearing to be intolerant of extensive shading. Although not well adapted to competing for light, it is very competitive on sites where tall and fast-growing species are excluded by moisture deficiencies, wind, and cold (Walter 1973, cited in Sanders and Greene 2006). Its compact cushion-like habit probably helps to reduce moisture loss (Walter 1973, cited in Sanders and Greene 2006). Therefore, this variety appears to favor sites where moisture stress is combined with high insulation (Sanders and Greene 2006).

Moisture rather than light is probably a controlling factor for Kern buckwheat. The foliage is densely covered with tomentum (wool) that substantially reduces the amount of light that strikes the leaf tissue. Although pubescence may affect photosynthesis, it also forms a layer of dead air at the leaf surface, which can reduce water loss from wind (Johnson 1975, cited in Sanders and Greene 2006).

Kern buckwheat is found in poorly draining depressions in white bentonite clay soils that are derived from volcanic ash (Sanders and Greene 2006). The depressions have pebbles, gravel, and rock cemented into the soil surface that form exposed open flats located on ridge tops and saddles between knolls (Sanders and Greene 2006).

This species occurs in chaparral and pinyon and juniper woodland (CDFW 2012b; CNPS 2011). Associated species include California sagebrush (*Artemisia californica*), Great Basin sagebrush (*Artemisia tridentata*), adobe yampah (*Perideridia pringlei*), fivetooth spineflower (*Chorizanthe watsonii*), and old fallen Jeffrey pines (CDFW 2012b; CCH 2011).

Population Status in the Planning Area

Kern buckwheat is endemic to Kern County and known from only three occurrences in the Sweet Ridge area of the southeastern Sierra Nevada Foothills in southeastern Kern County (CNPS 2011; CDFW 2012b; Jepson Flora Project 2011). Two of the three colonies at the type locality each consisted of more than 100 plants in 1992, 1993, and 1994. The remaining colony included over 100 plants in 1994 (CDFW 2012b). A collection in this area reported the population as abundant in 2010 (CCH 2011). The occurrence west of Middle Knob, was considered locally common in 1966 and included over 100 plants in 1993, 1995, and 1996. The occurrence on the west slope of Sweet Ridge included over 100 plants in 1994 (CDFW 2012b). There are also 1,000 individuals mapped at one site in the North Sky River project area that were recorded recently (Kern County 2011).

At one time up to six occurrences were identified as Kern buckwheat (Sanders and Greene 2006), but some were misidentified and only three have been verified as Kern buckwheat (CDFW 2012b). There were an estimated 400 plants based on observations in the early 1990s, but surveys in 1998 estimated the total population at approximately 10,000 individuals in four populations (Rutherford 1998, cited in Sanders and Greene 2006). It is unclear how these populations relate to the three currently known CNDDB occurrences. During these surveys it was noted that the populations contained a range of age classes and appeared reproductively healthy (Rutherford 1998, cited in Sanders and Greene 2006).

Kern buckwheat has been searched for extensively on Edwards Air Force Base since 1991 but has not been found there, and there is no suitable habitat. The Tehachapi So., Monolith, Mojave, Mojave NE, Cache Peak, Tehachapi NE, and portions of the Cross Mountain USGS quadrangles have also been searched. In addition, the Middle Knob/Pine Tree Canyon area has been searched by a BLM botanist but no Kern buckwheat has been found (NatureServe 2011). However, it is possible that additional populations could exist on unexplored ridgetops in the area since much of the occupied area is rugged and poorly explored (Sanders and Greene 2006).

All three occurrences for Kern buckwheat recorded in the CNDDB are in the planning area (CDFW 2012b). Two occurrences recorded in the CNDDB are located in the Ridgecrest RA, managed by the BLM (CDFW 2012b). The first, the type locality, occurs along trails on Sweet Ridge 2 miles south-southeast of Cache Peak and consists of three colonies. A 2010 collection was made at this type locality occurrence (CCH 2011). The second occurrence in the Ridgecrest RA, is

approximately 1 mile west of Middle Knob. The third CNDDB occurrence is on the west slope of Sweet Ridge, about 1.5 miles south of Cache Peak and is located on private land owned by a wind energy development company (CDFW 2012b).

Known distribution data for Kern buckwheat within the WEMO Planning area is depicted in Figure 3.4-16. Within the planning area, the CNDDB identifies approximately 23 acres of element occurrences for this species on BLM lands within the Middle Knob subregion (Table 3.4-2).

Regulatory Status

Kern buckwheat (*Eriogonum kennedyi* var. *pinicola*) is not Federally or state listed, but is a BLM sensitive species. Kern buckwheat has a CRPR of 1B.1. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .1 are "seriously threatened in California, with over 80% of occurrences threatened/high degree and immediacy of threat" (CNPS 2011). The Kern buckwheat has a California Heritage Element Ranking of S1.1, indicating that it is "critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province" (CDFW 2012b).

Threats

Current threats to Kern buckwheat are wind energy development on private land and vehicles (CNPS 2011). OHVs have already destroyed plants and habitat in one of the occurrences on BLM land. The highly restricted distribution and small number of remaining plants make this species vulnerable to stochastic extinction (Sanders and Greene 2006).

Approximately half of the 1-acre population on private land on Sweet Ridge was destroyed by the construction of wind energy facilities. Suitable habitat and plants were destroyed with the construction of access roads to newly subdivided lots and the construction of a ramp to a proposed campsite along the Pacific Crest Trail. Illegal grading has resulted in an erosion problem that threatens part of one population (Hare 1995 and Rutherford 1998, cited in Sanders and Greene 2006). Although cattle grazing is not known around the populations now, the area has been grazed in the past (Sanders and Greene 2006).

Based on observations, Kern buckwheat has been unable to recolonize disturbed areas (Hare 1995, cited in Sanders and Greene 2006).

Lane Mountain Milk-vetch *(Astragalus jaegerianus)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.9, pp. 3-189 and 3-190) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Lane Mountain milk-vetch is a member of the legume family (Fabaceae). It is a perennial herb approximately 3 to 7 decimeters (11.8 to 27.6 inches) in size (Charis 2002). It flowers in April and May and fruits ripen from the end of April to the end of May (Charis 2002). Work on pollinators indicates the species most likely to be effective pollinators include the megachilid bees *Anthidium dammersi*, *A. emarginatum*, and *Osmia latisculata* (Hopkins 2005; USFWS 2008c).

Greenhouse studies have shown higher rates of seed production in individuals that are self and cross-pollinated compared with unpollinated individuals, so pollination appears to be important for reproduction by this species (Rundel and others 2005, cited in USFWS 2008c). Genetic studies indicate that Lane Mountain milk-vetch is a facultative outcrosser (i.e., cross-pollinator) that relies more on outcrossing within dense populations than within low-density populations (Walker and Metcalf 2008). Dispersal mechanisms in Lane Mountain milk-vetch are unknown, although Charis (2002) suggests that dispersal may be by gravity, but notes that seeds and pods of other *Astragalus* species are fed upon by various birds, rabbits, and rodents.

Lane Mountain milk-vetch exhibits a relatively low recruitment rate; less than 2% of the 4,888 individuals detected by Charis (2002) were seedlings. Field and greenhouse studies by Rundel and others (2007) found that key factors for seedling growth and survival include the amount, frequency, and timing of precipitation. Generally, seed germination may be high under controlled greenhouse conditions, but much lower in the wild (Rundel and others 2007).

Community structure and the availability of suitable host plants for Lane Mountain milk-vetch appear to be important ecological factors. Charis (2002) found that Lane Mountain milk-vetch occurs in Mojave creosote scrub and Mojave mixed woody scrub with widely scattered Joshua trees. It does not occur in creosote scrub habitat dominated by creosote and white bursage. More than 99% of mature individuals were found on host plants, and the association with host plants appears to be non-random, with turpentinebroom accounting for about 20% of the host records, and white bursage, Mojave Desert California buckwheat, Cooper's goldenbush, Nevada jointfir, and "dead shrub" accounting for about 10% each (Charis 2002). Some common shrubs, such as creosote bush and white bursage, are used less frequently as host plants in relation to their abundance.

The growth patterns and distribution of Lane Mountain milk-vetch also appear to be related to the availability of moisture. Individuals annually go dormant during the hot, dry summer season and respond with vegetative growth to winter rains, or possibly also in response to temperature and photoperiod (Charis 2002). In very dry years, the species may have little vegetative growth, flowering, or fruiting (Bagley 1989, cited in Charis 2002). The greater presence of Lane Mountain milk-vetch on shallow ridges where soils are thinner and bedrock much closer to the surface, as opposed to deeper alluvial soils, suggests that occupied sites have a better moisture supply (Charis 2002).

Precipitation amounts, timing, and frequency are key factors in seedling growth and survival of Lane Mountain milk-vetch. In the wild, wet years are critical for seedling growth and survival, but invasive species may also proliferate in wet years, and may compete with and promote herbivory of milk-vetch (Rundel and others 2007). Even in a wet year (2004–2005), on a study plot, seedling survival to the following year was only 16% (8 of 49 individuals) (Rundel and others 2007). Rundel and others (2007) suggest that summer rains may be critical for seedling establishment and survival. More recent information indicates that drought over the last decade has had severe adverse effects on Lane Mountain milk-vetch populations, because of low seedling survival and depleted seed banks.

Lane Mountain milk-vetch occurs in Mojave creosote scrub and Mojave mixed woody scrub with widely scattered Joshua trees, and intergrades of the two communities that have relatively high shrub diversity (Charis 2002). The California Native Plant Society (CNPS 2011) also lists Joshua tree woodland as habitat occupied by the species, but the Charis (2002) study indicates that Joshua

trees are widely scattered in occupied habitat. The species does not occur in areas dominated by creosote bush and white bursage (Charis 2002). Occupied habitat is characterized by gentle slopes and low ridges 6.5 to 8.8 feet high, with shallow and lighter granitoid soils (Charis 2002). The species' distribution suggests that it may be responding to water supply (Charis 2002). It occurs at elevations of 3,100 to 4,200 feet above MSL (Charis 2002).

Lane Mountain milk-vetch typically occurs in patchy (i.e., clustered) distributions, but also occurs less commonly in distributions of a few scattered individuals over a broader area. It almost always is associated with a host2 shrub, which the Lane Mountain milk-vetch uses as a trellis. Of 4,888 mature plants recorded by Charis (2002), less than 0.5% were found growing alone. The six most frequent host plants accounted for approximately 75% of the records, with turpentinebroom (*Thamnosma montana*) accounting for about 20% of the host records, and white bursage, Eastern Mojave buckwheat (*Eriogonum fasciculatum* ssp. *polifolium*), Cooper's goldenbush (*Ericameria cooperi*), Nevada jointfir (*Ephedra nevadensis*), and "dead shrub" accounting for about 10% each (Charis 2002). Host-specific selection was apparent because some relatively frequent shrubs had extremely low frequencies as hosts, including creosote bush, littleleaf rhatany (*Krameria erecta*), Johnson's indigo bush (*Psorothamnus arborescens* var. *minutifolius*), desert peppergrass (*Lepidium fremontii*), and peach thorn (*Lycium cooperi*).

Population Status in the Planning Area

All known locations of Lane Mountain milk-vetch are within the planning area and are composed of four discrete population locales north of Barstow, covering about 21,000 acres: NASA Goldstone, Brinkman Wash/Montana Mine, Paradise Valley, and Coolgardie Mesa (Charis 2002).

The rangewide population status information cited by USFWS (2008c) in the 5-year review is based on the Charis (2002) surveys conducted in 2001, as summarized in Table 1 of the 5-year review. The number of documented plants in 2001 was 5,723 individuals over approximately 21,350 acres of occupied habitat among the four mapped populations. Charis (2002) also provided estimates for the population because transect survey coverage of potential was not 100% (see discussion in Data Characterization section below). The population estimate incorporated a "percentage observability" factor assumption, ranging from 10% to 100%, and an assumption of average plant density for unsurveyed areas based on transect count data. Charis (2002) estimated a population of approximately 14,120 individuals based on 100% observability to 141,200 individuals based on 10% observability; clearly, the population estimate is highly sensitive to the assumed observability.

Recent data indicate a declining population of Lane Mountain milk-vetch related to the prolonged drought from 1999 to 2009. There has been about an 88% reduction in population size, as measured by aboveground individuals, on plots continuously monitored since 1999, mainly as a result of degradation and mortality of host plants (Huggins and others 2010). However, the most recent data reported in the May 2011 critical habitat final rule indicate that while the current number of individual plants is smaller than in 2005, the number of individual plants on the study plots has increased from four plants in 2007 to 154 plants in 2010 (76 FR 29108–29129). Further, the mortality rate of individuals has decreased over the last 2 years (76 FR 29108–29129).

The relationship between population and drought and wet cycles is still not well understood. Plants can be dormant for several years, resulting in observations of fewer plants, but then reappear in a year with more favorable conditions, so the "population" has not really declined.

USFWS (2008c) reported that the U.S. Army has also been monitoring the four populations, but these data were not available for the 5-year review. However, because drought has had such a dramatic effect on this narrow endemic species on the monitored plots and it has fairly restricted habitat associations (i.e., it probably does not occur in heterogeneous microhabitats), it is reasonable to assume that other populations of Lane Mountain milk-vetch have suffered similar drought-related declines and that the current range-wide population is much smaller than documented in 2001 by Charis (2002).

Historically (i.e., prior to 1990), Lane Mountain milk-vetch was known from the Brinkman Wash, Coolgardie Mesa, and Paradise Valley areas; and as late as 1999, these were the only documented populations (Charis 2002).

The 2001 survey work by Charis (2002) confirmed the populations at the three previously known locations and found a new population—NASA Goldstone—which extended the species' range by about 1.4 miles north and 2.6 miles east. The Coolgardie Mesa population comprises approximately 9,775 acres in the Mud Hills and Lane Mountain USGS quadrangles (see previous note about the genetic distinction within the Coolgardie Mesa population). The Paradise Valley population comprises approximately 4,794 acres in the Williams Well quadrangle. Both the Brinkman Wash and NASA Goldstone populations are in the Paradise Range quadrangle, with Brinkman Wash comprising approximately 5,497 acres and NASA Goldstone comprising about 1,283 acres (Charis 2002). The CNDDB includes 22 occurrences in this area (CDFW 2012b).

Within the planning area, the CNDDB identifies approximately 2,004 acres of element occurrences for this species on BLM lands within the Coolgardie subregion planning area (Table 3.4-2 and Figure 3.4-17). In addition, approximately 9,888acres of Critical Habitat has been designated within the Coolgardie subregion (Table 3.4-2 and Figure 3.4-17).

Regulatory Status

Lane Mountain milk-vetch (*Astragalus jaegerianus*) is Federally listed as endangered but is not state listed. The final rule for critical habitat for Lane Mountain milk-vetch was published May 19, 2011 (76 FR 29108–29129). Lane Mountain milk-vetch has a CRPR of 1B.1. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .1 are "seriously threatened in California, with over 80% of occurrences threatened/high degree and immediacy of threat" (CNPS 2011). The Lane Mountain milk-vetch has a California Heritage Element Ranking of S1.1, indicating that it is "critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province" (CDFW 2012b).

Threats

The main anthropogenic threats to Lane Mountain milk-vetch are surface mining, OHV recreation, and military training activities (USFWS 2008c). The Coolgardie Mesa area has high mineral potential, with several small recreational mining operations that may have cumulative effects (USFWS 2008c). Unauthorized OHV use increased in one portion of the Coolgardie Mesa site in the 2000s, creating a barren area of approximately 20 acres where the species formerly occurred (USFWS 2008c). In the critical habitat rule, the USFWS also acknowledged the potential effects of climate change on Lane Mountain milk-vetch, but there is no information specific to this species indicating what areas may become important in the future in response to climate change (76 FR

29108–29129). The USFWS (2008c) also identifies two other threats to Lane Mountain milk-vetch: wildfires and nonnative species.

Little San Bernardino Mountains Linanthus *(Linanthus maculates)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.10, pp. 3-190) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Little San Bernardino Mountains linanthus is an annual herb in the phlox (*Polemoniaceae*) family. It is a diminutive, densely hairy, alternate-leaved annual species approximately 1 to 3 centimeters (0.4 to 1.2 inches) in height (Jepson Flora Project 2011; Patterson 1989). It reproduces via seed, but otherwise its ecology has not been well studied. As such, little is known about the plant's pollinator relationships, seed viability, or seed germination (Patterson 1989; Sanders 2006; CVAG 2006). The flower is white with a vermilion spot on each spreading lobe on most individuals, suggesting that the species is almost certainly insect-pollinated (Munz 1974; Sanders 2006). The flowering time for this species is March through May (CNPS 2011). A review of the collections shows that approximately one-third of the specimens were collected in March, two-thirds in April, and only a few in February and May (CCH 2011).

Little San Bernardino Mountains linanthus grows on loose, well-aerated, open sandy benches and flats on the margins of desert washes (Sanders 2006; Jepson Flora Project 2011). This plant is always found in open areas that receive no shade from nearby shrubs and is associated with other small annual species, such as sigmoid threadplant (*Nemacladus sigmoideus*), blushing threadplant (*N. rubescens*), evening primrose (*Camissonia pallida*), common loeflingia (*Loeflingia squarrosa*), Arizona nest straw (*Filago arizonica*), and Wallace's woolly sunflower (*Eriophyllum wallacei*) (Sanders 2006).

Population Status in the Planning Area

Little San Bernardino Mountains linanthus is endemic to Southern California with occurrences in San Bernardino, Riverside, and Imperial counties (CNPS 2011). This species' range is restricted to the mouth of Dry Morongo Canyon near the City of Desert Hot Springs and the north side of Joshua Tree National Park south of SR 62 in the Little San Bernardino Mountains, and from Whitewater Canyon in the eastern San Bernardino Mountains to Palm Springs. Virtually all of the Palm Springs populations are considered extirpated due to development (Sanders 2006). Additional areas where the species has been recently documented include the mouth of Rattlesnake Canyon and near the Two Hole Spring area on the northern side of the San Bernardino Mountains, and just east of the San Diego County line near Dos Cabezas Spring in Imperial County (CCH 2011; Sanders 2006).

There are four major populations of Little San Bernardino Mountains linanthus (Sanders 2006; CCH 2011). All populations are extant except for the Palm Springs populations, which were located in the center of what is now Palm Springs and along I-10 north of the city proper (Sanders 2006; CCH 2011). Because of the isolated nature of desert wash systems, the major populations are separated into smaller "population units" associated with individual washes (Sanders 2006). Two new populations have been discovered in the last two decades: a population in the Rattlesnake

Canyon and Two Hole Spring areas on the northern side of the San Bernardino Mountains and an Imperial County population located just east of the San Diego County line near Dos Cabezas Spring (CDFW 2012b; CCH 2011).

There has been a minimal effort to estimate the number of individuals in each population. Sanders' efforts to estimate population sizes for the species included personal communication with G. Helmkamp regarding his collections, resulting in the following estimates: about 10,000 individuals north of Indian Avenue near the mouth of Big Morongo Canyon (Riverside County) in 1996; widespread plants observed in flat areas between Joshua Tree and Indian Cove in 1995; a few hundred individuals in the Dry Morongo Canyon (San Bernardino County) area in 1992 and 1995 and six in 1996; and 100 plants in an area south of Joshua Tree near SR 62 in 1986, which were "reduced markedly" in 1987, 150–200 plants in 1988, 25–30 plants in 1990, and 1,000 plants in 1993 (Patterson 1989; Sanders 2006; CDFW 2012b).

There are several gaps in the early records for this species, including a 17-year gap from 1907 to 1924 (Sanders 2006; CDFW 2012b; CCH 2011). Only six collections were made between 1924 and 1960 and only two collections were made in the 1970s. Since the end of the 1970s, the number of collections has increased, probably because of the increase in desert botanical work and Patterson's 1989 description of habitat for the species (Sanders 2006).

Population trends are difficult to estimate for the species because population size in a given year appears to depend on environmental conditions and fluctuates greatly from year to year.

The CNDDB records 27 occurrences for this species (CDFW 2012b). Of the 15 occurrences documented in the CNDDB within the planning area, one population east of Yucca Valley and west of Joshua Tree in San Bernardino County, California, is considered historical since the plants have not been observed since 1937. However, this occurrence is still presumed to be extant (CDFW 2012b).

The recent occurrences of Little San Bernardino Mountains linanthus occur along the western boundary of the planning area in San Bernardino and Riverside counties (CDFW 2012b). Seven of the occurrences are at least partially located in Joshua Tree National Park. Two are located on BLM land just below the mouth of Rattlesnake Canyon in southeastern Lucerne Valley and east of Two Hole Spring at the northeastern base of the San Bernardino Mountains (CDFW 2012b). One occurs on private land south of the town of Joshua Tree. The remaining three have unknown ownership and occur on a wash north of Joshua Tree National Park, south of SR 62 east of Joshua Tree, and at Pipes Canyon north of Yucca Valley (CDFW 2012b).

Known distribution data for Little San Bernardino Mountains linanthus within the WEMO Planning area is depicted in Figure 3.4-18. Within the planning area, the CNDDB identifies approximately 297 acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2.

Regulatory Status

Little San Bernardino Mountains linanthus (*Linanthus maculatus*) is not Federally or state listed and has no other federal designations (e.g., BLM or USFS sensitive). Little San Bernardino Mountains linanthus has a CRPR of 1B.2. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .2 are "fairly threatened in California, with 20% to 80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). Little San Bernardino Mountains linanthus has a

California Heritage Element Ranking of S2, indicating that it is "imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province" (CDFW 2012b).

Threats

Little San Bernardino Mountains linanthus is potentially threatened by habitat disturbance and destruction due to urban expansion, OHV use, flood control activities, illegal dumping, and an increase in invasive non-native species (CNPS 2011). The largest populations are adjacent to communities, such as Yucca Valley, Joshua Tree, and Desert Hot Springs, that have grown substantially in the last two decades. Additional development pressures associated with the expansion of these communities could impact core populations (Sanders 2006).

Flood control maintenance activities pose a specific threat to the species as these activities change the hydrological regime and sediment-carrying capacity of flows within wash systems. In particular, flood control activities pose a substantial threat to populations of Little San Bernardino Mountains linanthus in the Whitewater Canyon, Mission Creek, and Dry Morongo Canyon Wash areas (CVAG 2006).

OHV use is a threat to Little San Bernardino Mountains linanthus because the species grows only in desert wash areas, which are favored by OHV users because they are so sparsely vegetated (Sanders 2006).

Mojave Monkeyflower *(Mimulus mohavensis)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.11, pp. 3-190 and 3-191) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Most members of the lopseed family are insect pollinated (Beardsley and Olmstead 2002); and given the showy flowers, Mojave monkeyflower pollinators are probably Hymenoptera (bees, wasps, ants, and sawflies) or Lepidoptera (butterflies and moths). MacKay (2006) hypothesized that the white margin of the corolla reflects ultraviolet light, and the maroon veins extending into this margin act as nectar guides to facilitate pollination.

Small seeds and an annual habit suggest that dispersal of Mojave monkey flower is mostly abiotic (MacKay 2006; NatureServe 2011). For populations located on rocky slopes above washes, it is probable that gravity carries seeds down into the washes and intermittent water flow may carry seeds further down washes. Although biotic vectors of seed transport are unknown, granivorous ants or rodents may transport seeds over short distances and birds may transport seeds longer distances (MacKay 2006).

Although suitable habitat for this species appears to be fairly abundant, it is quite restricted geographically. Population sizes fluctuate substantially from year to year, probably in response to the amount and timing of precipitation; as an annual, germination and establishment are dependent on the timing and amount of spring rains (MacKay 2006; NatureServe 2011). Unknown unusual

germination and establishment requirements may account for the considerable variability in population sizes from year to year (MacKay 2006).

This species occurs in Joshua tree woodland and Mojavean desert scrub, specifically creosote bush scrub (MacKay 2006; CNPS 2011). Mojave monkeyflower is associated with the following species or genera, among others: creosote bush, desert senna (*Senna armata*), white burrobrush, ratany (*Krameria erecta* and *K. grayi*), chollas (*Cylindropuntia* spp.), white bursage, prairie-clovers (*Dalea* spp.), catclaw, Bigelow's monkeyflower (*Mimulus bigelovii*), desert bells (*Phacelia campanularia*), desert fivespot (*Eremalche rotundifolia*), spiny hopsage (*Grayia spinosa*), and desert trumpet (*Eriogonum inflatum* var. *inflatum*) (MacKay 2006; CDFW 2012b).

Mojave monkeyflower commonly occurs in areas that are not subject to regular water flow (MacKay 2006). These areas include the gravelly banks of desert washes with granitic soils and rocky slopes above washes, as well as the sandy openings of creosote bush scrub (MacKay 2006).

Population Status in the Planning Area

This species occurs in the Mojave Desert in west-central San Bernardino County (Jepson Flora Project 2011). The greatest population densities occur south of Daggett and Barstow (MacKay 2006). However, the majority of the historical occurrences in the Barstow area have either been extirpated or impacted (CNPS 2011). The elevation range of this species extends from 600 to 1,200 meters (1,969 to 3,937 feet) (CNPS 2011).

Population trends for Mojave monkeyflower are unknown but are thought to be stable to declining (NatureServe 2011). One CNDDB occurrence has been possibly extirpated, and the status of 9 of the 56 total CNDDB occurrences of Mojave monkeyflower in the planning area has not been updated since 1990 (CDFW 2012b; MacKay 2006).

There are a total of 56 CNDDB occurrences for Mojave monkeyflower in the planning area. Of these, 9 occurrences have been recorded prior to 1990, are not dated, or are considered possibly extirpated (CDFW 2012b). These records extend from the area around Barstow southeast to the area around the Newberry Mountains, and one occurrence much farther south near Old Woman Springs.

Of the 56 total CNDDB occurrences in the planning area, 47 have been recorded in the CNDDB since 1990 and are presumed extant. One of the major populations of Mojave monkeyflower recorded in the CNDDB since 1990 that is presumed extant is located southeast of Barstow to Ord Mountain. A second concentration of occurrences is located northeast of Adelanto and extends to Helendale. Two isolated occurrences occur between these two major populations, at Hodge and just south of the Black Mountains summit. Of the current occurrences, approximately 89% (42 occurrences) are on lands managed by the BLM, and the remaining 11% (5 occurrences) are on lands that are privately owned or whose ownership is unknown (CDFW 2012b).

Known distribution data for Mojave monkeyflower within the WEMO Planning area is depicted in Figure 3.4-19. Within the planning area, the CNDDB identifies approximately 2,304 acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2.

Regulatory Status

Mojave monkeyflower is not Federally or state listed, but is a BLM sensitive species. Mojave monkeyflower has a CRPR of 1B.2. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .2 are "fairly endangered in California, with 20%–80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). Mojave monkeyflower has a California Heritage Element Ranking of S2, indicating that it is considered imperiled in California (CDFW 2012b).

Threats

Threats to Mojave monkeyflower include development, mining, non-native plants, solar and wind energy projects, grazing, vehicles, and road development (CNPS 2011; NatureServe 2011; MacKay 2006). Additional potential threats include pipeline installation and quarries and test pits adjacent to populations (MacKay 2006). Mojave monkeyflower is also under threat by the potential for the BLM to convert land occupied by this species to private lands, which could then be developed (MacKay 2006; CDFW 2012b). The area under consideration for disposal or land exchange is located between Barstow and Victorville (CDFW 2012b).

Because population sizes fluctuate considerably annually in response to environmental conditions, Mojave monkeyflower is susceptible to depletion of the seed bank after a series of drought years. In addition, small population sizes increase the risk of inbreeding, which may result in reduced seed set or reduced seed viability (MacKay 2006).

Mojave Tarplant *(Deinandra mohavensis)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.12, pp. 3-191) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Mojave tarplant is in the sunflower family (Asteraceae) (Jepson Flora Project 2011). The plant was thought to be extinct at one time but was rediscovered in 1994 by A. Sanders in the San Jacinto Mountains, in Riverside County (Sanders and others 1997). Mojave tarplant is an annual plant approximately 1 to 10 decimeters (3.9 to 39 inches) in height. Mojave tarplant and the closely related Red Rock tarplant (*Deinandra arida*) are the only two self-compatible species in the genus *Deinandra* (Tanowitz 1982; Baldwin pers. comm. 1997, cited in Sanders 2006b). This may be the result of genetic drift and/or the relative isolation of these two species, which occur on the edge of the desert as local populations (Sanders 2006b). Pollination studies have not been conducted for this Mojave tarplant; however, Faull (1987) has observed small beetles and honey bees visiting Red Rock tarplant flowers.

Mojave tarplant is known to reproduce easily in cultivation (B. Baldwin, pers. comm. 1998, cited in Sanders 2006a) and at a botanical garden has been known to escape into disturbed places (S. Boyd, pers. comm. 1998, cited in Sanders 2006a).

Mojave tarplant blooms from June through January (CNPS 2011). Flowering peaks between August and October. Once flowering has begun, it continues until the plants begin to senesce. Fruit maturity and dispersal are continuous as well. Seed dispersal vectors have not been reported for

this species; however, the seeds are relatively heavy and may just fall to the ground around the source plant. The seeds are not armed with any obvious mechanisms, such as hooks or wings, for long-distance dispersal (Sanders 2006a). Baldwin (pers. comm., cited in Sanders 2006b) reports that *Hemizonia* (now *Deinandra*) ray achenes maintain some degree of dormancy while the disk achenes freely germinate.

Mojave tarplant is associated with seasonally saturated clay or silty soils on gentle slopes or low gradient streams, with few shrubs and trees. These saturated areas are typically dry at the surface but provide a substantial water source at depth through summer (Sanders and others 1997). This species has a discontinuous and possibly relictual distribution (Sanders 2006a), and little is known of its life history and ecological relationships.

The Mojave tarplant occurs in open moist sites in arid regions near the margins of the desert, within chaparral, coastal scrub, and riparian scrub (CNPS 2011; Sanders 2006a). Plants are typically observed at seeps and along grassy swales and intermittent creeks. The most suitable habitat occurs in mountainous areas within microhabitats of low gradient streams and on gentle slopes with few shrubs and trees. This species is associated with clay or silty soils that are saturated with water early in the year. Mojave tarplant prefers areas that are dry at the surface but which have a substantial water source at depth through summer. Dwarfed plants occasionally are found in drier sites near occupied moist areas (Sanders and others 1997). This cycle of early saturation with later desiccation may reduce competition from other plant species; dryness during drought years may further reduce competition (Sanders 2006a).

At the type locality, Mojave tarplant was known to occur along a sandy intermittent creek; however, this habitat is now believed to be atypical and not sufficient to maintain a permanent population. Sanders and others (1997) does note that there are some occurrences of Mojave tarplant associated with sand, where the sand is adjacent to more typical habitat.

Population Status in the Planning Area

Mojave tarplant is known in Kern, Riverside, and San Diego counties (believed extirpated from San Bernardino County) (CDFW 2012b). This species occurs at elevations of 640–1,600 meters (1,900–4,800 feet) (CNPS 2011). The distribution is discontinuous and possibly relictual.

Because this species was only recently rediscovered (in 1994) there is little information available on population trends. Of the eight occurrences in the planning area, four are known from BLM land, two are on private land, and ownership is unknown for two of the occurrences. The occurrence on private land near Cutterbank Spring numbered 14 individuals in 2003. Approximately 15,000 plants were observed at the other occurrence on private land located at the south end of Kelso Valley in 2010. Many more plants were observed in 2011 including an additional 1,500 plants in the northeastern portion of the occurrence (CDFW 2012b). Of the two occurrences for which ownership is unknown, one numbered in the thousands in 1998 and the other numbered 109 individuals in 2003. Of the four occurrences on BLM land, one numbered 50,000 in 2003 (with 30 rosettes observed very early in the year in 2004), one numbered in the several hundreds in 2008, and one numbered 5,000 in 1998 (and was locally common in 2001 and numbered 3,000 in 2003). Approximately 50,000 plants were observed in 2003 at the last occurrence on BLM land at Cutterbank Spring; 30 plants were observed in 2004 in their rosette form in an early season survey, and plants were “abundant around the springs and in the surrounding drainage channels” in 2010 (CDFW 2012b). Overall, there are 69 occurrences in

Kern, Riverside, and San Diego counties (CDFW 2012b) and most of these appear to have number of individuals estimated once, making it difficult to discern a population trend.

There are a total of 69 occurrences in the CNDDB, eight of which occur in the planning area (CDFW 2012b). This species was not known to occur in the planning area prior to 1990.

Within the planning area, Mojave tarplant is known from the desert slope of the southern Sierra Nevada Mountains in Kern County (Sanders 2006a). There are eight occurrences in the planning area, all within Kern County. Four of the occurrences in the planning area are known from lands managed by the BLM; two are on private land, and ownership is unknown for two of the occurrences. The eight occurrences are located west of SR 14 and east of the Sequoia National Forest, north of I-40: near Cutterbank Spring, in Jawbone Canyon, near Short Canyon, in lower Esperanza Canyon, in lower Water Canyon, and in the vicinity of Cross Mountain (CDFW 2012b). Mojave tarplant may also occur at Red Rock Canyon in Red Rock Canyon State Park in Kern County (Faull, pers. comm. 1998, cited in Sanders 2006a).

Known distribution data for Mojave tarplant within the WEMO Planning area is depicted in Figure 3.4-20. Within the planning area, the CNDDB identifies approximately 81 acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2.

Regulatory Status

Mojave tarplant (*Deinandra mohavensis*) is not Federally listed, but is California endangered and a BLM sensitive species. Mojave tarplant has a CRPR of 1B.3. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .3 are "not very threatened in California, with less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known" (CNPS 2011). Mojave tarplant has a California Heritage Element Ranking of S2, indicating that it is considered imperiled in California (CDFW 2012b).

Threats

Mojave tarplant is threatened by grazing, recreational activities, development, hydrological alterations, road maintenance, and vehicles (CNPS 2011). The type locality was modified by construction of the Mojave River Forks Dam. Within the planning area cattle grazing occurs at some of the Mojave tarplant occupied areas, and in some areas is locally intense and may pose a threat. However, plants of the genus *Deinandra* may not be palatable to cattle, so grazing may not be a major threat. Trampling by cattle may be a threat around limited watering sources in dry areas (Sanders 2006a).

Nine Mile Canyon Phacelia *(Phacelia novenmillensis)*

Life History

Nine Mile Canyon phacelia is an annual herb in the borage or waterleaf family (Boraginaceae) that is endemic to California. Nine Mile Canyon phacelia is typically 5 to 10 centimeters (2.0 to 3.9 inches) tall (Jepson Flora Project 2013). Flowering period is from May to June (Calflora 2013) or February to June (CNPS 2013).

Nine Mile Canyon phacelia is found in open foothills. Substrates are sandy to gravelly (Jepson Flora Project 2013). This species is found in broadleafed upland forest, Cismontane woodland, pinyon and juniper woodland, and upper montane coniferous forest vegetation communities (CNPS 2013). Elevation range reported as 5,397 to 8,661 feet amsl (CNPS 2013).

Population Status in the Planning Area

Endemic to California (Inyo, Kern, and Tulare Counties) (CNPS 2013) and found on the east slope of the southern high Sierra Nevada Mountains and on the west edge of the Mojave Desert (Jepson Flora Project 2013). Known occurrences within the Project Area are concentrated in the Sierra Nevada foothills west of Indian Wells including Owens Peak, Ninemile Canyon, Lamont Peak, and Walker Pass (CNPS 2013).

Known distribution data for Nine Mile Canyon phacelia within the WEMO Planning area is depicted in Figure 3.4-21. Within the planning area, the CNDDB identifies approximately 246 acres of element occurrences for this species on BLM lands within the Sierra subregion (Table 3.4-2).

Regulatory Status

Nine Mile Canyon phacelia is not a federal or state listed species (CNPS 2013), but is a BLM sensitive species. Nine Mile Canyon phacelia has a CRPR of 1B.2 (CNPS 2013). CRPR 1B species are considered “rare, threatened, or endangered in California and elsewhere” (CDFW 2012b). CRPR species with a threat rank of .2 are “fairly endangered in California, with 20%–80% of occurrences threatened/moderate degree and immediacy of threat” (CNPS 2011). Nine Mile Canyon phacelia has a California Heritage Element Ranking of S2.2, indicating that it is considered imperiled in California (CDFW 2012b).

Threats

Nine Mile Canyon phacelia is threatened by grazing and recreation (CNPS 2013).

Owens Peak Lomatium *(Lomatium shevockii)*

Life History

Owens Peak lomatium is a perennial herb in the carrot family (Apiaceae) that is endemic to California. Owens Peak lomatium is typically 4 to 12 centimeters (1.6 to 4.7 inches) tall with an elongated taproot (Jepson Flora Project 2013). Flowering period is from April to May (Calflora 2013).

Owens Peak lomatium is found on rocky slopes and talus. Substrates are rocky (Jepson Flora Project 2013). This species is found in lower montane coniferous forest and upper montane coniferous forest vegetation communities (CNPS 2013). Elevation range is 5,807 to 7,218 feet amsl (CNPS 2013) or 7,218 to 8,202 feet amsl (Jepson Flora Project 2013).

Population Status in the Planning Area

Endemic to California (Kern County) (CNPS 2013) and found in the southern high Sierra Nevada Mountains (Jepson Flora Project 2013). Occurrences known within the planning area from Owens Peak and Mt. Jenkins west of Indian Wells (CNPS 2013).

Known distribution data for Owens Peak lomatium within the WEMO Planning area is depicted in Figure 3.4-22. Within the planning area, the CNDDB identifies approximately 79 acres of element occurrences for this species on BLM lands within the Sierra subregion (Table 3.4-2).

Regulatory Status

Owens Peak lomatium is not a federal or state listed species (CNPS 2013), but is a BLM sensitive species. Owens Peak lomatium has a CRPR of 1B.3 (CNPS 2013). CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .3 are "not very threatened in California, with less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known" (CNPS 2011). Owens Peak lomatium has a California Heritage Element Ranking of S2, indicating that it is considered imperiled in California (CDFW 2012b).

Threats

Threats to Owens Peak lomatium are not described (CNPS 2013).

Parish's Daisy *(Erigeron parishii)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.3, pp. 3-186) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Parish's daisy is in the Asteraceae family (IPNI 2011). It is an herbaceous, long-lived perennial subshrub approximately 7 to 30 centimeters (3 to 12 inches) in height from its taproot (Mistretta and White 2001; Sanders 2006). It flowers from May through August (CNPS 2011), peaking mid-May to mid-June (Sanders 2006). Based on the conspicuous flowers, pollinators are probably insects and likely include bees, butterflies, and other known pollinators of similar and related species (Sanders 2006). Parish's daisy produces plumed achenes adapted for wind dispersal (Mistretta and White 2001) and does not appear to have a seed dormancy mechanism (Mistretta 1994). Based on observations of seedlings at several sites (Krantz 1979), reproduction is probably primarily by seed rather than vegetatively by rhizomes or stolons. A recent study by Neel and Ellstrand (2001) found no evidence of vegetative reproduction, concluding that the species probably primarily reproduces sexually through outcrossing.

Recent research on allozyme diversity showed that genetic diversity was high (compared to many narrowly endemic plant taxa) and populations were only moderately differentiated, suggesting that gene flow among populations is still high and any recent fragmentation has not yet affected genetic diversity (Neel and Ellstrand 2001).

Parish's daisy occurs in Mojavean desert scrub and pinyon and juniper woodlands (CNPS 2011) and is largely restricted to loose, carbonate alluvium, although it is occasionally found on other rock types (Sanders 2006). Populations of Parish's daisy are most commonly found along washes on canyon bottoms or on loose alluvial deposits on adjacent benches, but they are also occasionally found on steep rocky slopes (Sanders 2006). Based on this species' occurrence on noncarbonate granitic soils, it is possible that the apparent carbonate preference is due to reduced competition from other plants, although reports of this species on noncarbonate soils are few (Sanders 2006). It

has also been observed at sites where soils have been found to be strongly alkaline, implying that the noncarbonated granitic soils may have been influenced in their soil chemistry by adjacent carbonate slopes (Sanders 2006).

Specific plant species associated with Parish's daisy have not been described in the literature, but dominant species within pinyon and juniper woodland where Parish's daisy is typically found include single-leaf pinyon pine, Utah juniper, and more rarely California juniper and western juniper. Understory species within pinyon and juniper woodland are more variable, but may include mountain-mahogany (*Cercocarpus ledifolius*), Mormon tea (*Ephedra viridis*), Mojave yucca, Joshua tree, and brittlebush.

Parish's daisy co-occurs with another carbonate endemic, Cushenbury oxtheca (*Acanthoscyphus parishii var. goodmaniana*). Its presence, however, appears to be negatively related to at least two other carbonate soils species - Cushenbury milk-vetch (*Astragalus albens*), and Cushenbury buckwheat (*Eriogonum ovalifolium* var. *vineum*), which tend to occur on more stable slopes.

Population Status in the Planning Area

Parish's daisy is endemic to Southern California, restricted to dry, calcareous (mostly limestone) slopes of the San Bernardino Mountains, with a few collections from granitic areas at the east end of the San Bernardino Mountains and in the Little San Bernardino Mountains where the species occurs on quartz monzonite substrate (Neel 2000; Sanders 2006). Parish's daisy occurs at elevations between 3,700 and 6,600 feet, most often in washes and canyon bottoms, but sometimes on alluvial benches or steep rocky mountainsides (Mistretta and White 2001). It is estimated that 1,029 acres are occupied Parish's daisy habitat (USFWS 2009g).

The current population status of Parish's daisy is unclear and there is a discrepancy in total reported occurrences of the species. According to the final listing rule in 1994, Parish's daisy was known from fewer than 25 occurrences with a total estimated population size of 16,000 individuals, but at that time the San Bernardino National Forest had mapped 87 site-specific occurrences (USFWS 2009g). USFWS (2009g) notes that what constitutes an occurrence has been subjectively defined over various surveys, making it difficult to specify status or change in status of Parish's daisy since it was listed. In addition, there has been an increase in survey efforts for this species since listing that has resulted in an increase in the number of occurrences detected. Sanders (2006) characterizes Parish's daisy as one of the more common carbonate endemics of the San Bernardino Mountains. Nonetheless, there has not been any systematic population studies conducted over time to document population trends.

Known distribution data for Parish's daisy within the WEMO Planning area is depicted in Figure 3.4-23. Within the planning area, the CNDDB identifies approximately 340 acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2. Additionally, approximately 940 acres of Critical Habitat has been designated within the planning area (Table 3.4-2 and Figure 3.4-23).

Regulatory Status

Parish's daisy is Federally listed as threatened, but is not state listed. Critical habitat was designated on December 12, 2002 (67 FR 78570–78610). A recovery plan addresses this species, *San Bernardino Mountains Carbonate Plants Draft Recovery Plan* (USFWS 1997b). As of 2010, no status changes for Parish's daisy were indicated by USFWS (75 FR 28636–28642). Parish's

daisy has a CRPR of 1B.1. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .1 are "seriously threatened in California, with over 80% of occurrences threatened/high degree and immediacy of threat" (CNPS 2011). The Parish's daisy has a California Heritage Element Ranking of S2S3, indicating that it is somewhere between "imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province" and "vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation" (CDFW 2012b).

Threats

The main threat to Parish's daisy is limestone mining because this species is mostly restricted to carbonate deposits (USFWS 2009g). Besides direct impacts, dust and artificial lighting can affect the species through dust impacts on soil chemistry and lighting availability for seeds and the impacts of artificial lighting on growing conditions (USFWS 2009g). Sanders (2006) notes that that after moistening, the mining dust appears to harden into a cement-like coating. Additional threats listed by USFWS and CNPS include energy development projects, OHVs, grazing, fuel-wood collection, fire suppression activities, camping, target shooting, road construction, and residential developments, but these threats are relatively low compared to mining (USFWS 2009g; CNPS 2011).

The specific potential effects of climate change on Parish's daisy are unknown, but if climate change caused a shift to higher elevations due to warmer and drier conditions, as has occurred with other plant species on the Santa Rosa Mountains of Southern California (Kelley and Goulden 2008), this endemic species could be concentrated in a smaller area and more vulnerable to extinction (USFWS 2009g).

Parish's Phacelia *(Phacelia parishii)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.14, pp. 3-192) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Parish's phacelia is a low-growing, annual herb in the borage or waterleaf family (Boraginaceae) ranging in height from 5 to 15 centimeters (0.2 to 0.5 inch) (Jepson Flora Project 2011). The comparatively simple, toothed to shallowly lobed leaves, and the unequal sepal size in fruit distinguish Parish's phacelia from many other phacelias; other species within its range that also have unequal sepals and have much showier flowers. The flowering season for Parish's phacelia is reported as April to July (CNPS 2011; Jepson Flora Project 2011), but all of the California collections have been made between April and May (White 2006b). The Mojave Desert flowering period is earlier than that of the Great Basin, and Smith (1997) reported that the California populations were fruiting by late April; the later dates have generally been for collections made in White Pine County, Nevada, at much higher elevation and latitude than the California occurrences.

Not much is known about the reproductive biology of the species, but it likely depends on wind and rain for seed dispersal. Given its restriction in California to seasonally wet alkaline flats, and

its many small seeds, its seed dispersal range is probably quite short, but seeds may occasionally be ingested by shorebirds or picked up with mud on their feet and carried long distances (White 2006b).

Although some precipitation data are known for the Nevada populations of Parish's phacelia (Smith 1997), there is little information on the ecology of the species in California. In Nevada at one of the Pahrump Valley sites, bees are thought to contribute to pollination, and at another Nevada site (Indian Springs Valley), moths are believed to be at least partially involved with pollination (Smith 1997).

Typical habitat for Parish's phacelia includes clay and alkaline soils, and dry lake margins at elevations of 1,772 to 3,937 feet. In California, the species has been documented in central San Bernardino County on playas and valley floors that are relatively unvegetated and have few associated species. Habitats are creosote bush scrub and alkali sinks. According to White (2006b), all the known occurrences of Parish's phacelia in California occur on sparsely vegetated alkaline flats, generally in dry, cracked mud flats of seasonal pools, and growth is apparently controlled by water level as plants may appear within different levels of the pools, depending on the hydrologic conditions and the timing of rainfall. Smith (1997) reports that the species tends to occupy flat, open expanses, but may also occur on gentle slopes.

Population Status in the Planning Area

Parish's phacelia is known in California from four sites east and south of Barstow in San Bernardino County and one site in Stewart Valley near the Nevada border in Inyo County. Although rare, its habitat is well known, and Parish's phacelia is more widely distributed in Nevada, and has also been identified from one location in Arizona.

This species occurs at elevations ranging between 1,772 and 3,937 feet (elevations in Nevada populations are somewhat higher), but all of the California collections have been made from alkaline playas or lakebeds below about 3,000 feet (White 2006b). In San Bernardino County, the species has been collected in USGS 7.5-minute quadrangles: Lucerne Valley, Fifteen Mile Valley, Harvard Hill, Yermo, Barstow, and Alvord Mountain West. In Inyo County, the species was collected from the Six-mile Spring quadrangle.

In 1984, Parish's phacelia was presumed extinct in California until it was rediscovered in 1989 by Bagley in a new San Bernardino County location southeast of Coyote Lake (Smith 1997). The species was collected by F. Smith in 1995 in Inyo County, California, and is now known from three occurrences in California (CNPS 2011).

Parish's phacelia was proposed as a federal candidate for listing in 1993 (58 FR 51144–51190), and Rhodes and Williams (1977, cited in Smith 1997) discussed its likely extirpation at historical occurrences in Nevada. Parish's phacelia is known from 15 occurrences in Nevada, and subsequent surveys in years of ample rainfall identified much larger populations and the recommendation for candidacy was withdrawn.

As noted above, USFWS estimated the population at the Coyote Dry Lake site as approximately 200 million plants in 1991. Bagley (1996, cited in White 2006b) visited the same site in 1996, an extremely dry year, and did not find evidence of the species that year.

The historical distribution of the species in California occurs in locations near Coyote Dry Lake, Rabbit Springs, and Calico in San Bernardino County, and in Stewart Valley in Inyo County

(CDFW 2012b). There are four occurrences of Parish's phacelia in the CNDDB (CDFW 2012b). However, the species is reported as presumed extinct (White 2006b; Smith 1997) at two of the known sites—the type location near Rabbit Springs and the Waterman's Ranch site near Calico (CDFW 2012b).

Parish's phacelia is currently known from only three sites in the planning area (CDFW 2012b; Smith 1997; White 2006b). The extant locations are the Stewart Valley, Inyo County, population discovered by F. Smith in 1995 (not recorded in CNDDB); and the San Bernardino County collections that were made by Ripley and Barneby at Lucerne Dry Lake in 1941 (CDFW 2012b), by Bagley in 1989, by Bransfield and Rutherford in 1991, and by Sanders and Skinner in 1995 in an area southeast of Coyote Dry Lake, near the southern boundary of Fort Irwin (CDFW 2012b). Parish's phacelia was collected at the third site near Yermo, east of Barstow, by Charlton in 1992 (Smith 1997; CDFW 2012b).

Bagley's 1989 collection was made along a string of dry lakes between Manix Tank Trail and Coyote Dry Lake, about 12 miles northeast of Yermo, noting a population of several thousand plants occupying about 5 acres. Subsequent USFWS surveys of the Coyote Dry Lake population in 1991 increased the estimate to approximately 50,000 plants and, by extrapolating to the area of occupied habitat, estimated that the population could be as many as 200 million plants on approximately 247 acres (White 2006b). In a subsequent 1995 survey, collection notes by Sanders and Skinner record about 10,000 individuals in the same area (Smith 1997). Smith noted about 200 plants at the Stewart Valley site on a 5- acre area.

Charlton's 1992 collection was made east of Barstow, near Yermo on Powerline Road, near the Sunrise Canyon Road off-ramp (CDFW 2012b). According to White (2006b), the location is about 6 miles southwest of the Coyote Dry Lake site.

Known distribution data for Parish's phacelia within the WEMO Planning area is depicted in Figure 3.4-24. Within the planning area, the CNDDB identifies approximately 1,654 acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2.

Regulatory Status

Parish's phacelia (*Phacelia parishii*) is not Federally or state listed. This species was previously classified as a Category 2 Candidate for Listing under the federal ESA as amended in 1988 (58 FR 51144–51190). Parish's phacelia has a CRPR of 1B.1. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). Parish's phacelia has a California Heritage Element Ranking of S1.1, indicating that it is "critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province" (CDFW 2012b).

Threats

The known California populations of Parish's phacelia are confined to a relatively small area, which makes the species vulnerable to extinction. With the exception of the Stewart Valley site, all occurrences of the species are within the vicinity of the Fort Irwin Military Base and could be extirpated if the populations are disturbed by military exercises, or by the expansion of the current military facilities in the area (White 2006b).

Populations that occur southeast of Coyote Lake in the Fort Irwin area are threatened by tank use and other off-road vehicles (CDFW 2012b). White (2006b) notes that other reports have indicated that access road construction and the establishment of power line corridors could disrupt the local hydrology, and that these potential activities threaten current populations. The BLM's special-status plant management program also lists overgrazing by cattle and horses as a threat to populations in the Barstow area (BLM 2005).

Red Rock Poppy *(Eschscholzia minutiflora ssp. Twisselmannii)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.16, pp. 3-193) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Red Rock poppy is a small annual herb in the poppy family (*Papaveraceae*) that stands approximately 2 to 14 inches tall (BLM 2010b; Jepson Flora Project 2011). It blooms from March to May (CNPS 2011). Red Rock poppy has a relatively large colorful flower, so it is most likely probably insect pollinated. Potential pollinators of Red Rock poppy that have been recorded on Edwards Air Force Base include solitary bees (*Dufourea desertorum, D. malacothricis, D. vernalis*), a hersperapis bee (*Hesperapis parva*), and miner bees (*Perdita carinata, P. inflexa, P. mortuaria, P. mucronata, P. robustula*) (Buchman and others 2010).

Information on the natural history of Red Rock poppy, such as seed germination, and seed dispersal has not been reported. However, it is a desert annual that reproduces by seed. In addition, the soil seed bank is probably important for the long-term survival of populations, as it is for many other desert annuals.

Red Rock poppy is associated with bajadas and alluvial fans, flats, washes, and slopes in Mojavean desert scrub communities on volcanic tuff (CNPS 2011; CDFW 2012b). It has a very limited geographic distribution, and little is known of its life history and ecological relationships. As an annual species the population numbers vary widely from year to year in response to annual rainfall. Plants may not appear at all in low rainfall years (CDFW 2012b).

Red Rock poppy occurs on volcanic tuff in Mojavean desert scrub on desert washes, flats, and slopes (CNPS 2011; CDFW 2012b). It has been recorded on bajadas and alluvial fans, flats, washes, and slopes (CDFW 2012b). The subspecies may be specific to rhyolite tuffs and granitic derived soils (Clark and Faull 1991), but these are common in the area where Red Rock poppy occurs (Sanders and Pitzer 2006). Red Rock poppy has also been reported on sedimentary mounds, limestone, metamorphic rocks, and rocky basalt (CDFW 2012b). Aspects are generally west, southwest, or south (CDFW 2012b). Associated species include a variety of common Mojave desert scrub shrubs and herbs (CDFW 2012b). The subspecies ranges in elevation from 680 to 1,230 meters (2,231 to 4,035 feet) according to CNPS (2011), but one occurrence is at 4,040 feet (CDFW 2012b).

Population Status in the Planning Area

Red Rock poppy is known only from the Rand and El Paso mountains in Kern and San Bernardino counties in the western Mojave Desert (CNPS 2011; Jepson Flora Project 2011). All 26 CNDDB occurrences are in the planning area (CDFW 2012b).

For the 22 recent (i.e., since 1990) occurrences in the planning area, population size estimates total over 41,000 plants (CDFW 2012b). The type locality for this species is Red Rock Canyon. Over the years this occurrence has supported 100 plants in 1998, 8 plants in 1989–1990, approximately 16,000 plants in 1991, and the largest observed population with over 35,000 plants in 2003. This occurrence was last seen in 2005, but a population estimate was not recorded. The population in Mesquite Canyon is the second largest for the species, with an estimated 3,375 individuals in 1991 (CDFW 2012b). No additional data are available to determine its current status and population trend, but it clearly exhibits large population fluctuations. CDFW (2012a) lists the trend as unknown for all occurrences.

All 26 CNDDB occurrences are in the planning area (CDFW 2012b). There are two historical CNDDB occurrences in the planning area from before 1990 (CDFW 2012b). One of these is a record from 1958 located approximately 2 miles southeast of Searles Station with unknown ownership (CDFW 2012b). The other is located on Edwards Air Force Base managed by the DOD; a BLM report from 1999 states that this is a "probable occurrence," but the identification needs verification (CDFW 2012b). Both of these occurrences are presumed to be extant (CDFW 2012b).

Twenty-four of the CNDDB occurrences in the planning area are recent occurrences (i.e., since 1990) and are presumed to be extant. Six of these are located within Red Rock Canyon State Park, managed by the DPR. The remaining 18 are located on BLM land farther east (CDFW 2012b).

Known distribution data for Red Rock poppy within the WEMO Planning area is depicted in Figure 3.4-25. Within the planning area, the CNDDB identifies approximately 2,170 acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2.

Regulatory Status

Red Rock poppy is not Federally or state listed, but is a BLM sensitive species. Red Rock poppy has a CRPR of 1B.2. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .2 are "fairly endangered in California, with 20%–80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). Red Rock poppy has a California Heritage Element Ranking of S2.2, indicating that it is considered imperiled in California (CDFW 2012b).

Threats

Red Rock poppy is primarily threatened by OHV activity (CNPS 2011; CDFW 2012b). In Red Rock Canyon State Park, habitat for Red Rock poppy occurs along the main routes of travel (Sampson 2007). OHVs disrupt the surface soil and compact the surface soil and subsoil, leading to soil loss. The most significant long term effect is the accelerated erosion and associated inability of areas subject to heavy OHV use to support natural revegetation. OHV use also directly damages and destroys plants. Plant rehabilitation efforts are often marginally successful or unsuccessful (as cited in Sampson 2007).

Red Rock Tarplant *(Deinandra arida)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.17, pp. 3-193) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

Red Rock tarplant is an annual herb in the sunflower family (Asteraceae) that stands approximately 2 to 8 decimeters (7.9 to 32 inches) in height. Red Rock tarplant blooms from April through November (CNPS 2011). Pollination studies have not been conducted for this species; however, Faull (1987) has observed small beetles and honey bees visiting Red Rock tarplant flowers.

Red Rock tarplant does not appear to reproduce vegetatively, but rather by seeds.

However, seed germination and seedling establishment has not been reported for this species. Baldwin reports that *Hemizonia* (now *Deinandra*) ray achenes maintain some degree of dormancy while the disk achenes freely germinate (Sanders 2006). Red Rock tarplant consistently produces fertile ray achenes (but few to zero fertile disk achenes). Sanders (2006) suggests that the ray achenes could contribute to the persistence of a Red Rock tarplant seed bank through difficult climatic cycles vegetatively.

Red Rock tarplant and Mojave tarplant (*Deinandra mohavensis*) are the only two selfcompatible species of *Hemizonia* (now *Deinandra*) (Tanowitz 1982; Sanders 2006). This may be the result of genetic drift and/or the relative isolation of these two species, which occur on the edge of the desert as local populations (Sanders 2006).

Red Rock tarplant grows in Mojavean desert scrub communities on clay soils and volcanic tuff (CNPS 2011). In general, this species is associated with seeps and seasonally moist substrates along ephemeral streams (sandy and gravelly washes), low ridges, and road shoulders (CDFW 2012b). Faull (1987) found that Red Rock tarplant habitat consists of the following:

1. Sandy to gravelly ephemeral alluvial washes, sometimes exhibiting surface platey structure;
2. Moist alkaline fringes of seeps and springs along alluvial flats and washes;
3. Relatively shallow, dry, sandy alluvial and colluvial slopes at the base of ridges and cliffs and associated erosional ravines; and
4. Ledges of dry colluvium suspended on steep cliff slopes up to 160 feet above the valley floor by ribs of resistant bedrock.

Preferred habitat appears to be adjacent to seeps and along washes (Sanders 2006). From a geologic substrate perspective, Red Rock tarplant appears to prefer erosional remnants of the Ricardo Group, but also occurs on Quaternary alluvium (Faull 1987). Associated species in moister locations include the seep-spring monkeyflower (*Mimulus guttatus*) and Palmer's monkeyflower (*Mimulus palmeri*) (Faull 1987).

Population Status in the Planning Area

Red Rock tarplant is known from Red Rock Canyon and Last Chance Canyon, primarily in Red Rock Canyon State Park in Kern County, California (Faull 1987; Tanowitz 1982; CDFW 2012b). This species occurs at elevations from 300 to 950 meters (900 to 2,850 feet) (CNPS 2011).

As of 1987, according to the DPR, the Red Rock tarplant was well protected and its abundance was stable or increasing (Faull 1987). For the five occurrences within the Red Rock Canyon State Park, abundance estimates for the four 1998 CNDDB records were 3,060 plants (1,250 plants in

1986), 2 plants, 1 plant, and 2,300 plants. The 2004 CNDDB record abundance estimate was 3,400 plants (11,000+ in 1986). The 1993 CNDDB record outside the Red Rock Canyon State Park does not include an estimate of plants (CDFW 2012b). No additional data are available to determine its current status and population trend.

There are six CNDDB occurrences in the planning area, all of which are recent (status updated since 1990 [CDFW 2012b]). All of these occurrences are from Red Rock Canyon and Last Chance Canyon, and five are within the Red Rock Canyon State Park (one is located just south of the state park) (CDFW 2012b). The sixth occurrence is on BLM property (Faull 1987).

Known distribution data for Red Rock tarplant within the WEMO Planning area is depicted in Figure 3.4-26. Within the planning area, the CNDDB identifies approximately 69 acres of element occurrences for this species on BLM lands within the El Paso subregion (Table 3.4-2).

Regulatory Status

Red Rock tarplant is not Federally or state listed, but is a BLM sensitive species. Red Rock tarplant was previously a candidate for federal listing (58 FR 64828–64845), but was removed from candidacy on February 28, 1996, in a notice of review (61 FR 7597–7613). Red Rock tarplant has a CRPR of 1B.2. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .2 are "fairly endangered in California, with 20%–80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). Red Rock tarplant has a California Heritage Element Ranking of S1.2, indicating that it is considered critically imperiled in California (CDFW 2012b).

Threats

The primary threat appears to be OHV use and colonization by invasive non-natives such as shrub tamarisk (*Tamarisk ramosissima*) (Faull 1987). Red Rock tarplant are vulnerable to anthropogenic disturbances such as OHV use (Faull 1987). Camping and vehicle parking at Red Cliffs in Red Rock Canyon may also be threats. Measures to control these threats have been implemented by the DPR in the past (Faull 1987), but current management is uncertain. Faull (1987) observed that Red Rock tarplant experiences herbivory by rabbits (and possibly ground squirrels): the main stems and branches of up to 75% of plants at one location were observed to have been removed by herbivores.

Robison's Monardella *(Monardella robisonii)*

Life History

Robinson's monardella is a perennial subshrub or shrub in the mint family (*Lamiaceae*) that is endemic to California. Robinson's monardella is typically 15 to 50 centimeters (5.9 to 19.7 inches) tall and it has an erect, multi-branched habit (Jepson Flora Project 2013). Flowering period is from April to September (Calflora 2013) or February to October (CNPS 2013).

Robinson's monardella is found among granite boulders (Jepson Flora Project 2013). This species is found in desert scrub (Jepson 2013) and pinyon and juniper woodland vegetation communities (CNPS 2013). Elevation range is 2,001 to 4,921 feet amsl (CNPS 2013).

Population Status in the Planning Area

Endemic to California (Riverside and San Bernardino Counties) (CNPS 2013) and found in the Little San Bernardino Mountains (Jepson Flora Project 2013). Known occurrences within the Project Area are in the general area north of Desert Hot Springs and Yucca Valley, parts of Joshua Tree NP, and adjacent lands to the north (CNPS 2013).

Known distribution data for Robinson's monardella within the WEMO Planning area is depicted in Figure 3.4-27. Within the planning area, the CNDDB identifies approximately 138 acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2.

Regulatory Status

Robinson's monardella is not a federal or state listed species (CNPS 2013), but is a BLM sensitive species. Robinson's monardella has a CRPR of 1B.3 (CNPS 2013). CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .3 are "not very threatened in California, with less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known" (CNPS 2011). Robinson's monardella has a California Heritage Element Ranking of S3, indicating that it is "vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation" (CDFW 2012b).

Threats

Robinson's monardella threats are not described (CNPS 2013).

Sanicle Cymopterus *(Cymopterus ripleyi var. saniculoides)*

Life History

Sanicle cymopterus is a small perennial herb in the carrot family (Apiaceae) that is known from California and Nevada. Sanicle cymopterus is typically 10 to 15 centimeters (3.9 to 5.9 inches) tall, sprouting from a buried root crown (Jepson Flora Project 2013). Flowering period is from April to June (Calflora 2013).

Sanicle cymopterus is found on gravelly, sandy, or carbonate substrates (Jepson Flora Project 2013). This species is found in Joshua tree woodland and Mojavean desert scrub vegetation communities (CNPS 2013). Elevation range is 3,609 to 5,446 feet amsl (CNPS 2013).

Population Status in the Planning Area

Sanicle cymopterus is known from California (Inyo County) and Nevada (CNPS 2013), in the southern high Sierra Nevada Mountains, southeast of the Sierra Nevada Mountains, and in the north desert mountains (Jepson Flora Project 2013). Known occurrences within the Project Area are located to the south and east of Owens Lake (CNPS 2013).

Known distribution data for Sanicle cymopterus within the WEMO Planning area is depicted in Figure 3.4-28. Within the planning area, the CNDDB identifies approximately 389 acres of element occurrences for this species on BLM lands within the Sierra subregion (Table 3.4-2).

Regulatory Status

Sanicle cymopterus is not a federal or state listed species (CNPS 2013), but is a BLM sensitive species. Sanicle cymopterus has a CRPR of 1B.2 (CNPS 2013). CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .2 are "fairly endangered in California, with 20%–80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). Sanicle cymopterus has a California Heritage Element Ranking of S1, indicating that it is "critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province" (CDFW 2012b).

Threats

Sanicle cymopterus is threatened by cattle grazing on BLM land at Lee Flat, as well as by vehicles and mining (CNPS 2013).

Short-joint Beavertail *(Opuntia basilaris var. brachyclada)*

Background information for the short-joint beavertail would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005). For a general discussion of this species, please refer to Section 3.3.8.20, pgs. 3-194 and 3-195. The supplemental information presented below is based on the species account from the California Native Plant Society (CNPS 2014) and recent BLM data.

Life History

Short-joint beavertail cactus is mostly associated with Joshua tree, pinyon pine, and juniper woodlands, although it also occurs in chaparral and Mojave desert scrub communities. It has been reported from a wide variety of well-drained soils, from sandy to rocky, in open streambeds and on rocky slopes. Flowering period is from April to August (CNPS 2014). It occurs between elevations of 3000 – 6500 feet.

Population Status in the Planning Area

Known distribution data for Short-joint beavertail cactus within the WEMO Planning area is depicted in Figure 3.4-29. Within the planning area, the CNDDB identifies approximately 25 acres of element occurrences for this species on BLM lands within the Victorville subregion (Table 3.4-2).

Regulatory Status

The short-joint beavertail is not Federally or state listed, but is a BLM sensitive species and has a CRPR of 1B.2 (CNPS 2013). CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .2 are "fairly endangered in California, with 20%–80% of occurrences threatened/moderate degree and immediacy of threat" (CNPS 2011). Short-joint beavertail has a California Heritage Element Ranking of S3, indicating that it is "vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation" (CDFW 2012b).

Threats

This species is threatened by urbanization, mining, horticultural collecting, grazing, and vehicles (CNPS 2014). Other possible threats include powerline construction and non-native plant encroachment (CNPS 2014).

Spanish Needle Onion *(Allium shevockii)*

The Spanish Needle onion was not included in the 2005 WEMO Final EIS (BLM 2005), but is considered to potentially occur within the planning area based on recent documentation (Dudek and ICF International 2012) and consultation with BLM biologists. The information presented below is based on the species accounts prepared for the recent March 2012 draft Desert Renewable Energy Conservation Plan baseline biology report (Dudek and ICF International 2012).

Life History

Spanish Needle onion is a perennial bulbiferous herb that stands approximately 10 to 20 centimeters (3.9 to 7.9 inches) tall (Jepson Flora Project 2011). It grows each year from an underground bulb, with the leaves withering after flowering, which is given variously as May to June (CNPS 2011) and June to July (Jepson Flora Project 2011). This information probably comes from the original Spanish Needle Peak population, because the lower elevation Tehachapi populations flower as early as late April.

Like several other onion species in California, Spanish Needle onion appears to reproduce mostly vegetatively, by production of new bulbs that form on short rhizomes growing from the base of the parent bulb (McNeal 1987), at least as indicated by the Spanish Needle Peak population (Pitzer 2006). The flowers, however, are large and distinctive and are probably attractive to insect pollinators, and plants in the Horse Canyon area have been reported to produce seed (Hare pers. comm. 1997, cited in Pitzer 2006). There has been no research on pollinators, seed production, establishment of bulbs, or other aspects of its reproduction (Pitzer 2006).

Spanish Needle onion grows in rocky soil and at the edge of rock outcrops and talus derived from volcanic and metamorphic rock (Pitzer 2006; CDFW 2012b; Jepson Flora Project 2011). The rocky sites inhabited by Spanish Needle onion are sparsely vegetated; the occurrences are surrounded by sparse pinyon-juniper woodland with pinyon pine, California juniper, chaparral yucca (*Hesperoyucca whipplei*), and narrowleaf goldenbush (*Ericameria linearifolia*) (CDFW 2012b). An elevation range of 2,000 to 2,500 meters (6,560 to 8,200 feet) is given in recent literature (Jepson Flora Project 2011), whereas CNPS (2011) provides a low elevation of 850 meters (2,790 feet). The Horse Canyon occurrences are at 4,800 to 5,225 feet, and recent records in the CNDDB give much lower elevations for the Jawbone Canyon occurrences: 1,050 and 3,000 feet (CDFW 2012b). Therefore, based on records in the CNDDB, its elevation range in the planning area appears to be 1,050 to 5,400 feet (CDFW 2012b).

Population Status in the Planning Area

Spanish Needle onion is known from two areas in Kern County: the type locality on Spanish Needle Peak in northern Kern County, and in the Horse Canyon/Jawbone Canyon area in the Tehachapi Mountains area on the southeast edge of the Tehachapi Range (CDFW 2012b; CNPS 2011). The CNDDB records 10 occurrences: one, the type locality, on Spanish Needle Peak; and nine in the Horse/Jawbone Canyon area in the Tehachapi Mountains (CDFW 2012b).

Spanish Needle onion has a very small global range, with relatively small numbers of plants in each occurrence. Five occurrences support fewer than 50 plants, and two contain 90 to 100 plants; however, at least 300 plants were noted in an incomplete count of the occurrence west of Horse Canyon (CDFW 2012b). Only one occurrence appears to have a substantial number of plants; this location is just west of Peak 4859 southeast of the Piute Mountains (CDFW 2012b). Eight of the nine occurrences in the planning area were considered to be in excellent condition when visited; the ninth was considered good (CDFW 2012b). There are no ongoing surveys that could provide information on population trends.

The original discovery of Spanish Needle onion was on Spanish Needle Peak just outside the planning area in BLM's Caliente RA and until relatively recently, this was the only known location. The nine Horse/Jawbone Canyon CNDDB occurrences are in the planning area. Recent discoveries (since 1995) of Spanish Needle onion extended the range to the Tehachapi Mountains. Three occurrences are in upper Horse Canyon; one is on a ridge just west of Horse Canyon; two are in Jawbone Canyon; one is east of Miller Springs; and two are near Pine Spring (CDFW 2012b).

Of the nine occurrences of Spanish Needle onion in the planning area, five are on lands managed by BLM. About half of the population in Horse Canyon is in the BLM Horse Canyon ACEC, which was established and is managed for its cultural resources, and not botanical resources. Additionally, the majority of this ACEC (all but approximately 0.1 acre) and all of the known Spanish needle onion populations within it are located outside the planning area.

Known distribution data for Spanish Needle onion within the WEMO Planning area is depicted in Figure 3.4-30. Within the planning area, the CNDDB identifies approximately six acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2.

Regulatory Status

Spanish Needle onion (*Allium shevockii*) is not Federally or state listed, but is a BLM sensitive species. Spanish needle onion has a CRPR of 1B.3. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b).

Threats

Because of the relatively remote and rugged character of its habitat, threats to the species are considered minimal (Pitzer 2006; CDFW 2012b). However, because it occurs in relatively small numbers at each known occurrence, it may be vulnerable to local extirpation from random events. Potential threats mentioned by surveyors are wind energy development, grazing, OHV use, and road/trail construction (CDFW 2012b), but there is no evidence that these threats are causing actual damage to any populations. An additional potential threat comes from the showy flowers that could attract collectors, but so far, there is no evidence that bulb collection is occurring (Pitzer 2006).

White-margined Beardtongue *(Penstemon albomarginatus)*

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.8.22, pp. 3-195 and 3-196) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

Life History

White-margined beardtongue is a short-lived perennial member of the plantain family (*Plantaginaceae*) that is 15 to 35 centimeters (5.9 to 13.8 inches) tall (CNPS 2011; Jepson Flora Project 2011). It appears to reproduce primarily through production and dispersal of seed (Etyemezian and others 2010) and blooms between March and May (Jepson Flora Project 2011). Peak flowering appears to occur in April of most years (Etyemezian and others 2010).

Like many Mojave Desert perennial plants, white-margined beardtongue reproductive events are rare and episodic and may require a combination of successive wet years that favor seed production, seed germination, and seedling growth (Etyemezian and others 2010). Andre (2010) notes that this species maintains a substantial soil seed bank and survives underground as a subterranean heterotrophy (root/caudex) during dry years (Andre 2010). Even during average years of precipitation, a large percentage of the seed bank will not germinate and many living plants remain dormant underground. Only a subset of plants will put on above ground growth, and an even fewer number flower and set seed. Seed banks can persist in the soil for many decades before germinating (Andre 2010).

Andre (2010) also has observed and documented frequent localized extinctions of cohorts with rapid establishment of plants in previously unoccupied areas. He concludes that plants at the California occurrence behave like biennials or short-lived perennials, relying upon the maintenance of a viable seed bank, and over time exhibit a shifting distribution within the aeolian sands where they occur (Andre 2010).

Etyemezian and others (2010) observed very limited seed production and dispersal of whitemargined beardtongue at study sites in Nevada during the drought years of 2008–2009. They attributed the lack of reproductive success to drought and insect herbivory at two sites, but did observe seed dispersal at one site in 2009. Seed dispersal distances ranged from 1 to 15 centimeters (0.4 to 6 inches) at this site.

MacKay (2006) noted that white-margined beardtongue is present in some washes but absent in other drainages nearby, and suggests that might be due to both limited seed dispersal distances and the lack of suitable stabilized deep sand in those other drainages (MacKay 2006). She suggests that the small seeds could be scattered short distances by ants or rodents, or may get transported by water in very wet years.

The tendency for plants to occur in scattered groups of up to 20 individuals, and the fact that young cuttings produce adventitious roots in experiments (Scogin 1989, as cited in MacKay 2006), suggest that vegetative reproduction may occur in this species in its natural habitat, even though attempts to propagate from cuttings at the garden failed (Scogin 1989, as cited in MacKay 2006).

The success of white-margined beardtongue is dependent upon a variety of interactions with pollinators and other nearby plant species, as well as a variety of ecological processes. The showy flowers are visited by several insects, including small carabid beetles, large flies, and vespid wasps with orange abdomens. Pollen was observed on upper-body surfaces of the vespids, making them the most likely pollinator of white-margined beardtongue (Scogin 1989, as cited in MacKay 2006).

White-margined beardtongue establishment is much more likely in canopy inter-spaces than under plant canopies, but Etyemezian and others (2010) could not determine whether competition with other perennial species or other micro-environmental factors were responsible for this phenomenon (Etyemezian and others 2010). For the few individuals they noticed growing in under canopy

locations, the overstory species was equally likely to be white bursage or big galleta grass (only in Clark County), but never creosote bush.

The CNDDB element occurrence information cites the habitat requirements of whitemargined beardtongue as Mojave Desert scrub and desert dunes, specifically in deep, stabilized desert sand, and in washes and along roadsides (CDFW 2012b). Within California, Andre (2010) notes that this species occurs on mostly "fine alluvial sands within a sparse creosote bush scrub community."

White-margined beardtongue occurs from 635 to 1,065 meters (2,083 to 3,494 feet) (CDFW 2012b). There are additional records in the CCH database that, if verified, would extend this elevation range to as low as 426 meters (1,398 feet) (Jepson Flora Project 2011).

Population Status in the Planning Area

White-margined beardtongue is known from only four general locations: two in the Mojave Desert of Southern Nevada, one in the Mojave Desert in California, and one in the Sonoran Desert of northwest Arizona (Smith 2001, cited in Etyemezian and others 2010).

Its distribution in California is restricted to eastern San Bernardino County (CDFW 2012b), in the following quadrangles (listed from west to east): Troy Lake, Hector, Lavic Lake, Sleeping Beauty, Ludlow, and Cadiz Summit. The majority of the 23 occurrences documented in the CNDDB, all of which are within the planning area (CDFW 2012b), are located north of I-40, including a large population occurring in a 4-mile-long wash northeast of Pisgah Crater, extending southwest from Sleeping Beauty Peak, and terminating in a flat spreading basin south of the freeway (CDFW 2012b; MacKay 2006). The species is also found in another wash extending south–southeast from Sleeping Beauty Peak, and in a number of smaller locations mapped since 2008 west of there in the vicinity of Hector (CDFW 2012b). South of I-40, the species has been documented in the vicinity of Lavic Lake and Swede Hill (southeast of Lavic Lake) (CDFW 2012b).

Five CNDDB occurrences were originally recorded prior to 1990, although they are all presumed extant (CDFW 2012b). The three oldest records, from 1935 to 1940, are located (1) in the vicinity of Lavic Lake; (2) south of Swede Hill, east of Lavic Lake; and (3) near the western junction of I-40 and SR 66 in the Ludlow quadrangle. These three records have not been updated since then. The two remaining records, last updated in 1989, are located (1) in the Cadiz Summit quadrangle in the vicinity of SR 66, and (2) in a wash extending south and southeast of Sleeping Beauty Peak on land managed by the BLM. The Cadiz Summit occurrence was added by the CDFW as a "best guess" based on a 1941 collection that documented white-margined beardtongue plants "between Cadiz and Danby." The site was searched by Scogin in 1989 and later by Andre, but neither botanist observed whitemargined beardtongue in this location. Scogin noted that there is "too much gravel cover, sand is too shallow" (CDFW 2012b). This occurrence needs additional field work.

Eighteen CNDDB occurrences have been observed since 1990, 16 of which are documented on BLM land (CDFW 2012b). Ownership of the land for the two remaining records observed since 1990 is unknown. All 18 of these records are located east of the Newberry Springs area at the western edge of the known range of the species in California and are presumed extant.

Known distribution data for white-margined beardtongue onion within the WEMO Planning area is depicted in Figure 3.4-31. Within the planning area, the CNDDB identifies approximately 2,971 acres of element occurrences for this species on BLM lands. The amount of acres identified within each subregion is detailed above in Table 3.4-2.

Regulatory Status

White-margined (*Penstemon albomarginatus*) beardtongue is not Federally or state listed, but is a BLM sensitive species. White-margined beardtounge has a CRPR of 1B.1. CRPR 1B species are considered "rare, threatened, or endangered in California and elsewhere" (CDFW 2012b). CRPR species with a threat rank of .1 are "seriously threatened in California, with over 80% of occurrences threatened/high degree and immediacy of threat" (CNPS 2011). White-margined beardtongue has a California Heritage Element Ranking of S1, indicating that it is "critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province" (CDFW 2012b).

Threats

At the time of the 2006 WEMO Plan analysis, all of the white-margined beardtongue occurrences in California were located within or adjacent to BLM verified solar and wind project applications, the BLM Pisgah Solar Energy Zone, approved solar projects, or on military bases. The proposed solar projects have been withdrawn from consideration for a variety of reasons and the Pisgah SEZ was eliminated from further consideration in the Final Solar PEIS. These locations are also near possible military base expansion lands, including Fort Irwin Army Base and the Twenty-Nine Palms MCAGCC (29 Palms). According to the 29 Palms Land Acquisition/Airspace Establishment Study FEIS (29 Palms FEIS), white-margined beardtongue is located in the Lavic Lake Training Area, but it was not observed or discussed as potentially occurring in the expansion areas to the west, south, and east of the existing combat center (Department of the Navy 2011b). However, the 29 Palms FEIS also reports potential habitat (i.e., creosote bush scrub and/or desert dunes) for white-margined beardtongue in all three expansion areas, so there is likely some risk to this species that would result from these expansion plans.

This species is also potentially threatened by the presence of I-40 and numerous utility access roads that facilitate movement of people and OHVs to the occupied habitat areas. MacKay (2006) notes that repeated destruction of above-ground plants may use up nutrient stores within the long taproot of the plant and result in declines of this species. Large, organized off-road races also create massive dust clouds and are held in areas adjacent to white-margined beardtongue habitat areas in Nevada. The dust has been seen rising hundreds of feet into the air (Mangrich, pers. obs. 2009), and poses a potential threat to the Nevada population's pollinators, as well as the plant's photosynthetic capacity (Mangrich, pers. obs. 2009). Although there are no known organized off-road races held near occupied habitat within the planning area, OHV activity in the planning area could pose similar, albeit somewhat less severe, threats.

Other threats include the presence of power lines and pipelines that bring human disturbance into areas of occupied habitat (MacKay 2006). Military activities (e.g., camping) have also been observed in the vicinity of occupied habitat areas, which could increase trampling damage to the species (MacKay 2006).

Although white-margined beardtongue is a showy plant, it does not appear that there is a threat resulting from horticultural efforts because it doesn't propagate well from cuttings, and transplantation efforts have been unsuccessful (Scogin 1989, as cited in MacKay 2006).

3.4.3.2 Wildlife Species

A total of 51 special status wildlife species were identified as potentially occurring within the planning area (BLM 2005, 2013a,b; Dudek and ICF International 2012). These species, their associated habitats, and their potential for occurrence within the study area are summarized in Appendix D, Special Status Species. The potential for each of the 51 species to be affected by the proposed action or alternatives was evaluated for each species based on their known distribution and suitable habitat within the planning area. Based on these evaluations, 32 special status wildlife species have been determined as not affected by the proposed action or alternatives based on their known distributions as discussed in Appendix D, Special Status Species. Potential occurrence for the remaining 19 species were identified by the locations of element occurrences on BLM lands as determined by the CNDDB, designated Critical Habitat, known nest locations provided by BLM biologists, ACECs, and other known population data (i.e., core areas). The total acreage of potential occurrence for each of the 19 species by subregion are listed in Table 3.4-3 and are discussed in detail below for each species.

Table 3.4-3. Acres of Identified Special Status Wildlife Species Potential Occurrence on BLM Lands within the WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Species	Potential Occurrence Type	Sum of Acres
Afton Canyon	AC	Desert tortoise	Critical Habitat	2.2
		Fringed myotis	CNDDB	4.9
		Golden eagle	Nest Site - 1/2 Mile Buffer	498.1
			Nest Site - 1/4 Mile Buffer	125.6
		Nelson's bighorn sheep	CNDDB	27336.0
		Pallid bat	CNDDB	22.4
Barstow	BA	Burrowing owl	CNDDB	2.0
		Desert tortoise	Critical Habitat	639.0
		Golden eagle	Nest Site - 1/2 Mile Buffer	0.1
		Le Conte's thrasher	BLM Designated Habitat	83.3
Black Mountain	BM	Bendire's thrasher	BLM Designated Habitat	1369.6
		Desert tortoise	Critical Habitat	91742.6
		Golden eagle	Nest Site - 1/2 Mile Buffer	817.6
			Nest Site - 1/4 Mile Buffer	286.4
		Mohave ground squirrel	Core Areas	2010.3
Broadwell Lake	BL	Bendire's thrasher	BLM Designated Habitat	4.9
		Burrowing owl	CNDDB	9.9
		Golden eagle	Nest Site - 1/2 Mile Buffer	1664.9
			Nest Site - 1/4 Mile Buffer	436.6
		Mojave fringe-toed lizard	CNDDB	611.5
		Nelson's bighorn sheep	CNDDB	22042.9
Calico Mountains	CM	Desert tortoise	Critical Habitat	29131.7
		Le Conte's thrasher	BLM Designated Habitat	38.3

Table 3.4-3. Acres of Identified Special Status Wildlife Species Potential Occurrence on BLM Lands within the WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Species	Potential Occurrence Type	Sum of Acres
Coolgardie	CG	Desert tortoise	Critical Habitat	81478.2
		Le Conte's thrasher	BLM Designated Habitat	49.3
		Mohave ground squirrel	Core Areas	31712.3
Cronese Lake	CL	Desert tortoise	Critical Habitat	81754.0
		Mojave fringe-toed lizard	CNDDB	5332.4
Darwin	DA	Le Conte's thrasher	BLM Designated Habitat	276.5
		Nelson's bighorn sheep	CNDDB	310.9
		Pallid bat	CNDDB	14.5
El Mirage	EM	Desert tortoise	Critical Habitat	26933.8
El Paso	EP	Burrowing owl	CNDDB	4.9
		Desert tortoise	Critical Habitat	67.8
		Golden eagle	Nest Site - 1/2 Mile Buffer	2214.9
			Nest Site - 1/4 Mile Buffer	699.6
		Le Conte's thrasher	BLM Designated Habitat	31.0
		Mohave ground squirrel	Core Areas	29138.1
			Leitner Population	2698.3
			Other Known Populations	259.4
Fremont Peak	FP	Desert tortoise	Critical Habitat	72849.4
		Golden eagle	Nest Site - 1/2 Mile Buffer	6.6
		Mohave ground squirrel	Leitner Population	28145.1
			Other Known Populations	13288.3
Harper Lake	HL	Burrowing owl	CNDDB	935.5
		Desert tortoise	Critical Habitat	27275.0
		Mohave ground squirrel	Leitner Population	3049.1
		Mojave fringe-toed lizard	CNDDB	4943.6
Iron Mountain	IM	Burrowing owl	CNDDB	6.1
		Desert tortoise	Critical Habitat	8499.9
		Mohave ground squirrel	Leitner Population	1060.3
Jawbone	JB	Bendire's thrasher	BLM Designated Habitat	13260.6
		Burrowing owl	CNDDB	58.1
		Golden eagle	Nest Site - 1/2 Mile Buffer	832.0
			Nest Site - 1/4 Mile Buffer	152.8
		Le Conte's thrasher	BLM Designated Habitat	238.4
		Mohave ground squirrel	Core Areas	54447.9
		Pallid bat	CNDDB	776.3

Table 3.4-3. Acres of Identified Special Status Wildlife Species Potential Occurrence on BLM Lands within the WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Species	Potential Occurrence Type	Sum of Acres
Johnson Valley	JV	Desert tortoise	Critical Habitat	4953.3
		Golden eagle	Nest Site - 1/2 Mile Buffer	2260.4
			Nest Site - 1/4 Mile Buffer	609.6
		Le Conte's thrasher	BLM Designated Habitat	101.3
		Western mastiff bat	CNDDB	154.4
Joshua Tree	JT	Desert tortoise	Critical Habitat	102680.3
		Nelson's bighorn sheep	CNDDB	9007.6
		Pallid bat	CNDDB	5.0
Juniper Flats	JF	Golden eagle	Nest Site - 1/2 Mile Buffer	212.4
			Nest Site - 1/4 Mile Buffer	9.6
Kramer Hills	KH	Desert tortoise	Critical Habitat	65661.5
		Mohave ground squirrel	Leitner Population	8037.9
Lancaster	LA	Desert tortoise	Critical Habitat	1369.1
		Le Conte's thrasher	BLM Designated Habitat	1.2
		Mohave ground squirrel	Core Areas	126.0
Middle Knob	MK	Burrowing owl	CNDDB	0.6
		Golden eagle	Nest Site - 1/2 Mile Buffer	636.8
			Nest Site - 1/4 Mile Buffer	152.0
		Le Conte's thrasher	BLM Designated Habitat	15.3
Mitchel Mountains	MM	Desert tortoise	Critical Habitat	13925.4
		Golden eagle	Nest Site - 1/2 Mile Buffer	302.9
			Nest Site - 1/4 Mile Buffer	118.0
Morongo Valley	MV	Least Bell's vireo	CNDDB	1441.2
		Nelson's bighorn sheep	CNDDB	5083.3
		Pallid bat	CNDDB	416.1
NA[1]	NA	Bendire's thrasher	BLM Designated Habitat	33.5
		Desert tortoise	Critical Habitat	667.8
		Le Conte's thrasher	BLM Designated Habitat	16.4
		Mohave ground squirrel	Core Areas	68.7
			Other Known Populations	129.7
		Mojave fringe-toed lizard	CNDDB	0.7
		Nelson's bighorn sheep	CNDDB	903.0
Needles South	NE	Desert tortoise	Critical Habitat	1197.2
		Le Conte's thrasher	BLM Designated Habitat	4.6
		Mojave fringe-toed lizard	CNDDB	12373.4
		Nelson's bighorn sheep	CNDDB	7587.2

Table 3.4-3. Acres of Identified Special Status Wildlife Species Potential Occurrence on BLM Lands within the WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Species	Potential Occurrence Type	Sum of Acres
Newberry / Rodman	NR	Desert tortoise	Critical Habitat	101325.6
		Golden eagle	Nest Site - 1/2 Mile Buffer	1261.7
			Nest Site - 1/4 Mile Buffer	308.8
		Nelson's bighorn sheep	CNDDB	24730.1
North Searles	NS	Le Conte's thrasher	BLM Designated Habitat	4765.6
		Mohave ground squirrel	Leitner Population	15328.9
		Nelson's bighorn sheep	CNDDB	31718.3
		Pallid bat	CNDDB	25.1
		Western small-footed myotis	CNDDB	25.1
Ord Mountains	OM	Burrowing owl	CNDDB	1.7
		Desert tortoise	Critical Habitat	106574.2
		Golden eagle	Nest Site - 1/2 Mile Buffer	4617.5
			Nest Site - 1/4 Mile Buffer	1259.2
		Nelson's bighorn sheep	CNDDB	879.1
Pisgah Crater	PC	Mojave fringe-toed lizard	CNDDB	1779.0
Rands	RA	Burrowing owl	CNDDB	69.1
		Desert tortoise	Critical Habitat	52676.2
		Golden eagle	Nest Site - 1/2 Mile Buffer	1182.1
			Nest Site - 1/4 Mile Buffer	301.6
		Gray vireo	CNDDB	69.2
		Le Conte's thrasher	BLM Designated Habitat	1.1
		Mohave ground squirrel	Leitner Population	10262.7
			Other Known Populations	18449.6
		Pallid bat	CNDDB	1156.5
		Spotted bat	CNDDB	12.9
Rattlesnake Canyon	RC	Bendire's thrasher	BLM Designated Habitat	34.6
		Golden eagle	Nest Site - 1/2 Mile Buffer	502.6
			Nest Site - 1/4 Mile Buffer	125.6
		Le Conte's thrasher	BLM Designated Habitat	5.9
Red Mountain	RM	Desert tortoise	Critical Habitat	111357.0
		Golden eagle	Nest Site - 1/2 Mile Buffer	502.6
			Nest Site - 1/4 Mile Buffer	125.6
		Mohave ground squirrel	Leitner Population	13068.7
			Other Known Populations	29974.4

Table 3.4-3. Acres of Identified Special Status Wildlife Species Potential Occurrence on BLM Lands within the WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Species	Potential Occurrence Type	Sum of Acres
Ridgecrest	RI	Le Conte's thrasher	BLM Designated Habitat	118.7
		Mohave ground squirrel	Leitner Population	14405.3
			Other Known Populations	14276.2
Sierra	SI	Burrowing owl	CNDDB	758.4
		Golden eagle	Nest Site - 1/2 Mile Buffer	3455.2
			Nest Site - 1/4 Mile Buffer	904.2
		Le Conte's thrasher	BLM Designated Habitat	1967.5
		Least Bell's vireo	CNDDB	28.0
		Mohave ground squirrel	Core Areas	63934.4
		Northern sagebrush lizard	CNDDB	9.9
		Swainson's hawk	CNDDB	68.6
South Searles	SS	Mohave ground squirrel	Other Known Populations	6952.6
Stoddard Valley	SV	Bendire's thrasher	BLM Designated Habitat	214.6
		Burrowing owl	CNDDB	10.6
		Desert tortoise	Critical Habitat	0.2
		Golden eagle	Nest Site - 1/2 Mile Buffer	7655.6
			Nest Site - 1/4 Mile Buffer	2173.2
		Le Conte's thrasher	BLM Designated Habitat	1836.7
		Mojave fringe-toed lizard	CNDDB	3.6
		Western mastiff bat	CNDDB	834.7
Victorville	VV	Desert tortoise	Critical Habitat	497.2
		Western mastiff bat	CNDDB	47.4
Wonder Valley	WV	Bendire's thrasher	BLM Designated Habitat	0.3
		Le Conte's thrasher	BLM Designated Habitat	9.2
		Mojave fringe-toed lizard	CNDDB	447.7
		Nelson's bighorn sheep	CNDDB	6751.9

[1]NA = BLM lands outside designated subregion boundaries within the WEMO planning area.

Additionally, 19 species were not included in the 2005 WEMO Final EIS (BLM 2005), but are in this SEIS since they are considered to potentially occur within the planning area based on recent documentation (Dudek and ICF International 2012) and consultation with BLM biologists. These species include the:

- Hoary Bat
- Western Red Bat
- Fringed Myotis
- Western Small-footed Myotis
- Least Bell’s Vireo
- Mountain Plover
- Swainson’s Hawk
- Tricolored Blackbird

- American Peregrine Falcon
- Bald Eagle
- Bank Swallow
- California Condor
- Greater Sandhill Crane
- White-tailed Kite
- Yuma Clapper Rail
- Mojave Tui Chub
- Northern Sagebrush Lizard
- Tehachapi Slender Salamander
- Arroyo Toad

The 19 special status wildlife species identified as potentially affected by the proposed action or alternatives within the planning area are described in the following section.

The majority of the updated summaries of species are based on the Species Accounts prepared for the recent March 2012 draft Desert Renewable Energy Conservation Plan (Dudek and ICF International 2012) baseline biology report. The intent of the DRECP includes effective protection and conservation of desert ecosystems while allowing for the appropriate development of renewable energy projects (California Energy Commission 2013). The WEMO Planning area exists within the boundaries of the DRECP planning area.

3.4.3.2.1 Mammals

Mohave Ground Squirrel

The information from the 2005 WEMO Final EIS (BLM 2005)is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012). All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of this species, please refer to Section 3.3.3, pp. 3-144 to 3-169 of the 2005 WEMO Final EIS.

Life History

There is little direct information on the potential role of MGS in maintaining ecological relationships and processes. Their burrow systems likely provide refuge for other species that do not dig their own burrows such as snakes and lizards and potentially other small rodents. The range of the MGS is entirely overlapped by the diurnal white-tailed antelope squirrel, but there appears to be little direct competition between the two species (MGSWG 2011). They are probably prey for several natural predators, such as coyote, American badger, bobcat, red-tailed hawk, golden eagle, prairie falcon, common raven, and Mojave rattlesnake (Best 1995).

MGS maintain three types of burrows within their home ranges: (1) home burrows that are used overnight during the active season and usually located at the edge of a home range; (2) aestivation burrows; and (3) accessory burrows that are used during social interactions or for escape and thermoregulation during the midday (Best 1995). Burrows are typically constructed under large shrubs (MGSWG 2011).

Harris and Leitner (2004) conducted a 5-year radiotelemetry study of home range use by MGS in the Coso Range in Inyo County. At this study site, individual MGS home ranges (calculated using

both minimum convex polygon and adaptive kernel methods) varied substantially by year, individual, sex, and season (i.e., mating season vs. post-mating season). Generally, males have larger home ranges than females, with the most pronounced differences during the mating season.

Harris and Leitner (2005) used radiotelemetry to track dispersal movements by juvenile MGS in their first year to hibernation sites. Most juveniles dispersed relatively long distances from their natal burrow area, and exhibited dispersal that is farther than other squirrels and other mammals in proportion to home range sizes (Harris and Leitner 2005).

The MGS breeding season is from mid-February to mid-March (Best 1995; Laabs 2006). Males emerge from hibernation in February, up to two weeks before females, and during this time they may be territorial (Best 1995). Females generally only occupy male territories for one or two days then establish their own home ranges after copulation. Males stake out the overwintering sites of females to mate with them when they emerge (MGSWG 2011).

Pregnant females are present from February to May and gestation lasts from 29 to 30 days (Best 1995). Litter sizes range from four to nine (Best 1995), though mortality of juveniles is high during the first year, especially for juvenile males (MGSWG 2011). Parental care and lactation continues through mid-May and juveniles emerge above ground from 10 days to 2 weeks later. Litters generally appear above ground in early May (Harris and Leitner 2004). Females will breed at 1 year of age if environmental conditions are suitable, but males do not mate until 2 years of age (MGSWG 2011).

Population Status in the Planning Area

Endemic to California, the Mohave ground squirrel is exclusively found in the northwestern Mojave Desert in San Bernardino, Los Angeles, Kern, and Inyo counties (Best 1995). The presumed historical range of the Mohave ground squirrel within the northwestern Mojave Desert was bounded on the south and west by the San Gabriel, Tehachapi, and Sierra Nevada mountain ranges; on the northeast by Owens Lake, and the Coso Slate, Quail, Granite and Avawatz mountains; and on the east and southeast by the Mojave River (Leitner 2008; MGSWG 2011). In addition, the species was historically found in one locality east of the Mojave River in the Lucerne Valley. Its historic range covered about 20,000 square kilometers (km2) (7,722 square miles (mi2)) (Gustafson 1993), which is the smallest geographic range of any ground squirrel species in the United States. However, for the 12-month finding for the species published in October 2011, USFWS used a somewhat larger historical range of approximately 21,525 km2 (8,311 mi2) (76 FR 62214– 62258). USFWS also stated in the 12-month finding that the range of the Mohave ground squirrel may be larger than defined in the finding or previously published based on recent sightings such as in an interior valley of the Tehachapi Mountains and in the Panamint Valley about 8 kilometers (5 miles) north of the defined range (76 FR 62214–62258).

Conversion of native desert habitats has likely resulted in the extirpation of Mohave ground squirrel from west of Palmdale and Lancaster where it likely occupied the Antelope Valley historically, but which has experienced rapid growth in recent decades (Laabs 2006; Leitner 2008). There are no recent records or observations from the southern portion of its range, between Palmdale and Lucerne Valley, suggesting that Mohave ground squirrel may have been extirpated in this highly developed area (Laabs 2006). Approximately 46% of the California Natural Diversity Database (CNDDB) records for the Mohave ground squirrel are historic or have no date. These records are located throughout the species' range (CDFW 2011).

The current range is reduced from the historic range as a result of the likely extirpation of the Mohave ground squirrel in the western portion of the Antelope Valley and potentially south of Victorville and southeast to Lucerne Valley (MGSWG 2011). Habitat for the species has been reduced by development of agricultural uses, grazing, urbanization, military activities, energy production, and recreation (MGSWG 2011). The current occupied range is estimated to be about 19,000 km2 (6,640 mi2) (MGSWG 2011).

The occurrence of Mohave ground squirrel is likely to be patchy within its range, even within apparently suitable habitat (MGSWG 2011). However, as noted by Leitner (2008), occurrence records tend to be concentrated in certain areas where trapping studies have been focused; these studies are discussed in more detail below. There has not been a systematic, range-wide census or statistically based random sampling study to determine occupation throughout the species' range (Leitner 2008). About 88% of the geographic area of known existing populations of the species, based on Leitner (2008), occur in the planning area (only a portion of the Coso Range-Olancha Core population is outside this area).

Recent (after 1990) records from the CNDDB and 2005 West Mojave Plan Mohave ground squirrel transect data and other California Department of Fish and Wildlife (CDFW) data include location occurrences ranging from Inyo in the north to 3 miles southwest of Rabbit Lake in the south. The eastern extent ranges to the Granite Mountains and Fort Irwin and the westernmost record is just east of Oak Creek (Dudek 2011).

Leitner (2008) provides the most current status of the Mohave ground squirrel based on compilation of a database, including unpublished field studies, surveys, and incidental observations for the 10-year period from 1998 through 2007. This database includes 1,140 trapping sessions, of which 102 resulted in observation of the species, and 96 additional incidental observations. Most of these studies and observations have been conducted in the southern part of the species' range south of State Route 58 and no range-wide systematic or statistically based random sampling has been conducted to characterize the species' status throughout its range. Leitner (2008) emphasizes that there are large areas of potential habitat where the species' status is unknown, especially on the China Lake Naval Air Weapons Station and Fort Irwin. Data compiled by Leitner within the planning area is detailed in Table 3.4-4 by subregion and shown in Figure 3.4-32.

Table 3.4-4. Acres of Leitner Data for the Mohave Ground Squirrel within the Planning Area[1]

Subregion	Subregion Abbreviation	Name	Sum of Acres
North Searles	NS	North Searles Valley	15,328.9
Fremont Peak	FP	Boron Extension	3,458.0
		Harper Lake	24,687.1
Harper Lake	HL	Harper Lake	3,049.1
Iron Mountain	IM	Harper Lake	1,060.3
Kramer Hills	KH	Harper Lake	8,037.9
El Paso	EP	Fremont Valley/ Teagle	2,698.3
Rands	RA	Boron Extension	8.0
		Fremont Valley/ Teagle	10,254.7

Table 3.4-4. Acres of Leitner Data for the Mohave Ground Squirrel within the Planning Area[1]

Subregion	Subregion Abbreviation	Name	Sum of Acres
Red Mountain	RM	Boron Extension	4,022.6
		Fremont Valley/ Teagle	9,046.1
Ridgecrest	RI	Fremont Valley/ Teagle	14,405.3
Total			**96,056.2**

[1]Data overlaps with Leitner data and Core Areas for the Mohave Ground Squirrel

In addition to the Leitner data above, other known populations have been documented by BLM biologists. The occurrences of other known Mohave ground squirrel populations within the planning area are detailed in Table 3.4-5 and shown in Figure 3.4-32.

Table 3.4-5. Acres of Mohave Ground Squirrel Known Population Data within the Planning Area[1]

Subregion	Subregion Abbreviation	Name	Sum of Acres
South Searles	SS	Ridgecrest	6,952.6
Fremont Peak	FP	Boron/ Kramer Junction	13,288.3
El Paso	EP	Ridgecrest	259.4
Rands	RA	Boron/ Kramer Junction	1,450.0
		Desert Tortoise Natural Area	16,999.6
Red Mountain	RM	Boron/ Kramer Junction	10,216.0
		Pilot Knob	19,758.4
Ridgecrest	RI	Ridgecrest	14,276.2
NA[2]	NA	Pilot Knob	45.2
		Ridgecrest	84.4
Total			**83,330.1**

[1]Data overlaps with Leitner data and Core Areas for the Mohave Ground Squirrel
[2]NA = BLM lands outside designated subregion boundaries within the WEMO planning area.

The 2005 WEMO Final EIS details that available data suggest that local MGS populations follow a "boom and bust" cycle, where they expand into habitats when conditions are favorable, and shrink back into core areas when conditions are less favorable, particularly when conditions such as drought occur over a several-year period. Approximately 181,438 acres of core area have been identified for this species within the planning area (Table 3.4-6, Figure 3.4-32).

Table 3.4-6. Acres of Mohave Ground Squirrel Core Area within the Planning Area[1]

Subregion	Subregion Abbreviation	Core Area Name	Sum of Acres
Black Mountain	BM	Coolgardie Mesa-Superior Valley	2010.3
Coolgardie	CG	Coolgardie Mesa-Superior Valley	31712.3

Table 3.4-6. Acres of Mohave Ground Squirrel Core Area within the Planning Area[1]

Subregion	Subregion Abbreviation	Core Area Name	Sum of Acres
El Paso	EP	Little Dixie Wash	29138.1
Jawbone	JB	Little Dixie Wash	54447.9
Lancaster	LA	Edwards Air Force Base	126.0
NA[2]	NA	Coolgardie Mesa-Superior Valley	65.5
		Coso Range-Olancha	3.3
Sierra	SI	Coso Range-Olancha	63138.0
		Little Dixie Wash	796.3
Total			**181,437.7**

[1]Data overlaps with Leitner data and Core Areas for the Mohave Ground Squirrel
[2]NA = BLM lands outside designated subregion boundaries within the WEMO planning area.

Threats

Threats to the Mohave ground squirrel would not change from the previous analysis provided by the 2005 WEMO Final EIS (BLM 2005) within the planning area. For a discussion of these threats, please refer to Section 3.3.3.5, pg. 3-157 to 167.

Bats

The information from the 2005 WEMO Final EIS (BLM 2005)is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012). All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.4, pp. 3-169 to 3-170 of the 2005 WEMO Final EIS.

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.4, pg. 3-169 to 3-170) is supplemented by the following updated information from the DRECP Baseline Biology Report (Dudek and ICF International 2012).

Life History

Five species occurring within the planning area could potentially be affected by the proposed action or alternatives: spotted bat, pallid bat, western mastiff bat, fringed myotis, and western small-footed myotis.

The fringed myotis and western small-footed myotis were not included in the 2005 WEMO Final EIS (BLM 2005). The fringed myotis and western small-footed myotis occur within a wide variety of habitats, but use caves, mines, buildings, and crevices as roost sites. Hibernation lasts from October/November through March. Mating occurs in the fall and the young are born from May through July (Zeiner, D.C. et al 1988-1990).

The fringed myotis is widespread in California and the western small-footed myotis is a common resident of arid uplands in California occurring from on the west and east sides of the Sierra Nevada, and in Great Basin and desert habitats from Modoc to Kern and San Bernardino counties.

The range for both species occurs along the western and northern boundaries of the planning area (Zeiner, D.C. et al 1988-1990).

All other life history information for the other three species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.4, pp. 3-169 to 3-170 of the 2005 WEMO Final EIS.

Population Status in the Planning Area

Within the planning area, the CNDDB identifies approximately 3,495 acres of element occurrences for these species on BLM lands (Figure 3.4-33). The amount of acres identified within each subregion is detailed above in Table 3.4-3. All other known occurrence data for the spotted bat, pallid bat, and western mastiff bat would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of this species, please refer to Section 3.3.4, pp. 3-169 to 3-170. Potential to occur within the area that could be affected by the proposed action or alternatives was evaluated based on the location of known mine sites.

Regulatory Status

The regulatory status for the five bat species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.4, pp. 3-169 to 3-170 of the 2005 WEMO Final EIS.

Threats

The threats identified for the five bat species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.4, pp. 3-169 to 3-170 of the 2005 WEMO Final EIS.

Nelson's Bighorn Sheep

The information from the 2005 WEMO Final EIS (BLM 2005) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012). All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of this species, please refer to Section 3.3.5, pp. 3-170 to 3-171 of the 2005 WEMO Final EIS.

Life History

The life history of the bighorn sheep would not change from the previous analysis provided by the 2005 WEMO Final EIS (BLM 2005) within the planning area. Please refer to Section 3.3.5.1, pg. 3-171

Population Status in the Planning Area

The CDFW (2010a) prepared the *Biennial Report to the Legislature Regarding Bighorn Sheep Management* pursuant to Section 4094 of the California Fish and Wildlife Code. This report summarizes census information related to long-term management of bighorn sheep (including the authorization of hunting tags) and includes sheep counts in specific management units in 2009 and 2010. The distribution of bighorn sheep is grouped by a regional system of subpopulations (or metapopulations) based on natural physical features such as geography and vegetation that affect species occurrence, as well as manmade obstacles that affect distribution, such as freeways (CDFW 2010c). Aerial surveys in 2009 and 2010 documented 1,022 bighorn sheep, including ewes, lambs, and rams, in the following mountain ranges: Marble Mountains; Clipper Mountains; Kelso Peak and Old Dad Peak; Clark, Kingston, and Mesquite Mountains; Orocopia Mountains; Sheephole Mountains; South Bristol Mountains; Cady Mountains; White Mountains; and San Gorgonio Mountains. The 1,022 individuals represent minimum populations in these areas because they were only animals actually observed; population size is assumed to be larger (CDFW 2010c). The CDFW (2010c) report included the Peninsular bighorn sheep metapopulation, with an estimate of about 950 adults and recruited lambs among the nine distinct subpopulations as of December 2010.

Within the planning area, the CNDDB identifies approximately 136,350 acres of element occurrences for this species on BLM lands (Figure 3.4-34). The amount of acres identified within each subregion is detailed above in Table 3.4-3.

Regulatory Status

The regulatory status of the bighorn sheep would not change from the previous analysis provided by the 2005 WEMO Final EIS (BLM 2005) within the planning area. Please refer to Section 3.3.5.1, pg. 3-171.

Threats

Threats to this species would not change from the previous analysis provided by the 2005 WEMO Final EIS (BLM 2005) within the planning area. For a discussion of these threats, please refer to Section 3.3.5.1, pg. 3-171.

3.4.3.2.2 Birds

Southwestern Willow Flycatcher

The information from the 2005 WEMO Final EIS (BLM 2005) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012). All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.6.11, pp. 3-178 to 3-179 of the 2005 WEMO Final EIS.

Life History

In California, the southwestern willow flycatcher is restricted to riparian habitats occurring along streams or in meadows (Craig and Williams 1998; Sogge and others 2010). The structure of these habitats typically consists of a dense mid-story and understory and can also include a dense canopy

(60 FR 10695–10715). However, suitable vegetation is not uniformly dense and typically includes interspersed patches of open habitat. Typical plant species associated with their habitat include willow (*Salix* spp.), mulefat (*Baccharis salicifolia*), box-elder (*Acer negundo*), stinging nettle (*Urtica* spp.), cottonwood (*Populus* spp.), tamarisk (*Tamarix* spp.), and Russian olive (*Elaeagnus angustifolia*). Within the habitat structure parameters discussed above, southwestern willow flycatcher does demonstrate adaptability in that it can occupy riparian habitats composed of native broadleaf species, a mix of native and exotic species, or monotypic stands of exotics (Sogge and others 2010). This subspecies is known to nest in monotypic stands of Russian olive and tamarisk (60 FR 10695–10715). Furthermore, along the San Luis Rey River in San Diego County, southwestern willow flycatcher has nested in riparian habitat dominated by coast live oak (*Quercus agrifolia*), and in Cliff-Gila Valley in New Mexico they are known to nest in tall box-elder. Plant species composition does not seem as important as a dense twig structure and an abundance of live, green foliage (Sogge and others 2010). Also, the location of the nest seems to depend more on suitable twig structure and live vegetative cover than height or plant species composition (Sogge and others 2010).

Southwestern willow flycatcher nesting sites are located near surface water or saturated soils. Due to the variability of hydrologic conditions in Southern California, water availability at a site may range from inundated to dry from year to year or within the breeding season. Nonetheless, moisture levels must remain high enough to support appropriate riparian vegetation (Sogge and others 2010). Dense willow thickets are the most important habitat component for breeding E. t. adastus and E. t. brewsteri in California (Stefani and others 2001).

Southwestern willow flycatchers are insectivorous and forage at the edges or internal openings of their territory, above the canopy or over open water. Their diet consists mainly of bees, wasps, flies, leaf hoppers, and beetles (Durst and others 2008b), which they catch in the air, glean from vegetation, or occasionally pick, catch, or seize from the ground (Sedgwick 2000). Presumably, the diets of migrating *E. t. adastus* and *E. t. brewsteri* are similar.

Southwestern willow flycatcher is predominantly monogamous although reports of polygyny are not uncommon (Sedgwick 2000). Males arrive at the breeding sites between early May and early June (USFWS 2002). Females arrive 1 to 2 weeks after males and inhabit the territory of a male (Finch and Stoleson 2000). Nest building begins approximately 2 weeks after pair formation. The female incubates the eggs for an average of 12 to 13 days. The nestlings fledge between 12 and 15 days after hatching (Sogge and others 2010). Southwestern willow flycatcher will typically renest following an unsuccessful attempt and less frequently may renest following a successful attempt.

Population Status in the Planning Area

In addition to the known breeding sites documented it the 2005 WEMO Final EIS (Section 3.3.6.11, pp. 3-178 to 3-179), the CNDDB contains one historical (i.e., pre-1990) occurrence for the southwestern willow flycatcher located north of Independence in Inyo County (CDFW 2012b). Four additional historical occurrences for willow flycatchers (subspecies not identified) are located in the vicinity of the cities of Mojave and California City (Dudek 2011). Critical habitat established along the Mojave River is situated within the Plan Area (70 FR 60886–61009). There are approximately 2,025 acres of Critical Habitat identified in the Plan Area in the subregions of Juniper Flats, Stoddard Valley, and Victorville. Within the planning area, the CNDDB identifies approximately 17.5 acres of element occurrences for this species (Figure 3.4-35) within the subregions of Juniper Flats and Victorville. However, Critical Habitat and CNDDB element

occurrences do not overlap with any BLM lands within the subregions identified and are, therefore, not detailed in Table 3.4-3.

Regulatory Status

The regulatory status for the southwestern willow flycatcher has not changed from the 2005 WEMO Final EIS as described in Section 3.3.6.11, pg. 3-179 (BLM 2005).

Threats

The primary threat to the southwestern willow flycatcher is loss, modification, and fragmentation of suitable riparian habitat (Sogge et al. 2010). In general, increased human populations and development have resulted in a decline of riparian habitat, a habitat type that is naturally rare, patchy, and dynamic in the Southwest due to the varying hydrologic conditions of the region. The specific primary causes for loss and modification of riparian habitats have been dams and reservoirs, water diversion and groundwater pumping, channelization, flood control, agriculture, recreation, and urbanization (Sogge et al. 2010). Other threats include nest parasitism by cowbirds and grazing.

Western Yellow-billed Cuckoo

The information from the 2005 WEMO Final EIS (BLM 2005) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012). All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.6.15, pg. 3-181 of the 2005 WEMO Final EIS.

Life History

In the western United States, nests are typically constructed in willows, Fremont cottonwood, mesquite, hackberry (*Celtis* spp.), soapberry (*Sapindus saponaria*), alder (*Alnus* spp.), or cultivated fruit trees on horizontal branches or vertical forks of the large tree or shrub (Hughes 1999). Nest sites in arid regions are restricted to relatively humid river bottoms, ponds, swampy areas, and damp thickets (Hughes 1999). Foraging occurs extensively in cottonwood riparian habitat (Hughes 1999).

The western yellow-billed cuckoo has a short breeding season, lasting only about 4 months from time of arrival on breeding grounds in the spring to fall migration. Western yellow-billed cuckoos typically lay a single clutch per season in mid-June to mid-July, and incubation occurs over 9 to 11 days (Hughes 1999; Johnson and others 2008). Development of the young is very rapid, with fledgling occurring in 6 to 9 days; the entire breeding cycle may be only 17 days from egg laying to fledging of the young (Hughes 1999). Fledglings are dependent upon parents for up to 3 weeks following fledgling (Johnson and others 2008). Cuckoos are a monogamous species, and both sexes incubate and care for the young (Hughes 1999).

Population Status in the Planning Area

The CNDDB contains 29 historical (i.e., pre-1990) occurrence records dating from 1917 to 1986. Of the known occurrences, 26 are from 3 years: 1977 (13), 1983 (2), and 1986 (11). Single known

occurrences are from 1917, 1945, 1964, and 1978. Of the historical known occurrences in the Plan Area, 23 are from the LCR, with 14 known occurrences from Imperial County, ranging from the Palo Verde area to the U.S.–Mexico border; 6 from eastern Riverside County in the Blythe area; and 2 from San Bernardino County in the Needles area. Five of the historical known occurrences are from the Amargosa River, Tecopa, China Ranch, and Independence areas in Inyo County, and 2 are from the Mojave River in the Upper Narrows and Hodge areas in San Bernardino County. Of 29 historical known occurrences, 22 are on public land and 7 are on private land.

Within the planning area, the CNDDB identifies approximately 138 acres of element occurrences for this species (Figure 3.4-36) within the subregions of Iron Mountain, Juniper Flats and Victorville. However, these CNDDB element occurrences do not overlap with any BLM lands within the subregions identified and are, therefore, not detailed in Table 3.4-3.

Regulatory Status

The regulatory status for the western yellow-billed cuckoo has been updated from the 2005 WEMO Final EIS (BLM 2005) to include a BLM Sensitive listing in addition to California endangered and proposed threatened under the ESA (as described in Section 3.3.6.15, pg. 3-181 of the 2005 WEMO Final EIS (BLM 2005). Additionally, a decision on the designation of Critical Habitat is pending.

Threats

The western yellow-billed cuckoo is sensitive to habitat fragmentation and degradation of riparian woodlands due to agricultural and residential development (Hughes 1999), and major declines among western populations reflect local extinctions and low colonization rates (Laymon and Halterman 1989). Groundwater pumping and the replacement of native riparian habitats by invasive non-native plants, especially tamarisk, have substantially reduced the area and quality of available breeding habitats for yellow-billed cuckoo (75 FR 69222–69294).

Bendire's Thrasher

The information from the 2005 WEMO Final EIS (BLM 2005) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012). All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.6.1, pp. 3-173 to 3-174 of the 2005 WEMO Final EIS.

Life History

This species breeds in desert areas containing cactus, Mojave yuccas, and Joshua trees.

Population Status in the Planning Area

The CNDDB identifies approximately 14,918 acres within element occurrences for this species within the planning area on BLM lands (Figure 3.4-37). The amount of acres identified within each subregion is detailed above in Table 3.4-3. In addition, approximately 11,710 acres has been designated as the Bendire's Thrasher ACEC to protect suitable Bendire's thrasher habitat between the Jawbone and Stoddard Valley Subregions (Figure 3.4-37).

Regulatory Status

The regulatory status for the Bendire's thrasher has been updated from the 2005 WEMO Final EIS (BLM 2005) to include BLM Sensitive and a USFWS bird of conservation concern in addition to the California Species of Special Concern status (as described in Section 3.3.6.1, pg. 3-173 of the 2005 WEMO Final EIS).

Threats

Identified threats include habitat destruction through rural and urban development, off-road vehicle activity during the nesting season, and removal of yuccas and cholla cacti. Grazing has shown both positive and negative effects on this species. Fragmentation of the small remaining populations is a serious long-term threat.

Burrowing Owl

The information from the 2005 WEMO Final EIS (BLM 2005) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012). All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.6.3, pg. 3-174 of the 2005 WEMO Final EIS.

Life History

Throughout their range, burrowing owls require habitats with three basic attributes: open, well-drained terrain; short, sparse vegetation generally lacking trees; and underground burrows or burrow-like structures (e.g., pipe openings) (Gervais and others 2008; Klute and others 2003).

Burrowing owls are opportunistic predators that will consume arthropods, small mammals, birds, amphibians, and reptiles (Haug and others 1993; Karalus and Eckert 1987; Gervais and others 2008). Owls typically forage in habitats characterized by low-growing, sparse vegetation (Haug and others 1993). In California, crickets and meadow voles were found to be the most common food items (Thomsen 1971).

Nesting in California generally runs from February through August, with peak activity from mid-April to mid-July (Zeiner and others 1990; Thomsen 1971; Gervais and others 2008). Burrowing owls are primarily monogamous and typically breed once per year.

California supports year-round resident burrowing owls and over-wintering migrants (Gervais and others 2008). Many owls remain resident throughout the year in their breeding locales (especially in central and Southern California) while some apparently migrate or disperse in the fall (Haug and others 1993; Coulombe 1971; Barclay 2007).

Burrowing owls exhibit high site-fidelity and reuse burrows year after year, although dispersal distances may be considerable and variable depending on location and the age of the owls. In California, western burrowing owls most commonly live in burrows created by ground squirrels (Gervais and others 2008). Therefore, the suitability and quality of burrowing owl habitat in the planning area is closely and positively related to the occurrence and population health of ground squirrels. In other regions where squirrel burrows do not occur, burrowing owls may depend on badgers for nest burrow excavation, although this species is a major predator of burrowing owls

(Green and Anthony 1997). Where burrowing mammals have been eliminated, burrowing owls may prefer grazed areas where livestock have reduced vegetation height (Wedgwood 1976).

Population Status in the Planning Area

In California, the burrowing owl's range extends throughout the lowlands from the northern Central Valley to the U.S.–Mexico border, with large populations in the Imperial Valley region of southeast California (Gervais and others 2008) and a small (perhaps extirpated) population in the Great Basin bioregion in northeast California (Cull and Hall 2007). The species' distribution and abundance vary considerably throughout its range (DeSante and others 2007; Wilkerson and Siegel 2010). Breeding burrowing owls are absent from the coast north of Sonoma County and from high mountain areas, such as the Sierra Nevada and the Transverse Ranges extending east from Santa Barbara County to San Bernardino County (Gervais and others 2008).

In addition to the statistics provided in Section 3.3.6.3, pg. 3-174 of the 2005 WEMO Final EIS (BLM 2005), burrowing owls occur across most of the Mojave and Sonoran deserts of Inyo, eastern Kern, northern Los Angeles, San Bernardino, eastern Riverside, eastern San Diego, and Imperial counties (Miller 2003, references therein). Garrett and Dunn (1981) described the species as "quite scarce" from Inyo County south through the eastern Mojave Desert. Greater abundance exists in the western Mojave Desert (Bureau of Land Management [BLM] 2005) where Wilkerson and Siegel (2010) recently estimated that 560 breeding pairs (approximately 6% of the California population) reside. However, with the exception of agricultural areas in the Imperial Valley, planning area-wide, regional numbers are low and occupied areas are widely scattered, which is likely typical for this species in desert systems (Gervais and others 2008). Some northerly birds may also move south into the planning area but the seasonality, magnitude and geographic pattern (if any) of the apparent winter influx from more northerly breeders is also poorly documented (BLM 2005).

Within the planning area, the CNDDB identifies approximately 1,857 acres of element occurrences for this species on BLM lands (Figure 3.4-38). The amount of acres identified within each subregion is detailed above in Table 3.4-3.

Regulatory Status

The regulatory status for the burrowing owl has been updated from the 2005 WEMO Final EIS (BLM 2005) to include BLM Sensitive and a USFWS bird of conservation concern in addition to the California Species of Special Concern status (as described in Section 3.3.6.3, pg. 3-174 of the 2005 WEMO Final EIS.

Threats

Threats to the burrowing owl would not change from the previous analysis provided by the 2005 WEMO Final EIS (BLM 2005) within the planning area. For a discussion of these threats, please refer to Section 3.3.6.3, pg. 3-174.

Golden Eagle

The information from the 2005 WEMO Final EIS (BLM 2005) is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012). All other background information for this species would not change from the previous analysis included in

the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.6.5, pg. 3-175 of the 2005 WEMO Final EIS.

Life History

Golden eagles use nearly all terrestrial habitats of the western states, occurring primarily in mountainous canyon land, rimrock terrain of open desert and grassland areas (Kochert and others 2002). In central California, they prefer open grasslands and oak savanna, with lesser numbers in oak woodland and open shrublands (Hunt and others 1998) but can also be found in desert grasslands and chaparral habitats (Millsap 1981). Secluded cliffs with overhanging ledges and large trees are used for nesting and cover. Preferred territory sites include those that have a favorable nest site, a dependable food supply, and broad expanses of open country for foraging. Golden eagles typically forage in open habitats including grasslands and shrublands.

Golden eagles in the planning area are mostly resident, but may move downslope for winter or upslope after the breeding season (Polite and Pratt 1990). Both residents and migratory individuals show fidelity to wintering areas (Kochert and others 2002).

Golden eagles use the same nest each year, alternate nests in successive years, or nest only every other year (Terres 1991). Pairs rarely re-nest when the first clutch is destroyed (Watson 1997) and there are no records of pairs producing more than one brood per year. Golden eagles prefer to locate their nests on cliffs or trees near forest edges or in small stands near open fields (Bruce and others 1982; Hunt and others 1998). Mating occurs from late January through August, with peak activity in March through July. Eggs are laid from early February to mid-May. Incubation lasts 43–45 days (Kochert and others 2002), and the fledging period is 72–84 days (Johnsgard 1990). The young usually remain dependent on their parents for as long as eleven weeks after fledging.

Golden eagles are a top avian predator in the scrubland, grassland, and woodland ecosystems that make up much of the planning area. They feed mainly on leporids (hares and rabbits) and sciurids (ground squirrels, prairie dogs, marmots), but they also take birds, fish, and reptiles, mostly on or near the ground, and they frequently feed on carrion (Kochert and others 2002). They may directly compete with ferruginous hawks and other smaller hawks for small mammals, and with California condors and common ravens for carrion. Territorial interactions with other golden eagles may result in some fatalities.

Population Status in the Planning Area

There are golden eagle historical occurrences throughout the planning area, but with concentrations in the west Mojave, the region between Victorville and Barstow east on I-15, the Mojave National Preserve, and the eastern portion of Joshua Tree National Park. The BLM identified “Key Raptor Areas” for golden eagles encompassing the Granite, El Paso, Newberry, and Red mountains (Raptor Research Foundation 1989), as well as important occupied habitat in the Clark Mountain Range and Calico Mountains.

A 0.5 mile buffer was placed around known golden eagle nest sites in the vicinity of the alternatives (Figure 3.4-39). Based on this buffer, 28,624 acres would be affected by the proposed action or alternatives (Table 3.4-7).

Table 3.4-7. Acres of Suitable Golden Eagle Habitat based on a 0.5 Mile Buffer Around Known Nest Sites within WEMO Planning Area by Subregion

Subregion	Subregion Abbreviation	Sum of Acres
Afton Canyon	AC	498.1
Barstow	BA	0.1
Sierra	SI	3,455.2
Juniper Flats	JF	212.4
Rattlesnake Canyon	RC	502.6
Wonder Valley	WV	1,664.9
Jawbone	JB	832.0
Middle Knob	MK	636.8
Black Mountain	BM	817.6
Fremont Peak	FP	6.6
Mitchel Mountains	MM	302.9
El Paso	EP	2,214.9
Rands	RA	1,182.1
Red Mountain	RM	502.6
Johnson Valley	JV	2,260.4
Newberry/Rodman	NR	1,261.7
Ord Mountains	OM	4,617.5
Stoddard Valley	SV	7,655.6
Total		**28,624.1**

Regulatory Status

The regulatory status for the golden eagle has been updated from the 2005 WEMO Final EIS (BLM 2005) to include a BLM Sensitive listing in addition to the California: Fully Protected, Species of Special Concern (as described in Section 3.3.6.5, pg. 3-175 of the 2005 WEMO Final EIS (BLM 2005).

Threats

Threats to the golden eagle would not change from the previous analysis provided by the 2005 WEMO Final EIS (BLM 2005) within the planning area. For a discussion of these threats, please refer to Section 3.3.6.5, pg. 3-175.

Gray Vireo

The information from the 2005 WEMO Final EIS (BLM 2005) is supplemented by the following updated information. All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.6.6, pp. 3-175 to 3-176 of the 2005 WEMO Final EIS.

Life History

This species is found on arid slopes dominated by short, densely branched, stiff-twigged shrubs. It is migratory, occurring in the western Mojave Desert from early April until mid-August.

Population Status in the Planning Area

Known distribution data for the gray vireo within the WEMO Planning area is depicted in Figure 3.4-40. Within the planning area, the CNDDB identifies approximately 69 acres of element occurrences for this species on BLM lands within the Rands subregion (Table 3.4-3).

Regulatory Status

The regulatory status for the gray vireo has been updated from the 2005 WEMO Final EIS (BLM 2005) to include USFWS bird of conservation concern in addition to the BLM Sensitive and California Species of Special Concern status (as described in Section 3.3.6.6, pp. 3-175 to 3-176 of the 2005 WEMO Final EIS).

Threats

Identified threats include habitat destruction through rural and urban development, off-road vehicle activity during the nesting season, wildland fires, and removal of yuccas and cholla cacti. Grazing has shown both positive and negative effects on this species. Fragmentation of the small remaining populations is a serious long-term threat.

LeConte's Thrasher

The information from the 2005 WEMO Final EIS (BLM 2005) is supplemented by the following updated information. All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.6.8, pg. 3-177 of the 2005 WEMO Final EIS.

Life History

The habitat for the LeConte's thrasher is creosote bush scrub with stands of cholla cactus, Joshua trees, and thorny shrubs.

Population Status in the Planning Area

Within the planning area, the CNDDB identifies approximately 9,560 acres of element occurrences for this species on BLM lands (Figure 3.4-41). The amount of acres identified within each subregion is detailed above in Table 3.4-3.

Regulatory Status

The regulatory status for the LeConte's thrasher has been updated from the 2005 WEMO Final EIS (BLM 2005) to include USFWS bird of conservation concern in addition to the California Species of Special Concern status (as described in Section 3.3.6.8, pg. 3-177 of the 2005 WEMO Final EIS).

Threats

The primary threat is loss of habitat and fragmentation of habitat into segments too small to support a viable population in the long term. LeConte's thrashers are sensitive to vehicle traffic during the nesting season, especially off road travel in washes.

Bell's Vireo (Least Subspecies)

The Bell's vireo was not included in the 2005 WEMO Final EIS (BLM 2005), but is considered to potentially occur within the planning area based on recent documentation (Dudek and ICF International 2012) and consultation with BLM biologists. The information presented below is based on the species accounts prepared for the recent March 2012 draft Desert Renewable Energy Conservation Plan baseline biology report (Dudek and ICF International 2012).

Life History

Bell's vireo is a neotropical migrant that breeds in the summer in riparian scrub. This species is largely associated with early successional cottonwood-willow and are known to nest in riparian woodlands dominated by willow (Peterson and others 2004) and Fremont cottonwood (Kus 2002b). Suitable willow woodlands are typically dense with well-defined vegetative strata or layers. The most critical structural component of nesting habitat in California is a dense shrub layer 2 to 10 feet aboveground (Goldwasser 1981; Franzreb 1989; Brown 1993). The presence of water, including ponded surface water or moist soil conditions, may be an important component of nesting habitat (Rosenberg and others 1991). Bell's vireo may forage in scrub or chaparral habitat near nesting habitat (USFWS 1986b).

Breeding least Bell's vireos begin arriving on their breeding grounds in late March and begin nesting in early April (Kus 2002a). Individuals may remain on the breeding grounds into early October, but nesting is typically finished by the end of July (Kus 1999).

Little is known about the migratory routes of this species. Individuals leave the northernmost breeding grounds by August or September (Barlow 1962). Most have left the United States by early October, although some may remain in the LCR Valley until late November (Brown 1993). During spring migration, adults return to their breeding grounds in early to mid-March and reach the northern limits of the breeding range in May (Brown 1993; Kus 1999). Home range and movement during the breeding season is limited to areas within dense riparian corridors.

Population Status in the Planning Area

There are multiple historical occurrences of least Bell's vireo in Inyo County in the northern portion of the planning area, and in the southern portion of the planning area adjacent to the western boundary of Joshua Tree National Park. Recent occurrence records of least Bell's vireo in the planning area in the following areas: near Lancaster and Palmdale, north of Hesperia, north of Victorville, and southwest of Yucca Valley (CDFW 2012b; Dudek 2011).

Within the planning area, the CNDDB identifies approximately 1,469 acres of element occurrences for this species on BLM lands (Figure 3.4-42). The amount of acres identified within each subregion is detailed above in Table 3.4-3.

Regulatory Status

The least Bell's vireo is both Federally listed and California state listed as endangered. Bell's Vireo is also listed as a Bird of Conservation Concern by the USFWS within the Mojave Desert Bird Conservation Regions (USFWS 2008a). Critical habitat is not found within the study area for this species.

Threats

Historical loss of riparian habitat due to agricultural practices, urbanization, off-road vehicular activity, and exotic plant invasion has contributed to decline of the species (USFWS 2006a, Wildlife Action Plan Team 2006). Loss of breeding habitat due to water source alteration (e.g., channelization, urbanization, and firewood cutting) also threatens the species. In addition, nest parasitism by the brown-headed cowbird has greatly reduced nest success throughout most of its breeding range and has been suggested as a primary cause for decline throughout California. In urbanized areas, where habitat is fragmented and breeding habitat lacks buffers, nest predation may also increase due to meso-predator release and the addition of non-native predators such as domestic or feral cats (USFWS 2006a). The Argentine ant (*Linepithema humile*) also has been noted as a potential nest predator (Peterson and others 2004).

Swainson's Hawk

The Swainson's hawk was not included in the 2005 WEMO Final EIS (BLM 2005), but is considered to potentially occur within the planning area based on recent documentation (Dudek and ICF International 2012) and consultation with BLM biologists. The information presented below is based on the species accounts prepared for the recent March 2012 draft Desert Renewable Energy Conservation Plan baseline biology report (Dudek and ICF International 2012).

Life History

Swainson's hawks are primarily a grassland bird but they are also found in sparse shrubland and open woodlands (England and others 1997). In Central California Swainson's hawks are primarily associated with grain and hay croplands that mimic native grasslands with respect to prey density and availability (Estep 1989, Babcock 1995). They generally nest in isolated trees, narrow bands of vegetation, or along riparian corridors in grassland, shrubland, and agricultural landscapes. Historically, Swainson's hawks nested in small willows or aspens remnant from wildfire or bison grazing, or in riparian areas (especially in California). Within the planning area, Joshua trees and non-native ornamental trees or trees planted as windbreaks also function as nest sites (CEC and CDFW 2010).

Swainson's hawks arrive on the breeding grounds in March in Central California (Fitzner 1980). Young generally fledge mid-July to mid-August at an average age of 43 days (Olendorff 1973, Fitzner 1980, Woodbridge 1987).

Migratory movements occur annually between North American breeding grounds and wintering areas primarily located in South America, although some Swainson's hawks use wintering grounds in California and Mexico (Fuller and others 1998, England and others 1997, Wheeler 2003, Bradbury unpublished data). Immature birds and post-breeding adults begin forming migration flocks in August and September, and begin the fall migration in September. Birds migrating to South America leave North America by October and arrive in Argentina in November (England

and others 1997). The return migration begins late-February and early March in Argentina (England and others 1997), with birds arriving in California from early March (Central Valley) through April (other California populations).

Population Status in the Planning Area

There are multiple historical occurrence records in the planning area located east of Lancaster, north of Fremont Wash and east of SR 395 (CDFW 2012b; Dudek 2011). Recent Swainson's hawk breeding populations inside the planning area have occurred in the Antelope Valley and Owens River Valley. The vast majority of these occurrences are clustered in the western Mojave region along the base of the San Gabriel and Tehachapi mountain ranges and in Antelope Valley. Scattered occurrences are located in the Fremont Valley and the Ridgecrest/China Lake Naval Air Weapons Station.

Known distribution data for Swainson's hawks within the WEMO Planning area is depicted in Figure 3.4-43. Within the planning area, the CNDDB identifies approximately 69 acres of element occurrences for this species on BLM lands within the Sierra subregion (Table 3.4-3).

Regulatory Status

The Swainson's hawk is California state listed as threatened and is also listed as a Bird of Conservation Concern by the USFWS within the Mojave Desert Bird Conservation Regions (USFWS 2008a).

Threats

Threats to this species include historical loss of riparian habitat due to agricultural practices, urbanization, and contracting range of Joshua trees and riparian habitats in the Mojave Desert (Bloom 1980). Chronic and acute pesticide poisoning also affects the Swainson's hawk (Goldstein et al. 1996, Risebrough et al. 1989).

3.4.3.2.3 Reptiles

Desert Tortoise

The information from the 2005 WEMO Final EIS (BLM 2005)is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012). All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.2, pp. 3-69 to 3-144 of the 2005 WEMO Final EIS.

Life History

The desert tortoise can be found in a wide variety of habitats, such as alluvial fans, washes, canyons, and saltbush plains (Coachella Valley Conservation Commission 2007; Woodbury and Hardy 1948; Lovich and Daniels 2000; USFWS 1994). Occupied habitat for populations in the Western Mojave Desert includes valleys, bajadas, and hills with sandy loams to rocky substrates (Germano and others 1994). The vegetation mostly consists of low growing sclerophyll shrubs with mostly winter germinating annuals (Germano and others 1994). Whereas most tortoises in the Mojave Desert are usually associated with creosote bush (*Larrea tridentata*) scrub on alluvial fans

and bajadas (USFWS 2008), they can also be found in Saltbush scrub (*Atriplex* spp.) (Stewart 1991) and even in some man-made structures, such as artillery mounds (Baxter 1988).

The presence of shrubs in tortoise habitat is extremely important. Shrubs not only supply shade for the tortoises during hot weather (Marlow 1979), but also the roots provide support and protection for tortoise burrows. For instance, near Twentynine Palms, California, 71% of desert tortoise burrows were associated with creosote bush, and desert tortoises avoided the only community without creosote bush (Baxter 1988). However, other investigators found that burrows were not significantly closer to creosote bush than random sites in areas with vegetation representing both Mojave and Sonoran affinities. Burrows were significantly farther from yucca (*Yucca* spp.) than random sites (Lovich and Daniels 2000). In still another case, burrows were associated with Mojave yucca (*Yucca schidigera*) and catclaw acacia (*Acacia greggii*) even though these species were not particularly abundant (Burge 1978). Wilson and others (1999) found that most juvenile burrows were associated with shrubs. These studies point out that utilization of shrubs varies with the location of the study site; nevertheless, shrubs provide important resources for the desert tortoise.

Several studies have also shown that edaphic (soil) conditions are important for desert tortoises. Tortoises spend up to 98% of their lives underground (Nagy and Medica 1986). Where soils are so sandy that they cannot support the roof of a burrow, tortoises are unlikely to utilize the area (Baxter 1988). In a multivariate analysis of tortoise abundance criteria, Weinstein and others (1986) indicated that "soil digability" is a significant regression variable (i.e., this variable accounted for a significant amount of the variance in habitat use). Conversely, if a caliche horizon (a hardened deposit of calcium carbonate) is present, it may be so hard that tortoises cannot successfully burrow under it. For instance, at the Twentynine Palms Marine base, Baxter (1988) found that every "tank pit" supported tortoise burrows, most often located just under the hardpan.

Desert tortoises are herbivores, and wildflowers, grasses, and in some cases, cacti make up the bulk of their diet (USFWS 2010e; Woodbury and Hardy 1948). Some of the more common herbaceous species utilized by the desert tortoise include desert dandelion (*Malacothrix glabrata*), primrose (*Oenothera* spp.), gilia (*Gilia* spp.), showy desert- marigold, and filaree. Additionally, tortoises may eat some grasses, such as Indian rice grass (*Oryzopsis hymenoides*) or galleta grass (*Hilaria rigida*), although the nutritional value may be less. Also, tortoises are known to eat some cacti such as prickly pear (*Opuntia mohavensis*), beavertail (*Opuntia basilaris*), and various cholla cacti (*Opuntia* spp.). Spring desert annuals and grasses are particularly important in that they supply tortoises with much needed water (USFWS 2010e), which can be stored by desert tortoises for long periods of time (Marlow 1979; Woodbury and Hardy 1948). In Twentynine Palms, California, desert tortoises were found in plant communities with high plant species diversity, such as washes and ecotones between communities (Baxter 1988). Although tortoises were captured more frequently in the diverse wash community—significantly more than expected based on a random distribution—this could be a result of higher visibility to the surveyors in these areas. Nevertheless, their burrows were also significantly closer to ecotones than a set of random points. The use of these high plant diversity areas may therefore be related to increased food availability or possibly the nature of the annual herbs found in these areas.

In addition to the description of tortoise activity presented in the 2005 WEMO Final EIS (BLM 2005) (3.3.2.3, pp. 3-73 to 3-74), tortoise activity is focused on its home range and is primarily determined by temperature (USFWS 1994). Nevertheless, some relocated tortoises have moved significant distances from their release point, including crossing major highways (Stewart 1991).

Duda and others (1999) found that tortoise home ranges tend to shrink during periods of drought compared to years of high rains. Following winter hibernation, tortoises become active as low temperatures abate in the spring months. During the spring, tortoises are active throughout the day, foraging on the fresh shoots of annual plants. But as the heat continues to increase into the summer months, tortoises are active only in the cooler morning, late afternoon, and evening hours. During the hot daytime temperatures, tortoises retreat to burrows to wait it out or, in some cases, will aestivate through the summer.

In addition to the description of tortoise activity presented in the 2005 WEMO Final EIS (BLM 2005) (3.3.2.3, pp. 3-75 to 3-76), the desert tortoise breeds in the late summer and fall, before going into hibernation for the winter. Males will "joust" to establish loosely defined home ranges, but these can overlap and are not exclusive. Home range size can vary dramatically, from 10 to over 450 acres (USFWS 1994). Females begin breeding at about 15 to 20 years of age, and will store the male's sperm (Gist and Fisher 1993; Turner and Berry 1984). Egg laying occurs in the spring, but occasionally may also take place in the fall. Incubation is typically about 100 days, with the eggs hatching in the late summer and early fall. There is little or no parental care of the nest or the young. The sex of the offspring is determined by the incubation temperature; females being hatched at higher ground temperatures (above 89°F) while males are hatched below this temperature (Spotila and others 1994). Desert tortoises can produce from one to three clutches of eggs per year. On rare occasions, clutches can contain up to 15 eggs; most clutches contain 3 to 7 eggs, with an average clutch size of 4.5 eggs (Turner and others 1984, 1986).

The desert tortoise is a primary consumer; that is, they feed on plants. As such, they compete for vegetation resources with other primary consumers, such as the desert iguana, Gambel's quail, mourning dove (*Zenaida macroura*), pronghorn antelope, and domestic cattle (*Bos taurus*). Adult tortoises are preyed on by few other animals; however, some may be taken by coyote and kit fox. Young tortoises are routinely preyed upon by kit fox and common raven.

Desert tortoise burrows supply important shade and thermoregulatory resources for a variety of species, including many species of snakes, insects and spiders, and small mammals.

Population Status in the Planning Area

It is anticipated that the desert tortoise will occur throughout the planning area, although its abundance may vary locally due to habitat characteristics, including anthropocentric disturbances. In addition to the information detailed in Section 3.3.2.4 (Subsections 3.3.2.4.1 to 3.3.2.4.2), pp. 3-76 to 3-91, historical information for the Mojave population densities or abundance does not exist to provide a baseline for population trends (USFWS 2008e). Long-term study plots and other studies, however, suggest "appreciable declines" at the local level in many areas, and that the identified downward trend of the species in the western portion of the range at the time of the federal listing as threatened in 1990 was valid and is ongoing (USFWS 2008e). Results of studies in other parts of the Mojave population's range also are inconclusive, but suggest that declines are broadly distributed across the desert tortoise's Mojave Desert range (USFWS 2008e). In addition, specific management actions over a 23-year monitoring program have not demonstrated a substantial positive effect on populations, although the life history of the species (i.e., delayed reproductive maturity, low reproductive rates, and relatively high mortality early in life) is such that rapid increases in populations are unlikely to be observed (USFWS 2008e). The population of desert tortoise in the West Mojave Recovery Unit, which encompasses the WEMO planning area, shows a downward trend. See *Status of the Desert Tortoise and Critical Habitat*,

http://www.fws.gov/nevada/desert_tortoise/documents/misc/status-desert-tortoise.pdf posted 02/10/2014.

Approximately 983,258 acres of designated Critical Habitat exists within the planning area (Table 3.4-8 and Figure 3.4-44).

Table 3.4-8. Acres of Desert Tortoise Designated Critical Habitat on BLM Lands within the WEMO Planning Area per Subregion

Subregion	Subregion Abbreviation	Sum of Acres
Afton Canyon	AC	2.2
Barstow	BA	639.0
Black Mountain	BM	91742.6
Calico Mountains	CM	29131.7
Coolgardie	CG	81478.2
Cronese Lake	CL	81754.0
El Mirage	EM	26933.8
El Paso	EP	67.8
Fremont Peak	FP	72849.4
Harper Lake	HL	27275.0
Iron Mountain	IM	8499.9
Johnson Valley	JV	4953.3
Joshua Tree	JT	102680.3
Kramer Hills	KH	65661.5
Lancaster	LA	1369.1
Mitchel Mountains	MM	13925.4
NA[1]	NA	667.8
Needles South	NE	1197.2
Newberry/Rodman	NR	101325.6
Ord Mountains	OM	106574.2
Rands	RA	52676.2
Red Mountain	RM	111357.0
Stoddard Valley	SV	0.2
Victorville	VV	497.2
Total		**983258.4**

[1]NA = BLM lands outside designated subregion boundaries within the WEMO planning area.

Additionally, DWMAs located within the planning area will be used to analyze potential effects to the desert tortoise. The planning area includes approximately 1,045,702 acres of DWMAs (Table 3.4-9 and Figure 3.4-44).

Table 3.4-9. Acres of Desert Tortoise DWMA Habitat on BLM Lands within the WEMO Planning Area per Subregion

Subregion	Subregion Abbreviation	DWMA Name	Sum of Acres
Afton Canyon	AC	Superior-Cronese DWMA	2.2
Barstow	BA	Ord-Rodman DWMA	653.8
		Superior-Cronese DWMA	0.0
Broadwell Lake	BL	Pinto Mountains DWMA	346.2
Joshua Tree	JT	Pinto Mountains DWMA	109,092.0
Wonder Valley	WV	Pinto Mountains DWMA	2.1
Lancaster	LA	Fremont-Kramer DWMA	1,365.9
Black Mountain	BM	Fremont-Kramer DWMA	856.1
		Superior-Cronese DWMA	90,886.4
Calico Mountains	CM	Superior-Cronese DWMA	29,330.8
Coolgardie	CG	Superior-Cronese DWMA	81,502.8
Cronese Lake	CL	Superior-Cronese DWMA	81,655.7
Fremont Peak	FP	Fremont-Kramer DWMA	70,793.6
		Superior-Cronese DWMA	2,063.7
Harper Lake	HL	Fremont-Kramer DWMA	403.8
		Superior-Cronese DWMA	40,718.5
Mitchel Mountains	MM	Superior-Cronese DWMA	13,892.9
El Mirage	EM	Fremont-Kramer DWMA	30,069.9
Iron Mountain	IM	Fremont-Kramer DWMA	8,482.0
		Superior-Cronese DWMA	11,230.5
Kramer Hills	KH	Fremont-Kramer DWMA	65,659.7
Victorville	VV	Fremont-Kramer DWMA	394.2
El Paso	EP	Fremont-Kramer DWMA	0.1
Rands	RA	Fremont-Kramer DWMA	73,736.9
Red Mountain	RM	Fremont-Kramer DWMA	60,442.6
		Superior-Cronese DWMA	54,216.8
Ridgecrest	RI	Fremont-Kramer DWMA	2.3
Johnson Valley	JV	Ord-Rodman DWMA	168.3
Newberry/Rodman	NR	Ord-Rodman DWMA	101,453.8
Ord Mountains	OM	Ord-Rodman DWMA	116,278.0
Stoddard Valley	SV	Ord-Rodman DWMA	0.2
Total			**1,045,701.7**

The BLM, with assistance from the Desert Tortoise Preserve Committee, established the Desert Tortoise Natural Area (DTNA) in 1976. The DTNA is managed to protect this unique habitat in its natural state, free from conflict with other land uses. Located in the western Mojave Desert in northeastern Kern County, the DTNA was designated as an ACEC in 1980 through the California

Desert Conservation Area Plan. The total area encompasses over 25,000 acres of public land. Approximately 22,216 acres of the DTNA ACEC are located within the Rands subregion of the planning area (Figure 3.4-44). It has one of the highest known densities of desert tortoises per square mile in the species' geographic range (California, Utah, Nevada, Arizona and northwest Mexico). Tortoise populations are from 100 to 200 per square mile in some parts of the DTNA.

Regulatory Status

The information from the 2005 WEMO Final EIS (BLM 2005) (Section 3.3.2.1, pg. 3-69), is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012).

The Agassizi's desert tortoise (*Gopherus agassizii*) (hereafter simply referred to as desert tortoise) is both a California state- and Federally listed threatened species. Critical habitat for desert tortoise was first designated for the Beaver Dam Slope (Utah) population in 1980 (45 FR 55654–55666). An initial recovery plan for the Mojave population of the desert tortoise was completed in 1994 (USFWS 1994). A revised draft recovery plan was completed in 2008 (USFWS 2008e) and finalized in 2011 (USFWS 2011).

Under the 2011 Recovery Plan (USFWS 2011), a revision of the desert tortoise recovery units was made reducing the initial six units to five based on recent genetic work (Murphy and others 2007; Hagerty and Tracy 2007). The principal changes are results of combining and expanding the previous northern Colorado and eastern Colorado units into one (i.e., Colorado Recovery Unit), a contraction of the Eastern Mojave Recovery Unit, an appurtenant expansion of the Northeastern Recovery Unit, and a contraction of the southern extreme of the Western Mohave Recovery Unit in the vicinity of the Coachella Valley.

Threats

Threats to desert tortoises within the WEMO Planning Area have not changed from the previous analysis provided by the 2005 WEMO Final EIS (BLM 2005) and associated 2006 Biological Opinion, except as discussed herein. For a discussion of these threats, please refer to the 2006 Biological Opinion in Appendix F.

Mojave Fringe-toed Lizard

The information from the 2005 WEMO Final EIS (BLM 2005)is supplemented by the following updated information from the DRECP Baseline Biology Report (March 2012). All other background information for this species would not change from the previous analysis included in the affected environment of the 2005 WEMO Final EIS (BLM 2005) and is not discussed further in this supplemental EIS. For a general discussion of these species, please refer to Section 3.3.7.1, pp. 3-182 to 3-183 of the 2005 WEMO Final EIS.

Life History

The Mojave fringe-toed lizard is best described as an opportunistic omnivore. They feed primarily on sand-dwelling insects, but will also feed on the flowers, leaves, and seeds of annual plants (Jarvis 2009). Juvenile Mojave fringe-toed lizards feed primarily on arthropods including ants, beetles, and scorpions. As is seen in many reptiles that live in arid environments, these lizards obtain most of their water from the insects and plants that they ingest (76 FR 61321–61330).

Mating typically occurs between April and late June (76 FR 61321–61330). Reproductive activity is highly dependent on the availability of sand-dwelling plants that grow in response to winter (October–March) rainfall (76 FR 61321–61330). Clutch size ranges from two to five eggs, but average two or three eggs (Miller and Stebbins 1964). During years with low rainfall females produce smaller clutch sizes, or none at all. Conversely, they may have multiple clutches in years with abundant rainfall (76 FR 61321–61330).

Mojave fringe-toed lizards are most active from late spring through early fall, when they are active during the hotter periods of the day. They seek refuge in burrows or under the sand when daytime surface temperatures start to exceed 49°C (120°F).

Population Status in the Planning Area

The Mojave fringe-toed lizard is known to occur at more than 35 sand dune complexes in California and one in Arizona, all of which are naturally occurring within the species' historical range (76 FR 61321–61330; Norris 1958).

Historically, this species was known to occur throughout the windblown sand areas in the following counties within the planning area: southern Inyo, San Bernardino, northern Los Angeles, and eastern Riverside. Within these counties, this species was known to occur within the present and historical river drainages and associated sand fields of the Mojave, Amargosa, and Colorado rivers (Jarvis 2009).

Since 2006, Mojave fringe-toed lizards have been found in locations within the Amargosa River drainage that did not have any historical occurrence records. As described above, this species is currently found within more than 35 named and unnamed sand dune complexes within the three major river drainages in the planning area:, Mojave, and. Norris (1958) described 31 dune complexes. However, a more recent paper by Murphy and others (2006) documents the extirpation of the species at four sites where they were previously reported (i.e., Harper and El Mirage dry lakes, Piute Butte, and Lovejoy Buttes).

Within the planning area, the CNDDB identifies approximately 25,492 acres of element occurrences for this species on BLM lands (Figure 3.4-45). The amount of acres identified within each subregion is detailed above in Table 3.4-3. In addition, approximately 22,161 acres has been designated as the Mojave Fringe-toed Lizard ACEC to protect the plant (Figure 3.4-45). The amount of Mojave Fringe-toed Lizard ACEC acres identified within each subregion is detailed in Table 3.4-10.

Table 3.4-10. Acres of Mojave Fringe-toed Lizard ACEC Occurrence within the WEMO Planning Area per Subregion

Subregion	Subregion Abbreviation	Sum of Acres
Afton Canyon	AC	4,173.0
Barstow	BA	3,337.1
Broadwell Lake	BL	12,013.0
Joshua Tree	JT	1,417.9
Wonder Valley	WV	1,220.1
Total		**22,161.1**

Spring field surveys were conducted in 2012 and 2013 on eight parcels within the Mojave fringe-toed lizard Area of Critical Environmental Concern (ACEC) within the WEMO Planning Area. The latest of these surveys was conducted between May 8 and May 31, 2013. The eight parcels are located in five geographic areas (Yermo-3 parcels, Manix-3 parcels, Rasor, and Twentynine Palms). The survey results for 2012 and 2013 are listed in Table 3.4-11.

Table 3.4-11. Comparison of Mojave Fringe-toed Lizard 2012 and 2013 Survey Transects and Detections for Parcels of Land Located within the Mojave Fringe-toed Lizard ACEC

Location	2012 Number of Transects	2013 Number of Transects	2012 Number of Detections	2013 Number of Detections
Yermo 1	4	5	3	0
Yermo 2	2	2	0	0
Yermo 3	4	1	3	1
Manix 1	0	1	n/a	0
Manix 2	0	1	n/a	0
Manix 3	0	5	n/a	2
Rasor	0	1	n/a	0
Twentynine Palms	0	5	n/a	4

Mojave fringe-toed lizards were encountered at four of the eight parcels in one or both years. Mojave fringe-toed lizards were not detected at Yermo Parcel 2 in 2012 or 2013. Three other parcels were not surveyed in 2012 and had no detections in 2013. In all, 16 Mojave fringe-toed lizards and 25 Zebra tailed lizards were detected on the sites during the two survey periods. In addition, seven Mojave fringe-toed lizards were encountered off transect during surveys of the ACEC parcels.

Four other parcels of potential Mojave fringe-toed lizard habitat were surveyed for presence/absence in spring, 2013 (Table 3.4-12). These sites were identified as potential habitat locations by United States Fish and Wildlife Service (USFWS) as part of their 2012 Mojave fringe-toed lizard Endangered Species Act listing decision. Two (Edwards North and Cuddeback Dry Lake Bed) of the four parcels did not contain suitable habitat for the Mojave fringe-toed lizard. Big Rock Creek Wash and Piute Butte parcels contained suitable habitat, but no Mojave fringe-toed lizards or sign were observed (Table 3.4-12).

Table 3.4-12. 2013 Surveys for Mojave Fringe-Toed Lizards in Potentially Suitable Habitat in the WEMO Planning Area

Location	Description	Results
Edwards North	An isolated 112-acre parcel along CA-58 and the northern boundary of Edwards Air Force Base that was identified by USFWS.	Approximately 12.5 acres were surveyed at this location on the morning of May 31, 2013, and no suitable habitat was found. The area consists of creosote and salt bush assemblage dispersed between unvegetated compacted soil flats, which could potentially resemble dunes from aerial imagery.
Cuddeback Dry Lake Bed	Approximately 2,200 acres along the northern and eastern edges of Cuddeback Dry Lake was identified as potential habitat by USFWS.	Approximately 25 acres were surveyed at this location on the morning of May 31, 2013, and no suitable habitat was found. The area consists of largely salt bush scrub assemblages adjacent to barren playa, with no low-compaction wind-blown sand deposits.
Big Rock Creek Wash	Big Rock Creek Wash is a highly diverse wash extending 20 miles north from the San Bernardino National Forest. USFWS designated approximately 8 miles of the wash as potential Mojave fringe-toed lizard habitat as it is within close proximity to extirpated sites such as Saddleback Butte State Park to the northeast, and BLM manages a 300 acre parcel adjacent to the wash.	Approximately 10 acres were surveyed on the morning of June 6, 2013, however no Mojave fringe-toed lizards or significant sign was observed. The wash is composed of granitic fluvial sands, interspersed with gravel and rocks, and is not composed of the loose Aeolian sand deposits required for Mojave fringe-toed lizard occupancy.
Piute Butte	A 250 acre parcel on Piute Butte, directly adjacent to the Antelope Valley Indian Museum, which was designated as extirpated for Mojave fringe-toed lizard by USFWS. This site contains ideal dune and blow-up habitat; however, the lizards have most likely become locally extirpated due to environment conditions due to successive years of intense drought.	Approximately 12 acres were surveyed around the edge of the parcel on the morning of June 6, 2013, and no Mojave fringe-toed lizards or sign was observed.

Regulatory Status

The regulatory status for the Mojave fringe-toed lizard has been updated from the 2005 WEMO Final EIS (BLM 2005) to include BLM Sensitive in addition to the California Species of Special Concern status (as described in Section 3.3.7.1, pg. 3-182 of the 2005 WEMO Final EIS (BLM 2005).

Threats

Threats to the Mojave fringe-toed lizard would not change from the previous analysis provided by the 2005 WEMO Final EIS (BLM 2005) within the planning area. For a discussion of these threats, please refer to Section 3.3.7.1, pp. 3-182 to 3-183.

Northern Sagebrush Lizard

Life History

The sagebrush lizard occurs in a wide variety of open forest and shrub habitat types and utilizes mammal burrows and rock crevices as hibernation sites during cold periods (Zeiner, D.C. et al 1988-1990). Individuals are active from March or April to late September or early October (Zeiner, D.C. et al 1988-1990). The reproductive season usually extends from late May to July (Zeiner, D.C. et al 1988-1990). Egg-laying usually occurs in June or July (Stebbins 1954) with newly emergent hatchlings observed from mid-August to late September (Zeiner, D.C. et al 1988-1990).

Population Status in the Planning Area

This species is widely distributed in montane chaparral, hardwood and conifer habitats, eastside pine and juniper habitats, and Great Basin shrub habitats of the Cascades and Sierra Nevada, and also east of the Sierra-Cascade crest in northern California (Zeiner, D.C. et al 1988-1990). Isolated populations exist at Sutter Buttes in the Sacramento Valley, in the Coast Ranges along the entire length of the state, in the mountains of southern California, and in the desert mountains of Inyo County. Elevation: 900-3200 m (3000-10,400 ft) (Zeiner, D.C. et al 1988-1990).

Known distribution data for the sagebrush lizard within the WEMO Planning area is depicted in Figure 3.4-46. Within the planning area, the CNDDB identifies approximately 10 acres of element occurrences for this species on BLM lands within the Sierra subregion (Table 3.4-3).

Regulatory Status

The sagebrush lizard is a BLM Sensitive species.

Threats

Threats to this species have not been identified for the planning area, but would most likely be similar to those described for the Mojave fringe-toed lizard including loss of habitat, an increases in local predator (i.e., common ravens), and OHV activities.

3.5 Socioeconomics and Environmental Justice

Within the WEMO Planning area, BLM is the steward of a variety of resources of economic and social importance to the community, including: mineral resources; renewable energy resources; locations that are amenable to be used as communication sites; recreation areas; and biological, cultural, wilderness, and other values which attract tourists to the area. Each of these resources, in turn, has the potential to affect, or be affected by, the area's travel management network. Increase in economic activity associated with any of these resources could result in increasing access needs, as well as increased pressure towards route proliferation. This socioeconomic analysis focuses on how use of these resources in the planning area is changing, and the effect that those changes are expected to have on future access needs.

3.5.1 Regional Economic Profile

The following information pertaining to existing economic and demographic conditions in the planning area is excerpted from the Socio-Economic Analysis developed for the 2005 WEMO Final EIS prepared by Alfred Gobar and Associates. Those data have been supplemented by being revised to reflect updated U.S. Census Bureau data, and additional discussion focusing on the role of access has been added. The complete socio-economic technical report is contained in Appendix N of the 2005 WEMO Final EIS. In addition, the presentation of the information in this section has been revised from that previously provided in the 2005 WEMO Final EIS by being focused on the role of access.

Encompassing nearly 9.4 million acres, the planning area is a substantial geographic region. This large study area includes over 974,000 residents per 2008-2012 ACS data, and encompasses portions of five separate counties. Motor vehicle access through such a large area is key to providing regional connectivity in such a dispersed area. The vast majority of travel is funneled to key arterial Interstates, highways and County roads, but access drives connectivity and commerce through all parts of the planning area, both for area residents and for all of Southern California.

In totality, the West Mojave's existing population base is significant, but also widely dispersed in scattered concentrations ranging from as few as less than 30,000 residents in the Barstow and Ridgecrest areas to more than 300,000 in the Palmdale-Lancaster area of Los Angeles County and the Victor Valley area of San Bernardino County. Given the large geographic area and widely dispersed population, motorized vehicle access is the key to maintaining regional connectivity across the area. The vast majority of motorized vehicle travel in the area is based on funneling traffic from dispersed areas into a few major arteries including interstate highways, State highways, and County roads. The planning area services this burgeoning, but widely dispersed, population that has, and uses the high desert as its recreational backyard.

Regional Environment

The WEMO planning area is also situated along the periphery of Southern California and its huge metropolitan population and employment base. Overall economic growth and trends throughout the WEMO Planning area are still greatly influenced and driven by growth and economic trends associated with the larger economic region of Southern California. The six-county Southern California region (Los Angeles, Orange, San Diego, San Bernardino, Riverside, and Ventura counties) had 21 million residents and 11 million nonagricultural wage and salary jobs in 2010.

A large number of workers residing in outlying areas, including the West Mojave planning area, commute to jobs in the more developed regions of Southern California because of the high volume of employment opportunities. Growth in employment throughout Southern California is one of the principal factors driving demand for living in outlying sub-regions, such as the West Mojave. Recent census data from 2010 strongly suggest that population and housing growth throughout the West Mojave was substantially concentrated within cities and unincorporated enclaves located closest to the major employment centers of Southern California. As a result, the WEMO Planning area population base has not been considered a self-generating economy even though certain industries such as aerospace, mining, military and government operations have long provided local employment to area residents.

This is rapidly changing. In 2000, about one in five workers residing in cities throughout the West Mojave commuted at least 60 minutes each way to work. In 2010, the average commute time in cities throughout the West Mojave was 29.5 minutes. The rapid growth of high desert cities has created an economy that is sustaining itself, but still relies to a large extent on the influx of dollars from other Southern California areas.

The planning area provides the major connecting corridor between the Southern California area and two other key metro areas—the Las Vegas metro area and the Central Valley of California. Recreation-, service- and tourism-sector jobs in the planning area are largely influenced by the economic conditions in Southern California and these other metro areas. Other jobs in the high desert continue to service these metro populations, such as energy generation and transmission, and mining.

Between 1980 and 2010 nonagricultural employment in Southern California grew 88.0 percent from 5.85 million jobs in 1980 to 11.0 million in 2010, outpacing the national growth rate. U.S Growth nonagricultural employment growth over this same time period was 58.0 percent. Aggregate employment has grown at a slower rate in absolute and relative terms since 1990 as a result of significant job losses during the early 90's. The overall slower pace of employment growth is indicative of broader trends describing the outlook of future economic growth in the region.

Regional Trends in Population and Employment

A wide variety of socioeconomic factors can be evaluated with regards to growth trends, but changes in population, employment, and housing tend to reflect principal drivers of urbanization and associated economic activity, and these in turn affect and are affected by the transportation network.

Total population within the six-county region of Southern California, plus Kern County, grew by 8.0 million residents over the 30-year period from 13.8 million residents in 1980 to 21.8 million residents in 2010. The resident population of Inyo County has remained relatively static since 1980 (about 18,000 residents) and is not explicitly evaluated in relation to regional trends since it hosts roughly 600 residents, or less than 0.1 percent of the WEMO population.

The total population throughout Southern California grew at an average annual rate of 1.93 percent. Los Angeles County continues to account for the largest share of the population in Southern California. The pattern of growth, however, is shifting and outlying sub-regions are capturing a greater share of total growth. Since 1980, outlying counties such as Riverside, San Bernardino, and Kern County have steadily increased their respective share of total population.

As shown in Table 3.5-1, nonagricultural employment trends since 1970 has followed population growth in the planning area. Agriculture (including grazing activities) and mining have a long history in the WEMO Planning area, but account for less than 1 percent of current employment opportunities. Non-agricultural employment correlates better than total employment with household formation, associated housing demand, and population growth since a large segment of agricultural employment is transient and seasonal with limited capacity to occupy market rate housing. Non-agricultural employment growth will constitute a principal force driving future housing growth and urbanization in the WEMO Planning area. Employment directly associated with recreation accounts for about 2 percent of total service-based employment, but is growing. Accommodation and food services are a much larger proportion of total service-based employment, and are increasing at a faster rate than other sectors. While most of the services employment is expected to support the local population and through travelers, some proportion of it is also related to recreation and motorized vehicle access on public lands in the West Mojave, which accounts for about 1 percent of current employment opportunities or about 2,500 jobs in the area.

Factors that augment the current employment base of the WEMO Planning area include a higher proportion of service and trade sector jobs (consistent with rural and emerging growth areas). The WEMO Planning area also has a moderately higher mix of government jobs, reflecting the historical role of federal and state agencies in the region. The manufacturing base within the WEMO Planning area is significantly underrepresented by comparison to the broader Southern California economy.

Table 3.5-1. WEMO Planning Area Employment Since 1970

Sector	1970	1980	1990	2000	2011	Change 1970-2011 (%)	Change 1990-2011 (%)
Farm/Agriculture Services	31,611	46,428	42,019	68,182	52,503	66	25
Mining	8,324	14,017	17,009	11,427	15,667	37	-8
Construction	15,924	29,521	58,625	60,851	61,308	282	5
Manufacturing	41,808	49,945	65,849	86,538	65,740	57	-<1
Services	119,657	294,705	470,470	634,888	814,242	580	73
Government	103,363	122,057	160,440	178,983	199,450	93	24

Source: EPS-HDT 2013

Not only is total employment in Southern California slowly increasing, but the outlying areas which comprise the WEMO Planning area are capturing larger shares of the growth. In 1980, Los Angeles County accounted for 62.1 percent of nonagricultural employment throughout the Southern California region, including Kern County. In 2010, Los Angeles County's respective share was down to 47.3 percent. By comparison, San Bernardino County captured an increasing share of employment (from 4.2 percent in 1980 to 7.2 percent in 2010), while the corresponding share for Kern County has remained relatively constant (2.9 percent). Both Riverside and San Bernardino County are commonly recognized as a single metropolitan statistical area (Inland Empire) for purposes of tracking socio-economic trends. On the basis of this definition, the Inland Empire has led Southern California in net employment gains since 1990 (314,400 jobs). As these

trends suggest, the proportionate share of nonagricultural employment growth has been shifting over the 30-year reference period, principally from Los Angeles County to the other six counties. As detailed in Table 3.5-1, a large amount of the nonagricultural employment growth has taken place in the projected area, as is evidenced by the elevated gains in employment over the past decades.

Since the CDCA Plan was approved in 1980, the livestock industry in the California Desert has undergone major decline, especially in the last 10 years. Most of the grazing operations on public land within the planning areas are small family operations. As the permittee or lessee has aged and is less able to run their grazing operation stocking rates have typically declined. Unless a younger family member or partner is capable of maintaining the grazing operation, in addition to stocking rates declining, fewer range improvements are maintained and usually no new range improvements are developed. This trend has been especially hard on the sheep industry. Very few sons or daughters follow in their parent's footsteps and continue family sheep operations. Overall, the AUMs that BLM may annually authorize under good conditions has decreased from its peak of nearly 40,000 AUMs in 1992 to less than 2,000 in 2013.

The cattle and sheep markets have also experienced substantial fluctuations over the past 30 years. These markets have a great deal of influence on family incomes and fluctuations in stocking rates. The overall costs of running a grazing operation has nearly doubled over the past 30 years while market returns have been fairly static along with BLM grazing fees.

Study Area Demographics

The demographic characteristics of the eleven incorporated cities which make up the WEMO Planning area are shown in Table 3.5-2.

The West Mojave extends across large portions of four Southern California counties (Los Angeles, San Bernardino, Kern, and Inyo), which all combined have 12.7 million residents (2010 Census) or nearly 37.2 percent of the Statewide population (34.1 million residents). Demographic characteristics describing an area are most often compared to corresponding characteristics describing a larger geographic setting of which it is a part. Roughly 80 to 90 percent of all residents within Southern California, however, reside in areas that are substantially more developed and urbanized than is the case with the WEMO Planning area.

Typical population densities generally range from roughly 2,500 persons per square mile in growing suburban areas to more than 7,500 persons per square mile in urbanized areas. By comparison, the corresponding population density for the eleven WEMO Planning area cities combined (accounting for 71 percent of the planning area population base) only averages about 865 persons per square mile (726,482 residents in 2010 divided by 840 square miles). The Census Bureau utilizes a minimum threshold of 1,000 persons per square mile to denote an urbanized setting. The WEMO Planning area is more characteristic of a large rural environment. As such, demographic traits that describe the WEMO Planning area reflect distinctly different circumstances than is true for more urbanized portions of Southern California, thereby minimizing the usefulness of direct comparisons. Instead, the State of California, which includes a sizeable rural population, serves as a more appropriate reference for comparing overall distinctions describing WEMO Planning area residents.

Table 3.5-2. 2010 Census Demographic Comparison, Incorporated Cities Within West Mojave Plan Region

Census Variable	Combined Cities	City of Adelanto	Town of Apple Valley	City of Barstow	City of California City	City of Hesperia	City of Lancaster	City of Palmdale	City of Ridgecrest	City of Twentynine Palms	City of Victorville	City of Yucca Valley
Total Population	726,482	31,765	69,135	22,639	14,120	90,173	156,633	152,750	27,616	25,048	115,903	20,700
% Share of Total	100.0%	4.4%	9.5%	3.1%	1.9%	12.4%	21.6%	21.0%	3.8%	3.4%	16.0%	2.9%
Population Growth (1990-2010)	85.1%	273.0%	50.0%	5.4%	137.1%	78.9%	231.2%	121.9%	-0.4%	111.9%	185.0%	51.2%
Families as % of Households	76.6%	84.2%	75.0%	67.0%	70.6%	80.0%	74.4%	82.3%	66.5%	72.2%	79.6%	63.5%
Population in Group Quarters	3.5%	5.5%	0.7%	1.6%	18.5%	0.0%	5.3%	0.1%	0.3%	13.4%	4.4%	1.1%
Average Household Size	3.1	3.8	2.9	2.8	2.8	3.4	3.2	3.6	2.5	2.7	3.4	2.5
Housing by Tenure Owner-Occupied	62.4%	57.8%	69.1%	49.0%	60.3%	66.9%	60.4%	67.9%	60.5%	33.9%	61.8%	63.5%
Renter-Occupied	37.6%	42.2%	30.9%	51.0%	39.7%	33.1%	39.6%	32.1%	39.5%	66.1%	38.2%	36.5%
Unit Vacancy	10.3%	14.0%	9.6%	15.4%	21.3%	8.9%	9.3%	7.7%	9.5%	14.2%	11.2%	13.4%
Median Housing Value	$178,745	$118,500	$230,300	$123,300	$145,100	$193,700	$214,800	$227,300	$191,100	$166,300	$172,500	$183,300
Median Rent	$970	$1,034	$986	$782	$878	$1,067	$1,113	$1,130	$777	$927	$1,091	$888

Table 3.5-2. 2010 Census Demographic Comparison, Incorporated Cities Within West Mojave Plan Region

Census Variable	Combined Cities	City of Adelanto	Town of Apple Valley	City of Barstow	City of California City	City of Hesperia	City of Lancaster	City of Palmdale	City of Ridgecrest	City of Twentynine Palms	City of Victorville	City of Yucca Valley
Median Household Income	$49,935	$42,208	$50,664	$45,417	$53,768	$48,624	$52,290	$55,213	$59,830	$43,412	$52,357	$45,502
Workforce Characteristics Workers per 1,000 Population*	418	304	418	441	413	412	412	430	498	566	394	416
Occupation (Age 16+) White Collar*	69.0%	63.1%	70.3%	68.3%	69.0%	65.4%	70.7%	69.4%	73.1%	70.1%	67.9%	68.9%
Blue Collar	31.0%	36.9%	29.7%	31.7%	31.0%	34.6%	29.3%	30.6%	26.9%	29.9%	32.1%	31.1%
Average Commute Time	29.5	38.6	29.8	24.3	32.6	39	30.7	40.1	14.3	14	34.5	26.3

*2000 Census
Source: Alfred Gobar Associates; U.S. Bureau of the Census.

The West Mojave extends across large portions of four Southern California counties (Los Angeles, San Bernardino, Kern, and Inyo), which all combined have 12.7 million residents (2010 Census) or nearly 37.2 percent of the Statewide population (34.1 million residents). Demographic characteristics describing an area are most often compared to corresponding characteristics describing a larger geographic setting of which it is a part. Roughly 80 to 90 percent of all residents within Southern California, however, reside in areas that are substantially more developed and urbanized than is the case with the WEMO Planning area. As noted in Table 3.5-3, counties within the planning area are anticipated to grow by double digits over the 2010 to 2030 timeframe. All of the counties, except Inyo and Los Angeles, are expected to grow at a rate that exceeds that of the state.

Table 3.5-3. Population Projections in the WEMO Planning Area

Geography	2010	2020	2030	2040	2050	2060	% Change 2010-2030	% Change 2010-2060
Inyo*	18,528	19,350	20,428	22,009	23,053	23,921	10.2	29.1
Kern	841,146	1,057,440	1,341,278	1,618,681	1,858,455	2,055,622	59.5	144.3
Los Angeles	9,824,906	10,441,441	10,950,335	11,243,022	11,434,565	11,562,720	11.5	17.7
Riverside*	2,191,886	2,593,211	3,046,064	3,462,256	3,828,798	4,216,816	39.0	92.3
San Bernardino	2,038,523	2,273,017	2,626,945	2,988,648	3,248,440	3,433,047	28.9	68.4
California	37,309,382	40,643,643	44,279,354	47,690,186	50,365,074	52,693,583	18.7	41.2

Source: California Department of Finance 2013.
*contains only one census tract within the planning area.

Typical population densities generally range from roughly 2,500 persons per square mile in growing suburban areas to more than 7,500 persons per square mile in urbanized areas. By comparison, the corresponding population density for the eleven WEMO Planning area cities combined (accounting for 71 percent of the planning area population base) only averages about 865 persons per square mile (726,482 residents in 2010 divided by 840 square miles). The Census Bureau utilizes a minimum threshold of 1,000 persons per square mile to denote an urbanized setting. The WEMO Planning area is more characteristic of a large rural environment. As such, demographic traits that describe the WEMO Planning area reflect distinctly different circumstances than is true for more urbanized portions of Southern California, thereby minimizing the usefulness of direct comparisons. Instead, the State of California, which includes a sizeable rural population, serves as a more appropriate reference for comparing overall distinctions describing WEMO Planning area residents.

Compared to the State as a whole, the WEMO Planning area consists of a relatively young population base. The planning area includes a heavy composition of families, and similarly has a greater proportion of residents 20 years of age or younger than the State. As result, there are relatively fewer small households (two persons or less). The West Mojave is still attracting a large number of new households but at a whole. The affordability of housing in the WEMO Planning area remains a principal attraction to the new households, resulting in population

growth rates in the planning area being higher than in the more fully developed areas of the Inland Empire, and the attraction of those households to lower-cost, local recreation and tourism options.

Workforce participation (workers, not jobs) among West Mojave households continues to lag the State and Southern California economy. Census data (2010) indicates there was an average of 1.35 workers (persons indicating a place of work) per household throughout the WEMO Planning area compared to a State-wide average of approximately 1.47 workers per household. Similarly, current estimates of local employment (local jobs, as distinct from resident workers) also indicate that there are fewer job opportunities in the WEMO Planning area (1.14 jobs per occupied household) than is true for the State economy or Southern California as a whole (1.34 jobs per household). The incidence of local job opportunities in the WEMO Planning area, is comparable to slightly less than other outlying regions of Southern California, including Kern County (1.33 jobs per household) and the Inland Empire (1.24 jobs per household).

Demographic traits and growth trends describing the WEMO Planning area overall vary considerably within the planning area. The San Bernardino sub-area of the planning area accounts for 64 percent of the planning area's land area, nearly 49 percent of the 2000 resident population, and nearly 48 percent of population growth between 1990 and 2000. By comparison, the Los Angeles sub-area only accounts for 7 percent of the planning area's land area, but 41 percent of the 2000 resident population, and over 50 percent of corresponding population growth. The Kern sub-area accounted for 11 percent of the 2000 population base, but less than 2 percent of total corresponding growth. The Inyo sub-area, with roughly 600 residents, accounts for less than 0.1 percent of the WEMO planning area population base and has experienced an overall decline in population since 1990. On a combined basis, the Los Angeles and San Bernardino sub-areas accounted for over 98 percent of total population growth between 1990 and 2000.

The population growth and changes in the planning area add stress to the transportation network in several ways:

- Regional and Planning Area population growth adds more vehicles to the existing network;
- Planning Area population growth requires retooling of the network and its uses as new communities are constructed, become more densely populated, and require additional access needs;
- The modest income characteristics of the Planning Area population also favor closer-to-home recreation options that add more vehicles to the existing network.
- Population growth in outlying portions of the Planning Area results in increases in average commute times and therefore a greater number of vehicle miles traveled per person; and
- The youthfulness of Planning Area population growth increases the number of persons engaged in vehicle-based recreation, and in particular in OHV use.

3.5.2 Economic Contribution of Tourism and Recreation

The high desert environment of the West Mojave continues to offer a diverse range of options for growing urban populations throughout Southern California and Nevada seeking recreation and leisure activities in a natural setting. Tourism and recreation demands are being driven by both regional and planning area population growth and characteristics. The high desert region attracts nearly 2.0 million visitor-trips a year for off-highway vehicle recreation and nearly 1.5 million visitors to State and National Parks in the area. In addition to generating a need for access in the planning area, this recreation travel adds to socioeconomic activity by supporting local businesses and related jobs.

Table 3.5-4 summarizes levels of tourism-related employment in and around the planning area in 2011. Since 1998, travel and tourism-related employment has grown from 14.3 percent of total private employment to 16.0 percent. From 1998 to 2011, employment in travel and tourism increased 36.3 percent, as compared to an increase of 18.7 percent in non-travel and tourism employment. These figures demonstrate the relative growth in the importance of recreation in the overall economy.

Table 3.5-4. Local County Travel and Tourism-Related Employment in 2011

Sector	San Bernardino County	Inyo County	Kern County
Total Travel and Tourism Employment	81,593	1,889	28,029
Retail Trade	19,246	191	5,791
Passenger Transportation	393	1	79
Arts, Entertainment, and Recreation	10,490	279	3,790
Accommodation and Food	51,464	1,418	18,429

Source: EPS-HDT 2013

OHV recreationists, whether they use OHVs as a means to access other forms of recreation, or find recreation opportunities in the driving of the OHV itself, contribute to the local economies of the planning area in a variety of ways. Economic contributions depend on the level of use in areas surrounding desert towns, and the future significance of contributions depends on the nature of ongoing recreation use trends. Table 3.5-5 addresses the various ways by which recreation opportunities in various areas of the WEMO Planning area contribute dollars to local economies.

Table 3.5-5. Recreation Economic Contribution

Region or City	Principal Recreational Activities on Adjoining Public Land	OHV Use in Nearby Areas	Source of Economic Contribution	Trends in Growth	Comments

Table 3.5-5. Recreation Economic Contribution

Region or City	Principal Recreational Activities on Adjoining Public Land	OHV Use in Nearby Areas	Source of Economic Contribution	Trends in Growth	Comments
Inyo County (Pearsonville Little Lake)	Commercial filming, Motorcycle touring	Low	Fuel, food	Increasing as the LA Basin grows	Most visitors to the area will acquire supplies in larger communities further south
Kern County	Large range of vehicle dependent recreational activities	Cumulatively High	Lodging, meals, supplies, vehicle repairs, fuel	Increasing	Given the close proximity of this portion of Kern County to the LA Basin and that it serves as the "Gateway" to the Sierras and the Desert, growth is high and is expected to increase.
California City	OHV touring in the Rand and El Paso mountains – off-road motorcycle play	Moderate	Fuel, camping supplies, and food	Has been increasing with the growth of the LA Basin	Visitors coming over the Tehachapi and headed to the Rand and El Paso Mountains will likely stop in California City. In spite of recent closures in the Rands, the level of use outside of California City has not diminished. The closures have in fact increased demands on local law enforcement due to increased private property trespass.
Mojave	SUV touring, off-road Events for 4WD, motorcycles, and all desert play vehicles	High	Vehicle repairs and vehicle parts, fuel, camping supplies, motels, and food	Increasingly significant with growth in LA Basin and the increasing popularity of desert	The Tehachapi Pass carries a significant load of recreation traffic from the San Joaquin Valley headed to the Mojave Region. Certainly any increase in recreation activity has a potential for economic gain for Mojave.

Table 3.5-5. Recreation Economic Contribution

Region or City	Principal Recreational Activities on Adjoining Public Land	OHV Use in Nearby Areas	Source of Economic Contribution	Trends in Growth	Comments
Ridgecrest	SUV touring, organized OHV events, rock hounding, commercial filming	High	Vehicle repairs and parts, fuel, camping supplies, food, hotels	Increasing	Viewed as both a significant current and future source of economic revenues
San Bernardino County	Large range of vehicle dependent recreational activities	Cumulatively High	Lodging, meals, supplies, vehicle repairs, fuel	Increasing	Given the close proximity of this portion of San Bernardino County to the LA Basin and the "Inland Empire" and that it serves via I-15/US 395 as the "Gateway" to the Sierras and the Desert, growth is high and is expected to increase.
Baker	SUV touring, OHV events, 4WD and motorcycle play, rock hounding, mining exploration	Low	Vehicle repairs and vehicle parts, fuel, camping supplies, motels, and food	Slight increase due to remoteness	Baker is at the eastern edge of the study area and most users come out of the LA Basin and the San Joaquin Valley. Therefore, most recreation expenditures for the Mojave come from recreation users not going thru Baker.
Barstow	SUV touring, OHV events, 4WD and motorcycle play, rock hounding, mining exploration	High	Vehicle repairs and vehicle parts, fuel, camping supplies, motels, and food	Increasing	Barstow is at the heart of the Mojave Study Area with traffic coming in from LA via Highway 15 and from the west via Highway 58. An increase in recreation related expenditures could have a significant positive effect on Barstow.

Table 3.5-5. Recreation Economic Contribution

Region or City	Principal Recreational Activities on Adjoining Public Land	OHV Use in Nearby Areas	Source of Economic Contribution	Trends in Growth	Comments
Daggett	SUV touring, OHV events, 4WD and motorcycle play, rock hounding, mining exploration	Low	Fuel and food	Increasing slightly	Daggett is located about 5 miles east of Barstow and the majority of travelers will stock up in Barstow and only use Daggett for last minute supplies. Therefore, a light increase in recreation activity will have a very slight economic impact to this small community.
Lucerne Valley	SUV touring, desert exploring via 4WD and motorcycle, rock hounding, and mining exploration	Low	Fuel, camping supplies, and food	Slight increase; due to the fact that the area is somewhat "off the beaten path" the level of growth is less than other areas	Lucerne Valley is located just north of the San Bernardino Mountains about 10 miles east of Apple Valley. The following BLM sub regions surround Lucerne Valley: Juniper, Granite, Ord, and Bighorn, also to the east is Johnson Valley OHV Area. Lucerne does not serve a large number of travelers.
Ludlow	SUV touring, OHV events, 4WD and motorcycle play, rock hounding, mining exploration	Low	Fuel and food	Increasing slightly	Ludlow is located about 50 miles east of Barstow and the majority of travelers will stock up in Barstow. Therefore, a light increase in recreation activity will have a very slight economic impact to this small community.

Table 3.5-5. Recreation Economic Contribution

Region or City	Principal Recreational Activities on Adjoining Public Land	OHV Use in Nearby Areas	Source of Economic Contribution	Trends in Growth	Comments
Newberry Springs	SUV touring, OHV events, 4WD and motorcycle play, rock hounding, mining exploration	Low	Fuel and food	Increasing slightly	Newberry Springs is located about 18 miles east of Barstow and the majority of travelers will do their business in the bigger city. Therefore, a light increase in recreation activity will have a very slight economic impact to this small community.
Trona	Commercial filming, motorcycle touring	Low	Fuel and food	Increasing as visitation increases to Death Valley NP	Although most visitors to the area get supplies in Ridgecrest, the future economic contribution to this economically depressed community is significant.
Victorville/ Apple Valley	SUV touring, OHV events, 4WD and motorcycle play, rock hounding, mining exploration	High	Vehicle repairs and vehicle parts, fuel, camping supplies, lodging, food	Increasing	Victorville does receive a high volume of recreation traffic leaving the LA Basin on Highway 15. It is close to the Stoddard Valley OHV Area, Johnson Valley OHV Area, and Granite, Ord, and Juniper BLM Sub Regions. Any increases in OHV recreation could result in significant monetary inputs into the local economy.

Table 3.5-5. Recreation Economic Contribution

Region or City	Principal Recreational Activities on Adjoining Public Land	OHV Use in Nearby Areas	Source of Economic Contribution	Trends in Growth	Comments
Yucca Valley	SUV touring, desert exploring via 4WD and motorcycle, rock hounding, and mining exploration	Low	Fuel, camping supplies, food	Slight increase; most of the recreation growth is to the northwest	Yucca Valley is east of the San Bernardino Mountains, and south of the BLM sub region of Bighorn and north of the Morongo sub region. Yucca Valley is not on a major highway and, relative to other cities, does not serve a large volume of recreation traffic.

Source: Advance Resource Solutions, Inc.

3.5.3 Environmental Justice

3.5.3.1 Regulatory Framework

Executive Order 12898

In 1994 President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, to direct federal attention on environmental and human health conditions in minority and low- income communities. EO 12898 promotes nondiscrimination in federal programs that substantially affect human health and the environment, and it guarantees information access and public participation relating to these matters. This order requires federal agencies to identify and address any disproportionately high or adverse human health or environmental effects on minority and/or low-income populations resulting from programs, policies, and activities of federal agencies. The Council on Environmental Quality (CEQ) oversees federal compliance with EO 12898.

Council on Environmental Quality's Environmental Justice Guidance under the National Environmental Policy Act

To ensure that federal agencies effectively identify and address environmental justice concerns according to EO 12898, the CEQ, in consultation with the Environmental Protection Agency (EPA), developed guidance to assist federal agencies to implement procedures. According to the CEQ's *Environmental Justice Guidance under NEPA*, agencies should consider the composition of affected areas to determine whether minority or low-income populations are affected by a proposed action, and, if so, whether those environmental effects may be disproportionately high or adverse (CEQ 1997).

According to the CEQ environmental justice guidelines, minority populations should be identified if:

- A minority population percentage either exceeds 50% of the population of the affected area, or:
- If the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (e.g., a governing body's jurisdiction, neighborhood census tract, or other similar unit).

Environmental Protection Agency (EPA) Final Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses

The EPA's *Final Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses* defines how the EPA will ensure that disproportionately high and adverse human health or environmental effects on minority communities and low-income communities are identified and addressed. It establishes agency-wide goals for engaging American Indian, Alaska Native, Native Hawaiian, and other indigenous peoples. It also establishes agency-wide goals for environmental protection and lists actions the EPA would take to incorporate environmental justice into its mission (EPA 1998).

Environmental Protection Agency Plan Environmental Justice 2014

The EPA's Plan Environmental Justice (EJ) 2014 is a strategy to help the agency integrate environmental justice into its programs, policies, and activities. Plan EJ 2014 identifies Cross-Agency Focus Areas, Tools Development, and Program Initiatives as the three essential elements that will advance environmental justice across the EPA and other agencies of the federal government.

Bureau of Land Management Land Use Planning Handbook, Appendix D

The Plan Area includes all or part of the following Department of Interior (DOI) Bureau of Land Management (BLM) field office jurisdictions:

- Ridgecrest
- Barstow
- Needles
- Palm Springs/South Coast

Appendix D (Social Science Considerations in Land Use Planning Decisions) of the BLM Land Use Planning Handbook provides guidance on integrating social science information into the planning process for projects within BLM lands. Any information gathered for planning purposes must be considered in the context of BLM's legal mandates. To be effective, social scientific data and methods identified in Appendix D must be integrated into the entire planning process (BLM 2005). Furthermore, Section IV (Environmental Justice Requirements) of Appendix D provides guidance for assessing potential impacts on population, housing, and employment as they relate to environmental justice. It also describes variables such as lifestyles, beliefs and attitudes, and social organizations with respect to environmental justice.

Defining Environmental Justice Populations

The CEQ Environmental Justice Guidance defines "minorities" as individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black not of Hispanic origin, or Hispanic (CEQ 1997). The total minority population has been calculated by subtracting the white alone, not Hispanic or Latino, population from the total population. An environmental justice population is identified when the minority population of the potentially affected area is greater than 50% or the minority population percentage is meaningfully greater than the minority population in the general population or other appropriate unit of geographical analysis. For this analysis, any census tract with a minority population greater than 50% was identified as an environmental justice tract of concern.

The CEQ Environmental Justice Guidance defines "low-income populations" as populations with mean annual incomes below the annual statistical poverty level. For this analysis, low-income population was determined by utilizing the U.S. Census tract data for the 5-year period 2008-2012. For this purpose, "low-income" is equated with "below poverty level." Other measures of "low-income" are also in use in California. For example, the State of California Department of Housing and Community Development, Division of Housing Policy Development establishes annually specific "low-income" thresholds for California counties. The Department distinguishes as well between "low-income," "very low income," and "extremely low" income thresholds for households of different sizes.

The CEQ and EPA guidance documents do not provide a discrete threshold for determining when a low-income population should be identified for environmental justice. For this analysis, a population of a U.S. Census tract that merits an environmental justice analysis has a percentage of its low-income population of the potentially affected census tract greater than the area-wide percentage of the low-income population across the entire West Mojave planning area.

3.5.3.2 Minority and Low-Income Populations in the WEMO Planning Area

Percentages of minority and low-income populations for individual census tracts furnish the criteria for identifying census tracts that merit consideration in an EJ analysis. Table 3.5-6 presents data on the population of each U.S. Census tract in the West Mojave Planning Area as well as the numbers and percentages of minority and low-income subpopulations within each census tract. The demographic data in Table 3.5-6 for each census tract used in the EJ analysis was sourced from the U.S. Census Bureau 2008-2012 5-Year American Community Study (ACS).

A census tract cell in Table 3.5-6 that is bolded in the column "Percent Minority Population" indicates a tract of concern for EJ analysis. Census tracts of EJ concern have minority populations greater than 50%. Low-income populations in census tracts that are bolded under the column "Percent Low-Income Population" also indicate a tract of concern for EJ analysis. Census tracts of EJ concern have a percentage of low-income people greater than the average percentage of all low-income people residing in the West Mojave Planning Area.

The population of the WEMO Planning area has on average a lower percentage of minority residents than the state of California. In contrast, the population of the WEMO Planning area has a greater number of low-income residents than in the population of the state of California.

Locations of census tracts with considerations of minority and low-income populations of environmental justice concerns are portrayed in Figure 3.5-1. The following enumeration summarizes the number of identified environmental justice tracts of concern by county:

- Inyo County: Does not contain any tracts with concerns for minority and low-income populations.
- Kern County: Contains eight tracts with concerns for low-income concerns and no tracts with minority concerns.
- Los Angeles County: Contains 17 tracts with both minority and low-income concerns, 29 tracts with minority concerns only, and 35 tracts with concerns for low-income populations.
- Riverside County: Contains only one tract with concerns for both minority and low-income populations.
- San Bernardino County: Contains two tracts with both minority and low-income concerns, one tract with minority concerns only, and 42 tracts with concerns for low-income populations.

Table 3.5-6. Minority and Poverty Populations within the WEMO Planning Area[1,2]

Location/County	Census Tract	Total Population	Minority Population	Minority Population (%)	Low-Income Population	Low-Income Population (%)[3]
Inyo		**3,234**	**513**	**15.9**	**460**	**14.2**
	8*	3,234	513	15.9	460	14.2
Kern		**94,476**	**21,999**	**23.3**	**17223**	**18.2**
	52.01*	5,167	276	5.3	913	17.7
	52.03*	4,458	459	10.3	1193	**26.8**
	53	2,127	474	22.3	463	**21.8**
	54.01	6,371	1,051	16.5	838	13.2
	54.02	5,354	977	18.2	282	5.3
	54.03	7,629	2,038	26.7	825	10.8
	54.04	6,530	1,357	20.8	911	14.0
	55.01	5,945	679	11.4	866	14.6
	55.06	5,052	1,127	22.3	710	14.1
	55.07	7,692	2,770	36.0	1855	**24.1**
	55.08	5,167	1,572	30.4	1641	**31.8**
	56	2,017	383	19.0	596	**29.5**
	57	2,745	786	28.6	22	0.8
	58.01	6,821	2,507	36.8	1010	14.8
	58.02	7,030	2,873	40.9	2335	**33.2**
	59	3,344	1,471	44.0	1155	**34.5**
Kern (continued)	60.04*	1,637	304	18.6	195	11.9
	60.07*	6,491	343	5.3	720	11.1
	65	2,899	552	19.0	693	**23.9**
Los Angeles		**375,147**	**163,719**	**43.6**	**70993**	**18.9**

Table 3.5-6. Minority and Poverty Populations within the WEMO Planning Area[1,2]

Location/County	Census Tract	Total Population	Minority Population	Minority Population (%)	Low-Income Population	Low-Income Population (%)[3]
	9001.02	791	113	14.3	224	**28.3**
	9001.03	6,482	1,665	25.7	2061	**31.8**
	9001.04	5,603	1,994	35.6	1211	**21.6**
	9002.01	1,201	148	12.3	120	10.0
	9003	3,853	1,062	27.6	461	12.0
	9005.01	6,475	2,466	38.1	1851	**28.6**
	9005.04	5,508	2,607	47.3	586	10.6
	9005.05	4,169	2,059	49.4	1180	**28.3**
	9005.06	4,647	1,444	31.1	730	15.7
	9005.07	7,944	2,948	37.1	2006	**25.3**
	9005.08	3,331	1,437	43.1	707	**21.2**
	9006.02	5,324	1,482	27.8	2120	**39.8**
	9006.05	7,055	1,988	28.2	1440	**20.4**
	9006.06	3,898	1,457	37.4	1222	**31.3**
	9006.07	4,510	2,278	***50.5***	1744	**38.7**
	9006.08	3,335	867	26.0	800	**24.0**
	9006.09	5,339	1,999	37.4	1744	**32.7**
	9007.01	4,749	1,753	36.9	1282	**27.0**
	9007.03	3,763	1,413	37.5	1005	**26.7**
	9007.04	2,863	1,091	38.1	605	**21.1**
	9007.05	4,627	1,629	35.2	874	18.9
	9008.03	9,910	5,354	**54.0**	1592	16.1
	9008.04	2,911	1,414	48.6	945	**32.5**
	9008.05	4,817	2,144	44.5	794	16.5
	9008.06	3,089	1,604	***51.9***	1168	**37.8**
	9009	3,690	871	23.6	458	12.4
	9010.03	5,532	3,607	***65.2***	0	0.0
	9010.04	12,411	3,691	29.7	1517	12.2
	9010.07	2,250	130	5.8	176	7.8
	9010.08	2,970	938	31.6	245	8.2
	9010.09	5,667	1,555	27.4	1148	20.3
	9010.10	6,007	1,819	30.3	1926	**32.1**
	9010.11	4,903	1,438	29.3	583	11.9
	9011.01	5,478	1,368	25.0	1028	18.8
	9011.02	5,505	1,383	25.1	858	15.6
	9012.05	10,376	2,543	24.5	555	5.3
Los Angeles (continued)	9012.09*	1,449	89	6.1	137	9.5
	9012.10	1,512	100	6.6	42	2.8
	9012.13	3,825	673	17.6	165	4.3
	9100.01	5,814	3,593	**61.8**	638	11.0
	9100.02	6,351	3,141	49.5	1156	18.2

Table 3.5-6. Minority and Poverty Populations within the WEMO Planning Area[1,2]

Location/County	Census Tract	Total Population	Minority Population	Minority Population (%)	Low-Income Population	Low-Income Population (%)[3]
	9101.01	1,275	770	***60.4***	492	**38.6**
	9102.01	4,432	2,835	***64.0***	1562	**35.2**
	9102.02	5,612	1,382	24.6	190	3.4
	9102.05	1,073	339	31.6	47	4.4
	9102.06	3,229	1,433	44.4	75	2.3
	9102.07	5,689	2,210	38.8	430	7.6
	9102.08	6,681	3,132	46.9	902	13.5
	9102.09	4,004	1,408	35.2	277	6.9
	9102.10	7,063	2,630	37.2	304	4.3
	9103.01	4,242	1,099	25.9	236	5.6
	9103.02	5,607	1,574	28.1	346	6.2
	9104.01	6,475	3,198	49.4	482	7.4
	9104.02	3,251	2,145	***66.0***	1223	**37.6**
	9104.03	2,351	1,800	***76.6***	1328	**56.5**
	9104.04	3,916	2,265	***57.8***	1443	**36.8**
	9105.01	5,438	4,420	***81.3***	2984	**54.9**
	9105.02	4,145	2,912	***70.3***	1584	**38.2**
	9105.04	4,878	3,507	***71.9***	1354	**27.8**
	9105.05	3,017	2,059	***68.2***	487	16.1
	9106.01	6,308	3,934	***62.4***	1773	**28.1**
	9106.02	3,420	2,528	***73.9***	1050	**30.7**
	9106.03	7,328	4,655	***63.5***	843	11.5
	9106.05	4,450	2,355	***52.9***	1316	**29.6**
	9106.06	2,954	1,892	***64.0***	881	**29.8**
	9107.05	12,059	7,544	***62.6***	1086	9.0
	9107.06	6,042	3,367	***55.7***	1247	**20.6**
	9107.07	4,666	2,805	***60.1***	851	18.2
	9107.09	1,663	681	41.0	198	11.9
	9107.11	7,615	4,250	***55.8***	1457	19.1
	9107.12	2,657	1,659	***62.4***	294	11.1
	9107.13	5,843	3,583	***61.3***	1009	17.3
	9107.14	3,961	2,681	***67.7***	883	**22.3**
	9107.15	6,656	3,613	***54.3***	1207	18.1
	9107.16	5,783	3,649	***63.1***	832	14.4
	9108.04*	3,087	537	17.4	303	9.8
Los Angeles (continued)	9108.05*	4,204	399	9.5	485	11.5
	9108.12	407	33	8.1	23	5.7
	9110.01	3,709	1,066	28.7	394	10.6
	9800.03	0	0		0	
	9800.04	23	15	***65.2***	11	**47.8**
Riverside		**3,513**	**1,444**	**41.1**	**594**	**16.9**

Table 3.5-6. Minority and Poverty Populations within the WEMO Planning Area[1,2]

Location/County	Census Tract	Total Population	Minority Population	Minority Population (%)	Low-Income Population	Low-Income Population (%)[3]
	469*	3,513	1,444	41.1	594	16.9
San Bernardino		**497,644**	**137,457**	**27.6**	**102843**	**20.7**
	100.04	8,735	1,150	13.2	847	9.7
	100.09	3,677	855	23.3	485	13.2
	100.10	6,124	1,973	32.2	1657	**27.1**
	100.11	4,821	1,716	35.6	1494	**31.0**
	100.12	4,768	515	10.8	757	15.9
	100.13	8,463	2,328	27.5	1128	13.3
	100.14	5,080	1,218	24.0	1810	**35.6**
	100.15	5,213	1,090	20.9	1084	**20.8**
	100.16	5,693	1,536	27.0	1402	**24.6**
	100.17	14,479	3,872	26.7	2066	14.3
	100.18	7,882	2,543	32.3	1773	**22.5**
	100.19	5,507	1,373	24.9	1561	**28.3**
	100.20	6,969	2,230	32.0	1716	**24.6**
	100.21	6,539	699	10.7	1915	**29.3**
	100.22	3,958	656	16.6	587	14.8
	100.23	5,836	925	15.8	693	11.9
	100.24	5,062	934	18.5	1168	**23.1**
	100.25	7,005	2,987	42.6	1807	**25.8**
	100.26	11,902	4,787	40.2	3403	**28.6**
	103*	3,692	713	19.3	802	**21.7**
	104.02	11,024	2,234	20.3	689	6.3
	104.09*	2,727	403	14.8	489	17.9
	104.10	2,809	373	13.3	369	13.1
	104.11	6,945	1,285	18.5	1154	16.6
	104.12	7,258	1,181	16.3	970	13.4
	104.13	6,431	1,195	18.6	1323	**20.6**
	104.15	5,291	1,793	33.9	563	10.6
	104.16	3,755	374	10.0	930	**24.8**
	104.17	3,391	429	12.7	903	**26.6**
	104.19	4,827	1,032	21.4	1043	**21.6**
	104.20	4,074	768	18.9	643	15.8
	104.21	5,619	1,857	33.0	1317	**23.4**
San Bernardino (continued)	104.22	1,319	87	6.6	182	13.8
	104.23	3,654	450	12.3	806	**22.1**
	104.24	1,375	52	3.8	360	**26.2**
	116	6,622	856	12.9	1004	15.2
	117	1,720	433	25.2	358	**20.8**
	118	7,391	2,168	29.3	1188	16.1
	119	4,020	996	24.8	850	**21.1**

Table 3.5-6. Minority and Poverty Populations within the WEMO Planning Area[1,2]

Location/County	Census Tract	Total Population	Minority Population	Minority Population (%)	Low-Income Population	Low-Income Population (%)[3]
	120.01	6,194	2,288	36.9	574	9.3
	120.02	5,569	2,463	44.2	995	17.9
	121.01	5,087	1,277	25.1	475	9.3
	121.03	4,121	915	22.2	509	12.4
	121.04	5,853	1,323	22.6	1371	**23.4**
	250	9,584	3,161	33.0	979	10.2
	89.01	2,368	185	7.8	526	**22.2**
	91.07	5,529	279	5.0	957	17.3
	91.08	6,134	1,269	20.7	1244	**20.3**
	91.09	5,372	936	17.4	565	10.5
	91.10	16,159	7,313	45.3	3048	18.9
	91.12	8,931	4,022	45.0	1823	**20.4**
	91.14	9,802	4,832	49.3	1766	18.0
	91.16	6,883	3,331	48.4	3929	**57.1**
	91.17	7,233	2,173	30.0	2667	**36.9**
	91.18	20,987	7,627	36.3	3324	15.8
	91.19	5,314	1,164	21.9	773	14.5
	92.01	4,623	107	2.3	213	4.6
	93	1,217	368	30.2	247	**20.3**
	94	3,153	1,194	37.9	1720	**54.6**
	95	6,855	2,560	37.3	2092	**30.5**
	97.07	6,303	860	13.6	918	14.6
	97.08	4,498	623	13.9	772	17.2
	97.09	6,214	1,383	22.3	1377	**22.2**
	97.10	7,927	1,712	21.6	3354	**42.3**
	97.11	9,409	1,737	18.5	765	8.1
	97.12	5,933	1,663	28.0	2047	**34.5**
	97.13	6,661	1,177	17.7	656	9.8
	97.14	3,661	766	20.9	851	**23.2**
	97.15	7,976	1,471	18.4	913	11.4
	97.16	6,863	1,688	24.6	2601	**37.9**
	97.17	4,198	481	11.5	481	11.5
	98	4,499	1,197	26.6	1714	**38.1**
San Bernardino (continued)	9802	4,228	2,255	***53.3***	0	0.0
	99.04	10,544	4,087	38.8	3268	**31.0**
	99.05	8,102	4,693	***57.9***	3013	**37.2**
	99.06	4,604	1,872	40.7	807	17.5
	99.08	4,486	1,558	34.7	902	**20.1**
	99.10	4,837	1,831	37.9	588	12.2
	99.11	7,027	2,167	30.8	1105	15.7
	99.12	5,123	1,490	29.1	1448	**28.3**

Table 3.5-6. Minority and Poverty Populations within the WEMO Planning Area[1,2]

Location/County	Census Tract	Total Population	Minority Population	Minority Population (%)	Low-Income Population	Low-Income Population (%)[3]
	99.13	5,926	1,893	31.9	2170	**36.6**
WEMO TOTAL		**974,014**	**325,132**	**33.3**	**192,113**	**19.6**
CALIFORNIA		**37,325,068**	**14,072,515**	**37.7**	**5,590,100**	**15.0**

*Tracts transect the planning area boundary.

[1] Bolded numbers within the percent minority population and percent low-income population columns, indicate a tract with environmental justice populations.

[2] Because U.S. Census 2008-2012 American Community Survey (ACS) estimates come from a sample population, a certain level of variability is associated with the estimates. Supporting documentation on ACS data accuracy and statistical testing can be found on the ACS website in the Data and Documentation section available here:
http://www.census.gov/acs/www/data_documentation/documentation_main/.

For purposes of this analysis, U.S. Census ACS 5-Year 2008-2012 data were utilized to provide current data, consistency between the data used to identify minority and low-income populations, and consistency between the different geographies presented. U.S. Census ACS data from census tracts are considered the best available information for representing the demographic makeup of the WEMO Plan Area communities for the environmental justice analysis in this EIS. Federal agencies commonly use published U.S. Census ACS data in compliance with Executive Order 12898 and CEQ and EPA guidance for incorporating Environmental Justice Concerns under the National Environmental Policy Act of 1969 (NEPA).

[3] Represents individuals with mean annual incomes below the annual statistical poverty level, identified by poverty status in the last 12 months, identified as “percent below poverty level” within the US Census 2008-2012 ACS data set.

Source: U.S. Census Bureau American Community Survey 2008-2012.

3.6 Recreation Activities

Located only 90 minutes from downtown Los Angeles, the WEMO Planning area is the recreational backyard of the metropolitan area's 21 million residents, of whom nearly 2 million participate in OHV activities and an even greater number camp, hike or drive for pleasure. The Mojave Desert provides an easily accessible, uncrowded recreation experience. The many recreation opportunities of the WEMO Planning area arise from the variety of its mountains, bajadas, dry lakes and badlands, the diversity and affluence of its visitors and the sheer volume of space that its landscape provides.

The types of recreation provided in the WEMO Planning area are highly varied. Due to its vastness, many visitors feel a greater freedom from regulations that encourages them to try new forms of recreation while not having to worry about bothering others. Given the scale of the desert and this sense of freedom, it is not surprising that many of the recreational activities center around vehicles, speed events or activities that require a great deal of acreage and separation from other visitors. These activities include motorcycle activities, four wheel drive exploring, sightseeing, target shooting, hunting, using experimental vehicles/aircraft, model rocketry, and dry land windsailing. Many other recreational pursuits that do not revolve directly around the recreational aspect of vehicle use are, by necessity (due to the distances involved), dependent upon motorized vehicles. Examples of this include endurance equestrian rides and support vehicles, hiking, mountain biking, bird watching, botany, rockhounding, camping, geocaching, and picnicking, for which vehicles are a means to access various destinations. In Chapter 4, the effect of the designated route network on recreational opportunities is quantified and evaluated through the mileage of routes designated for these various recreational uses.

3.6.1 Patterns of Use

Although most recreational activities are widely dispersed, certain activities have "hot spots" that have been established over time. How or why they were established varies from case to case, but may be due to the features (topography, geology) of the area, proximity to urban areas, the availability of access into the area, and publicity. Understanding recreation patterns and hot spots is critical to the design of an effective motorized vehicle access network. Particular features or land-characteristics may make a given area highly desirable for a certain type (or types) of recreational activity. For instance, flat, expansive terrain is often desirable for recreational activities such as target shooting, driving for pleasure, and more quick-paced race events. On the other hand, mountainous terrain is often more conducive to such activities as rock climbing, hiking, rock hounding or technical four wheel rock crawling. In addition, specific attractions of an area dictate the types of use as well as the levels of use that predominate.

Some of the most popular hot spots in the desert portions of the WEMO planning area are dry lakebeds. Dry lakebeds pose unique access issues. This is due to the difficulty in following routes across lakebeds, and the adverse impacts and safety issues with marking them. Major lakebeds have been individually classified as to their availability for access and associated recreational use, and are generally identified as either open or closed, or available by permit. Smaller lakebeds are available for access consistent with the access parameters for surrounding areas, i.e., either open access or limited to designated routes. Two of the larger lakebeds in the West Mojave desert that have not yet been specifically designated for access are Cuddeback and Koehn Lake Beds.

Cuddeback Lake is a sizeable lakebed that has been a popular destination for both casual recreational use as well as commercial use for several decades. Ease of access, the frequency that the lakebed is dry, and surrounding vistas contribute to its attraction. The casual recreational uses that occur on the lakebed include land sailing, model rocket launching, bicycling, photography, star-gazing, and camping. Additionally, motor vehicle use of all kinds is popular on the lakebed including motorcycles, ATV, recreational Off-Highway Vehicle, and four wheel drive vehicles, as well as motorized and non-motorized use associated with commercial filming. Past and current levels of use are not currently consistent with the access designation for the surrounding area.

Koehn Lake is a sizeable lakebed located in the Fremont Valley north-west of the Rand Mountains and south of the Jawbone area that is not particularly popular for the public but has some unique safety issues. To the unfamiliar visitor, Koehn Lake's surface appearance is misleading. To the naked eye generally the lakebed appears to be dry, but the lake actually only has a thin crust of a few inches on the surface. After one breaks through this crust the subsurface is a clayish like material that acts similar to quick sand. Because of the potential hazard posed by the lakebed surface, recreational use and travel across the lakebed have not been a popular activity, and public use is a concern to BLM.

Coyote and Chisholm Trail Lakes are two lakebeds in the Joshua Tree area that are popular destinations for casual recreational users, due to their proximity to Copper Mountain Community College. Ease of access to college students and surrounding vistas contribute to their attraction. The casual recreational uses that occur on the lakebed are generally limited to day use riding, including motorcycles and all-terrain vehicles, with occasional motorized use associated with occasional overnight camping. The routes across these lakebeds are difficult to ascertain for a user entering from a route adjacent to the lakebed, and they serve as a substantial source of route proliferation onto adjacent lands. These two lakebeds are currently designated as limited to designated routes, but the difficulty of the public identifying designated routes and BLM managing the limited use is a concern to BLM.

The relative proximity of the Mojave Desert to urban centers makes it easy and convenient for recreationists to visit those "hot spots" and other areas having the features that they desire. About 85% of all visitors to the Mojave Desert are from the urban areas of Southern California. The BLM public lands are closer to the Los Angeles basin than other similar desert-environment recreation areas, such as the Mojave National Preserve and the national parks, and offer more expansive areas and a wider variety of recreational experiences.

Motorized vehicle access is itself a feature or characteristic that may or may not be sought. For example, a recreationist hoping to photograph or film particular wildlife undisturbed in its natural habitat would not want access so convenient that it attracts a large number of other visitors. Recreationists seeking to hike and camp in remote, difficult to reach areas to experience solitude would not find a location that has ready access from a major highway to be desirable. Conversely, a recreationist seeking to ride his dune buggy over sand dunes with groups of other people may appreciate easy access. Many other motorized users are seeking ready motorized access to the desert landscape to experience the space and solitude that heavily used areas cannot offer.

Publicity about an area's recreational opportunity often attracts users. Although some of this publicity can come through the mainstream news media (newspapers, television news reports), much of it comes by "word of mouth." A recreation club (motorcycle riding club, four wheel drive club, dune buggy club, hiking and camping club, equestrian endurance riding club, rock hounding

club, rock climbing club, photography club, or wildlife viewing club) may send out newsletters to its members identifying areas that have those features that are considered ideal for the type of recreational activity that the club engages in. The popularity of the web (organizational websites, Facebook) and similar mechanisms to share information have further increased sharing of information about locations and destinations in the desert. Computer apps can provide pictures and specific directions to sites, and have further expanded the reach of information beyond club members and small groups of individuals. This promotes discussion about specific areas and facilitates increased recreation at those sites. Recreation clubs are often drawn to specific hot spots where people participating in that particular type of recreation can gather and socialize.

Guidebooks and maps publicize favorite recreation sites. Guidebooks are available that describe areas in the Mojave Desert that offer significant opportunities for specific activities. These guidebooks typically describe the areas of interest in sufficient detail to lead recreationists to the most promising regions for the activity. Maps published by the American Automobile Association and regional user interest groups are particularly popular, for they indicate areas where different types of recreational activities occur.

Recreationists engage in activities that make use of more than one type of feature or terrain, and often desire to travel to locations where multiple types of terrain are readily available or that are relatively close to other areas having different terrain. In dual sport motorcycle touring, for instance, recreationists use motorcycles that are licensed for use on regular streets and highways but are capable of off-road travel. Recreationists engaged in such touring can ride to the desert on major highways, and then go off-road once a desired trail or special recreation opportunity has been reached. Their motorcycles can fit through tight spaces that larger vehicles, are unable to access.

Four-wheel drive vehicles have their attractions as well. A single four wheel drive SUV can accommodate more people and items than can a dual sport motorcycle, and can also readily switch from regular highway travel to off-road touring.

Table 3.6-1 presents a summary of recreation uses throughout the WEMO Planning area. It describes the primary destinations and recreational activities that occur at particular geographic locations within the planning area.

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA-1[2]					
TMA 1 – Broadwell Subregion	South third of TMA, bounded by Highway 40 on south, T&T on east, Newberry Springs to west, Hidden Valley Rd to north.	A couple of large valleys dominate this subregion. The north boundary is the road bisecting Hidden Valley (traditional cattle grazing), running east-west, which connects on the east to Broadwell Dry Lake basin, a north-south running valley. The north center third is in the Cady Mountain Wilderness Study Area. The western portion receives higher OHV traffic exploring from nearby urban areas in Newberry Springs, T&T popular historic route, significant north-south green sticker route, Route 66, OHV touring, scenic exploration. The area includes a large tower power transmission corridor.	Middle Country	Back Country	Middle Country
TMA 1 – Afton Subregion	North third of TMA, bounded by Interstate 15 on north, Hidden Valley Rd on south, Preserve/T&T east boundary, Newberry Springs west boundary.	This area includes a primary ancient, historic and current east west transportation corridor which includes the Mojave Trail (used for nearly 10,000 years), Old Spanish National Historic Trail, Mormon Rd., Government/Mojave Rd. and today Hwy15 and BNSF railroad. The center southern third is in Cady Mountains Wilderness Study Area; includes Afton Canyon, developed campground, overlooks, eligible Mojave River Wild & Scenic segment, Rasor OHV Area, Big Horn Sheep drinker, hunting, and rock collecting. The area includes active and historic mines, T&T historic grade, Rasor Ranch and BNSF railroad. Fuel, food and water are available at Hwy15 exits for Afton and Rasor.	Front Country	Middle Country	Front Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 1 – Barstow Subregion	West third of TMA; directly east of Barstow, north boundary Hwy15, south boundary Hwy 40. Majority land private, mixed development, military base, railroad, agriculture.	The area includes assorted small scattered tracts of public land, including portions along the Mojave River. There are few open routes. Available routes primarily connect private roads and provide commercial rather than casual OHV recreation. The area includes a historic settlement area with Camp Cady and Soldier Mountain, Manix ACEC, Old Spanish National Historic Trail, Mormon Rd. Extensive agricultural developments with roads, and power and water systems. Other developments include commercial power plant, mining, and communications sites, Marine supply base, rail yard and airport; hotels, restaurants and gas stations.	Rural Country	Urban Country	Urban Country
TMA-2					
TMA 2 - Darwin Subregion	Northern end of TMA, bounded by Hwy. 190 on the north, Death Valley NP on the east, China Lake NWS on the south, and Coso Range Wilderness on the west	Open desert expanse that is sporadically interrupted topographically by the upper extent of the Coso Range, the Darwin Hills, and other unnamed hills. The Darwin Falls Wilderness is on the north east flank of the area which provides opportunities for primitive and unconfined non-mechanized forms of recreation. The area is popular for its backcountry vehicle touring and exploration of historic mining sites, primitive camping, packing, hiking, camping, rock collecting, wild horse viewing, and photography. Popular recreational destinations include China Gardens spring, Lower Centennial cabin site, and the historic mining community of Darwin.	Back Country	Back Country	Back Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 2 - Sierra Subregion	Western half of TMA, bounded by CDCA boundary and Hwy. 190 on the north, China Lake and Darwin Subregion on the east, Hwy 178 on the south, and the Inyo NF and CDCA boundary on the west	This area is generally a north south trending valley outlined on the western edge by the Eastern Sierra escarpment and the Coso Range on the east side. The area includes the Owens Peak, Sacatar Trail, and Coso Range Wilderness areas that provide for primitive and unconfined non-mechanized forms of recreation. Recreational activities include dispersed hiking and camping, rock climbing, upland game bird and deer hunting, bird watching, wildflower viewing, mountain biking, and horsebacking along with OHV travel and touring. Popular destinations within the area include Fossil Falls and its developed campground, Indian Wells, Short, and Sand Canyons, Ayers Rock, and the Olancha Sand Dunes Open Area.	Front Country	Middle Country	Middle Country
TMA 2 - North Searles Subregion	Northeastern end of TMA, bounded by the Slate Range Crossing on the north, the ridge top of the Slate Range separating Searles Valley from Panamint Valley on the east, Township line 26S on the South, and China Lake NWS on the west	The region consists of the upper part of the Searles Valley, part of the ancient lakebed above Searles Lake and is encircled by the Argus and Slate ranges on the west, east, and north respectively. Recreational pursuits include OHV driving for pleasure, technical four wheel driving, rock climbing, birding, horseback riding, hunting, rock hounding, along with hiking and backpacking. Popular destinations in the region include Isham Canyon, the Escape Trail, and Great Falls Basin. The Argus Range Wilderness, Wilderness Study Area and ACEC provide opportunities for non-mechanized forms of recreation.	Back Country	Back Country	Back Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 2 - South Searles Subregion	Southeastern end of TMA, bounded along Township line 26S on the north, China Lake NWS on the east, Randsburg Wash Road on the south, and China Lake NWS on the west.	The region consists of the lower part of the Searles Valley made up of mostly gravel to silty lakebed sediments accentuated by the unusual Trona Pinnacles. Recreational pursuits in the area include gem and mineral collecting, star gazing, photography, OHV driving for pleasure, along with motorcycle racing and commercial 4-wheel drive, dual sport, and equestrian tours. Popular destinations within the area include the Trona Pinnacles National Natural Landmark and Searles Lake when it is opened to guided gem and mineral collecting trips.	Front Country	Middle Country	Front Country
TMA 3					
TMA 3 – Joshua Tree	Southeastern most portion of BFO; dry desert lands rise to the south from Highway 62. Joshua Tree NP. South boundary, west is 247.	The area includes various recreation sites, features and connecting routes are found throughout this area, a transitional interface zone between the desert and mountains to the south. Features include extensive historic mines and related roads, ruins and camps; Pinto Mountain Wilderness, popular shooting areas; remote 4 x 4 touring and exploration.	Back Country	Primitive Country	Back Country
TMA 3 – Wonder Valley	North east third of TMA, open valley, lightly scattered residential; between Hwy 62 & 29 palm marine base	Desert Valley basin oriented east-west; slopes rise gently to the south into rugged and remote Pinto Mountains, Joshua Tree NP and gateway community of 29 Palms, to the north desert lands gradually rise to ridgeline and 29 Palms Marine Base. The area includes extensive/dispersed urban interface, diverse features include Giant Rock, the Integratron and Copper Mountain Community College; full service town of 29Palms; small playas and dune systems popular with local OHV riders, and scattered staging areas.	Rural Country	Rural Country	Front Country
TMA 3 – Rattlesnake Canyon	South center field office; desert uplands around east-northeast base of San Bernardino Mountains. West boundary is Hwy18.	This area includes a swath of land along the base of the San Bernardino Mountains, extending north into the desert as far as Hwy 247. The area includes Rattlesnake Wilderness, numerous springs, thicker vegetation and larger wildlife, grazing, historic mines, and increasingly denser housing.	Front Country	Front Country	Middle Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 3 – Juniper Flats	Southwest corner BFO; borders Hwy18 on east, SBNF to south, Mojave River on west & Hwy 247 to north.	This area includes an intensive urban interface with regular human activity, single track, OHV play, 4x4 exploration and scenic touring, equestrian, hiking, hotspring soaking, Pacific Crest Trail, Old Spanish National Historic Trail, hunting, numerous springs, fire wood collection, and dispersed camping. Features include community services, powerlines, pipelines, communications sites, railroad and dispersed visitor management control structures like signs, kiosks and fences.	Front Country	Front Country	Middle Country
TMA 3 – Morongo Valley	Center-southern most portion of BFO, centered around town of Morongo Valley; area at eastern base of San Bernardino Mountains, between San Gorgonio Wilderness & PSC.	This area includes the transitional zone between the eastern base of the San Bernardino Mountains and dry upland desert ranges around Twentynine Palms and Joshua Tree NP. A series of parallel canyons, rocky ridges and boulder outcrops transected by numerous roads, rights of way, utility corridors, ranches, farms, cabins, tract homes, and more intensive developments in town; relatively artistic town w/unique architecture in harmony with landscape.. ROWs and access to private holdings are primary uses of roads; also 4x4 and OHV play, hunting (shotgun), hiking, wildlife viewing, photography, and nature appreciation.	Rural	Rural	Rural
TMA 3 – Needles South	Northwest corner of NFO. N boundary Route 66 & Hwy40, S boundary Cleghorn Lakes Wilderness; W boundary 29 Palms Marine Base, E boundary Amboy Rd.	This area comprises relatively lower and drier desert basin area, and a more recent historic transportation corridor providing access to Needles and points east. The most prominent feature is Amboy Crater National Landmark. The area includes scattered ruins of large mining operations, pipelines, powerlines, railroad and highways. This area is a swath of land about 12 miles long, but 20 miles across and 2-3 miles wide running in a NW-SE arc. The area contains Ludlow and busy Amboy Rd. It is an excellent area for early viewing of desert wildflower blooms in the lower desert.	Front Country	Middle Country	Front Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 3 – Pisgah Crater	Center east portion of BFO. S boundary is 29Palms marine base, boundary I40; W boundary is Powerline Rd., E boundary 2.5 miles west of Ludlow.	This area is a small narrow swath of land 2-3 miles wide, about 12 miles long between Hwy40 and 29 Palms Marine Base. The area is open plain gently draining east with significant lava flows originating further south. Scarce creosote scrub plant community, lava flows and Pisgah cinder cone (active commercial mine) combine in unique mars type landscape. The area is popular for scenic touring and photography. It is a relatively remote area with few visitors, yet human sounds are near constant because of intensive ambient sounds associated with transportation activities and low flying aircraft.	Middle Country	Back Country	Back Country
TMA 4					
TMA - 4 Jawbone Subregion	Northern end of TMA, bounded by Hwy 178 on the north, Hwy 14 on the east, Township line 31S on the south, and the CDCA boundary on the west.	This area is highlighted by the Jawbone Canyon and Dove Springs Open Areas along with the flat to rolling terrain that rises towards the western flank to take in the Scodie Mountains, along with the Kiavah and Bright Star Wilderness areas. The predominant recreational activity in the area is OHV riding including hill climbing, trail riding, and touring by both motorcycles and four wheel drives. Additional recreational activities include camping, star gazing, hiking, upland game bird and deer hunting, picnicking, target shooting, wildlife and wildflower viewing. Popular destinations in addition to the Open Areas include the Jawbone Station Visitor Center, Butterbredt Springs, and the Pacific Crest National Scenic Trail.	Front Country	Rural	Front Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA - 4 Middle Knob Subregion	Central section of TMA, bounded by Township line 31S on the north, Hwy 14 on the east, Kern and Los Angeles county lines on the south, and the CDCA boundary on the west.	This area consists of two small groupings of public lands around Antimony Flats and Middle Knob along with scattered public lands south of Highway 58 down to the Los Angeles county line. Recreational pursuits include vehicle touring, single track motorcycle touring, site seeing, camping, hunting, target shooting, hiking and backpacking. Popular destinations in the region include the Pacific Crest National Scenic Trail and its various trailheads that provide the ability for one to take a short day hike or do a point to point hike.	Front Country	Front Country	Middle Country
TMA - 4 Lancaster Subregion	Southern area of TMA, bounded by Highway 58 on the north, San Bernardino county line on the east, Angeles NF on the south, and the CDCA boundary on the west.	Assortment of scattered tracts of public land; predominantly within Los Angeles county. Open routes primarily connect private roads and provide casual OHV recreation. Extensive private land developments w/roads, power and water systems. Other developments include commercial power plant, military bases, airports, hotels, restaurants and gas stations.	Rural	Back Country	Back Country
TMA 5					
TMA 5 – Fremont Peak	Northwest corner of BFO; N boundary Ridgecrest FO W boundary Hwy395 S boundary Hwy58 & BNSF E boundary Harper dry lake	This area is in the western portion of the field office area along Highway 395. It provides popular access portals and staging areas for motorized recreation around Fremont Peak and points east. Features include Fremont Peak, the dominate landscape feature; good access, easy hike, historic mines, dry lakebeds and long roads connecting distant features. There are a few developments including scattered communication and radar sites.	Middle Country	Back Country	Back Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 5 – Black Mountain	Northwest portion, east of and similar to Fremont peak. N boundary Ridgecrest, China Lake W boundary Fremont Peak S boundary Hwy 58 & BNSF E boundary Coolgardie	This area is relatively remote with few roads or developments. The area includes the Black Mountain Wilderness, Black and Inscription Canyons, Opal Mountain open dry lakebed Superior, and landsailing. The terrain varies from sandy expanses to rocky canyons and lava flows. The area includes extensive and significant petroglyphs and related sites; guzzlers and preserves. It is a popular 4x4 tour destination site, scenic touring and OHV play; dispersed camping, rock collecting, and hunting	Back Country	Back Country	Middle Country
TMA 5 – Harper Lake	North central portion of TMA. Wide expansive open valleys, low hills, Harper dry lake.	The north shore of the dry lakebed is the site of an ancient Native American settlement with extensive petroglyphs and springs, converted to historic farm and stage stop for Death Valley. Uses include farming, ranching, grazing, ACEC and watchable wildlife site. Historic center for stage, railroad, mining, ranching and agricultural sites, and is recently evolving into large scale industrial solar plants and transmission lines. Activities include 4x4 and OHV touring, hunting, landsailing, birding, rock collecting, photography, painting and night sky observation	Front Country	Front Country	Middle Country
TMA 5 – Coolgardie	Also north central portion TMA. Softer & rounded landscape, between Ft Irwin to north & City of Barstow to south; Calico to east & Black Mountain to west.	This area is in the north central portion of TMA5 and the Barstow field office area. It is a high plateau directly north of Barstow extending out to Ft. Irwin. It has an extensive Joshua Tree forest, with winter snow common. Gently terrain and good soils make ideal provide ideal OHV touring opportunities; extensive recreational gold mining area, active and historic uses. Soils (dg type) and slopes are well suited to 2wh drive scenic touring, 4x4 and OHV play and exploration. Features include springs, cabins, met towers and long roads connecting the horizon. Well maintained road to top of Lane Mountain provides excellent vistas.	Middle Country	Middle Country	Front Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 5 – Mitchel Mountains	Center of BFO, south center portion of TMA. Small pocket of low rugged mountains border north side of Barstow City.	This area has few roads and trails, scattered historic mines, key communication sites on peaks, no springs; significant vista from top of Mitchel Mountain. Intensive use from urban interface includes recreation shooting, OHVs, 4x4s, mountain biking, running, hiking, dog walking, equestrian use, and geo-caching. People commonly wander and explore into fringes along city edge.	Middle Country	Middle Country	Back Country
TMA 5 – Calico Mountains	Central portion of TMA. Borders I15 on south, Ft. Irwin Rd to west & north, Alvord Mountains to east.	This area includes the rocky, rugged, colorful Calico Hills and historic mining town; Coyote dry lake in the north portion (closed). The area is very popular for target shooting, riding OHVs and general exploration. Numerous roads, trails, mines, adits, and diggings are popular for groups, jeep clubs, SRPs, exploration, hiking, equestrian, 4x4 touring and OHV play. The town includes stores, historic cemetery, restaurants, and campground, and is popular with regional, national and international tourists; There is a KOA campground at the freeway. More activities include climbing, photography, painting and commercial photography.	Front Country	Front Country	Middle Country
TMA 5 – Cronese Lake	North eastern portion of TMA. Borders I15 on south, Ft. Irwin to north; west from Coyote Dry Lake east to almost Baker.	This area is remote and rugged with numerous jagged mountains and ranges, scattered small playas, and dry upland desert lands. There are few roads, vast Soda Wilderness Study Area, occasional communication sites, power, pipe and communication lines; mountaintop communication sites and few other developments. Similar to the Afton TMA this is an ancient, historic and modern day east-west travel corridor and includes portions of Old Spanish National Historic Trail, Mormon Rd, Route 61 and Hwy15. This is the primary path travel and trade corridor between the west coast and all points east. Cronese Lake was the western border of the Anasazi Empire. The area includes a tank trail.	Back Country	Primitive Country	Back Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 6					
TMA 6 – Edwards Bowl	Pocket area north of El Mirage, west of Hwy395, east of LA county & south of Edwards.	This area is relatively flat open desert with few scattered low hills; soft sandy flats, small dry playas and rugged rocky knolls. Numerous roads and trails crisscross the area from years of intensive OHV use, a result of staging and encroaching urban areas. The area has easy access from 3 sides. Activities include hunting (shotguns), scenic touring, communication sites, powerlines, and scattered mines. This is a fairly remote and quiet area.	Middle Country	Primitive Country	Middle Country
TMA 6 – Kramer Hills	West center portion of BFO and center of TMA. West boundary is Hwy395 & east is Helendale Rd; north boundary is Hwy59 & south boundary is Silver Lakes.	This is a relatively open area with soft sandy soils in flats and scattered rugged rocky knolls. Long straight roads seem to fade into distance. It provides areas of general exploration for nearby communities, and is popular for jeeping and scenic touring. Developments include scattered mines and powerlines.	Middle Country	Back Country	Back Country
TMA 6 – Iron Mountain	Area south of Hwy58, east of Helendale, and north of Route 66.	The major landscape feature is the Mojave River along the TMA southern boundary. Trails and roads in this area are popular for equestrian riding, hiking, scenic touring, 4x4 exploration and OHV play; hunting, photography and bird watching. Features include the Old Spanish National Historic Trail, Mormon Rd., BNSF tracks, historic mines and old stage routes north to Harper and Death Valley.	Middle Country	Primitive Country	Back Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 7					
TMA - 7 Ridgecrest Subregion	Northeastern portion of TMA, including the community of Ridgecrest, bounded by China Lake NWS on the north and east, Golden Valley Wilderness on the south, and Hwy 395 on the west.	The region abuts the communities of Ridgecrest and Inyokern. The topography includes sloping bajadas, braided washes, and narrow canyons along with the rolling Rademacher, Spangler, and Sand Hills areas. Recreational opportunities include OHV and four wheel drive touring, hunting and target shooting, stargazing, photography, exploring mine sites, social gathering, rock hounding, hiking, running, mountain biking, and horseback riding. Prominent recreational destinations include the Rademacher Hills trail system, Goldbug Interpretive Mine Site, and the Spangler Hills Open Area and the neighboring Sand Hills.	Urban	Rural	Rural
TMA - 7 El Paso Subregion	Northwestern portion of TMA, bounded by Hwy 178 on the north, Hwy 395 on the east, Garlock and Redrock-Randsburg Road on the south and Hwy 14 on the west.	The region consist of prominent volcanic peaks (El Paso Mountains), broad valleys, rolling foothills, badlands, sloping bajadas, braided washes and narrow canyons. Popular recreational pursuits include upland game bird hunting, rock and mineral collecting, cultural site viewing, OHV touring, hiking, camping, mountain biking, horseback riding, along with commercial 4-wheel drive and dual sport tours, and competitive equestrian endurance rides. Recreational destinations include Burro Schmidt Tunnel, Bickel Camp, El Paso Mountains Wilderness, Goler Gulch and Sheep Springs.	Middle Country	Middle Country	Middle Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA - 7 Rand Subregion	Southwestern portion of TMA, bounded by Garlock and Redrock-Randsburg Road on the north, Hwy 395 and the Kern/ San Bernardino county line on the east, Hwy 58 on the south, and Hwy 14 on the west	The bajadas, alluvial fans, and undulating hills that lie between the towns of Randsburg and California City along with scattered sections of land south of California City within eastern Kern make up this area. Recreational activities within the region include OHV trail riding and touring, upland game bird hunting, rock hounding, gold prospecting, hiking, nature study, and photography. Popular destination locations include the Desert Tortoise Research Natural Area, Government Peak, and the living ghost town of Randsburg.	Middle Country	Back Country	Front Country
TMA – 7 Red Mountain Subregion	Southeastern portion of TMA, bounded by Golden Valley Wilderness and 29S Township line on the north, China Lake NWS on the east, Cuddeback Lake Road, Hwy's 395 and 58 on the south, and the Kern/San Bernardino county line on the west.	This region encompasses rolling hills, steep mountainous terrain of the Lava Mountains, and the flat desert terrain that slopes towards Cuddeback Lake. Recreational activities in the region include upland game bird hunting, wildflower viewing, cultural site viewing, photography, target shooting, dispersed camping, hiking, land sailing, horseback riding, mountain biking, and OHV touring. Additionally one can find many non-mechanized recreational opportunities within the Golden and Grass Valley Wilderness areas. Popular destinations include Steam Well, Red Mountain Spring, and Cuddeback Lake.	Middle Country	Back Country	Middle Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 8					
TMA 8 – Stoddard Valley	Area between Victorville & Barstow, south of Hwy15; east boundary Hwy247, west boundary Mojave River.	The central portion is the Stoddard Valley OHV area; the north portion borders Mojave river with uses similar to Iron Mountain TMA. The area includes the Old Spanish National Historic Trail, Mormon Rd., Hwy 15, Route 66, springs, Sawtooth campground, Margaritaville, climbing, hiking, peak bagging, rock hounding, birding, herping, model rockets, scenic touring, equestrian uses and hunting (shotgun). The area has extensive and intensive human use and sounds, significant urban interface and regular on-going use throughout the area for 4x4 exploration and OHV play. The area includes travel facilities, powerlines, pipelines, communication sites, ranches, farms, light industry, large scale cement mines, and a few small scale wind turbines. The area includes campground host at Sawtooth, kiosks, signs, fences and regular field patrols.	Front Country	Rural Country	Front Country
TMA 8 – Ord Mountains	Nearly geographical center of field office, center north of TMA. West boundary Hwy247, east boundary Camp Rock Rd, north boundary I40 & Bartow, south is Lucerne Valley	This area is relatively remote in the sense that this area is off-set slightly east of nearby urban areas. It is a popular area for scenic touring with larger mountains separating numerous small valleys. The area has numerous springs and cacti species; includes extensive historic ranching and mining sites, and nationally significant modern day infrastructure including communication sites, powerlines and pipelines. Activities include 4x4 and OHV touring, exploration and play, SRPs, commercial filming and grazing.	Middle Country	Back Country	Middle Country

Table 3.6-1. Summary of Recreational Activities in the West Mojave Planning Area

Area	Location	Primary Destinations and Recreational Activities	Physical Settings[1]	Social Settings[1]	Administrative Settings[1]
TMA 8 – Newberry Rodman	TMA south of Hwy40 and north of Johnson Valley OHV Area; Camp Rock Rd is the west & SW boundary; east & NE boundary is powerline.	This is a rugged area containing large areas of impassable lava flows near Route 66, and rugged mountains further south in the Newberry/Rodman ranges. The area includes the large Rodman Wilderness Area and sites with extensive petroglyphs. The area includes guzzlers, communication sites, historic and active mines, grazing, gravel pits, and on-going gold prospecting; hunting (shotgun) hiking and equestrian uses.	Middle Country	Back Country	Back Country
TMA 8 – Johnson Valley	Most of TMA includes Johnson Valley OHV Area and public lands as far south and west as Hwy247.	The major feature in this area is the Johnson Valley OHV Area designated for 4x4 and OHV use, including exploration, touring, play and competition. The area is popular for large scale OHV events and competitions. It includes the Cougar Buttes area popular with trials bike SRP events and commercial filming. The area includes dry lakebeds, lava flows, rugged mountains, long valleys, springs, Creosote and Yucca Ring plan assemblies, and extensive and large scale mine operations. Sensitive areas are closed and fenced; signs, kiosks and visitor patrols help guide visitors and protect sensitive resources.	Front Country	Front Country	Front Country

[1] Settings are based on BLM Recreational Settings ranging from Urban, Rural, Front Country, Middle Country, Back Country, and Primitive.
[2] Sub-region locations are shown in Figure 2.1-1, and TMAs are based on the TMAs proposed in Alternatives 2 and 3, and shown in Figure 2.3-2.

Many of the subregions are extensively used for OHV touring, Open Areas, and motorized vehicle events. The Barstow and Lancaster subregions have relatively limited OHV recreation because they have little public land, and most of their motorized routes connect to private land and commercial developments. The Afton, Juniper Flats, Cronese Lake, and Iron Mountain subregions are the sites of historic trails, including the Old Spanish National Historic Trail, Mojave Trail, and Mormon Road. Backcountry and non-mechanized recreation are prominent in the Darwin, Sierra, North Searles, Cronese Lake, Red Mountain, and Newberry Rodman subregions.

BLM's CDCA Plan has designated several areas within the West Mojave as "Open Areas", totaling 271,661 acres. This constitutes 7.8 percent of the approximately 3.1 million acres of BLM-managed public lands in the WEMO Planning area. Open Areas are some of the most popular destinations in the desert, and the designated access routes to these Open Areas are some of the most heavily used routes on public lands. Within Open areas, unlike limited vehicle access areas, there is no "route designation." Motorized vehicles may travel anywhere, subject to site-specific access limitations, so long as the vehicle is operated responsibly in accordance with regulations. However, dispersed OHV recreationists in Open Areas generally follow a system of routes created over time that provide for touring at reasonable speeds that minimize likelihood of breakdown or vehicle damage.

In areas where the use is particularly concentrated, the density of routes can be very high. Staging areas and group camping areas are often located nearby to these areas of concentrated use. Open Areas are destinations for uses that are not available in other parts of the desert where access is limited to designated routes. The types of uses may depend on soils, topography and historic patterns of use. Table 3.6-2 briefly describes each Open Area, visitor use levels and the principal recreation activities that occur there.

Table 3.6-2. Characteristics of BLM Open Areas

Open Area	Total Size (acres)	Visits in 2012	Visitor Days in 2012	Principal Recreation Activities	OHV Use Patterns
Dove Springs	3,840	54,597	162,654	OHV activities include motorcycle hill climbing, ATV/quad use. Non-OHV activities include camping, shooting, and hunting.	The entire Dove Springs open area is used for camping and OHV driving. OHV driving centers on riding up and down the hillsides using all types of OHVs.
El Mirage	25,600	95,264	179,835	Approximately 50% of the activity is not typical OHV activity (i.e. motorcycles, quads, jeeps). The dry lakebed attracts visitors with experimental vehicles, aircraft, land wind sailors, etc. The predominant OHV activity is motorcycle use.	Most use is concentrated on and around the dry lakebed. Significant motorcycle use takes place away from the lakebed towards the mountains to the northwest. Visitors generally stay on long-established routes. Permitted events, sightseeing, camping, and dispersed camping occur in the area.

Table 3.6-2. Characteristics of BLM Open Areas

Open Area	Total Size (acres)	Visits in 2012	Visitor Days in 2012	Principal Recreation Activities	OHV Use Patterns
Jawbone Canyon	7,000	52,259	155,601	Predominantly dirtbike motorcycle use engaging in hill climbing activities, as well as dual sport motorcycle and 4WD touring/sightseeing.	Camping areas are concentrated along three miles of the Jawbone Canyon Road. OHV users enjoy the challenge of riding up and down hillsides throughout the canyon. The steepness of the hillsides that riders use varies from moderate to extremely steep.
Johnson Valley	96,000[1]	204,002 (combined Johnson and Stoddard[2])	511,491 (combined Johnson and Stoddard[3])	Unrestricted OHV recreation. Predominantly dirt bike motorcycle use, as well as dual sport motorcycle and 4WD touring/sightseeing. Permitted events, camping, and dispersed camping occur in the area.	Primarily "Green Sticker" motorcycle use participating in "trail riding". Approximately 50% of that use takes place in the form of permitted "organized" events (e.g., races).
Rasor	22,400	4,095	8,159	Predominantly dirt bike motorcycle use, as well as dual sport motorcycle and 4WD touring/sightseeing. Camping, dispersed camping, and sightseeing occur in the area.	Dispersed OHV use.
Spangler Hills	62,080	2,549	6,309	Predominantly dirtbike, motorcycle use, as well as dual sport motorcycle and 4WD touring/sightseeing. Organized competitive events also occur here.	The area provides many OHV routes through open, gentle desert terrain. There are more challenging routes through hills along the sides of the open area. Three popular camping areas are Teagle Wash, Wagon Wheel, and east of US 395.
Stoddard Valley	54,400	204,002 (combined Johnson and Stoddard)	511,491 (combined Johnson and Stoddard)	Predominantly dirtbike motorcycle use, as well as dual sport motorcycle and 4WD touring/sightseeing. Permitted events, camping, and dispersed camping occur in the area.	OHV use is widely dispersed. Approximately 50% of the use is estimated to be associated with permitted events. Heaviest use occurs at staging areas. Visitors tend to stay on pre-existing routes as the terrain becomes rougher and as they travel away from the staging areas.

[1] *This includes the 53,000-acre Shared-Use Area as well as the remaining 43,000 acres which now constitute the Johnson Valley Off-Highway Vehicle Recreation Area in PL 113-66.*

[2] *These numbers include some level of use in the portion of the JV OHV Area prior to the military expansion under PL 113-66, which had yet to be implemented on the ground.*

[3] *Ibid.*

Table 3.6-2. Characteristics of BLM Open Areas

Open Area	Total Size (acres)	Visits in 2012	Visitor Days in 2012	Principal Recreation Activities	OHV Use Patterns
Olancha Dunes	341	13,584	8,558	Unrestricted OHV recreation. Predominantly ATV and Dune buggy use with some motorcycle use.	The dune system in the area provides a beginner to intermediate level riding experience. This is due to the fact that the dunes are small compared to other dune systems in the CDCA, such as those found at Dumont or the Imperial Sand Dunes. In addition to OHV use the dunes have been used for commercial photography purposes.

3.6.2 Trends

3.6.2.1 General Recreation Trends

Table 3.6-3 provides the numbers of visitors and visitor days at a variety of recreational sites since 1999, including campgrounds, trails, special-interest (archeological and geological) sites, information centers, and OHV areas. In general, use levels at the sites which are not focused on OHV use range on the order of hundreds or thousands of visitors and visitor hours per year. However, the level of OHV-focused activities, such as use of Open Areas, is frequently on the order of several hundred thousand visitors and visitor hours per year, reflecting the popularity of OHV use as a recreational activity in the Planning Area.

California's population is increasing rapidly. The State's population is projected to grow from 34 million in 2000 to 46 million by 2035 (California Department of Finance 2013). The population of the planning area is projected to grow from 795,000 in 2000 to more than 1.5 million people by 2035. This increase in population is reflected in an increase in use of public lands for recreation throughout the Planning Area, as shown in Table 3.6-3. The total levels of recreational use are about the same in the Barstow and Ridgecrest Field Office areas, on the order of about 800,000 to 1 million visitors and visitor hours in each area in 2012. This level of use is approximately double the levels in both areas in 1999.

3.6.2.2 Trends in OHV Use

California has the greatest number of OHV recreation enthusiasts in the country. Its 3.5 million recreationists constitute 14.2% of all California households. Since 1980, however, the number of acres available to OHVs for dispersed recreation has decreased 48 percent in California's deserts alone (from 13.5 million acres in 1980 to 7 million acres in 2000). At the same time, OHV "green sticker" registrations have increased by 108%. Attendance at the State of California's State Vehicular Recreation Areas (SVRAs) increased from 1985 to 2000 by 52%. Registration of OHVs through the California Department of Motor Vehicles increased from 235,003 in 1980

to a peak of 1,135,919 in 2008. Since 2008, the number has declined every year to 905,366 in 2013.

OHV Vehicle Trends: Californians have embraced the sport utility vehicle (SUV). As SUV sales increase, the demand for off-highway opportunities for SUV owners is also on the rise. Simultaneously, there have been notable declines in motorcycle sales in California concurrent with steady increases in ATV and SUV sales. As a consequence, there appears to be a trend toward wider trails for larger off-highway vehicles (i.e., SUVs) as opposed to single-track trails used for motorcycling.

The Recreational Off-Highway Vehicle (ROV) is fast becoming the OHV of choice due to its size (smaller than a truck/SUV but larger than an ATV) and cost. Sometimes referred to as side-by-sides or UTVs, ROVs are motorized off-road vehicles designed to travel on four or more non-highway tires, with a steering wheel, non-straddle seating, seat belts, an occupant protective structure, and engine displacement up to 1,000cc. Current models are designed with seats for a driver and one or more passengers. ROVs currently in the market are specifically designed for an operator age 16 or older and one or more passengers.

The increase in California's population has caused significant increases in urban development. Expansion of development in high desert cities may reduce the land area available for rural OHV recreation areas, and has occurred against a backdrop of decreasing availability of public land access. The expansion of the Twenty-Nine Palms marine base resulted in an additional withdrawal of 152,500 acres, of which 98,547 acres are public land that was available to motorized and non-motorized recreational use. This is the loss of 98,547 from the largest OHV Area in the U.S. A portion of this area, approximately 53,000 acres, is to be managed as a Shared Use area. The Shared Use Area (SUA) will be available for 10 months of the year for recreational use, including the King of the Hammers event.

The listing as threatened or endangered of species and conservation of sensitive habitats has also resulted in area closures to OHV access. Wilderness designations have also resulted in large areas that are no longer accessible to OHV. Air pollution controls imposed by the California Air Resources Board's Red Sticker Program have restricted the use of two-cycle engine motorcycles in OHV riding areas to a limited number of months in the year instead of year-round. Motorized touring on popular historic trails has been restricted in places to preserve the historic integrity of the trails, making them less accessible to many users.

The levels of OHV use have generally not been affected by livestock grazing. Both OHV use and grazing use varies widely at any particular time in grazing allotments, but few conflicts occur between these two uses, whether or not stocking rates are high or low. Where range fences are built to restrict and direct cattle movements, route access on open routes is maintained and cattle movements are restricted at openings in fences across open routes using cattle guards or gates. Major OHV restrictions at range improvements in grazing allotments are generally for resource protection, such as riparian areas, rather than due to grazing activities and conflicts. OHV Trends are generally unaffected by stocking rates or the retirement of allotments.

Access for Disabled and the Elderly: A few improved non-motorized trails have been developed on public land to provide better access for the disabled and elderly. The number of these trails is limited by the resources available for intensive design costs and maintenance levels. Also, these publics desired experiences not readily available on other federal and State lands. Therefore, access for disabled and elderly focus on providing and enhancing motorized

touring opportunities. In 1994, surveys were conducted at the Oceano Dunes SVRA. This survey revealed that approximately 9% of all those surveyed had within their group a disabled individual who was able to access the dunes and beach because vehicles were allowed in those areas. Increasing numbers of senior citizens want to experience remote outdoor areas via OHV access. As the baby-boomer population continues to age, they find it increasingly difficult to access these areas without the use of off-highway vehicles.

Behavioral Trends: Motorized access can be for a variety of purposes, including economic pursuits, to access private property, and for recreation such as touring, hunting, accessing trailheads or unique resource values, and rockhounding. With expanded leisure time, conflicts have arisen between those who use vehicles as a means of access and those who operate vehicles as a recreational activity. Safe access by the public to the desert is primarily provided by motor vehicle. However, many members of the public are concerned that increased use of motorized vehicles decreases the unique values, such as scenic values and quiet spaces, which attract many recreationists to the desert. As use levels increase, available land for recreational pursuits decreases, and local landowners are concerned with trespass by OHV recreational users.

Tread Lightly is a national nonprofit OHV organization with a mission to promote responsible recreation through ethics education and stewardship programs. Tread Lightly's environmental educational message, along with its training and restoration initiatives are strategically designed to instill an ethic of responsibility in OHV enthusiasts. Their program is long-term in scope with a goal to balance the needs of the people who enjoy outdoor recreation with our need to maintain a healthy environment. This program has educated many OHV users on being respectful and responsible land users.

At the El Mirage Off-Highway Vehicle (OHV) Area there is a program for youth called Junior Ranger Program specifically designed for responsible off road riding behavior. Either a BLM Park Ranger or an employee of the Friends of El Mirage will teach a group of young people about the principles of safe riding with the addition goal of gaining an appreciation of their riding environment. The program is free to the public and is offered most weekends during the riding season. The program promotes principles of responsible outdoor recreation to empower youth to do their part and help sustain OHV recreation.

OHV enthusiasts have donated their time to projects combating erosion, replanting recently burned forests, trash collection, renovating trails to improve rider safety, patrolling of OHV areas, being campground hosts, and more to promote responsible use. Such volunteerism is an indication of the commitment that most OHV enthusiasts share to conserve the environment and future opportunities to experience the desert.

Technological Improvements: OHV manufacturers have made huge strides in improving their vehicles to minimize excessive noise. Since 1990, noise levels from motorcycle dirt bikes have decreased from 96 to 88 decibels. Noise reduction can also be accomplished by utilizing specific design and construction techniques in OHV areas, through careful trail planning and construction of berms to impede or dissipate sound. Further technological innovations are being made to reduce noise, and air pollution.

Table 3.6-3. Number of Visitors and Visitor Days in West Mojave, 1999-2012

Area		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Barstow Field Office															
Afton Canyon															
Afton Canyon Campground	Visits	1166	1450	1028	826	777	1130	397	1038	1138	49249	772	752	394	n/a
	Visitor Days	1060	1318	1194	1501	1412	2053	721	1886	2067	89469	1402	1365	716	n/a
Afton Canyon Natural Area	Visits	1267	1181	1330	2189	3478	2379	1684	2157	1943	1584	2106	3363	2107	2106
	Visitor Days	297	277	316	529	841	575	407	521	470	383	509	813	509	509
Afton Group Area Campground	Visits	428	451	607	560	1219	1177	446	511	513	418	557	838	556	556
	Visitor Days	392	413	819	1027	2235	2158	818	937	941	766	1021	1537	1019	1019
Dispersed Use	Visits	11293	10355	2064	5458	9333	4996	3643	4190	5264	3428	4561	7664	4561	4561
	Visitor Days	3021	2770	529	1333	2279	1220	889	1023	1285	837	1114	1871	1114	1114
Mojave Road	Visits	1370	1533	1746	1961	4986	3171	4200	4830	4850	3646	5193	8312	6295	5257
	Visitor Days	229	255	291	337	831	889	700	805	808	608	866	1385	1049	876
Total Afton Canyon	Visits	15524	14970	6775	10994	19793	12853	10370	12726	13708	58325	13189	20929	13913	12480
	Visitor Days	4998	5033	3149	4727	7598	6895	3535	5172	5571	92063	4912	6971	4407	3518
Barstow, Extensive															
Calico Early Man Site	Visits	1615	2431	2609	1419	1541	1662	1272	1455	1467	1195	1590	2886	2161	1588
	Visitor Days	170	423	454	247	368	289	222	253	256	208	277	1776	673	277
Dispersed Use	Visits	172981	175022	543051	516213	502202	504158	326228	425199	427073	348117	463958	735801	463729	463798
	Visitor Days	77457	78077	273994	296422	288043	288602	187458	243281	244321	199320	267357	421596	266645	267802
Juniper Flats Intensive Use Area	Visits	7324	4166	7067	6362	6362	6124	5130	5883	5908	4832	6405	9638	6422	6422
	Visitor Days	1154	656	1288	1336	1336	1286	1077	1235	1241	1015	1345	2024	1349	1349
Lucerne Dry Lake Specialized Sport Site	Visits	0	0	0	532	1458	1097	734	898	1035	913	964	1829	1099	917
	Visitor Days	0	0	0	435	1236	914	612	748	886	786	809	6122	916	764

Table 3.6-3. Number of Visitors and Visitor Days in West Mojave, 1999-2012

Area		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mojave Road	Visits	532	878	840	753	2303	2332	572	653	656	533	711	1124	712	712
	Visitor Days	89	146	140	126	384	389	95	109	109	89	119	187	119	119
Total Barstow, Extensive	Visits	182452	182497	553567	525279	513866	515373	333936	434088	436139	355590	473628	751277	474123	473437
	Visitor Days	78780	79232	275876	298566	291267	291480	189464	245626	246813	201418	269907	431705	269702	270311
Desert Discovery Center															
Information Center	Visits	4795	2347	4405	5108	4294	5452	4160	3092	11	3634	11	9395	0	5493
	Visitor Days	296	145	347	485	408	518	395	294	1	345	1	893	0	522
Dispersed Use	Visits	0	0	6	16	15	534	12	2059	4527	493	5040	8063	0	4831
	Visitor Days	0	0	0	1	1	44	1	172	377	41	420	672	0	403
Total Desert Discovery Center	Visits	4795	2347	4411	5124	4309	5986	4172	5151	4538	4127	5051	17458	0	10324
	Visitor Days	296	145	347	486	409	562	396	466	378	386	421	1565	0	925
El Mirage															
Dispersed Use	Visits	99278	142953	129573	123801	140873	153154	91980	99578	99739	83683	116356	170401	66684	95264
	Visitor Days	105844	162548	182517	208557	237986	255289	150973	173940	168802	141793	196441	276768	119591	179835
Total El Mirage	Visits	99278	142953	129573	123801	140873	153154	91980	99578	99739	83683	116356	170401	66684	95264
	Visitor Days	105844	162548	182517	208557	237986	255289	150973	173940	168802	141793	196441	276768	119591	179835
Rasor															
Dispersed Use	Visits	13891	14522	13934	8175	6677	4555	3275	4568	4896	3078	4998	6509	4349	4095
	Visitor Days	14863	15539	19803	16289	13304	9076	6525	9102	9755	6133	9959	12969	8665	8159
Mojave Road	Visits	853	838	878	715	815	777	1752	1832	1838	1497	1992	2988	1992	1992
	Visitor Days	142	140	19949	119	136	130	1189	305	306	250	332	498	332	332
Total Rasor	Visits	14744	15360	14812	8890	7492	5332	5027	6400	6734	4575	6990	9496	6341	6087
	Visitor Days	15005	15679	19949	16408	13440	9206	7714	9407	10061	6383	10291	13467	8997	8491

Table 3.6-3. Number of Visitors and Visitor Days in West Mojave, 1999-2012

Area		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Stoddard and Johnson															
Anderson Dry Lake Staging Area	Visits	8024	5794	8526	10515	12665	13214	9773	12711	12096	11583	12236	31132	14677	15256
	Visitor Days	6748	3624	7352	11035	11610	12113	8959	12758	11088	13587	11216	34050	20035	20637
Cougar Buttes Intensive Use Area	Visits	694	1226	3640	3854	10323	14038	9347	8417	8137	8252	8391	13657	10231	10537
	Visitor Days	432	830	6381	9120	9472	13242	8271	5774	5721	7842	5649	9561	13737	11754
Dispersed Use	Visits	102814	84783	124808	128583	79388	96652	93491	98870	81669	77330	149053	157663	98722	97432
	Visitor Days	42730	61592	107597	152722	92901	112176	124994	135148	89941	94117	242937	215208	126960	128846
Means Dry Lake Intensive Use Area	Visits	2281	1887	1469	4292	5915	4510	4802	5364	5257	4520	15698	24592	21616	38332
	Visitor Days	3835	1482	1096	3620	6057	3616	4753	4731	4214	3718	12585	89175	120197	317292
Sidewinder Road Staging Area	Visits	7992	8214	11869	10110	12898	12342	5914	6802	7336	5558	6974	16215	9568	8179
	Visitor Days	5968	5928	19570	7586	9652	9236	4426	5090	6017	4159	5219	27336	8464	6121
Slash-X Staging Area	Visits	7686	5601	7583	7420	11298	9667	3890	4475	6495	10730	4872	7311	8599	4871
	Visitor Days	9705	3577	4281	5540	8436	7218	2905	3341	9905	26875	3638	5459	11706	3637
Soggy Dry Lake Intensive Use Area	Visits	2094	3414	8723	10660	19199	17265	13573	16920	15994	15238	15762	26501	19146	14772
	Visitor Days	1300	2120	6191	9382	15873	13970	11001	13759	12950	20148	12754	27283	21442	12389
The Rockpile Staging Area	Visits	4024	4266	8873	3298	14151	15689	10298	14187	16465	10615	14123	22695	14124	14623
	Visitor Days	6415	5351	14319	2963	9917	10995	7217	10103	12931	7439	9898	17842	9899	10815
Total Stoddard and Johnson	Visits	135609	115185	175491	178732	165837	183377	151088	167745	153449	143826	227108	299766	196683	204002
	Visitor Days	77133	84504	166787	201965	163918	182566	172526	190704	152757	177885	303896	425914	332440	511491
Superior/Rainbow															
Dispersed Use	Visits	29424	26577	18656	28047	22890	17890	4417	5080	5101	4354	5451	8836	5520	5555
	Visitor Days	8607	7774	6011	10599	8747	6945	1645	1892	1900	1622	2030	3655	2235	2186

Table 3.6-3. Number of Visitors and Visitor Days in West Mojave, 1999-2012

Area		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Harper Dry Lake	Visits	1133	1358	1940	2136	2032	1620	1497	1935	1902	1585	2106	3346	2227	2106
	Visitor Days	189	226	323	356	339	270	250	323	317	264	351	558	371	351
Owl Canyon Campground	Visits	1635	2311	1552	1537	1443	1312	533	845	930	2000	1025	925	748	134
	Visitor Days	1542	2180	1588	2817	2644	2404	977	1548	1704	3665	1878	1696	1371	246
Owl Canyon Group Campground	Visits	749	694	822	992	888	698	630	732	726	592	787	1184	1253	788
	Visitor Days	831	770	1115	1783	1596	1255	1132	1300	1305	1064	1415	2128	2252	1416
Rainbow Basin Natural Area	Visits	2534	2962	1381	2396	7563	5421	3994	4594	4332	3310	4477	9945	4999	4999
	Visitor Days	507	592	276	479	1513	1084	799	919	866	662	895	1989	1000	1000
Total Superior/Rainbow	Visits	35475	33902	24351	35108	34816	26941	11071	13177	12991	11841	13846	24237	14747	13582
	Visitor Days	11676	11542	9313	16034	14839	11958	4803	5982	6092	7277	6569	10026	7229	5199
Total for Barstow Field Office	Visits	487877	507214	908980	887928	886986	903016	607644	738866	727298	661967	856168	1293564	772491	815176
	Visitor Days	293822	358683	657938	730949	729457	757956	529411	631297	590484	627205	792437	1166416	742366	979770
Ridgecrest Field Office															
Eastern Sierra															
Dispersed Use	Visits	5124	5000	15000	165036	58722	18001	18120	18268	20754	21164	23298	23300	22836	22902
	Visitor Days	4142	3896	13750	151274	84965	16501	16610	16746	19024	19400	21356	21358	20933	20994
Owens Peak Trailhead	Visits	14625	15050	13000	6000	16550	23588	22987	20875	19605	19527	18648	19500	18720	9572
	Visitor Days	13699	10811	12177	5620	15360	18319	21531	19563	18369	18290	17467	18265	17534	8966
Sacatar Trailhead	Visits	2420	2800	0	2000	4860	4400	4423	4412	3760	3784	3621	3712	3608	3706
	Visitor Days	2077	1299	0	1717	4171	3777	3796	3787	3227	3248	3108	3186	3097	3181
Short Canyon Trailhead	Visits	14211	15000	0	2800	12810	33000	32869	32987	13143	13421	11598	12177	11924	11503
	Visitor Days	4932	5206	0	1103	5044	12994	12942	12989	5175	5285	4567	4795	4695	4529

Table 3.6-3. Number of Visitors and Visitor Days in West Mojave, 1999-2012

Area		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total Eastern Sierra	Visits	36380	37850	28000	175836	92942	78989	78399	76542	57262	57896	57165	58689	57088	47683
	Visitor Days	24850	21212	25927	159714	109540	51591	54879	53085	45795	46223	46498	47604	46259	37670
El Paso Mountains															
Boral Corral Pit Shooting Range	Visits	2320	2000	2501	6000	2056	3500	4051	4392	5564	7502	6301	6020	5939	6223
	Visitor Days	358	292	521	875	300	510	610	875	836	1188	934	878	866	908
Dispersed Use	Visits	18189	18805	20000	14335	22068	30784	31317	30999	40273	40139	46573	49188	47712	48270
	Visitor Days	14025	14574	15500	10999	17012	23108	24147	23948	31174	31089	35762	37921	36977	37275
El Paso Mountains Trailhead	Visits	5423	11051	5500	30000	20680	29000	28988	25369	22198	22045	500	733	779	752
	Visitor Days	3977	6815	4033	15000	15165	21267	21258	18604	16279	16166	367	467	528	551
Last Chance Canyon Trailhead	Visits	5124	5000	10400	1200	780	4101	4098	4048	2698	3587	100	36555	3590	36455
	Visitor Days	7700	7646	15903	1835	1193	6271	6267	6190	5655	5485	153	55899	5490	55746
Total El Paso Mountains	Visits	31056	36856	38401	51535	45584	67385	68454	64808	71733	73273	53474	92496	58020	91700
	Visitor Days	26060	29327	35957	28709	33670	51156	52282	49617	53944	53928	37216	95165	43861	94480
Mojave															
Cache Peak PCT Trailhead	Visits	758	2370	1500	1345	4800	5500	5763	5771	5769	5803	5826	5900	5889	5815
	Visitor Days	1352	3178	2675	2399	8560	5072	10277	10292	10288	10349	10390	10522	10502	10370
Desert PCT Trailhead	Visits	585	1005	450	375	2713	8100	8222	8231	8156	7988	7821	8000	7801	7813
	Visitor Days	1043	853	803	669	4838	9370	14663	14679	14545	14245	13947	14267	13912	13933
Dispersed Use	Visits	2877	2500	7000	45000	14490	23500	24000	24621	23249	23598	24607	24611	24365	24590
	Visitor Days	3896	3385	9479	60938	19622	31823	32500	33341	31483	31956	32807	33326	32994	33037
Total Mojave	Visits	4220	5875	8950	46720	22003	37100	37985	38623	37174	37389	38254	38511	38055	38218
	Visitor Days	6291	7416	12957	64006	33020	46265	57440	58312	56316	56550	57144	58115	57408	57340

Table 3.6-3. Number of Visitors and Visitor Days in West Mojave, 1999-2012

Area		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Rand Mountain															
Desert Tortoise Natural Area	Visits	7158	17520	4000	15000	33211	39200	39469	39443	38821	38765	9325	9675	9486	9512
	Visitor Days	1694	4146	947	3550	7860	9293	9341	9335	9188	9174	2207	2290	2245	2251
Dispersed Use	Visits	7677	7450	8200	8000	19300	50000	49876	5244	5429	5702	5828	6524	6263	6345
	Visitor Days	4371	4271	4701	4587	11065	28667	28596	3007	3113	3578	3783	3773	3591	3638
Rand Mountain and Fremont Valley Intensive Use Area	Visits	7985	7600	7800	7775	33950	0	0	50358	50287	50007	44297	50009	39900	40017
	Visitor Days	4079	3882	3985	3972	17343	0	0	25725	25688	25545	22628	25544	20382	20442
Total Rand Mountain	Visits	22820	32570	20000	30775	86461	89200	89345	95045	94537	94474	59450	66208	55649	55874
	Visitor Days	10144	12299	9633	12109	36268	37960	37937	38067	37989	38297	28618	31607	26218	26331
Red Mountain															
Dispersed Use	Visits	16395	15900	16000	16042	39721	44880	45034	46140	46539	46490	48971	49696	48571	49106
	Visitor Days	29668	29084	29267	29000	72498	80835	82265	84233	85016	84960	89310	89798	88724	88993
Golden Valley Trailhead	Visits	3524	7040	3500	20050	8300	4300	4400	4461	4387	4291	3921	4154	3898	4035
	Visitor Days	1968	3432	1954	8850	4634	2401	2457	2491	2449	2396	2189	2317	2176	2253
Grass Valley Trailhead	Visits	2578	4900	2500	2450	6600	8900	8832	8769	8648	8297	8045	8150	7980	8127
	Visitor Days	1439	2396	1396	1368	3685	4969	4931	4896	4828	4632	4492	4550	4456	4538
Spangler OHV Area	Visits	33128	30500	0	82828	60121	12683	18519	20630	27169	26157	27331	27725	2389	2549
	Visitor Days	92088	92542	0	244002	173130	5721	44867	50764	69610	66186	76093	72844	1821	6309
Steam Wells	Visits	489	300	0	320	2350	1123	1099	1250	1287	1327	1306	1340	1314	1213
	Visitor Days	143	88	0	93	685	328	321	365	375	387	381	391	383	354
Summit Range Intensive Use Area	Visits	3542	3000	0	2000	82500	89222	9822	9879	7986	7955	7943	7999	7859	7903
	Visitor Days	3129	2650	0	1767	72875	78813	8676	8726	7054	7027	7016	7066	6942	6981

Table 3.6-3. Number of Visitors and Visitor Days in West Mojave, 1999-2012

Area		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total Red Mountain	Visits	59656	61640	22000	123690	199592	161108	87706	91129	96016	94517	97517	99064	72011	72933
	Visitor Days	128435	130192	32617	285080	327507	173067	143517	151475	169332	165588	179481	176968	104502	109428
Ridgecrest															
Argus Range Trailhead	Visits	1200	3200	4000	7700	10400	21000	21246	21097	20876	21006	19985	20017	19216	19248
	Visitor Days	1080	2200	3600	6930	9360	18900	19121	18987	18788	18905	17987	18015	17294	17323
Ayers Rock	Visits	0	0	5000	1600	1749	2100	2088	1946	1896	1786	1763	1776	1769	1782
	Visitor Days	0	0	600	133	146	175	174	162	158	149	147	148	147	149
Briggs Cabin	Visits	NA	NA	NA	NA	NA	NA	2068	NA	NA	NA	2319	NA	NA	2273
	Visitor Days	NA	NA	NA	NA	NA	NA	2275	NA	NA	NA	2551	NA	NA	2500
Coso Range Trailhead	Visits	1520	3720	2000	1765	5410	2100	2450	2364	2359	2351	2243	2300	2208	2198
	Visitor Days	3167	3062	4167	3677	11271	4375	5104	4925	4915	4898	4673	4792	4600	4579
Darwin Falls Trailhead	Visits	1225	350	700	725	6992	3800	3810	3754	3623	3587	3421	3541	3470	3434
	Visitor Days	1286	368	735	761	7342	3990	4001	3942	3804	3766	3592	3718	3644	3606
Dispersed Use	Visits	77834	26900	53800	980	83593	7628	18580	20318	20816	22024	24013	24768	25172	26694
	Visitor Days	79675	51477	45506	907	71200	7673	15894	17324	17745	19011	20472	21454	21534	23239
Fossil Falls Trailhead	Visits	30150	58700	59300	30000	41000	31000	31245	31356	31562	31571	31549	31560	30361	30373
	Visitor Days	24346	47400	47885	24225	33108	25033	25230	25320	25486	25494	25476	25485	24517	24526
Fossil Falls Campground	Visits	0	450	1700	250	1168	2143	465	571	193	177	155	233	215	199
	Visitor Days	0	300	1133	167	779	1429	310	395	137	118	103	155	331	306
Keynot Mine Cabin	Visits	NA	NA	NA	NA	NA	NA	208	NA	NA	NA	168	NA	NA	102
	Visitor Days	NA	NA	NA	NA	NA	NA	118	NA	NA	NA	95	NA	NA	58
Kopper King Cabin	Visits	NA	NA	NA	NA	NA	NA	30	NA	NA	NA	32	NA	NA	36
	Visitor Days	NA	NA	NA	NA	NA	NA	17	NA	NA	NA	18	NA	NA	20

Table 3.6-3. Number of Visitors and Visitor Days in West Mojave, 1999-2012

Area		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Lower Centennial Canyon Cabin	Visits	350	300	25	30	1041	2200	1865	1873	1798	1782	1695	1699	1611	1615
	Visitor Days	198	170	14	17	590	1247	1057	1061	1019	1010	961	963	913	915
Olancha Dunes OHV Area	Visits	4100	4100	4150	4300	3110	14700	14822	14688	14721	14784	14206	14212	13578	13584
	Visitor Days	2583	2583	2615	2709	1959	9261	9338	9253	9274	9314	8950	8954	8554	8558
Rademacher Hills Intensive Use Area	Visits	26550	53550	26601	49000	37300	68600	68479	68569	69165	69480	69354	69774	69624	69504
	Visitor Days	9470	19100	9488	17477	13304	24467	24428	24456	24669	24784	24736	24808	24815	24790
Ridgecrest Field Office Information Center	Visits	500	500	1000	1350	1600	1150	1500	1600	1723	1854	1116	1120	998	2124
	Visitor Days	30	30	23	82	97	69	91	97	104	1125	67	68	60	1775
Salt Wells Corrals Information Center	Visits	20100	20100	20200	21000	12800	28000	26250	27313	27453	27287	26973	27001	26482	26648
	Visitor Days	854	854	859	893	544	1190	1116	1162	1167	1160	1146	1148	1125	1133
Trona Pinnacles	Visits	17535	0	20000	23900	20000	21300	22003	22588	23257	23356	24687	24692	24454	24532
	Visitor Days	16074	0	18000	21908	18333	19525	20169	20706	21319	21410	22630	22634	22416	22488
Total Ridgecrest	Visits	181064	171870	198476	142600	226163	205721	217109	218037	219442	221045	223679	222693	219158	224346
	Visitor Days	138763	127544	134625	79886	168033	117334	128443	127790	128585	130131	133604	132342	129950	135965
Southern Sierra															
Bright Star Trailhead	Visits	2575	7050	4500	4250	7244	3501	3486	3398	3005	3021	2900	2847	2790	2815
	Visitor Days	7292	8512	7500	7083	12073	5835	5810	5663	5008	5035	4833	4745	4650	4692
Cameron Ridge PCT Trailhead	Visits	650	2130	1500	1575	11311	6700	6856	6798	6783	6687	5803	5821	5762	5780
	Visitor Days	1159	2733	2675	2809	20171	6366	12227	12123	12096	11925	10349	10381	10276	10308
Dispersed Use	Visits	55570	54900	55500	55000	82220	49000	49233	52461	53143	53007	51993	48596	64000	60824
	Visitor Days	75002	74344	75156	74479	111340	65864	66177	70516	71433	71250	69403	65233	86027	81488

Table 3.6-3. Number of Visitors and Visitor Days in West Mojave, 1999-2012

Area		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Dove Springs OHV Area	Visits	30100	30142	30200	32000	42000	55000	57320	57981	58497	50138	54150	73747	45000	54597
	Visitor Days	89924	90049	90223	95600	125475	163854	170766	172735	174272	149369	191071	219705	134063	162654
Dove Springs PCT Trailhead	Visits	540	1060	530	625	3511	7000	6954	6845	6798	6759	6191	6196	6022	6164
	Visitor Days	963	994	945	1115	6261	5378	12401	12207	12123	12054	11041	11050	10739	10992
Jawbone OHV Area	Visits	25555	25600	25500	26250	37111	61000	60890	59834	59791	53574	47337	87820	51000	52259
	Visitor Days	76346	76480	76181	78422	110869	181628	181300	178156	178028	159517	140897	259454	151853	155601
Jawbone Station Information Center	Visits	10106	11000	11000	18000	14682	6500	14421	11193	10201	10631	6575	4425	5514	400
	Visitor Days	438	477	477	780	636	282	625	485	442	461	285	192	239	174
Kiavah Trailhead	Visits	5833	12200	6500	5800	9023	38000	37891	21671	21631	21491	15985	15867	15231	15344
	Visitor Days	9722	13133	10833	9667	15038	63333	63152	36118	35885	35818	26642	26445	25385	25573
Robbers Roost Climbing Area	Visits	585	800	1200	1400	2364	5900	5924	6023	5964	5978	5550	5347	5293	5249
	Visitor Days	263	360	540	630	1064	2655	2666	2710	2684	2690	2498	2406	2382	2362
Total Southern Sierra	Visits	131514	144882	136430	114900	209466	232601	242975	226204	225713	211286	206484	250126	200612	207054
	Visitor Days	258109	267082	264530	270585	402927	495195	515124	490713	491971	448119	457019	599611	425614	453844
Total Ridgecrest Field Office	Visits	466710	491543	452257	716056	882211	872104	821973	810388	801877	789880	736023	827787	700593	737808
	Visitor Days	592652	595072	516246	900089	1110965	972568	989622	969059	983932	938836	939580	1141412	833812	915058

NA – Not Available.

3.6.3 Off-Highway Vehicle Use

Users of OHVs engage in many different types of recreation in the Mojave Desert. These can be categorized into two general groups: (1) Where the driving of the vehicle is itself the recreational activity, and (2) Where the vehicle is a means of access to other forms of recreation.

3.6.3.1 Driving OHVs for Recreation

There are various types of OHV recreation. These include general vehicular touring, motorcycle recreation, and ATV and four-wheel-drive use (4WD).

General Vehicular Touring

Many people engage in recreational touring. Such touring allows visitors to see vast areas of the desert while spending less time on the land itself and providing more control over potential desert safety risks. OHV touring may occur on both flat and mountainous terrain using SUVs, jeeps and similar vehicles.

OHV touring vehicles, such as the popular SUV, have 4WD capabilities to handle off-road conditions and are designed to be comfortable for normal street usage. They do not have to be towed by another vehicle to particular staging areas; rather, they can be driven on the highway and, when opportunity presents itself, they can follow a dirt trail. Vehicles that have 4WD capability have a broader range of access opportunities because they can traverse different types of terrain features and meet or exceed highway safety standards.

In the mid-1980s, off-road enthusiasts, and state and local government agencies collaborated to provide a system of interconnected roads and "jeep" trails. Today, over 600 miles of trails have been designated by the State of California as "Back Country Discovery Trails." A goal of this trail system is to provide a backcountry opportunity for non-traditional trail users, such as persons with disabilities, senior citizens, and families with small children.

The California Backcountry Discovery Trail (CBDT) system is one of shared-use. Equestrians, hikers, and cyclists are welcome, although the trail system is designed for off-road enthusiasts. The existing roads that make up the "principle route" network were selected with a stock, SUV in mind. The CBDT network provides recreationists with an abundance of OHV touring opportunities. "Alternate trails" departing and later rejoining the principle route provide more challenging experiences and are open to green sticker vehicles.

Motorcycle Recreation

Many desert recreationists engage in motorcycling and motorcycle events. In most (but not all) cases, the motorcycles, equipment and supplies have to be transported to the desired locations by street-legal vehicles, such as SUVs. Motorcycle touring provides a unique opportunity to get off the beaten path and experience areas of the WEMO Planning area that are not accessible to other motorized users.

One popular activity is dual sport motorcycling. Dual sport motorcycles are designed to perform off-road, and they are also “street-legal” for operation on paved roads. Therefore, the use of a street-legal vehicle to transport the bike is not necessary. A person using this type of motorcycle

can enjoy riding on the highway, and then go off-road when the desired trail is reached. The dual sport motorcycle gives the rider a broader and more flexible recreational experience.

There are also many popular motorcycle events that occur in the study area, including enduros, hare n' hound, hare scramble, and European scrambles. These events allow participants to ride in varying types of terrain, which present different challenges and require varying degrees of skill. Many of these events occur in OHV Open Areas, on a fairly regular basis. Several types of events also can occur on the designated competitive "C" routes outside of Open Areas. Table 3.6-4 presents a descriptive summary of motorcycle events that can occur outside of OHV Open Areas on the "C" routes in the WEMO Planning area.

Table 3.6-4. Types of Motorcycle Events Outside of OHV Open Areas

Name	Type of Start	Speed Event?	Comments
European Scramble	Mass	Y	The race course is ten miles, using a mass start by class.
Hare Scramble	Mass	Y	The race course contains a 30 mile loop repeated for stronger riders.
Hare & Hound	Mass	Y	The race course is two thirty-mile loops configured as a figure 8, not repeating the same track in the second loop. The second loop continues with only the more advanced riders.
Enduro	Staggered	N	This is a time-controlled event and speeds can be slowed through sensitive areas. Riders lose two points for every minute they are early to the finish and one point for every minute they are over the specified course time.
Dual Sport Ride	NA	NA	This is a tour event and portions of the ride can be on paved routes as well as off road. The participant numbers can be limited to 50 to 100 entrants and speeds can be limited as well.

Each year there are a few commercial tours and dual sport rides that take place on BLM land. These activities generally use well-defined public land vehicle routes. These tours typically involve motorcycle and 4WD sightseeing and exploration tours. There are generally two types of commercial tour events: guided and unguided (self-guided), which are described below.

- Guided Tours: A typical guided tour operator might lead three to ten tours each year, with participants following a trail leader. The group stops together several times during the day to see and learn about various natural and manmade features. The trip leader is generally an expert on the particular area and is able to relay information pertaining to natural and historic resources to participants. These are often organized by local or regional natural history, geology, or environmental clubs or educational institutions.
- Unguided Tours (including Dual Sport Events): Dual Sport Events, those events designed for street-legal motorcycles capable of off highway travel, are the best example of unguided tours. In these events, participants are given a map and "Roll Chart" that depict the tour route turn by turn. There is no element of competition so participants may arrive at the final destination at their convenience. Often "bail out" opportunities are identified

so that participants can safely leave the off highway portion of the route to return to paved roads and the final destination on their own.

ATV and "Technical" 4WD Recreation

ATVs are small motor vehicles with wheels or tractor treads for traveling over rough ground. They often have 4WD capability. ATVs are often viewed as being more agile than other 4WD vehicles and can access narrower routes since they are relatively small and handle like motorcycles. ATVs, however, are only allowed to accommodate one person unless designed for two by the manufacturer. ATVs are not appropriate for dual sport activities, since they are not legal on public highways.

Typical 4WD vehicles (SUVs and jeeps) have fairly similar capabilities, including the capability to travel off-road on rocky terrain. They are significantly larger than ATVs, as they can accommodate several passengers, supplies and equipment. 4WD vehicles such as SUVs and jeeps often have "dual sport" capabilities and perform efficiently both on regular streets, roads, and highways, as well as off-road. SUVs are generally used to traverse relatively flat, yet rough, terrain, while jeeps with their narrower and shorter wheelbase are more capable of negotiating rougher terrain than a typical stock SUV.

Technical 4WD vehicles constitute a class of vehicle that includes jeeps, trucks, and SUVs that have been significantly modified from their "stock" condition. Through the addition of specialty tires, transmissions, engines, and suspensions, these vehicles are less functional in open-highway situations, but very effective in traversing otherwise impassable routes (e.g. large boulders). "Rock-crawling" is an example of an activity that utilizes vehicles of this class. Travel is typically very slow (i.e. less than 5 mph) over and around rocks, in contrast to SUV and even jeep touring. Enthusiasts must possess a high level of technical "four-wheeling" skill. They may even employ the use of power winches to pull the vehicle over the more difficult rock formations. The challenge in technical 4WD use is to apply one's skills to cross the rocks, rather than tour large regions.

Competitive Events

BLM permits about 90 competitive events annually. These include about 70 OHV events and 20 equestrian, mountain biking and running events. Most of these events occur in the Spangler Hills, Stoddard, and Johnson Valley Open Areas.

The current system of Competitive "C" routes are designated routes outside of the Spangler Hills Open Area upon which competitive motorized races are allowed to occur. The designation of the original system of "C" routes to the northeast, south, and west of the Spangler Hills OHV Open Area, comprising approximately 50 miles, occurred in the OHV Area Management Plan (1993). During the development of the Spangler Hills OHV Area Plan many public comments wanted to see the Spangler Hills OHV Open area expanded to include as much as possible of the original Desert Plan's 1980 Spangler/Rademacher Open Area Planning Unit. In response to these comments, the concept of the "C" routes was developed—to provide for some competitive motorized opportunities in the area while maintaining the natural character of the landscape.

Prior to the implementation of the CDCA Plan, competitive events were very popular in the desert and occurred both in and outside of Open areas. The Summit Range area south of the Spangler Hills was classified as an Open Area; thus cross-country travel was allowed. The

CDCA Plan changed the Summit Range area to a limited access area, and the MUC in the area to moderate use. Therefore, after 1980 vehicles were required to stay on existing routes of travel. The CDCA Plan specifically allowed for competitive events on all existing routes of travel in limited access areas as long as mass starts and camping remained inside open areas. The area was used in this manner until the temporary listing of the desert tortoise in August, 1989. From 1989 until 1993, no competitive events occurred outside of Spangler Hills or other Open Areas.

With the adoption of the Spangler Plan (pg. 14) and supporting BO (pgs. 2, 6-8), from 1993 until 2001 competitive motorized events were allowed to take place under permit on the designated "C" routes. In 2001 competitive events were discontinued on the "C" routes as a result of the Stipulated Settlement Agreement reached between the BLM and the Center for Biological Diversity. In 2006 "C" routes were partially reopened with the WEMO Plan ROD being signed. The 20 miles to the northeast were reopened to competitive use while the southern and western area routes were not (2005 WEMO Final EIS pg. 2-163).

Similarly in 1980, three competitive corridors were identified to provide long-distance opportunities for competitive motorized races to cross through limited access lands. None of these have been run since the designation of critical habitat in the WEMO Planning area in 1989. Three of the four have been subsequently eliminated in the land-use plans. Routes used in the past for the competitive events generally are now used for long-distance opportunities for non-competitive motorized events.

The Stoddard Valley to Johnson Valley non-competitive connector route was illustrated generally on the oversize maps accompanying the 2006 WEMO Plan (Maps 2-1, 2-15, 2-16, 2-17, 2-19 and 2-21). Slight deviations from the illustrated path have been made to avoid private land where permission to cross has been denied.

Non-motorized competitive events in the planning area are not necessarily restricted to designated routes of travel. These events, because they are competitive, do require a permit and will have an identified course. Non-motorized or non-mechanized events are generally directed to designated routes out of resource concerns, and staging areas may be restricted or precluded in areas based on their location or elements of ACEC or other activity plans. Non-participant motorized support vehicles would be restricted to specified designated routes of travel.

Compliance With Regulations

Compliance has generally improved since the implementation of the CDCA plan. With the exception of a few areas, OHV free play has gradually moved to the OHV open areas. Compliance is most problematic in popular areas of historic OHV use and adjacent to local communities. Compliance has been most effective when a pro-active approach to vehicle management is used, including the identification of outstanding recreation opportunities to direct recreationists to, such as through quality signing and mapping to help visitors locate appropriate opportunities, as well as through enforcement and additional education efforts. Limitations to resources, including sign replacement, law enforcement and rehabilitation resources have historically been issues in further improving compliance.

3.6.3.2 Driving OHVs to Access Other Recreation

Many visitors use a vehicle as a means to attain a recreation end, rather than as the end itself. This recreation type falls into two classes: (a) point and (b) dispersed forms of recreation.

Point Forms of Recreation

Often an OHV is driven to a specific destination such as a scenic geologic or cultural site, trailhead, staging area, or campsite. For instance, equestrians use an OHV to tow horse trailers and other equipment to designated staging areas where they can set up for horseback riding. The recreational activity is not the driving of the OHV itself; it is merely used to access the staging area for the equestrian ride. Similarly, hikers may use an OHV to travel to a trailhead; once there, the recreationist would then begin their hike.

Dispersed Forms of Recreation

This form of recreation is more dependent upon vehicle use than point forms of recreation, but the use of the vehicle is still not viewed as the primary source of recreation. For instance, a recreationist who desires to photograph a particular species of wildlife or wildflower may hike, ride a horse or use an OHV to search for a subject. Driving a vehicle is not the primary recreation; photography is. Because there is no specific destination, this form of recreation is referred to as “dispersed” rather than “point.”

3.6.4 Non-Motorized Use (Mechanized and Non-Mechanized)

The public lands along with the designated road and trail systems provide many opportunities for travel by both mechanized and non-mechanized means. Mechanized travel is moving by means of a mechanical device that is not powered by a motor such as a bicycle or land sailer. While non-mechanized travel is movement by foot, horseback, or other animal-powered travel. Common forms of non-motorized travel that occurs within the WEMO Planning area include mountain biking, land sailing, horseback riding, backpacking, running, walking, and hiking.

Many non-motorized and non-mechanized activities occur on more remote multiuse trails that also accommodate motorized users. Popular camping areas including Afton Canyon, Rainbow Basin/Owl Canyon, Sawtooth Canyon, Sand Canyon and Short Canyon. These popular destinations serve as staging areas for non-motorized exploration of the surrounding area.

The Rademacher Hills Trail (RHT) is a 14 mile network of trails which extends through the desert terrain on the south side of Ridgecrest. The RHT is comprised of trail segments which pass through a variety of terrain. These segments provide differing degrees of trail difficulty ranging from open flat desert to steep rocky ridges. The trail system is designed to provide the opportunity for both loop trips as well as point-to-point trips.

The Pacific Crest National Scenic Trail extends along the entire western boundary of the planning area, connecting the San Bernardino and Angeles Mountains with the Sierra Mountains. In the southern portion of the planning area, the PCT is almost completely located on private land. The central and northern portions of the trail in the WEMO Planning area, comprising about 80 miles, include substantial portions of public land. However, this is a small portion of the more than 2,800 miles of this nationally designated trail. The 80-mile segment starts at Tylerhorse Canyon outside of the community of Rosamond in the south and extends to just north of Bird Springs Pass where the trail enters the Sequoia National Forest.

The Harper Lake ACEC includes a 1-mile system of wheelchair accessible trails that pass over and offer views of a marshy wetland and lake with migrating and nesting birds of all types.

Sawtooth Canyon, adjacent to the campground, provides a unique recreational experience for rock climbers. Up the side of the canyons pitons have been put in place by area climbers to serve as anchors and climbing aids for subsequent users.

Much non-motorized use in the WEMO Planning area occurs in the backcountry off of designated routes. Recreationists stage along designated routes or parking areas, and explore the backcountry on their own. Local recreationists, particularly equestrians, will stage from their property or corrals near public lands.

3.6.5 Facilities, Improvements, and Special Uses

The BLM has developed facilities and made improvements at locations that attract many recreational users during their travels into the west Mojave desert region. Some of these developed facilities include Harper Lake, Fossil Falls, Calico Early Man Site, Rainbow Basin Natural Area, and Trona Pinnacles. Campground facilities have been developed for both individuals as well as groups at Sawtooth Canyon, Afton Canyon, Owl Canyon, and Fossil Falls.

Additionally, there are three Visitor Centers run by the BLM within the WEMO Planning area. Those are the Desert Discovery Center located in downtown Barstow, the El Mirage Visitor Center located on the shores of El Mirage Dry Lake, and the Jawbone Station Visitor Center located at the entrance to the Jawbone Canyon Open Area.

These facilities have proven to be very popular stop off location for both OHV recreation enthusiasts and the public as a whole, as well as providing educational outreach with local organizations and schools. They provide maps, books, interpretive displays, and environmental education to all who stop by. In addition, specific environmental classes of all types and OHV safety classes are offered.

Rand Mountain Permit Program

Off-highway vehicle use within the Rand Mountains Management Area (RMMA) and the Western Rand Mountains ACEC has gone through significant changes over the years. From 1973 until 1980 the area was designated as “Open” which allowed vehicle travel anywhere in the area, and the area hosted numerous competitive OHV events. In the 1980 CDCA Plan, vehicle use within the area was changed to being allowed on “existing routes of travel” and no more motorized competitive events were allowed. Then the Rand Mountains Fremont Valley Management Plan was approved in 1994, an approved route network was designated, and the miles of routes approved for use was reduced from a network of approximately 764 miles down to 129 miles, according to the Plan. Much evidence of the routes that were not included in the approved network still remains on the ground, due to their historic use.

In 2006, the BLM adopted the 1994 network, expanded the ACEC, and approved a visitor use permit program for motorized vehicle use in the Rand Mountains in WEMO, to manage impacts to sensitive resources in the area. Visitors to the area are required to complete a short educational orientation program and once this was completed could purchase a permit. The goal of the Permit program is to increase compliance with applicable rules and regulations. A fee for these permits covers the cost of managing the permit program. In 2008, implementing this new program was begun in a two phased approach. The first phase is underway, which focuses on outreach and education of users, and implements a no cost permit for motorized vehicle use of

the area. The second phase of the program has not yet been initiated, and would require the completion of the educational course and the payment of the fee for use of the area.

To date the program is currently in Phase 1. Visitors desiring to use motorized vehicles on the designated route system within the area are able to receive a free permit after they are informed of the use regulations for the area and certify they understand the designated route network and agree to only operate vehicle on the designated routes in the management area. The continued need and feasibility of implementing this visitor use permit system is of concern to the BLM due to use pattern changes, quantity of entry ways, and the man power needed to implement.

3.6.6 Recreation Safety

As discussed above, recreation in the WEMO Planning area is dependent on the availability of motorized routes to either directly support recreational uses, or to provide access to recreation areas. Therefore, the analysis of impacts in Chapter 4 is primarily linked directly to mileage of routes available for various recreational activities. Another factor affecting recreation is the potential for safety hazards to exist along these routes. In the planning area, a common safety hazard is abandoned mine features, of which 10,254 have been inventoried by BLM in the planning area. These features commonly include human-dug excavations which may be visually prominent or may be masked by vegetation or soil. These excavations can be entered accidentally if they located within the stopping, parking, and camping distance from the route. Similarly, they can be entered intentionally, and the odds of this occurring are highest when the feature is closest to a motorized route. Therefore, BLM has evaluated the mileage of routes within 100 feet of an inventoried safety hazard as a factor in considering the impact of the route network on recreation.

3.7 Grazing

3.7.1 Grazing Allotments

There are a total of 27 public land grazing allotments (areas designated as suitable for grazing of domestic livestock) within the West Mojave (WEMO) Planning area, of which eight are inactive and not grazed. Two of these allotments have been donated back to BLM and permanently retired from grazing under the authority of the 2012 Appropriations Act. The type of livestock and type of forage allocation for allotments have been designated in the BLM's CDCA Plan. Allotments are designated as ephemeral, perennial, or ephemeral/perennial based on the type of forage that is available on the allotment. Cattle, sheep, and, horses, or a combination of these may be authorized to graze on an allotment. Table 3.7-1 indicates the livestock type and forage type designated for each allotment.

Under the Taylor Grazing Act, allotments are classified under Section 3 as a grazing permit or under Section 15 as a grazing lease. Allotments with perennial forage have an established limit of forage based on the quality and quantity of perennial plants, stated in animal unit months (AUMs) for a defined period of grazing use. An AUM is a measure of perennial or ephemeral feed that will support a cow and its calf, a ewe and its lambs, or a bull for one month. Perennial forage consumption is typically authorized at the same level from year to year unless forage production does not meet seasonal norms. When the CDCA Plan (1980) originally allocated AUMs for forage consumption for livestock use it occasionally suspended AUMs for forage allocations to wildlife and for poor rangeland conditions to improve watershed stability.

In contrast, grazing use in allotments with ephemeral forage does not have an established level or specified period of use. Instead, the amount and length of grazing use in any particular season or year is based on ephemeral production and determined just prior to authorizing the grazing use. In the WEMO Planning area, minimum forage production is 230 lbs/acre to authorize ephemeral grazing for a season for most of the planning area. The 2006 WEMO Plan authorized ephemeral sheep grazing on two allotments within portions of the Fremont-Kramer DWMA. In these areas the minimum forage production is 350 lbs/acre to authorize ephemeral grazing. This level of forage is anticipated to provide sufficient forage for both domestic livestock and wildlife, and still provide ample seed source to sustain production in subsequent years within the planning area.

In most cases, BLM authorizes grazing by permit or lease for a period of 10 years. A shorter period of time is sometimes issued for special circumstances, such as to accommodate a shorter-term lease of the base property or when the Authorized Officer determines that a shorter- term authorization is in the best interest of range management. Additionally, temporary, non-renewable grazing authorization may be issued for special short-term needs such as trailing, or when there is short-term surplus forage available for grazing. All permits and leases are subject to modification and to annual adjustments. Such modifications are implemented through consultation between the permittee or lessee and the BLM, and consistent with terms of applicable biological opinions and Section 106 of NHPA review.

The permit or lease identifies mandatory terms and conditions that specify the number, kind and/or type of livestock that may graze the allotment, and the grazing period (usually with specific beginning and ending dates). In addition, many permits and leases also require adherence to prescribed grazing prescriptions in the form of grazing systems, such as deferred,

deferred-rotation, or rest-rotation. Other authorizations may have conditions pertaining to turnout dates based on vegetation conditions. Based on range type, season of use and range condition all permittees and lessees have specific grazing utilization thresholds and other specified terms and conditions to protect site-specific areas such as riparian areas, wildlife habitat, and special status plant populations. These terms and conditions have been developed in consultation and cooperation between BLM and the livestock operator, were developed based on decisions made in the 2006 WEMO Plan, are the result of the 2006 WEMO Plan, and/or may be the result of biological opinions, other resource management strategies, or another planning effort.

There are 105 natural water sources located on the 20 currently active grazing allotments within the WEMO Planning area. Natural water sources include seeps, springs and creeks. There are also 47 wells and manmade water sources on the active grazing allotments in the planning area. The standard distance to place salt or mineral blocks from natural water sources (riparian areas) is one quarter mile. The one-quarter mile requirement is a standard term and condition for most grazing permits and leases issued in the WEMO Planning area where natural water sources occur within a grazing allotment. This requirement is also a proposed regional guideline.

Frequently, the permittee or lessee elects to graze fewer livestock than the full amount of grazing authorized under the active preference (permitted use) for the grazing season. Sometimes this is due to environmentally related factors such as droughts or fires, and in other cases it may be to accommodate the livestock operator's need to adjust livestock numbers for marketing or livestock husbandry purposes. Normally, the BLM will authorize the requested amount of non-use on a short-term basis. In rare situations, the BLM may temporarily authorize another qualified applicant to graze the amount of authorized non-use in an allotment, depending upon the reason for non-use.

Grazing use of perennial vegetation in all of the active allotments that have been grazed since 1992 (on at least a periodic basis) is expected to continue at lower stocking rates overall, except where the permittee or lessee voluntarily relinquishes their lease or permit. In 2012, Congress passed the Consolidated Appropriation Act of 2012. A provision of that act allows for the reallocation of forage from livestock use to wildlife use consistent with the donation language contained in Section 122 (b) of the Act. The donation language in this act specifically states that "the Secretary shall accept the donation of any valid existing permit or lease authorizing grazing on public lands within the California Desert Conservation Area." The Lava Mountain and Walker Pass Common Allotments have been relinquested under the authority of this act. Overall, livestock producers have voluntarily reduced stocking rates for much of the 1990s and 2000s, resulting in less livestock use than the lease or permit allows. In 1992, a high of 78,314 AUMs were authorized in the CDD for both sheep and cattle use. Between 2006 and 2014, the AUMs authorized within the West Mojave Planning Area ranged from almost 6,000 AUMs in 2006 to just 1,561 AUMs in 2013 for all classes of livestock (BLM, Rangeland Administration System (RAS)). Both cattle and sheep grazing have been authorized under existing biological opinions in desert tortoise habitat (see Appendix Q).

Since 1992, lessees with allotments classified as ephemeral/ perennial have not requested, nor has grazing been authorized for, ephemeral forage or temporary non-renewable (TNR) perennial forage within the southern half of the WEMO Planning area. During the same period, lessees and permittees in the higher, more northern desert portions of the WEMO Planning area have routinely requested ephemeral authorizations, and have requested and been authorized to use

TNR perennial forage when conditions allowed. Table 3.7-1 shows the years in which perennial forage was utilized in allotments.

The authorization of sheep grazing in ephemeral allotments is common in both field office areas in years when sufficient forage production occurs. However, the number of ephemeral sheep allotments, the numbers of sheep, and the number of woolgrowers have substantially declined over the last 10 years. Three allotments were eliminated by the WEMO Plan, and one additional allotment and substantial portions of another can no longer be grazed due to their proximity to bighorn sheep habitat.

The 2006 Biological Opinion from FWS prepared for the 2006 WEMO Plan concluded the following: "The Valley Well Allotment occupies 480 acres east of Highway 247; it is authorized for 24 animal unit months and has been grazed 5 of the last 10 years. The Bureau's biologist recommended that it not be included in the Ord-Rodman Desert Wildlife Management Area because of its proximity to the base property of the rancher and its degraded condition (Chavez 2004). This allotment is within the boundaries of the Ord-Rodman Critical Habitat Unit. Because of the small size of the allotment, its degraded condition, and location adjacent to the heavily used Highway 247 and other human disturbances, we do not consider that it supports the primary constituent elements of critical habitat and will not discuss it further in this biological opinion."

In 2005, the Army purchased the base property for the Harper Lake, Cronese Lake and Cady Mountain Allotments as mitigation for the expansion of Ft. Irwin Army Training Center. These allotments remain inactive and vacant.

Additional descriptions of specific allotments are available in the 2006 WEMO Plan Volume II, Appendix O. In addition, more recent, allotment specific Environmental Assessments (EAs) were prepared for the actively grazed allotments after the 2005 WEMO Final EIS was published. Additional information on the allotments can be found in these EAs, and they are included by reference. Updates on specific resources and associated impacts such as soils from these EAs have been incorporated into the analysis in Chapter 4 of this SEIS. The grazing EAs are available for download from the California NEPA website or can be requested from the local BLM offices.

Table 3.7-1 presents the most current information on each cattle and sheep grazing allotment, and Table 3.7-2 describes BLM's most recent environmental evaluation and current grazing status on each allotment. Table 3.7-3 depicts the acreages of grazing allotment in DWMAs, ACECs and in designated wilderness areas and Table 3.7-4 displays the riparian Unusal Plant Assemblages (UPAs) and their currently assessed conditions within grazing allotments in DWMAs.

3.7.2 Motorized Access to Allotments and Range Improvements

Motorized access is required for all aspects of range management. Most access to allotments occurs via designated routes. Motorized access to range improvements and fences is generally limited to the authorized permittee or lessee, depending on the duration and frequency of activities and the sensitivity of the resources in the area. During cattle grazing activities, motorized access is intermittent and light in most of the allotment except during gathering and redistribution of livestock. These activities are concentrated in specific areas that comprise a very small portion of the allotment, and are accessed several times a season, including with

larger trucks for transport of the animals. For cattle and horse allotments, the concentration areas are identified in the permit/lease or planning documents, and do not change from year to year without further analysis.

Ephemeral sheep grazing, by contrast, involves a more dispersed motorized access and a good deal of constant pedestrian use of the allotment. Individual herders that accompany the sheep, herd the animals to different portions of the allotment from grazing season to grazing season, depending on the relative production and past use. Sheep are accompanied by the herder, who travels with a trailer that is parked adjacent to the access route, and moves about with the herd. The size, number, and location of trucks and trailers is modest, and few areas are refrequented on a regular basis. Sheep are watered at temporary troughs via a water truck. Watering and bedding areas are dispersed throughout the allotment, and are typically sited in previously disturbed areas. In Chapter 4, BLM uses the mileage of routes in close proximity to range improvements as an indicator of impacts to access for grazing operators. There are a total of 191 inventoried range improvements throughout the WEMO Planning area.

Table 3.7-1. Affected Grazing Allotment Information

Allotment Name	Allotment Acres		Active AUMs	Range Type[1]	Livestock Type	Season of Use[2]	Number of Years Grazed 1992-2005	Number of Years Grazed 2006-2013	Multiple Use Class
	Public Land	Total							
Antelope Valley[1]	7,158	7,871	0	Ephemeral	Sheep	NA	2	1	U
Boron[1]	11,202	82,892	0	Ephemeral	Sheep	NA	7	4	U
Bissell[1]	777	48,889	0	Ephemeral	Sheep	NA	9	4	U
Buckhorn Canyon[4,6]	7,634	27,053	NA	Ephemeral	Sheep	NA	0	0	C
Cady Mountain[4,6]	160,104	231,897	2,010	Ephemeral/ Perennial	Cattle	Y-L	0	0	I
Cantil Common[1]	202,897	233,693	0	Ephemeral	Sheep	NA	10	4	L/C/I/M
Cronese Lake[4,6]	48,509	65,304	500	Ephemeral/ Perennial	Cattle	Y-L	0	0	I
Double Mountain[4,6]	2	576	38	Perennial	Cattle	5/1-11/30	0	0	U
Hansen Common[1]	34,848	72,102	354	Ephemeral/ Perennial	Cattle and Sheep	12/1-9/30	14	5	L
Harper Lake[4,6]	18,118	20,918	600	Ephemeral/ Perennial	Cattle	Y-L	13	0	I
Johnson Valley[4,6]	109,186	118,320	NA	Ephemeral	Sheep	NA	1	0	M
Kelso Peak[1]	2,718	2,718	132	Perennial	Cattle	Y-L	0	0	C
Lacey-Cactus-McCloud[5]	147,488	157,051	1,425	Perennial	Cattle	11/1-5/31	9	0	L
Monolith-Cantil[1]	10,825	14,739	0	Ephemeral	Sheep	NA	8	4	L
Oak Creek[4,6]	23	177	16	Perennial	Cattle	NA	0	0	U
Olancha[1]	13,762	15,876	606	Perennial	Cattle	4/1-6/30	8	5	L
Ord Mountain[2]	128,308	143,968	3,632	Ephemeral/ Perennial	Cattle	Y-L	14	8	I
Pilot Knob[4,6]	38,994	45,619	0	Ephemeral	Cattle	NA	5	0	L/C

Table 3.7-1. Affected Grazing Allotment Information

Allotment Name	Allotment Acres		Active AUMs	Range Type[1]	Livestock Type	Season of Use[2]	Number of Years Grazed 1992-2005	Number of Years Grazed 2006-2013	Multiple Use Class
	Public Land	Total							
Rattlesnake Canyon[2]	26,832	28,757	1,081	Ephemeral/ Perennial	Cattle	Y-L	14	8	I
Round Mountain[1]	15,253	18,093	880	Ephemeral/ Perennial	Cattle	12/1-3/31	8	6	L
Rudnick Common[1]	163,842	236,184	6,736	Ephemeral/ Perennial	Cattle and Sheep	Y-L	14	8	L/C/U
Shadow Mountain[1]	16,965	86,384	NA	Ephemeral	Sheep	NA	8	2	M
Spangler Hills[1]	57,695	69,141	0	Ephemeral	Sheep	NA	7	2	I/M/C
Stoddard Mountain[1]	16,889	173,297	NA	Ephemeral	Sheep	NA	8	2	M
Tunawee Common[7]	51,729	55,931	1,889	Perennial	Cattle and Sheep	2/16-5/31	9	5	L/C
Valley Well[2]	480	480	24	Ephemeral/ Perennial	Horses	Y-L	14	8	C
Warren[1]	584	584	55	Perennial	Sheep	Y-L	7	0	I

(1) Those allotments classified as ephemeral (E) produce forage from primarily ephemeral (annual) plants. Those allotments classified as perennial (P) produce forage from perennial grass and shrubs. Those allotments with ephemeral and perennial (E/P) forage have a mixture of both range (forage) types.
(2) The period livestock typically graze forage on the allotment. Grazing use on some allotments is authorized to occur all year long or YL. The grazing period of use does not apply (NA) to ephemeral allotments because grazing use occurs when forage is available.
(3) Darwin Allotment has been recently absorbed into Lacey-Cactus McCloud Allotment.
(4) Allotments are inactive and not used.
(5) Lacey-Cactus-McCloud (LCM) Allotment was evaluated in an EA in 2013; as a result the LCM Allotment has absorbed the Darwin Allotment, which is not yet reflected in these numbers.
(6) Allotment is also proposed for relinquishment in the preferred alternative of the DRECP.
(7) Grazed only by sheep at this time.
(8) Grazing currently only occurs in the North area. Grazing is suspended in the Middle and South areas due to fires, poor condition of range improvements, and, in the South, automobile hazards.
(9) The allotment has been permanently retired through the authority of the 2012 Appropriations Act (Public Law 112-74, sec 122b).

Table 3.7-2. Status of Grazing Allotments

Allotment Name	EA Prepared and DR approved for grazing lease/permit renewal	Date of EA	Other Info Received on Status	Status
Antelope Valley	Yes	April 24, 2007		Active-10 yr. permit
Boron	Yes	April 24, 2007		Active-10 yr. permit
Bissell	Yes	April 24, 2007		Active-10 yr. permit
Buckhorn Canyon	No	N/A	No existing lease, to be relinquished or permanently retired.	This allotment is proposed to be unavailable for ephemeral sheep grazing in the preferred alternative. The AUMs would be reallocated for wildlife and ecosystem functions.
Cady Mountain	No	N/A	No existing lease, to be relinquished or permanently retired.	This allotment is proposed to be unavailable for livestock grazing in the preferred alternative. The AUMs would be reallocated for wildlife and ecosystem functions.
Cantil Common	Yes	April 24, 2007		Active-10 yr. permit
Cronese Lake	No	N/A	No existing lease, to be relinquished or permanently retired.	This allotment is proposed to be unavailable for livestock grazing in the preferred alternative. The AUMs would be reallocated for wildlife and ecosystem functions.
Darwin	No	N/A	Being incorporated into Lacey-Cactus-McCloud, will no longer be stand-alone allotment.	This allotment has been incorporated into the LCM Allotment.
Double Mountain	No	N/A	No existing lease, to be relinquished or permanently retired.	This allotment is proposed to be unavailable for livestock grazing in the preferred alternative. The AUMs would be reallocated for wildlife and ecosystem functions.
Gravel Hills	No	N/A	Allotment classified as no longer available by WEMO 2006.	This allotment was classified as “no longer available for ephemeral sheep grazing” by WEMO 2006 (see LG-26).

Table 3.7-2. Status of Grazing Allotments

Allotment Name	EA Prepared and DR approved for grazing lease/permit renewal	Date of EA	Other Info Received on Status	Status
Hansen Common	Yes	April 24, 2007, revised September 2008		Active-10 yr. permit
Harper Lake	No	N/A	No existing lease, to be relinquished or permanently retired.	This allotment is proposed to be unavailable for livestock grazing in the preferred alternative. The AUMs would be reallocated for wildlife and ecosystem functions.
Johnson Valley	No	N/A	Elements within the 2006 WEMO Plan have precluded the authorization of ephemeral sheep grazing within all or portions of these allotments. No existing lease, to be relinquished or permanently retired.	This allotment is classified as "no longer available for ephemeral sheep grazing." based on its proximity to occupied habitat for Bighorn Sheep and the 9-mile rule adopted by the 2006 WEMO Plan. The allotment is proposed to be unavailable for livestock grazing in the preferred alternative. The AUMs would be reallocated for wildlife and ecosystem functions.
Kelso Peak			EA in progress.	Active
Lacey-Cactus-McCloud	Yes	July 2011	Approved August 13, 2013	Active-10 yr. permit
Lava Mountain	Yes	April 24, 2007	Relinquished in February, 2013, under authority of the 2012 Appropriations Act (Public Law 112-74, sec 122b).	This allotment has been permanently retired through Congressional act. The AUMs have been reallocated for wildlife and ecosystem functions.
Monolith-Cantil	Yes	April 24, 2007		Active-10 yr. permit

Table 3.7-2. Status of Grazing Allotments

Allotment Name	EA Prepared and DR approved for grazing lease/permit renewal	Date of EA	Other Info Received on Status	Status
Oak Creek	No	N/A	Elements within the 2006 WEMO Plan have precluded the authorization of ephemeral sheep grazing within all or portions of these allotments. No existing lease, to be relinquished or permanently retired.	This allotment is proposed to be unavailable for livestock grazing in the preferred alternative. The AUMs would be reallocated for wildlife and ecosystem functions.
Olancha	Yes	May 2007		Active-10 yr. permit
Ord Mountain	Yes	July 2007		This is currently an active cattle allotment within a DWMA as allowed through formal consultation with FWS (see 1-8-03-F-58) -10 year grazing lease.
Pilot Knob	In process	Est. 2015	Allotment has been voluntarily relinquished.	This allotment was classified as “no longer available for ephemeral cattle grazing” by WEMO 2006 (see LG-10), and AUMs have been reallocated for wildlife and ecosystem functions under the terms of the voluntary relinquishment.
Rattlesnake Canyon	Yes	June 2007		This is an active cattle allotment, portions of which are located in non-critical habitat for the desert tortoise, as allowed through formal consultation with FWS (see1-8-03-F-58) -10 year grazing lease.
Round Mountain	Yes	September 2007		This is an active cattle allotment outside of habitat for the desert tortoise-10 year grazing lease.
Rudnick Common	Yes	April 24, 2007, revised July 2007		Active-10 yr. permit
Shadow Mountain	Yes	August 2007		Active-10 year grazing lease. Ephemeral sheep grazing restricted to portions of this allotment outside DWMA and critical habitat for the desert tortoise.

Table 3.7-2. Status of Grazing Allotments

Allotment Name	EA Prepared and DR approved for grazing lease/permit renewal	Date of EA	Other Info Received on Status	Status
Spangler Hills	Yes	April 24, 2007		Active-10 yr. permit
Stoddard Mountain	Yes	April 2007		Active. Ephemeral sheep grazing restricted to portions of Middle Stoddard outside of the Mojave Monkey Flower Conservation Area-10 year grazing lease.
Superior Valley	No	N/A	Allotment classified as no longer available by WEMO 2006.	This allotment was classified as “no longer available for ephemeral sheep grazing” by WEMO 2006 (see LG-26).
Tunawee Common	Yes	October 2008		Active-10 yr. permit
Valley Well	Yes	March 2007		Active. This is a small domestic horse allotment. Grazing is authorized and allowed to continue in critical habitat for the desert tortoise based on formal consultation with the FWS (1-8-07-F-37R) -10 year grazing lease.
Walker Pass Common	Yes	April 24, 2007	Relinquished in May, 2013, under the authority of the 2012 Appropriations Act (Public Law 112-74, sec 122b).	Allotment permanently retired through Congressional act. The AUMs have been reallocated for wildlife use and ecosystem functions.
Warren	Yes	April 24, 2007		Active-10 yr. permit

Table 3.7-3 Acres of Grazing Allotments in DWMAs, Wilderness, and ACECs

Special Designation Unit	Cantil Common	Buckhorn Canyon	Cronese Lake	Harper Lake	Ord Mountain	Shadow Mountain	Johnson Valley	Total Acres
Fremont-Kramer DWMA	6,196	0	0	0	0	596		6,792
Ord-Rodman DWMA	0	0	0	0	117,290	0	429	117,719
Superior-Cronese DWMA	0	0	25,875	15,936	0	0		41,811
Black Mountains Wilderness	0	0	0	6,839	0	0		6,839
Newberry Mountains Wilderness	0	0	0	0	6,938	0		6,938
Rodman Mountains Wilderness	0	0	0	0	17,462	0		17,462
Black Mountain ACEC	0	0	0	0	0	0		0
Cronese Basin ACEC	0	0	10,190	0	0	0		10,190
Mojave Monkeyflower ACEC	0	0	0	0	7,729	0		7,729
Rodman Mountains Cultural Area ACEC	0	0	0	0	1,673	0		1,673
Totals	6,196							217,153

Table 3.7-4 Riparian UPAs in DWMA Grazing Allotments

Allotments (DWMA)	Riparian UPA	Assessed Condition
Ord Mountain	Upper Sweetwater Spring - West	PFC
Ord Mountain	Upper Sweetwater Spring - East	FAR – No Apparent Trend (Stable)
Ord Mountain	Lower Sweetwater Spring	PFC
Ord Mountain	Willow Spring	FAR – Upward Trend
Ord Mountain	Kane Spring	FAR – Upward Trend
Ord Mountain	Badger Spring	Non-functional (source not locatable)
Harper Lake	No natural springs	N/A
Cronese Lake	No natural springs	N/A

Table 3.7-4 Riparian UPAs in DWMA Grazing Allotments

Allotments (DWMA)	Riparian UPA	Assessed Condition
Cantil Common	No natural springs	N/A
Shadow Mountain	No natural springs	N/A
Buckhorn Canyon	No natural springs	N/A

3.8 Energy Production, Utility Corridors, and Other Land Uses

Most land uses in the West Mojave (WEMO) Planning area require the provision of some sort of motorized access. Land uses on public lands primarily consist of a number of different types of approvals for commercial, private or other governmental purposes. Land uses authorized on public lands include a wide variety of industrial and commercial development, examples of which are pipelines, roads, transmission lines, commercial filming, small and large scale industrial sites, power facilities, mines, and communication sites. Types of authorizations range from permits and leases (including Recreation and Public Purpose Act leases) to right-of-way (ROW) grants.

3.8.1 General Land Uses Affected by Transportation Network

Access within the boundaries of new facilities is generally handled through a plan of development. Roads within facility boundaries are managed as additional facilities equivalent to other structures, and are not available for public access without the permittee's permission and oversight. Authorizations generally are issued with a set of stipulations that prescribes allowable development with associated design features to address site specific resource values. Permitted access restrictions may also be considered when there are access safety issues, when routes dead-end beyond a project, if the project is short-term or temporary, and in consideration of associated impacts, or to manage sensitive resources.

Authorized land uses can affect the transportation network and other resources in several ways. Most authorizations include provisions for access to the site during facility construction or operation. These provisions can include authorization for use of existing routes, or authorization to construct and use new routes. Authorization for use of these access roads often includes route maintenance activities or requirements, and therefore these are frequently some of the best maintained routes on public lands. Most frequently, public use of these routes precedes authorized use since each applicant for a permit, plan of development, or ROW is strongly encouraged to propose an existing, open route to access their project site. Therefore, in general, these authorized access routes are also available to the public at the time they are permitted. New routes generally serve as connectors from an existing open route to the project boundary. New routes to projects most frequently are identified as Limited Use routes (routes to be used only by the specific authorized users), but if a new route provides through access or crosses open routes, some or all of the route may be made available to the public and/or other users.

Authorizations can also affect the transportation network if the requested land use is incompatible with continued public use of one or more routes. This can occur with land-intensive uses in which a large land area is fenced and made inaccessible to the public. In these cases, the requested land area may include one or more publicly-available routes that would no longer be available. This is a common occurrence with large-acreage sites such as solar power plants. The common practice in these cases is to evaluate the need for access associated with the routes that are being made inaccessible, and to re-route them around the facility is that access is still needed.

A third effect of the authorization of new routes associated with land uses is the potential for proliferation of associated unauthorized routes. For a single-site land use such as a solar facility, the potential for route proliferation is expected to be low because the new route would likely not

be very long, and would likely be located near other major transportation arteries. However, land uses that involve multiple sites in remote areas, such as communications sites or wind turbines, may have a greater potential for route proliferation because they provide new access to remote areas.

3.8.2 Land Uses Within WEMO Planning Area

Within the WEMO Planning area, there are currently approximately 1,705 active rights-of-way (ROW). These land and mining authorizations almost always involve some level of motorized access across public lands. This access occurs at intervals which vary widely, and range from many times per day to less than once a year. The number of active rights-of-way and other authorizations changes frequently as new authorizations are issued and existing ones expire or are terminated.

Utility Corridors

The CDCA Plan, as amended, established a network of sixteen utility planning corridors across the Mojave and Colorado Deserts. All new linear utilities exceeding the following thresholds must be located within a utility corridor:

- New electrical transmission towers and cables of 161 kV (kilovolts) or above;
- All pipelines with diameters greater than 12 inches;
- Coaxial cables for interstate communications; and
- Major aqueducts or canals for interbasin transfers of water.

Seven of these corridors cross the WEMO Planning area: Corridors A, B, BB, C, D, G, and H. Each corridor is between two and five miles wide. The intent of the corridors is to provide a delivery system network that meets public needs in a manner that minimizes the proliferation of widely separated rights of way by encouraging the joint use of corridors for utilities. By locating a project within a corridor, a project proponent does not receive immediate approval to construct a project: a federal right of way grant must still be obtained and a NEPA document prepared.

Utility corridors comprise the most extensive linear network in the planning area, and they generally parallel U.S. highways. Since these utility corridors extend hundreds of miles in length and are two to five miles in width, it is the goal to share access roads within the corridors whenever feasible to minimize route proliferation. These major corridor routes are also routes available to the public, and serve as major arterial access across the planning area. They also may include many side routes to access above-ground or below-ground facilities. As aerial and remote monitoring of facilities increases, the frequency of motorized use on these side-routes is declining. However, many maintenance activities still need to be performed on-site, requiring continued access.

Occasionally the unique needs of a project may require that it be located outside of a corridor. To accommodate these situations, several “contingent” corridors were identified by the CDCA plan that could be activated through a CDCA plan amendment. A project could be located outside of either an activated or contingent corridor, but only through a CDCA plan amendment that examined whether the need for a one-time exemption from the corridor network warranted construction in a non-corridor location. This has happened only once since the CDCA plan was

adopted, for the All American Pipeline in 1983, in a region outside of the western Mojave Desert.

In general, the utility corridors established in the CDCA Plan already contained transmission lines and pipelines at the time of their designation as corridors. Therefore, the corridors also contained a network of parallel access roads to support maintenance and operations of these facilities. In many cases, newly proposed facilities within these corridors can be constructed and operated without the need for additional routes. Each route within the corridors must be evaluated, based on its authorized use, potential resource impacts, and other access needs, to determine if it can be made accessible to the public in addition to the authorized users.

Access for Private Landowners

Private land owners may also receive authorization to utilize routes on public land to access their property. Private landowners are guaranteed access to their lands. The location and manner of that access is a discretionary action if it involves a new or upgraded road, and private landowners may request easement for this additional access. However, BLM policy does not require permitted access by private landowners. Although some federal lands do have such requirements, the CDCA Plan has not adopted such a policy. Due to the amount and distribution of private land in the planning area, most private landowners do not possess authorizations for use of access routes to their land; therefore access to private lands is generally a consideration of providing public access.

Renewable Energy Facilities

Renewable energy includes solar power, wind, and biomass resources. As demand has increased for clean and viable energy to power the nation, consideration of renewable energy sources available on public lands has come to the forefront of land management planning. The West Mojave region contains the natural resources to support the development of alternative energy sources such as wind, geothermal and solar facilities, and there will likely be future proposals for the development of these resources as energy demands increase.

Each existing and proposed renewable energy facility interacts with the designated travel network, but the interaction is different depending on the type of facility. The facilities have in common a need for access roads to the power generation site, electrical substations and switchyards, and transmission system. However, the configuration of the power generation facilities affects the number and configuration of roads needed to support each facility.

For solar power plants that occupy a single site, a single access road may be sufficient to support construction and operation of the facility. Ease of access to local highways and existing transmission systems is generally a factor in site selection by the applicants, so the number and length of necessary access roads, including newly constructed roads, is relatively low. However, the facilities also occupy very large land areas of several thousand acres. By the nature of the facilities, the land area must be completely fenced and public access excluded from this large area. In almost all cases, motorized, non-motorized, and non-mechanized routes already exist within the project area, and public access to those routes must be eliminated. This closure, in turn, may affect the public's use of the routes for recreation or access to other recreation areas, or the use of the route by an authorized user to access their permitted facilities. In general, the environmental analysis of each solar facility includes an evaluation of the impact of the project

on existing routes, and commonly includes a requirement that roads or trails be re-routed, if necessary, to ensure continued access for the public and authorized users.

Wind power facilities have a different effect on routes than solar facilities. Instead of being concentrated in a single, large land area, the power generation facilities exist as hundreds or, in some cases, thousands of individual small turbines. Due to the small footprint of the individual turbines, wind generation facilities do not have a long-term impact on use of routes by the public or authorized users. However, because the applicant must have long-term access to each individual turbine for construction and maintenance, the number and length of routes necessary to support the facility is relatively high. In almost all cases, facility construction requires new roads covering a large area. Also, wind turbines need to be located in higher elevations. By needing to access higher elevations, these routes tend to cross areas with steep slopes, presenting the potential for increased erosion. These mountain slope areas also tend to be the locations of springs, presenting the potential to impact riparian resources, unusual plant assemblages, water quality, and biological resources associated with these areas. Finally, the higher elevation areas are commonly attractive for recreational uses such as hiking, camping, rock hounding, and wildlife viewing. By adding lengthy new routes in high elevation areas, wind turbine facilities present the potential for increasing the proliferation of unauthorized routes in these sensitive areas. Evaluation of wind power applications, therefore, requires consideration of resource impacts across the entire facility route network, including decisions such as the types of impacts that may occur, whether new routes are to also be available to the public or other users, and how to ensure that construction of new routes does not lead to proliferation of unauthorized routes.

Table 3.8-1 lists the renewable energy projects which have been approved or are currently being evaluated in the area.

Table 3.8-1. Renewable Energy Projects

Project	Type	Field Office	Size (MW)	Acreage	Status
Calico	Solar	Barstow	663	4,604	Approved, project subsequently relinquished
Soda Mountain	Solar	Barstow	350	4,397	Proposed
Abengoa Mojave	Solar on private land, transmission on public land	Barstow	250	154	Approved
Alta East	Wind	Ridgecrest	300	2,592	Proposed
Tylerhorse	Wind	Ridgecrest	60	1,100	Proposed
Haiwee	Geothermal1	Ridgecrest	NA	NA	Proposed
Barren Ridge	Transmission	Ridgecrest	NA	NA	Approved

(1) Current evaluation is for general leasing decision, not specific projects.

Non Renewable Energy

The majority of the natural gas fueled power plants within the study area are cogeneration facilities, the one exception being the Coolwater facility east of Barstow. In May of 2000, the California Energy Commission granted approval to the High Desert Power Plant Project, a new natural gas fueled 750 MW facility. This facility is proposed to be located on a 25-acre site of the

Southern California International Airport, formerly George Air Force Base, in the city of Victorville.

Non-renewable energy facilities tend to occupy a single, small-scale site near existing roads, and thus do not require construction of or access to an extensive route network. These facilities are generally supported by a single access road into the facility, and access roads adjacent to supporting pipelines and transmission lines.

Communication Sites

The WEMO Planning area also supports a large number of communications sites operated by leaseholders. In general, these facilities are similar to wind turbines in that they occupy a small land area that is unlikely to interfere with use of nearby routes by the public or other authorized users. However, they also tend to be sited in distal locations, at high elevations, thus requiring a lengthy access road for construction and maintenance. The impacts associated with these routes at higher elevations would be similar to those for wind turbines, including increased potential for erosion on steep slopes, presence of riparian and other sensitive resources, and the potential for proliferation of unauthorized routes for recreation purposes.

Mine and Mineral Claim Access

Most of the Limited Access areas within the WEMO Planning area are available for mining and mineral exploration. Provision of access to these resource values is a key component of the transportation network. Access for exploration and development of minerals is granted under several authorizations, depending on the scope of activities and the type of minerals being mined. Mineral management programs in BLM include fluid minerals (oil, gas, and geothermal) and solid minerals (locatable, leasable, and salable). Fluid minerals are exclusively leasable; however, some solid minerals are also leasable such as phosphate and salt deposits that contain sodium or potassium. Calcium and carbonate salts are leasable or locatable, depending on their uses. The remaining solid minerals are generally locatable or salable. Locatable solid minerals are those such as metals and gypsum. Salable minerals are those such as common varieties of sand and gravel, clay, and rock. The BLM manages oil and gas leases under Title 43 CFR, Part 3100, and geophysical exploration is covered under Part 3150. Geothermal leasing is managed under Part 3200, mineral materials under Part 3600 regulations, mining claims for locatable minerals under Part 3800 regulations, and solid leasable minerals, other than coal or oil shale, under Part 3500.

As with other land-use authorizations, whenever appropriate, the designated route network is used for motorized access. Frequently additional access is required to reach the sites of minerals. Less frequently, restrictions are placed on the use of these access routes for safety and/or security reasons, in order to protect discoveries. Generally, mining activities are of a small scale and do not affect the continuity of the overall network. However, the major salt mining operations on Searles Dry Lake do provide constraints on through-area access by other users.

Locatable minerals, which include metallic and more precious or unique commodities, are located on public lands, and can be potentially patented to mining interests based on discovery and evaluation. Access for locatable minerals is provided under the 1872 Mining Law and implementing regulations in 43CFR3809, and is non-discretionary. BLM retains authority over the appropriate manner and specific location of access routes. There are currently 5 active mines

within the WEMO Planning area. In addition, there are more than 3,000 active lode, placer, and millsite claims, most of which require a plan of operation in the WEMO Planning area.

Each mine and claim requires use of the transportation network for access. An approved plan is required for most surface disturbance in the WEMO Planning area associated with mining or exploration activity greater than one acre. Access to these active mines and claims is included in a plan of operations submitted to BLM for review and approval. In addition, some mines outside of the planning area may require use of the planning area's transportation network for access. Notice-level operations are smaller exploratory activities causing surface disturbance. In more sensitive areas, a notice is appropriate up to one-acre, unless otherwise further restricted in the land-use or activity plan. In less sensitive areas, a notice may be appropriate for operations up to 5 acres in size. The notice must specify access, which BLM reviews and may modify.

Casual use mining exploration, for which an operator need not notify the BLM, pertains to those projects that do not exceed casual use. Many of these claimants do not file a plan or notice, and therefore are not provided motorized access specific to their activity on public lands. Rather, they may use motorized vehicles provided the use is consistent with the regulations governing such uses at 43 CFR 8340 for off-road vehicle use designations contained in BLM land-use plans.

Approval for authorizations for most saleable and leasable minerals is discretionary; therefore providing access to those minerals is also discretionary. If mining is approved, BLM determines the appropriate manner and specific location of access routes, as with locatable minerals. In many cases, technical considerations govern the location of the necessary access route, and the impacts associated with access are considered by BLM, along with the rest of the facility and operation, in determining whether to authorize the facility. As with other routes, BLM may apply minimization requirements, as necessary to avoid or reduce impacts. There are some specific commodities, such as Strategic and Critical Minerals, for which authorization, and therefore access, is not discretionary.

3.9 Cultural Resources

This chapter presents the existing management situation and environmental setting/affected environment for cultural resources in the planning area, which is the scope of the analysis. The following describes the broad category, cultural resources, as well as the subsets historic properties and historical resources.

A cultural resource is an object or definite location of human activity, occupation, use, or significance identifiable through field inventory, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, buildings, places, or objects and locations of traditional cultural or religious importance to specified social and/or culture groups. Cultural resources include the entire spectrum of objects and places, from artifacts to cultural landscapes, without regard to eligibility for inclusion on the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR).

Historic Properties are a legally defined subset of cultural resources that are included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior and per the NRHP eligibility criteria at 36 CFR 60.4. Historic Properties may include any prehistoric or historic district, site, building, structure, traditional cultural property, or object. The term also includes properties of traditional religious and cultural importance to a Native American tribe that meets the NRHP criteria. “Eligible for inclusion on the NRHP” refers both to properties formally determined as such in accordance with regulations of the Secretary of the Interior and all other properties that meet the NRHP criteria.

Historical Resources are a legally defined subset of cultural resources that meet the criteria for listing on the CRHR as provided at CCR Title 14, Chapter 11.5, Section 4850. Historical Resources may include, but are not limited to, any object, building, structure, site, area, place, record, or manuscript which that is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

3.9.1 Definition of the APE

The Area of Potential Effects (APE) is defined in 36 CFR Part 800, the implementing regulations of Section 106 of the National Historic Preservation Act, as "[t]he geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking." [36 CFR Part 800.16(d)].

The APE for the land-use plan amendment is the West Mojave Planning Area. This takes into account the potential for direct and indirect impacts to physical, visual, and auditory attributes of cultural resources and cultural landscapes, from all decisions allowable as part of the WEMO Plan. This includes the proposed amendments and revisions, grazing use decisions, and the establishment of a travel management framework specific to the Planning Area.

The APE for specific route designations developed as part of the West Mojave Route Network Project is defined as the area formed by the actual routes plus the 300-foot-wide corridor along

each side of open routes that is available for pulling off and parking of vehicles. This encompasses areas near or adjacent to routes that may be subject to effects related to use of the route, such as camping and secondary-vehicle staging. This area forms the basis for the NEPA analysis in this document.

3.9.2 Regulatory Setting

3.9.2.1 Federal

National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966 (Public Law [PL] 89-665, 16 United States Code [U.S.C.] 470-1), as amended, generally sets forth as the national policy of the federal government, in cooperation and partnership with the states, local governments, Native American tribes, and private organizations and individuals to (1) use measures, including financial and technical assistance, to foster conditions under which our modern society and our prehistoric and historic resources can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations; (2) administer federally owned, administered, or controlled prehistoric and historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations; (3) contribute to the preservation of non-federal prehistoric and historic resources and give maximum encouragement to organizations and individuals undertaking preservation by private means; and (4) encourage the public and private preservation and utilization of all usable elements of the nation's historic built environment. (16 U.S.C 470-1).

Sections 106 and 110 of the NHPA have specific bearing on federal agency historic preservation activities and the management of historic properties. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on such historic properties and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on those undertakings. These regulations require federal agencies to conduct the necessary studies or consultations to identify cultural resources that may be affected by an undertaking, evaluate cultural resources that may affected to determine if they are eligible for the NRHP, and to assess whether such historic properties would be adversely affected. Where historic properties would be adversely affected, the federal agency is required to consult with the State Historic Preservation Officer, Native American tribes that attach religious or cultural significance to historic properties, the Advisory Council on Historic Preservation, and other consulting parties to resolve the effects of the undertaking.

Section 110 of the NHPA (16 U.S.C. 470h-2) generally provides that all federal agencies assume responsibility for the preservation of historic properties that are owned or controlled by such agency. Under this section, federal agencies must establish a preservation program for the identification, evaluation, and nomination to the NRHP, and for protection of historic properties. The agency’s preservation program shall ensure:

A. That historic properties under the jurisdiction or control of the agency are identified, evaluated, and nominated to the National Register.

B. That such properties under the jurisdiction or control of the agency as are listed in or may be eligible for the National Register are managed and maintained in a way that considers the preservation of their historic, archaeological, architectural, and cultural values in

compliance with Section 106 and gives special consideration to the preservation of such values in the case of properties designated as having national significance.

C. That the preservation of properties not under the jurisdiction or control of the agency, but subject to be potentially affected by agency actions, are given full consideration in planning.

D. That the agency's preservation-related activities are carried out in consultation with other federal, state, and local agencies, Indian tribes, Native Hawaiian organizations carrying out historic preservation planning activities, and with the private sector.

E. That the agency's procedures for compliance with Section 106 of this Act

   i. are consistent with regulations issued by the Council pursuant to this Act.

   ii. Provide a process for the identification and evaluation of historic properties for listing in the National Register and the development and implementation of agreements, in consultation with State Historic Preservation Officers, local governments, Indian tribes, Native Hawaiian organizations, and the interested public, as appropriate, regarding the means by which adverse effects on such properties will be considered

   iii. Provide for the disposition of Native American cultural items from federal or tribal land in a manner consistent with section 3(c) of the Native American Grave Protection and Repatriation Act" (25 U.S.C. 3002[c]) (16 U.S.C 470h-2(a)).

National Register of Historic Places

The NRHP is the official list of the nation's historic places worthy of preservation. Authorized by the NHPA, the NRHP is part of the national program to identify, evaluate, and protect America's historic and archaeological resources. Cultural resources listed or eligible for listing on the NRHP are called historic properties.

Eligibility for inclusion in the NRHP is specified in regulations at 36 CFR 60.4 and is based on the following:

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

A. That are associated with events that have made a significant contribution to the road patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or representation of the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield, information important in prehistory or history.

An NRHP-eligible site must meet one or more of the above criteria and have integrity appropriate to the criteria. In most cases, archaeological sites typically qualify under Criterion D; non-archaeological properties often qualify for listing under Criterion A, B, or C. Integrity varies

in terms of the criterion under which the site is evaluated. For example, an archaeological site evaluated under Criterion D would need to have the potential to provide meaningful scientific research data that is important to prehistory or history. If the site has been disturbed or damaged to the extent it cannot do this, it would lack integrity. Historic buildings, on the other hand, typically need to be in their original location and be relatively unmodified or restorable to have integrity under Criterion A, B, or C. Historic buildings and structures must also evoke the historic period of significance to a layperson. None of the four criteria are mutually exclusive. It is not uncommon for a historic structure to have a related archaeological component.

Under special consideration, some cultural resources not otherwise eligible may be considered eligible. These include religious properties, moved properties, birthplaces and graves, cemeteries, reconstructed properties, commemorative properties, and properties less than 50 years old.

National Environmental Policy Act, as amended

NEPA (42 U.S.C. §§ 4321–4370c.) provides the statutory basis for considering impacts on the cultural environment as a whole, as well as cultural resources that are not historic properties. NEPA places the responsibility on the federal government to "preserve important historic, cultural, and natural aspects of our national heritage, and maintain, whenever possible, an environment [that] supports diversity and a variety of individual choice" (42 U.S.C. § 4331[b][4]). NEPA requires federal agencies to conduct an interdisciplinary analysis of the environmental consequences of their actions early in the decision-making process. For cultural resources, this analysis considers the effects of agency actions on physical features such as archaeological sites, buildings, and structures, as well as the practice of religious and other traditional lifeways that reflect community heritage. Implementing regulations are found in 40 CFR §§ 1500–1508, 36 CFR § 800.8, and 32 CFR § Part 775.

Federal Land Policy and Management Act of 1976

The FLPMA (P.L. 94-579; 43 U.S.C. §§ 1701 et seq.) mandates that public lands be managed in a manner that will protect the quality of scientific, scenic, historic, ecological, environmental, air and atmospheric, water resource, and archeological values. Title VI of the FLPMA establishes the California Desert Conservation Area. BLM, under the Secretary of the Interior, is the implementing agency for FLPMA. However, under 43 U.S.C. § 1781.h, the Secretary of Agriculture and Secretary of the Defense manage public lands that fall within their respective jurisdictions if the lands are located within or adjacent to a California Desert Conservation Area. Permits authorizing the collection of fossils for scientific purposes are issued under FLPMA.

Archaeological Resources Protection Act

The Archaeological Resources Protection Act (as implemented by 43 CFR 7) was enacted to protect archaeological resources on public lands and Indian lands and to acknowledge that archaeological resources are an irreplaceable part of America's heritage. The Archaeological Resources Protection Act applies when a project may involve archaeological resources located on federal or tribal land. The Archaeological Resources Protection Act requires that a permit be obtained before excavation of an archaeological resource on such land can take place and that artifacts recovered during excavation are curated at an appropriate facility. Section 7.8 of 43 CFR 7 includes professional qualification standards for archaeologists conducting work under

the permit covered by this act. The act also provides for the notification of Indian tribes when sites of cultural or religious importance could be harmed. In addition, it details descriptions of prohibited activities and financial and incarceration penalties for convicted violators. It provides authority to federal officials to better manage archaeological sites on public land (16 U.S.C. 470aa-470mm).

Antiquities Act; Title 16, U.S.C. Section 431-433

This act authorizes the president to designate as national monuments objects or areas of historic or scientific interest on lands owned or controlled by the United States. The act required that a permit be obtained for examination of ruins, excavation of archaeological sites, and the gathering of objects of antiquity on lands under the jurisdiction of the Secretaries of Interior, Agriculture, and Army, and provided penalties for violations.

Preserve America, Executive Order 13287

Agencies shall provide leadership in preserving America's heritage by actively advancing the protection, enhancement, and contemporary use of the historic properties owned by the federal government. Each agency is to provide and maintain an assessment of the status of its inventory of historic properties and their ability to contribute to community economic development initiatives.

Where consistent with its mission and governing authorities, and where appropriate, agencies shall seek partnerships with state and local governments, Native American tribes, and the private sector to (1) promote the unique cultural heritage of communities and of the nation and to realize the economic benefit that these properties can provide, and (2) cooperate with communities to increase opportunities for public benefit from, and access to, federally owned historic properties.

Indian Sacred Sites, Executive Order 13007

In managing federal lands, agencies shall, to the extent practicable, permitted by law, and not inconsistent with agency functions, accommodate Indian religious practitioners' access to and ceremonial use of Indian sacred sites. Agencies are to avoid adversely affecting the physical integrity of these sites, maintaining the confidentiality of such sites, and informing tribes of any proposed actions that could restrict access to, ceremonial use of, or adversely affect the physical integrity of, sacred sites.

Consultation and Coordination with Indian Tribal Governments, Executive Order 13175

In formulating or implementing policies that have tribal implications, agencies shall respect Indian tribal self-government and sovereignty, honor tribal treaty and other rights, and strive to meet the responsibilities that arise from the unique legal relationship between the federal government and Indian tribal governments. The Executive Memorandum of April 29, 1994, outlines the principles that agencies are to follow in their interactions with Native American tribal governments.

The Timbisha Shoshone Tribal Homeland Act of 2000 designated a 640-acre parcel within the northern portion of the planning area (Darwin Subregion) as trust land for the Timbisha-Shoshone Tribe (Whitley 2000, Caton 2009).

American Indian Religious Freedom Act, 42 U.S.C. 1996

This act recognizes that freedom of religion for all people is an inherent right and that traditional American Indian religions are an indispensable and irreplaceable part of Indian life. Establishing federal policy to protect and preserve the inherent right of religious freedom for Native Americans, this act requires federal agencies to evaluate their actions and policies to determine if changes should be made to protect and preserve the religious cultural rights and practices of Native Americans. Such evaluations are made in consultation with native traditional religious leaders.

Native American Graves Protection and Repatriation Act, 25 USC 3001-13

This act establishes requirements for the treatment of Native American human remains, and associated funerary objects, and objects of cultural patrimony on federal land. The implementing regulations for this act are found at 43 CFR 10. In the event of an inadvertent discovery of human remains and/or associated funerary objects, work shall stop in the immediate area and be protected. The federal agency is required to notify and consult with tribes that are, or likely to be, culturally affiliated with the remains and/or associated funerary objects. Upon request, each agency is required to return any such item to any lineal descendant or specific tribe with whom such item is associated.

CDCA Plan Cultural Resources Element

The general goals of the California Desert Conservation Area (CDCA) Plan Cultural Resources Element are to:

1. Broaden the archaeological and historical knowledge of the CDCA through inventory efforts and the use of the existing data. Continue the effort to identify the full array of the CDCA's cultural resources.
2. Preserve and protect representative sample of the full array of the CDCA's cultural resources.
3. Ensure that cultural resources are given full consideration in land use planning and management decisions, and ensure that BLM authorized actions do not result in inadvertent impacts.
4. Ensure proper data recovery of significant (NRHP quality) cultural resources where adverse impacts cannot be avoided.

These goals have not been modified in the West Mojave Plan.

3.9.2.2 State

Historical resources are afforded consideration and protection by CEQA and PRC Section 5024.1. The CRHR was established by California PRC Section 5024, which requires state agencies to identify and protect state-owned resources that meet CRHR listing criteria. These criteria are consistent with the NRHP criteria, but have been modified for the state use to include a range of historical resources that better reflect the history of California. A resource is considered historically significant or a historical resource if it meets one of the following criteria for listing on the CRHR:

1. Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
2. Associated with the lives of persons important to local, California, or national history.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values.
4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

3.9.3 Background

3.9.3.1 Regional Overview

The evaluation of potential cultural resources in accordance with the criteria established by the federal and state legislation and regulations described earlier is made with reference to a historic context. The context is defined as "the patterns or trends by which a specific occurrence, property, or site is understood and its meaning (and ultimately its significance) within history or prehistory is made clear" (National Park Service 1995). A general context for the consideration of cultural resources within the West Mojave Area is presented below.

Prehistory

The prehistory of the West Mojave Area spans four general temporal periods: Late Pleistocene and Early, Middle, and Late Holocene. In light of the many cultural sequences, the temporal periods are described below.

Late Pleistocene (20,000-10,000 BP)

Despite some claims for very early human occupation within the Planning Area (Davis et al. 1980), the earliest well-documented evidence is found in the form of the distinctive fluted Clovis-style projectile points that have been found at scattered locations throughout the region (Rondeau et al. 2007). Because these points are typically found on the surface and are not associated with radiocarbon assays, the dating of these early occupations remains problematic. However, Olivella beads from several sites within the Planning Area, including the Stahl Site in Inyo County, one site in Riverside County, and four sites in San Bernardino County (Goldstone, Awl Site, Rodgers Ridge, and Flood Pond), have yielded radiocarbon dates within the Late Pleistocene range. These sites were located adjacent to lakes or marshes and often contain a variety of artifact forms such as scraping tools, leaf-shaped bifaces, and associated debitage (i.e., prehistoric debris) (Erlandson et al. 2007; Fitzgerald et al. 2005). Based on the relatively high frequency of points and scrapers, these early groups have traditionally been seen as mobile big-game hunters; however, recent studies suggest that their economies were more diverse and focused on smaller animals and plant foods, and that large game played a minor role (Erlandson et al. 2007). They are believed to have lived in small populations in temporary camps located near permanent water sources (Sutton et al. 2007).

Early Holocene (10,000-7,500 BP)

In general, the transition from the terminal Wisconsin to the Early Holocene within the Mojave Desert was characterized by somewhat warmer and increasingly drier conditions. Pluvial lakes,

while still present in the region, were generally retreating and had dried completely by around 8,000 years ago. Human use of the desert is manifested by the Lake Mojave Complex, which occurred between approximately 10,000 and 8,000 years ago, and is characterized by projectile points of the Great Basin stemmed series and abundant bifaces, steep-edged unifaces, crescents, and occasional cobble-core tools and ground stone implements. Sites attributed to the Lake Mojave Complex have usually been found only as surface deposits and lack materials suitable for dating. However, some radiocarbon dates have been obtained for sites at Lake Mojave, Fort Irwin, Twentynine Palms, Rosamond Lake, and China Lake (Sutton et al. 2007). These sites are frequently found on the shorelines of pluvial lakes. Site types include residential bases, lithic workshops, and small camps. Settlement patterns are seen as highly mobile, with small social units visiting resource patches on seasonal rounds. Faunal remains have been found in limited quantities at Lake Mojave sites, but evidence from excavations at Fort Irwin suggest hunting focused on small game, reptiles, and rodents (Sutton et al. 2007).

Middle Holocene (7,500 to 4,000 BP)

During the first part of the Middle Holocene, a drier climate resulted in sporadic and relatively short-duration appearance of shallow desert lakes. Researchers have posited that during this period settlement within the Mojave Desert focused on upland contexts, along remnant pluvial lake basins and channels, and at spring/seep locations. During the early part of the Middle Holocene, the Pinto Complex (7,000 to 4,000 BP) appeared in the area encompassed by the Planning Area. Radiocarbon data from some sites in the Mojave Desert suggest that there was an overlap between the Lake Mojave and Pinto complexes and that the Pinto Complex may have begun in the Early Holocene (Sutton et al. 2007). The artifact assemblage includes Pinto points, leaf-shaped points and knives, drills, heavy-keeled scrapers, retouched flakes, choppers, hammerstones, and shell beads. Manos and flat milling stones appear in abundance for the first time in the Mojave Desert. Based on this high abundance of milling tools, intensive plant exploitation was one of the inhabitants' subsistence strategies and access to plant resources must have been an important factor in determining site placement (Sutton et al. 2007). Groups most likely consisted of multiple families living in centralized sites logistically close to locations used to gather resources (Sutton et al. 2007).

Sutton et al. (2007) propose that the Deadman Lake Complex may be somewhat distinct from the Pinto Complex. To date, the Deadman Lake Complex has been identified in the Twentynine Palms area only. The assemblage has small- to medium-size contracting stemmed points, an abundance of battered cobbles and core tools, bifaces, simple flake tools, milling tools, and shell beads from the Pacific Ocean and the Sea of Cortez. The artifacts are similar to Pinto Complex artifacts, but use the local igneous materials. Sutton et al. (2007) note also that it is possible the Deadman Lake Complex reflects a localized version of the Pinto Complex in which the sites are located at higher elevations and thus have access to different resources than those of the Pinto Complex in remnant pluvial lake basins.

Late Holocene (after 4,000 BP)

Following an approximate 1,000-year period of reduced occupation in the Mojave Desert (Sutton et al. 2007), the Gypsum Complex (approximately 4,000 BP and 2000 BP) emerged amid the somewhat wetter and cooler climatic conditions of the Late Holocene. The artifact assemblage characteristic of Gypsum sites consists of Elko, Humboldt, and Gypsum Cave points; triangular

knives; large points with straight bases and shoulders; hammerstones; choppers; flake-based scrapers; scraper-planes; large drills with expanding bases; stone pendants; limited shell beads; millingstones; manos; mortars; and pestles (Warren 1984). Faunal remains from Gypsum sites indicate hunting focused on artiodactyls, lagomorphs, and rodents (Sutton et al. 2007).

Prehistoric sites and features with diagnostic elements indicate use of the Darwin area from at least the Newberry Period (ca. 4,000 -1,350 BP) through contact, though the potential for evidence of earlier occupation exists in several sites where subsurface deposits have been identified and remain undisturbed.

In Owens Valley and the eastern Sierra, the period between 2000 BP and 1500 BP (the Newberry Period in regional chronologies) is characterized by highly mobile groups, caches of Elko and Humboldt Basal notched points, bifaces, and milling equipment (Eerkens and Spurling 2008; Faull 2007). Sites dating to the latter part of this period are typically base camps with structures and lithic reduction sites. Obsidian quarrying reached its peak during this period (Eerkens and Spurling 2008). Sites occur more in the Volcanic Tablelands and northern Owens Valley than in the southern Owens Valley area (Poulson 2009).

The Late Holocene from about 1500 BP to the time of the historic era is viewed by most archaeologists as the extension of the ethnographic present. A series of dry and wet episodes characterize the climate during this period (Larsen and Michaelsen 1989; Sutton 1996, Weide et al. 1974). Lakes in the Mojave Desert started to dry up and site locations are centered near ephemeral water sources during the latter part of this period.

The Rose Springs Complex during the latter part of the Late Holocene (1500 to 1000 BP) marked the beginning of the bow-and-arrow technology in the Mojave Desert. These sites have well-developed middens and a variety of material culture including Eastgate and Rose Spring projectile points, stone knives, drills, pipes, bone awls, milling tools, marine shell artifacts, and large quantities of obsidian (Sutton et al. 2007). The sites are found near springs (Saratoga, Rose) along washes and sometimes along lakeshores (Rogers/Rosamond and Koehn lakes). Evidence of wickiups and pit houses has been found in two sites in the western Mojave Desert (Sutton et al. 2007).

In the Owens Valley, sites dating to 1500-600 BP (identified in regional chronologies as the Haiwee Period) show evidence of more sedentary groups with semi-subterranean houses. The bow and arrow (Rose Spring and Eastgate points), and storage pits are introduced, and artifact caching mostly disappears (Faull 2007). Production at obsidian quarries drops off (Eerkens and Spurling 2008). The band-like structure is replaced by the household as the primary socioeconomic unit (Poulson 2009). Subsequently, (600 BP to contact, Marana Period Cottonwood and Desert Side-notched points and Owens Valley Brown ware (a coil and scrape type of construction) are introduced and there is an increase in ground stone tools as the harvesting of green pinyon nuts becomes a subsistence focus (Bettinger 1989; Eerkens and Spurling 2008).

Protohistory and Ethnographic Context

To evaluate cultural development, archaeological explanations need to be expanded. The similarities between the Late Holocene period and the ethnographically recorded occupation of the area have resulted in an extrapolation from the ethnographic present to Late Holocene patterns. While this has its difficulties, certain types of ethnographic information can be

employed in the evaluation of the archaeological record. Perhaps the most valuable is the linguistic structure of the area.

The use of linguistic evidence for prehistory is more tenuous than the more substantial cultural material record but it can provide important insight. If the archaeological record and linguistic evidence both reflect actual activities, the reconstruction proposed by one field should be substantiated by the other. When an area undergoes an intensive linguistic change (as from one stock to another), it may also undergo a corresponding change in the material remains left by the people involved. If two groups are in extended contact, their nonlinguistic elements can be assimilated while their language may remain relatively distinct (Bright and Bright 1965).

One of the most important questions that needs to be addressed and that requires consideration of ethnographic and linguistic information is the development of the location of the native populations at the time of contact. Where did they come from, and when did they arrive?

The major linguistic division within the Planning Area is the Uto-Aztecan stock, which includes the Numic and Takic subfamilies. Speakers of languages derived from the Numic branch of the Uto-Aztecan language group include the Kawaiisu, Southern Paiute, Western Shoshone, and Owens Valley Paiute; the speakers of the languages derived from the Takic branch include the Cupeño, Kitanemuk, Serrano, and Cahuilla (Warren 1984).

Evidence for population movements and the location of these groups at contact have been evaluated based on diagnostic artifacts, projectile points, milling technology and ceramics, burial patterns, and specialty items such as crescentics and beads.

Numic/Takic Language Subfamilies (Mojave Desert/Western Great Basin)

Golla (2007) proposes the development of the Numic and Takic languages in California as dating from about 2000 years ago, and that the Numic languages developed somewhat more recent between 1500 and 2000 years ago. Bettinger and Baumhof (1982) estimate a time depth for the split between the Numic dialects beginning around 800 years ago.

In most explanations, the expansion of the Uto-Aztecan languages within the Mojave Desert and Western Great Basin show similar time depths to the Yuman languages in the Colorado Desert. As with the Yuman languages, expansion toward the coast either filled a void or replaced an existing population. Early explanations described the “Uto-Aztecan wedge” based principally on the assumption of a broad Hokan dispersed language group and the position of the Uto-Aztecan languages relative to the Salinan and Yuman languages. This explanation is challenged by both the proposed timeline for their development and the archaeological record.

As noted earlier, the four tribes that speak languages from the Numic branch are the Kawaiisu, Southern Paiute (Chemehuevi), Western Shoshone, and Owens Valley Paiute, and the four tribes that speak languages from the Takic branch include the Cupeño, Kitanemuk, Serrano, and Cahuilla. As stated above, to understand what remnants may have been left behind by these tribes, it is important to know where their traditional territories are located. The following is a description of lands traditionally occupied by each tribe.

The Kawaiisu occupied the southern end of the Sierra Nevada watershed by the Piute and Tehachapi mountains at the line between the Great Basin and California cultures. The habitat was in the mountainous ridge between the Mojave Desert and the San Joaquin Valley. One source suggests that there were Mountain Kawaiisu who lived in the Piute and Tehachapi

mountains and Desert Kawaiisu who lived east of Tehachapi into southern Death and Panamint valleys where they sometimes lived with Shoshone (Garfinkel and Williams 2009).

The Chemehuevi are considered a subgroup of the larger Southern Paiute group. The Chemehuevi occupied territory west of and along the Colorado River, south of Needles into eastern Mojave Desert as far east as Providence Mountains (Kroeber 1925; Kelly and Fowler 1986). In 1776, there were no Chemehuevi along the Colorado River; however, they moved into the Chemehuevi Valley after the Halchidoma were forced to move east with the Maricopa. After 1876, they moved back to the remote desert when war broke out with the Mojave (Kroeber 1925).

The Western Shoshone occupied a region that included Death Valley through the highlands of central Nevada into northwestern Utah, Skull, Deep Creek, Panamint, and Saline valleys (Thomas et al. 1986, Norwood et al. 1980).

The Owens Valley Paiute occupied a narrow valley along the Owens River on the eastern side of the southeastern Sierra Nevada and extends north to Benton, California, and east to Fish Lake Valley, Nevada (Liljeblad and Fowler 1986; Norwood et al. 1980; Steward 1934).

The Cupeño were a small group of about 500 to 750 who occupied an area approximately 10 miles in diameter south of the San Luis Rey River and centered on the area now known as Warner Springs within the valley of San Jose de Valle (Bean and Smith 1978b; Kroeber 1925).

The Kitanemuk lived in the Tehachapi Mountains at the southern end of the San Joaquin Valley with Antelope Valley being their southern boundary (Kroeber 1925; Blackburn and Bean 1978).

The Serrano territory generally encompassed the San Bernardino Mountains east of Cajon Pass, east to Twentynine Palms and south to Yucaipa Valley (Bean and Smith 1978a).

The Cahuilla occupied mountains, passes, canyons, valleys, and desert from the Colorado Desert north of the Chocolate Mountains and across to Borrego Springs, westerly along Palomar Mountain, northerly to the Santa Ana River near Riverside, then easterly along the San Bernardino Mountains to Orocopia Mountain, and encompassing the San Jacinto and Santa Rosa mountain ranges (Bean 1978).

Cultural Characteristics for Numic and Takic Language Speakers

Cultural characteristics similar for Numic and Takic language speakers in the Mojave Desert include diagnostic point types and coil and scrape pottery or paddle and anvil pottery (Bean 1978; Bean and Smith 1978a; Thomas et al, 1986). There are four point types that may be associated with contact populations in the Numic/Takic language area: Rose Spring, Eastgate, Cottonwood and Desert Side Notched. These tribes also traditionally cremated their dead with the exception of the Kitanemuk and Kawaiisu (Strong 1929, Blackburn and Bean 1978; Zigmond 1986; Kelly and Fowler 1986, Garfinkel and Williams 2009). The Western Shoshone and Owens Valley Paiute practiced both cremations and burials (Busby et al. 1979; Thomas et al. 1986). The Cahuilla and Southern Paiute (Chemehuevi) also were agriculturalists and the Owens Valley Paiute practiced a specialized irrigation system to grow crops (Bean 1978, Busby et al. 1979, Kelly and Fowler 1986; Steward 1933). Sutton et al. (2007) suggest a geographic difference for artifact types. They note that the northern Mojave Desert or the Numic language areas have a combination of Desert Side Notched and Cottonwood triangular points, brown ware pottery, some buff ware pottery near the Mojave River, and primarily Coso obsidian artifacts.

The eastern portion of the Mojave Desert also representing Takic language areas have only Cottonwood triangular points, brown and buff ware pottery, and local obsidian artifacts. The Mojave River appears to have been a boundary between the Takic and Numic speakers (Sutton et al. 2007).

Historic Period

Initial Exploration by Europeans

The term historic period generally is defined as the period after initial contact between Native American groups and European explorers/settlers, when written sources about the area become available. An arbitrary date for the beginning of the historic period for California would be 1540, with the expedition of Spanish explorer Hernando de Alarcon. Alarcon's expedition brought the first Europeans to the Planning Area. The expedition sailed up the Colorado River as far as the confluence of the Colorado and Gila Rivers (Woznicki 1968). In the same year Melclor Diaz led an expedition by foot up to the confluence of the Colorado and Gila rivers. In 1700, Father Eustebio Francisco Kino traveled from Sonora, Mexico, to the Yuma area, and for the next few years Spanish priests and missionaries moved up and down the Colorado and Gila rivers visiting the tribes.

Exploration into central and northern portions of the Planning Area was slower and more intermittent. In 1772 Pedro Fages, a Spanish army officer and commander of California's Spanish force, crossed into the Planning Area while following a band of runaways from the presidio at San Diego (Greene 1983). His chase appears to have led him through the San Bernardino Valley, over to the high desert near Cajon Pass, and into the Mojave Desert before proceeding on to the south end of San Joaquin Valley and then on to Monterey (Greene 1983). Juan Maria de Rivera explored the southern portions of Colorado and Utah in 1765 during an expedition to find routes west from Santa Fe, New Mexico. In 1776, an expedition by Franciscan missionaries Francisco Atanasio Dominguez and Silvestre Velez de Escalante left Santa Fe, New Mexico, looking for a route to the California coast. They did not reach the coast, but did explore portions of the Great Basin before turning back (Malouf and Findlay 1986).

Trails, Trading Routes, and Transportation

The first Spanish period trails in the Planning Area were pioneered by the de Anza Expeditions in 1774-1775 and 1775-1776. Mexico gained its independence from Spain in 1821, but travel in the Planning Area was still limited. Travel on the existing trails in the area increased after restrictions against private traders were lifted (Malouf and Findlay 1986). American trappers and traders began working the northern portion of the Planning Area in increasing numbers in the early 1800s, including groups led by Jedediah Smith in 1826-1827 and Peter Ogden in 1829-1830 (Malouf and Findlay 1986). Both these groups came into California in the region of Needles and moved west through the Mojave Desert, using the Mojave Indian Trail, and then north into the San Joaquin Valley (Malouf and Findlay 1986).

A primary route for the growing trade was the Old Spanish Trail, pioneered by Antonio Armigo in 1829. The Old Spanish Trail began in Santa Fe, New Mexico, and ended at the Pacific Ocean at the Pueblo of Los Angeles. Armigo's route included portions of the routes blazed by de Rivera, Dominguez and de Escalante, and Jedediah Smith. The portion of the trail route within

the Planning Area followed the Mojave River west past what is now Barstow, then southwest through the Cajon Pass to Mission San Gabriel and on to Los Angeles.

The Old Spanish Trail became increasingly important to trade in the 1830s, being used by many American trappers and traders. The Mojave River Valley was also a popular route for horse and cattle thieves and Native American slave traders bound for the established settlements in New Mexico. The trail was designated in 2002 as a National Historic Trail.

The Southern Pacific Railroad constructed a railroad line from Mojave to Needles, on the Colorado River, between 1882 and 1883, which increased the exploitation of the regions' mineral resources (Hector 1987). The town of Barstow, originally named Waterman, was founded in 1886 as a town for railroad workers. The establishment of a main transfer station at Yermo, 10 miles from Barstow, resulted in significant growth in Barstow itself (Hector 1987).

The completion of the San Pedro, Los Angeles, and Salt Lake Railway line from Salt Lake City, Utah, to Barstow in May of 1905 further increased the town's importance. Much of the route ran through only sparsely inhabited areas in the Planning Area, Barstow being the only town of any size. Although not a large town, Kelso, on the line east of Barstow, was a major staging stop for the railroad.

Numerous small railroads were constructed in the Planning Area for the express purpose of servicing mining operations. The Borate and Daggett Railroad, constructed in 1898, was used to haul borate the dozen miles from the mines at Borate to the Southern Pacific line at Daggett (Ross 2002). Many Navajo Native Americans worked on the construction of the line. The Borate and Daggett ran for nine years, carrying mail and passengers in addition to its main cargo of borate (Ross 2002).

When the railroad route from Barstow to Needles was constructed, a dirt road was also established adjacent to the tracks (Hatheway 2001). This road was most likely built as part of the construction of the railroad, but was soon used for wagon transportation. Through the rest of the 1800s and into the first decade of the 1900s, the road was only lightly used, since the train provided a much more cost-effective way of transporting people and goods through the area. After the turn of the century, however, the rise of the automobile made the road a potential route from Nevada to the west coast. The County of San Bernardino improved the existing dirt road in 1911 (Hatheway 2001), possibly to entice the State of California to adopt the route as a highway. Plans were being formed for a highway connecting the east coast and west coast, and the Needles to Barstow to Los Angeles route was one of the main considered alignments.

Mining

Mining has been a recurring and significant factor in the development of the Planning Area. By the early 1850s, gold deposits had been discovered in San Bernardino County around Leach Lake and Lytle Creek (Greene 1983.) In the early 1860s, gold was discovered in the Picacho Peak area north of Blythe and in the Bear and Holcomb Valleys in the San Bernardino Mountains. In the 1870s, gold mining began in earnest in both the northern and southern portions of the planning area. Silver and gold deposits were identified in Darwin in 1874, prompting a mining boom that, at its peak in 1876, included a population of 1000 miners, families, and immigrant workers, 20 mines, 200 buildings, 2 smelters and an extension route for the Cerro Gordo Freighting Company with regular service to the ports of Los Angeles. Further south in the same timeframe, mining began in the Little San Bernardino and Eagle Mountains near

Twentynine Palms and Joshua Tree National Park. The oasis at Twentynine Palms had originally been explored by a military survey party led by Colonel Henry Washington in 1885 (Greene 1983). At its height of operations the area supported numerous mining districts (Greene 1983). At its full extent the area in and around the park supported numerous mining districts, including Twentynine Palms, Washington, Gold Park, Piñon, Cottonwood, Eagle Mountain, Monte Negras, Rattler, and Dale (Greene 1983:89-90).

One of the major mining areas opened up as a result of the Southern Pacific line from Mojave to Needles was the Buckeye Mining district, located in the mountains south of the rail line and approximately 50 miles east-southeast of Barstow. Two of the principal mines begun in the area in the late 1880s were the Bagdad and Roosevelt mines, established by John Suter (Ross 2001). A rich gold ore deposit was found in the late 1890s, after the claims had been sold by Suter. The first shipment of ore was delivered to the Randsberg-Santa Fe reduction company's stamp mill in Barstow in 1901 (Ross 2001). A second mining company, the Benjamin E. Chase Gold Mining Company, had been set up in the Buckeye district. Chase was also the president of the Ludlow & Southern Railway, which was built in 1903 to transport ore form the Chase mines to the railhead at Ludlow (Ross 2001). The two operations merged in 1904, and between then and 1910 it was the largest gold producing operation in San Bernardino County. It was also the largest copper producing operation in the county. Gold production fell after 1910, and the mines were worked intermittently from 1910 to the 1970s.

A mining boom started in the Mojave Valley in 1860 after silver was discovered by Robert W. Waterman and John L. Porter (Hector 1987). By the early 1880s the Calico silver mining district was established, and the town of Calico was founded in 1881 along the Mojave River. Silver deposits were also discovered around Ivanpah, which became a major mining district in the 1870s, and in the Providence Mountains in the 1870s-1880s (Greene 1983). In addition to silver and gold, borate deposits were found in 1883 north of Daggett by Hugh Stevens and Bill Neel. Mining commenced soon after, and in 1888 the most promising claims were purchased by Francis M. Smith, who also owned the borax mines in the Death Valley area.

Numerous silver mines were also established during the early 1860s in the Coso Range, resulting in the establishment of the Coso Mining Company and the Coso Gold and Silver Mining Company, among others (Norwood et al. 1980). Mining success fluctuated greatly in these areas and was never as successful as some other areas. A third mining area was established in 1865 in the Inyo Range on the southeast side of the Owens Valley, centered at Cerro Gordo. This area was very productive, and by 1868 the Union Mine at Cerro Gordo was the most productive silver mine in the United States (Norwood et al. 1980). Labor disputes, lack of a railroad, and economic recession caused problems sustaining mining activities in some areas. Other areas with gold and silver finds relatively quickly became played out, and miners move on to more productive areas.

In addition to gold and silver, salt was mined in the Saline Valley east of Independence. Salt mining began in 1864 and continued until 1918, but transportation costs kept the enterprise from growing to a major operation (Norwood et al. 1980). The Saline Valley Salt Tram, located just east of the planning area, was completed in 1913 to transport salt over the Inyo Mountains to Owens Valley where it was then shipped via railroad. It was the steepest tram in the United States rising from 1,100 feet in the Saline Valley to 8,500 feet at the crest of the Inyo Mountains, and then dropping to 3,600 feet in Owens Valley. The tram is on the National Register of Historic Places (#74000514) (Conrad 1973).

From 1945 to 1957, the Anaconda Copper Company made the Darwin area the largest lead producing area in California. The mines were reopened again in 1967 and have remained active, albeit in a much less productive state. In a 1968, a report on the town of Darwin, it was estimated that there are 30 miles of workings and tunnels in the surrounding hills and canyons (Norwood et al 1980).

Agriculture and Ranching

As a result of the mining operations in the area around the Owens and Panamint valleys, farmers and cattlemen also moved into the area, especially the Owens Valley, to supply food to the miners. The influx of Americans into the area resulted in conflicts with the indigenous Native American groups (Norwood et al. 1980). Camp Independence was established by the Army in 1862 in the Owens Valley to quell Native American-White miner violence that had broken out in the area. Temporarily abandoned in 1864, it was re-occupied in 1865 after violence again broke out and remained active until abandoned in March 1877 (California State Military Museum 2011c).

Agriculture began in the Owens Valley as a response to the miners' need for food in the area. Although the area received little rain, the Owens River supplied enough dependable water for irrigation. By the beginning of the twentieth century, the city of Los Angeles was experiencing a severe water shortage and it was proposed to William Mulholland, president of the Los Angeles Water Department, that the Owens River be tapped to supply Los Angeles with water (Norwood et al. 1980). A $23 million bond was approved by Los Angeles voters, water rights were purchased, and an aqueduct was completed by 1913. The diversion of water to Los Angeles did not immediately impact agriculture in the Owens Valley, but a drought in 1921-1922 began a decline that ended farming in the area by the mid-1930s (Norwood et al. 1980).

During the 1880s, the area around Twentynine Palms began to be used as a cattle range, with a number of large cattle companies based in the Banning and Big Bear areas running their herds from Morongo Valley to Twentynine Palms (California State Military Museum 2011g). Ranches in the area included the Barker and Shay Ranch, Jim Mart’s "I-S" outfit, the Chase and Law Ranch, and the Talmadge brand, all of which used the area during the winter months. Warren’s Well was also the gathering point for the spring and fall cattle roundups until World War II (California State Military Museum 2011g).

Military Installations in the Planning Area

A chain of military posts was established in San Bernardino County between 1859 and 1860 by Captain James H. Carleton. These posts were created to protect the travel route, called the Old Government Road, from San Bernardino across the Mojave Desert to Fort Mojave, near Needles (Hector 1987). The posts were garrisoned by elements of the California Volunteers during the Civil War, and most were evacuated at the war’s end. Due to local concerns for protection of travel route and increasing mining activity, the posts were reoccupied in the late 1860s (California State Military Museum 2011b). Two of the more substantial posts were Fort Piute and Camp Cady. Fort Piute was established about 20 miles east of Fort Mojave, and Camp Cady was located about 20 miles east of Barstow (California State Military Museum 2011b). Both had permanent buildings constructed of either adobe or rock. Both also had histories of abandonment and reoccupation, with Fort Piute finally being abandoned in 1868 and Camp Cady in 1871 (California State Military Museum 2011b).

In Inyo County, Camp Independence was established by the Army in 1862 as a result of disputes between the Owens Valley Paiute and local ranchers. As cattleman and ranchers moved into Owens Valley and cattle grazed on the Paiute food supply, the Paiute stole and killed some cattle for food. The ranchers armed themselves and violence between the Native Americans and whites escalated; this became known as the Owens Valley Indian War (1861-1865). The ranchers asked the help of the military in Los Angeles and Fort Tejon. Camp Independence was built to quell the conflicts between the Native Americans and ranchers and protect the road to the mines in Nevada. The Paiute were escorted to San Sebastian Indian Reservation in 1863. The camp operated until 1877 when disputes subsided (California State Military Museum 2011c).

The presence of the military in the Planning Area increased dramatically in the years immediately before and after America entered World War II. One of the first to open was Fort Irwin. Originally established as the Mojave Anti-Aircraft Range, it was opened in 1940. In 1942 the range was renamed Camp Irwin, in honor of MG George LeRoy Irwin (California State Military Museum 2011e). It was deactivated in 1944 and reactivated in 1951 as Camp Irwin Armoured Combat Training Area for troops destined for the Korean conflict (California State Military Museum 2011e). The first antenna to support the National Aeronautics and Space Administration's unnamed exploration of deep space, called Pioneer Deep Space Station, was constructed at Fort Irwin in 1958 (NPS 2013). Renamed Fort Irwin in 1961, it was declared a permanent installation. Deactivated again in 1971, it was reactivated in 1980 as the National Training Center and serves as a major training facility for the Army, Marine Corps, and National Guard (California State Military Museum 2011e). The Pioneer Deep Space Station National Historic Landmark is located within Fort Irwin and is on the National Register (#85002813).

Edwards Air Force Base (AFB), located north and east of Lancaster, was established in 1942 on land first purchased in 1933 for use as a bombing range of units stationed at March AFB (Miksell 2000). The facility was from inception used for testing of highly secret developmental aircraft (Miksell 2000). Rogers Dry Lake is located within the base and its natural attributes of clean air, isolated location, weather, variable terrain, and large expanse was ideal for the military to flight test aircraft. The base emerged during the Cold War as a premier Air Force high-technology complex, especially important in the areas of experimental flight testing, captive flight testing (test tracks), rocket propulsion research, and in the 1960s, a center for astronaut training (California State Military Museum 2011d). Edwards AFB continues to be a major testing facility of new and experimental aircraft. In 1985 Rogers Dry Lake was added as a National Historic Landmark and is now listed on the NRHP (# 85002816). It is also a National Historic Site and as such part of the National Park system.

The Marine Corps Air Ground Combat Center, Twentynine Palms (MCAGCC) was first opened in 1940 as an Army glider training area (California State Military Museum 2011g). Converted to an Army fighter pilot training and bombing range in 1943, it was decommissioned and the land transferred to the County of San Bernardino in 1945. In 1952 the Marine Corps took control of the property and named it Headquarters Marine Corps Training Center, Twentynine Palms, California (State Military Museum 2011g). It became the MCAGCC, Twentynine Palms in 1979. At approximately 495 square miles, it is the largest Marine Corps Base in existence.

The Marine Corps Logistics Base, Barstow, opened in the summer of 1942 as Navy Supply Depot, Barstow, but was transferred to the Marine Corps as it was being completed in December of the same year (Hector 1987). The logistics base supplied material needed for the Fleet Marine Forces in the Pacific theater during World War II. The base also saw significant expansion

during the Korean War years, and has continued to expand its services to the Marine Corps in the subsequent decades (Hector 1987). Because it employs a large number of civilian workers, the growth of the base has also resulted in the growth of the nearby town of Barstow.

Naval Air Weapons Station China Lake (NAWS CL), originally called Naval Ordinance Test Station Inyokern, was established in 1943 for the California Institute of Technology to conduct research into rockets and rocket propellants (Miksell 2000). NAWS CL continued after World War II with development and testing of guided missiles, jet aircraft ejection systems, and later space program capsules and the intercontinental ballistic missile development program (Miksell 2000). NAWS CL is the Navy's largest single land holding at 19,600 square miles and continues as their center for research, testing and evaluation of weapons systems. The Coso Rock Art District National Historic Landmark is within the boundaries of NAWS CL and is on the National Register (#66000209).

3.9.3.2 Identified Resources

Cultural Resources

The CDCA Plan provides management for approximately 25 million acres in Imperial, Kern, Los Angeles, Inyo, Riverside, and San Bernardino counties. The 9.4 million acres encompassed by the West Mojave Area are entirely within the CDCA. To describe the cultural resources within the Planning Area on a programmatic level, various sources were researched to gather information regarding the types and number of cultural resources. The baseline of the knowledge and understanding about cultural resources within the CDCA Planning Area comes from studies completed between 1969 and 1980 in support of the Plan. During the CDCA planning phase, approximately 179,200 acres were systematically inventoried using a variety of methods including stratified random sample surveys to intensive purposive surveys. Surveys and overviews conducted as planning for the CDCA within the Planning Area are listed in Table 3.9.3-1. Each of these investigations identified areas with higher sensitivity for finding cultural resources, the types of resources found, and the ethnographic and historic background. They also contained recommendations for protecting cultural resources including installations of fencing, signage, and road closures.

As of January 1, 1980, there were an estimated 14,229 recorded cultural resources within the CDCA Planning area. A sample of 2,903 sites were categorized by site type, including: villages, temporary camps, shelter/cave, milling station, lithic scatter, quarry site, pottery locus, cemetery, cremation locus, intaglio/geoglyph, rock alignment, petroglyph, pictograph, trail, roasting pit, isolated find, cairn, historic, other, and multiple (Table 3.9-1). The table identifies a wide range of cultural resources including habitation sites, temporary camps, rock shelters, caves, milling stations, lithic scatters, chipping circles, quarries, ceramic scatters, cemeteries, cremation features, rock alignments, geoglyphs, petroglyphs, pictographs, trails, roasting pits, cairns, isolated artifacts, mines, homesteads, historic campsites, and historic trash scatters. For definitions for these site types, see the CDCA Proposed Plan Final Environmental Impact Statement, Appendix Volume D (BLM 1980).

Table 3.9-1. Sample of Sites From the CDCA Plan

Site Types in CDCA Plan	# of Sites	Time Period	Eligibility
Village	27	Prehistoric	Eligible
Temporary camp	426	Prehistoric	Possibly
Shelter/cave	163	Prehistoric	Possibly
Milling station	262	Prehistoric	Possibly
Lithic scatter	689	Prehistoric	Possibly
Quarry site	30	Prehistoric	Possibly
Pottery locus	67	Prehistoric	Possibly
Cemetery	0	Prehistoric	Eligible
Cremation locus	2	Prehistoric	Eligible
Intaglio/geoglyph	1	Prehistoric	Eligible
Rock alignment	11	Prehistoric	Possibly
Petroglyph	57	Prehistoric	Eligible
Pictograph	0	Prehistoric	Eligible
Trail	41	Prehistoric	Possibly
Roasting pit	342	Prehistoric	Possibly
Isolated find	311	Prehistoric	Not eligible
Cairn	18	Prehistoric	Unknown
Historic	319	Historic	Possibly
Other	49	Unknown	Unknown
Multi-component	88	Both	Possibly
Total	**2903**		

Prehistoric and historic properties and traditional cultural properties on federal lands are formally identified as significant by being listed in the National Register of Historic Places (NRHP) or determined eligible for listing.

Current Status of Sites within the West Mojave

Cultural resource inventories completed to date in the WEMO planning area include the sampling survey associated with the original CDCA Plan, and inventories completed for large-scale renewable energy projects, infrastructure projects such as highway and transmission corridors, and small-scale development projects. The BLM has also conducted 124 inventories associated with OHV travel and ACECs, covering approximately 24,320 acres. BLM has prepared a summary of OHV related inventories as a component of the Section 106 process.

In 2013, BLM conducted a review of cultural resource records for the West Mojave planning area to update the BLM cultural resource GIS-based geodatabase and identify additional sites that may be affected by the transportation network alternatives. This data was integrated into a GIS layer file used during development and analysis of alternatives. Table 3.9-2 lists the currently known cultural resources, including NRHP listed Districts and Sites that have been

identified within the West Mojave planning area. Table 3.9-3 provides an overview of resources listed on the NRHP which occur within the West Mojave Area.

Table 3.9-2. Summary of Known Cultural Resources in the West Mojave

Location (Travel Management Area)	National Register Listed Districts	National Register Listed Sites	Total Sites
TMA 1	0	0	792
TMA 2	1	4	1137
TMA 3	0	0	780
TMA 4	0	0	1745
TMA 5	2	0	1212
TMA 6	0	0	1469
TMA 7	3	6	1217
TMA 8	1	1	1361

Table 3.9-3. West Mojave Sites and Historic Districts Listed in the National Register of Historic Places

Property Name	County	Sites Included	Known Values	Current Condition
Ayres Rock	Inyo County	Rock Art	Traditional Use; Conservation; Scientific	Site has some erosion evidence from an old user created trail no longer in use. A single MC trail was noted on site during monitoring. Site is regularly monitored by a team of site stewards.
Bandit Rock (Robber's Roost)	Kern	1 (several sites present were not included in nomination)	Historic (sites not included in nomination are prehistoric)	Unauthorized OHV activity beyond posted signs, currently used for camping, shooting and hunting.
Black Mountain Rock Art District	San Bernardino	9000 (est)	Scientific, conservation, traditional use, public; within Black Mountain ACEC and Black Mountain Wilderness	2 sites noted with some ongoing damage from looters. Signs have been erected and site stewards monitor the locations. Signs posted at Black Wash to inform visitors of fragility and punishment. Fence also erected to keep vehicles out of Inscription Canyon is in good condition.
Blackwater Well	Kern	17	Prehistoric	Open routes through the site. Artifacts occur within the roadways and erosional drainages created by use of the road.

Table 3.9-3. West Mojave Sites and Historic Districts Listed in the National Register of Historic Places

Property Name	County	Sites Included	Known Values	Current Condition
Burro Schmidt's Tunnel	Kern	1	Historic (Not Yet Recorded)	Ongoing tourism, mining and looting have impacted the site over the years.
Calico Mountains Archeological District	San Bernardino	n/a	Scientific, traditional use, public	One site under excavation for recovery of artifacts. Other sites within and adjacent to a County Park. Ongoing scientific inquiry and tourism have impacted the sites over the years. Unauthorized OHV activity beyond posted signs, currently used for camping, shooting and touring.
Fossil Falls Archaeological District	Inyo	32	Scientific, conservation, traditional use, public; Prehistoric; includes part of Fossil Falls ACEC	One set of recent MC tracks noted past the barrier for 120 meters, which turned around at that point, site in the area was not disturbed. Indicates more signing may be needed.
Last Chance Canyon Archaeological District	Kern	160 (an additional 55 sites within 2 mile radius of boundary)	Prehistoric/historic/Native American; Last Chance Canyon ACEC within boundaries	Wilderness sites are generally intact. Other sites are currently being mapped and monitored under contract. Some important contributing sites are evaluated separately in this table.
Newberry Cave	San Bernardino	1	Conservation, traditional use	The site is in good condition and shows no signs of OHV activity in the area. Newberry Cave is situated on a rocky steep mountain with no OHV access.
Red Mountain Spring Archaeological District	San Bernardino	23 formally recorded; a number of others being documented as a result of recent research	Mostly prehistoric but some historic remains	Area has been partially fenced and closed to OHV use. A guzzler and weather station are located on one edge of the district boundary. Sites are in good condition, however, unauthorized OHV tracks were observed in several of the sites off of a two track road

Table 3.9-3. West Mojave Sites and Historic Districts Listed in the National Register of Historic Places

Property Name	County	Sites Included	Known Values	Current Condition
Rodman Mountain Petroglphs Rock Art District	San Bernardino	4 major loci: SBR307A, B, C (Deep Tank), SBR306A, B, C (Surprise Tank Howes Tank Rodman Mtns Geoglyph Site	Scientific, Conservation, Traditional Use, Public	Howe's Tank is in wilderness, and has no damage. The road to the site shows no evidence of use. Deep Tank is in good shape and no damage was observed. Rodman Mountain Geoglyph site is fenced and shows no signs of incursions. Surprise Tank Canyon has existing damage from graffiti and attempted removal of glyphs (first noted in the 1970s.) Signs posted at the canyon to inform visitors of fragility and punishment. Fence also erected to keep vehicles out of canyon is in good condition. Site stewards regularly monitor the District. New OHV incursions not noted.
Steam Well Petroglyphs Archaeological District	San Bernardino	4	Prehistoric	Sites in wilderness. OHV is noted to the boundary of the wilderness area and trailhead, but does not appear to be entering the wilderness. Sites not monitored inside of wilderness.
Trona Pinacles Railroad Camp	San Bernardino	Camp associated with the Trona RR.	Scientific, Historic	Site in good condition. OHV impacts minimal despite location near an authorized route and increased visitation to the area.
Twenty-Mule Team Borax Wagon Road	San Bernardino	1	Historic	The road alignment is currently open to use by OHV. Portions of the route are widened by use.

The site location data collected as part of this planning effort indicate many portions of the planning area may be considered sensitive for the occurance of cultural resources. The West Mojave Planning Area is characterized by a variety of environmental zones and associated natural resources that include, among other features, pleistocene lakes, the Owens and Mojave River Corridors, perennial seeps and springs, the prominent Sierra Nevada Mountain Range, and smaller desert mountain ranges. The northwestern and southeastern portions of the planning are typified by environmental transitions between the Mojave Desert and the Great Basin and the Mojave Desert and Sonoran Desert, respectively. As part of the initial data acquisition program developed between BLM and SHPO, BLM completed monitoring of all NRHP listed sites on public lands in the planning area, and a sample of sites per Subregion. The results of this program are listed in Table 3.9-4.

Table 3.9-4. Other West Mojave Sites Monitored for this Planning Effort

Name	Cultural Resource Values	Current Condition
CA-INY-372	Conservation; Scientific; Traditional use	No evidence of unauthorized OHV use on site; frequent visitation
CA-INY-372/H	Conservation; Scientific; Traditional Use	Recent OHV travel noted thru the site, and an informal turnaround on-site. LADWP or site visitors continuing to use historic route. Potential evidence of recent attempts at looting. Noted additional minimization action needed.
CA-INY-1639	Scientific; Traditional Use; Public	Fossil Falls Contributing: Footprints noted in the site, but no evidence of recent vandalism.
CA-INY-1642	Traditional Use; Public	Fossil Falls Contributing: One set of recent MC tracks noted past the barrier for 120 meters, site in the area was not disturbed.
CA-INY-1643	Conservation; Scientific; Traditional Use	Fossil Falls Contributing: Majority of site now protected from OHV access by barriers and regular monitoring. Visitation directed away from this site toward main lava flow (Fossil Falls) has been effective.
CA-INY-1997	Traditional Use	The site is in stable condition. Signs of recreational shooting and OHV traffic is noted in the vicinity. Burros are currently utilizing natural water retention areas near the site.
CA-INY-2147/H	Traditional Use	Site in stable condition. Road in good condition. Additional recordation of sites conducted during monitoring.
CA-INY-2268H	Scientific	No impact; inaccessible. Needs additional recordation.
CA-INY2821/H	Traditional Use	Site in stable condition with minimal impact from OHV use or visitation. Site regularly monitored by a site steward.
CA-KER-140	Scientific; Traditional Use	Numerous OHV incursions noted thru the site.
CA-KER-148	Traditional Use; Contributing to listed district	Last Chance Canyon: Continued OHV use through site
CA-KER-208/H	Scientific; Traditional use	Site in Stable Condition, fencing keeping most OHV and livestock away from site
CA-KER-226/H	Conservation; Scientific; Traditional use	New vandalism (spray paint of rock art) and single OHV tracks into site. Noted needed fence repair and add'l rehab

Table 3.9-4. Other West Mojave Sites Monitored for this Planning Effort

Name	Cultural Resource Values	Current Condition
CA-KER-250	Traditional Use; Contributing to listed district	Last Chance Canyon: Impacts from erosion and OHV intrusions, location is near a mine and 2 routes
CA-KER-261	Scientific; Public; Contributing to listed district	Last Chance Canyon: Designated route adjacent to site
CA-KER-437	Scientific; Contributing to listed district	Last Chance Canyon: Site condition improving after barriers and rehab. No recent OHV traffic
CA-KER 967	Traditional Use	Site approx. 300 meters from designated route. No OHV use noted on site—existing impacts limited to use of main access route leading to major destinations. Additional recordation of site needed.
CA-KER-968/1716	Traditional Use	Site larger than previously recorded and bisected by an authorized route. MC tracks and a campfire ring were noted off the main route. Needs signing to direct camping and use to main camping area further to the west, and additional recordation.
CA-KER-6430	Scientific	Site stable and conditions improving since barrier installation. Newly exposed diagnostic artifacts collected to prevent additional site looting
CA-KER-7816	Scientific; Traditional use	Site in good and stable condition but OHV activity continues through site past installed barrier. Noted needed add'l rehab
CA-KER-7819/H	Conservation; Scientific; Traditional use	Site in stable condition. Grazing impacts noted outside of fenced area. No signs of looting or vandalism.
CA-SBR-134	Traditional Use: Rock Art	Site in good condition.
CA-SBR-211	Traditional Use, Habitation Site	Red Mountain Spring ACEC. Site is in stable condition. Signs of OHV incursions beyond locked gate.
CA-SBR-561	Conservation; Scientific; Traditional Use: Large habitation site with artifacts, spring, mortar, previous discoveries of human remains.	Site in good condition and shows no signs of OHV disturbance. Site is fenced, within a preserve, and has a caretaker who monitors and lives at the preserve.
CA-SBR-697	Scientific; Traditional Use: Large lithic quarry.	Site substantially disturbed by a modern, abandoned quarry. Evidence of visitation and traffic in and around the quarry has had minimal adverse effects on the site.

Table 3.9-4. Other West Mojave Sites Monitored for this Planning Effort

Name	Cultural Resource Values	Current Condition
CA-SBR 1012/H	Scientific, Traditional Use: Prehistoric and historic quarry	Christmas Canyon ACEC. Site is in stable condition. Elimination of this area from OHV events has contributed to restoration of sites previously impacted by OHV use.
CA-SBR-1908/H	Conservation; Scientific; Traditional Use: Multicomponent site with 494 features	Site in good condition and shows no signs of OHV disturbance
CA-SBR-1968	Scientific; Traditional Use: Large lithic procurement and habitation site	Site in good condition and shows no signs of OHV disturbance
CA-SBR-2071H	Traditional Use: Large historic dump site	Site in good condition and shows no signs of OHV disturbance
CA-SBR-2142/H	Scientific; Traditional Use: Prehistoric camp site with lithic tools, and debitage surrounding Stoddard Well (Smith 1939). Historic component includes Stoddard Well and area, and represent several phases of use or development.	Site in good condition and shows minimal damage despite its location along the well-used Stoddard Wells Road (CA-SBR-9360H).
CA-SBR-2280	Traditional Use	Site previously described with 4 loci. The probable locations were inventoried, but site not relocated.
CA-SBR-2596	Conservation; Scientific; Rock Art	Red Mountain Spring ACEC. Site is inaccessible by OHV and is in stable condition
CA-SBR-2597	Conservation; Scientific; Prehistoric campsite	Red Mountain Spring ACEC. Unauthorized and previously open OHV route in vicinity of the site. Site is in stable condition.
CA-SBR-2600/H	Conservation; Scientific; Prehistoric habitation and historic development	Red Mountain Spring ACEC. Unauthorized, single-track motorcycle tracks observed through site. Previously open route has been blocked by locked gate.
CA-SBR-2609	Conservation; Scientific Use. Prehistoric habitation	Red Mountain Spring ACEC. Unauthorized, single-track motorcycle tracks observed through site. Previously open route has been blocked by locked gate.
CA-SBR-2610	Conservation; Scientific Use. Prehistoric habitation	Red Mountain Spring ACEC. Unauthorized, single-track motorcycle tracks observed through site. Previously open route has been blocked by locked gate.

Table 3.9-4. Other West Mojave Sites Monitored for this Planning Effort

Name	Cultural Resource Values	Current Condition
CA-SBR-2611	Conservation; Scientific Use. Prehistoric habitation	Red Mountain Spring ACEC. Unauthorized, single-track motorcycle tracks observed through site. Previously open route has been blocked by locked gate.
CA-SBR-2612	Conservation; Scientific Use. Prehistoric habitation	Red Mountain Spring ACEC. Unauthorized, single-track motorcycle tracks observed through site. Previously open route has been blocked by locked gate.
CA-SBR-2613	Conservation; Scientific Use. Prehistoric habitation	Red Mountain Spring ACEC. Unauthorized, single-track motorcycle tracks observed through site. Previously open route has been blocked by locked gate.
CA-SBR-2614	Traditional Use: Lithic reduction scatter of 5,435 sq. meters near the National Old Trails Road with 90 prehistoric artifacts and 4 loci.	The overall condition of this site is good with no alterations. The site shows no signs of OHV disturbance.
CA-SBR-2910H	Scientific; Traditional Use: Prehistoric occupancy site	Site on both public and private land and shows no sign of OHV activity.
CA-SBR-3594 (Ragtown)	Traditional Use; Public: Historic mining and RR features, mostly post1930's covering approx. 2 sq. miles.	Site access fenced on private land and shows no sign of OHV activity.
CA-SBR-3780	Scientific; Traditional Use: Prehistoric occupancy site	Site on both public and private land and shows no sign of OHV activity.
CA-SBR-4020H	Traditional Use: 2 concentrations of historic and non-historic trash.	Site in fair condition and shows continuing authorized OHV activity (transmission line).
CA-SBR-4022/H	Traditional Use: Prehistoric small lithic and historic refuse scatter. The historic components may be associated with the historic wagon road or other linear features.	Site in fair condition with nearby authorized OHV activity (transmission line).
CA-SBR-5340	Conservation, Traditional Use: Prehistoric lithic scatter and occupation site	Christmas Canyon ACEC. Removal of this area from OHV events has allowed sites to rehabilitate. Site in stable condition.
CA-SBR-6018	Scientific; Traditional Use: Prehistoric lithic and occupation site	Site in good condition and shows no sign of OHV activity.
CA-SBR-10509	Traditional Use	Site intersected by SR247 and shows no sign of OHV disturbance
CA-SBR-10576/H	Scientific; Traditional Use: Prehistoric quarry, reduction sites, and rock cairns	Site in stable condition and shows no signs of OHV disturbance

Table 3.9-4. Other West Mojave Sites Monitored for this Planning Effort

Name	Cultural Resource Values	Current Condition
CA-SBR-10850/H	Conservation, Scientific Use: Prehistoric lithic scatter with historic mining features	Christmas Canyon ACEC. Removal of this area from OHV events has allowed sites to rehabilitate. Site in stable condition.
CA-SBR-11422H	Traditional Use: Remnant industrial site and historic blacksmith shop remnants	Site in stable condition and shows no signs of OHV disturbance
CA-SBR-11776	Traditional Use	Site on both public and private land, and continues to be used as an illegal trash dump
CA-SBR-12297	Conservation, Scientific Use: Prehistoric habitation	Red Mountain Spring ACEC. Unauthorized, single-track motorcycle tracks observed through site. Previously open route has been blocked by locked gate
CA-SBR-13182	Conservation, Scientific Use: Prehistoric lithic scatter and habitation	Christmas Canyon ACEC. Removal of this area from OHV events has allowed sites to rehabilitate. Site is immediately adjacent to existing OHV route. Site is in stable condition.
CA-SBR-13183	Conservation, Scientific Use: Prehistoric lithic scatter and habitation	Christmas Canyon ACEC. Removal of this area from OHV events has allowed sites to rehabilitate. Site is immediately adjacent to existing OHV route. Site is in stable condition.
CA-SBR-13184	Conservation, Scientific Use: Prehistoric lithic scatter and habitation	Christmas Canyon ACEC. Removal of this area from OHV events has allowed sites to rehabilitate. Site is immediately adjacent to existing OHV route. Site is in stable condition.
CA-SBR-13185	Conservation, Scientific Use: Prehistoric lithic scatter and habitation	Christmas Canyon ACEC. Removal of this area from OHV events has allowed sites to rehabilitate. Site is immediately adjacent to existing OHV route. Site is in stable condition.
CA-SBR-13186	Conservation, Scientific Use: Prehistoric lithic scatter	Christmas Canyon ACEC. Removal of this area from OHV events has allowed sites to rehabilitate. Site is immediately adjacent to existing OHV route. Site is in stable condition.

Table 3.9-4. Other West Mojave Sites Monitored for this Planning Effort

Name	Cultural Resource Values	Current Condition
CA-SBR-13187	Conservation, Scientific Use: Prehistoric lithic scatter	Christmas Canyon ACEC. Removal of this area from OHV events has allowed sites to rehabilitate. Site is immediately adjacent to existing OHV route. Site is in stable condition.
CA-SBR-13193	Conservation, Scientific Use: Prehistoric lithic scatter	Christmas Canyon ACEC. Removal of this area from OHV events has allowed sites to rehabilitate. Site is immediately adjacent to existing OHV route. Site is in stable condition.
CA-SBR-13370	Scientific; Traditional Use: Prehistoric habitation from two periods	Site in good condition and does not show signs of OHV disturbance
CA-SBR-15917H	Traditional Use; Public: Historic mine features	Site in good condition and does not show signs of OHV disturbance
CA-SBR-16064	Site evaluation indicates the site does not meet NRHP eligibility requirements	Site in good condition and does not show signs of OHV disturbance
EL-1	Public: Historic foundations with no associated trash midden or datable material and low potential for sub-surface deposits.	Site in fair condition in El Mirage OHV Open Area.
MK-1	Traditional Use	Re-identified old site bisected by an authorized route. OHV and associated camping impacts along route noted. Needs additional recordation.
PL-SOK-MMO-113 - Unevaluated	Scientific; Traditional Use: Prehistoric quarry and lithic scatter	Site shows evidence of historic mining disturbance
Afton Cemetery Site	Scientific; Traditional Use: Prehistoric graves	This site is in good condition and shows no sign of OHV activity.
Christmas Canyon Arch. District	Conservation, Scientific; Traditional Use; includes Christmas Canyon ACEC	OHV activity has been limited due to closure of this area to OHV events. Some OHV use observed off designated trails
Indian Wells Canyon	Traditional Use, Public	High intensity use area due to closeness to PCT and the main route also provides popular wilderness access. Impacts are from hunting and use of authorized route.
Maze Site	Traditional Use: Historic adits, shafts and mining prospects, large geoglyph approx. 6.8 ac.	Site shows some signs of OHV disturbance.
Red Mountain Spring	Conservation; Traditional Use; Designated ACEC	Unauthorized, single-track motorcycle tracks observed through site. Previously open route has been blocked by locked gate.

There are 29 areas of critical environmental concern (ACEC) within the West Mojave Area. Of these 29, 17 are important and relevant in total or in part for their cultural resources values and many include sites that are listed in Table 3.9-3 or Table 3.9-4 above. Table 3.9-5 describes ACECs with cultural components that have been designated within the West Mojave planning area. Each ACEC has its own management plan with more specific protection goals and descriptions of the cultural resources. Some are valued for their prehistoric sites, some for their historic era sites, some for their Native American values, and some for a combination of these.

Table 3.9-5. Cultural Resource ACECs in the West Mojave Area

ACEC	Cultural Resource Values
Afton Canyon	Moderate density and complexity of sites. Twenty recorded prehistoric sites, including quarries, lithic scatters with ground stone, and occupation/multi-use sites. Represent riparian and lacustrine resource exploitation, tool manufacture, trade, and desert settlement (Bureau of Land Management 1989:38). Scientific use.
Bedrock Spring	Prehistoric. Subject to current research by BLM, this ACEC also contains a variety of site types including habitation sites, rock shelters, rock art, milling, and others. Publication of current research will add materially to our understanding of prehistory in this portion of the Mojave Desert.
Black Mountain	Area contains the most extensive assemblages of prehistoric petroglyphs within California. Quarry and lithic workshops are found within the ACEC as well as evidence for obsidian trade (Bureau of Land Management 1988:6). Scientific, traditional use.
Calico Early Man Site	Lithic tools and debitage are associated with possibly the earliest human occupation on the North American continent. Continued research investigates human occupation and settlement of the Western Hemisphere (Bureau of Land Management 1984:2.1). Public use.
Christmas Canyon	Prehistoric. Subject of current research that is revealing a large and very significant complex of sites, including examples of rare cultural phenomena. Some sites are related to various stands of Pleistocene Lake Searles and preliminary dates indicate great age for some of them, while at least one site contains historic materials, indicating a very long period of use.
Cronese Lakes	This area contains sites representing occupation beginning 8,000 years ago. Cultural remains provide information regarding subsistence and settlement patterns in the Great Basin (Bureau of Land Management 1985:1-5). Scientific use.
Denning Spring	Cultural resource values include at least four major resource locations. In addition to historic resources not formally recorded, prehistoric sites are designated SBR3828 and SBR 3829B and 3829C (Bureau of Land Management 1982:3). Scientific use.
Fossil Falls	Large complex of prehistoric sites associated with Pleistocene Owens River, 32 of which are listed in the National Register. Research here dates back to work of M.R. Harrington in the 1950s. Area includes the Stahl site, on private land, also an important type site for explication of western Great Basin/Northern Mojave cultural chronology.
Jawbone-Butterbredt	Native American values. Contains a number of locations that were identified by a Kawaiisu elder whose family had lived in the area, including prehistoric and proto-historic/historic archaeological sites, sacred areas, and areas that were known or thought to contain burials.
Juniper Flats	Numerous sites have open trash middens, evidence of cooking, tool manufacture, hunting, and plant/animal processing. An occupied rockshelter is also present. Early historic remains are related to homesteading and mining (Bureau of Land Management 1988:9). Scientific use.
Last Chance Canyon	Prehistoric. Part of the Last Chance Canyon National Register District; the portion of the District considered to be most at risk was selected for ACEC status. Also includes important historic resources.

Table 3.9-5. Cultural Resource ACECs in the West Mojave Area

ACEC	Cultural Resource Values
Rainbow Basin	The badlands within the planning area expose one of the best known and most intensively studied late Miocene age fossil assemblages in the United States. Fourteen archaeological sites have been located, characterized by temporary habitation, flake scatter, petroglyphs, historic mining remnants (Bureau of Land Management 1991:32, 36). Scientific, traditional, public use.
Red Mountain Spring	Prehistoric. Contains 23 recorded sites and other sites that have been located during recent research by Cal Poly Pomona archaeologists. Site types include habitation sites, lithic scatters, milling features, rock art, trails, stacked stone structures, and hunting blinds. Although the ACEC was designated for prehistoric resources there are also historic materials within the ACEC.
Rodman Mountains	Rock art sites in this area have been listed on the NRHP.
Rose Spring	Contains several prehistoric sites. Research at these sites started in the 1950s and continues (Lanning 1963, Riddell 1956). These sites are type sites for cultural chronology of the western Great Basin.
Salt Creek Hills	Site of the first hard rock gold mine in the Mojave Desert (Bureau of Land Management 1992:5). Public use.
Steam Well	Prehistoric. Contains four petroglyph sites

Most archaeological sites have not been evaluated for their significance or eligibility for listing in any formal roster of significant sites. Because one of the criteria for determining whether or not a site may be eligible for listing in the National Register is that the site has "yielded, or may be likely to yield, information important in prehistory or history" (36 CFR 60) many site types are a priori eligible for listing and are treated as such for management purposes regardless of whether or not formal determinations have been made. Such site types include permanent or semi-permanent habitation sites ("villages"); temporary camps containing multiple tool types, especially if they contain obsidian; and utilized shelters or caves that contain the same types of materials. As analytical techniques improve or new technologies are perfected, the kinds of data that can be extracted from archaeological materials increase. In contrast to most archaeological sites, which generally provide information on aspects of material culture and relationships between sites and groups of people, sites containing rock art (petroglyphs and pictographs) can provide glimpses into the intellectual and spiritual aspects of culture. Historic sites may yield information on industrial technologies and how they were used or adapted in individual situations; ethnic, gender and age make-up of working populations; food preferences; availability of luxury items to various groups; and even how speculation on Wall Street affected small mining operations in the western United States (Barnes 2001).

All of this means that many, many archaeological sites, both recorded and unrecorded, are likely to be found to be significant and eligible for listing in the National Register of Historic Places if formally evaluated. For these reasons the actual number of sites listed in the National Register is not an accurate indicator of the significance of the resource base as a whole.

Historic Trails

National Historic Trails with alignments within the Planning Area include the Old Spanish National Historic Trail, a unit of the National Park System. Approximately 135 miles of the Old

Spanish National Historic Trail are within the Planning Area. In total, this trail is over 2,700 miles in length and crosses New Mexico, Colorado, Arizona, Utah, Nevada, and California. The various route alignments of this historic trail network were a combination of indigenous people's paths, and horse and mule exploration and trade routes utilized to transport merchandise and people in the early 1800s. Mexican trader Antonio Armijo is said to have led the first commercial caravan from Abiquiú, New Mexico, to Los Angeles late in 1829 (NPS 2012). By 1848, at the end of the Mexican–American War, the United States had taken control of the southwest, and with the subsequent Gadsden Purchase, planned a southern route for a transcontinental railroad. After 1848, use of the Old Spanish Trail declined as other routes to California were utilized. The Old Spanish National Historic Trail was established in 2002 and is co-administered by the NPS and BLM, but includes all land statuses. The Old Spanish National Historic Trail is not a constructed contiguous trail with a demarcated alignment, and it has very few officially designated hiking trails along the trail corridor. Although portions of the trail are in private ownership, points along it have public access, viewpoints, and interpretive sites for visitors. Almost none of Old Spanish National Historic Trail is on the Register, and because it is hard to find through pedestrian survey, it is not likely to even be recorded and evaluated. Therefore, the Old Spanish National Historic Trail designated alignment will be considered and treated as eligible for the National Register on the basis of its setting and visual characteristics and verified historical significance, unless the particular segment lacks integrity.

Sites within Grazing Allotments

As stated in Chapter 1, BLM currently utilizes the Supplemental Procedures for Livestock Grazing Permit/Lease Renewals: A Cultural Resources Amendment to the State Protocol Agreement between California Bureau of Land Management and the California State Historic Preservation Officer to address the NHPA Section 106 compliance for processing grazing permit renewals for existing livestock allotments. As a component of the Supplement, BLM conducts a Class I records review for each grazing allotment at the time of permit renewal. Regular monitoring and intensive inventory is conducted in areas of livestock congregation; specific issues identified from livestock grazing on cultural resources are addressed on a case-by-case basis. Table 3.9-6 displays a summary of known cultural resources organized by grazing allotments within WEMO.

Table 3.9-6 Summary of Cultural Resources within each Grazing Allotment

Allotment	Prehistoric	Historic	Combined	Unknown	Total
Antelope Valley	10	4	0	0	14
Bissell	16	6	1	23	46
Boron Sheep	50	26	3	32	111
Buckhorn Canyon	0	0	0	25	25
Cady Mountain	0	0	0	299	299
Cantil Common	347	361	15	89	812
Cronese Lake	0	0	0	250	250
Darwin	1	1	0	1	3
Double Mountain	0	0	0	0	0
Gravel Hills	30	2	0	98	130

Table 3.9-6 Summary of Cultural Resources within each Grazing Allotment

Allotment	Prehistoric	Historic	Combined	Unknown	Total
Hansen Common	150	21	5	56	232
Harper Lake	0	0	0	42	42
Johnson Valley	0	0	0	71	71
Kelso Peak	0	0	0	0	0
Lacey-Cactus-McCloud	111	16	8	147	282
Lava Mountain	56	1	0	8	65
Monolith Cantil	1	9		11	21
Oak Creek	5	1	1	0	7
Olancha Common	28	6	1	22	57
Ord Mountain	0	0	0	65	65
Pilot Knob	8	0	0	17	25
Rattlesnake Canyon	0	0	0	7	7
Round Mountain	0	0	0	52	52
Rudnick Common	288	117	24	32	461
Shadow Mountains	4	0	0	223	227
Spangler Hills	73	3	12	48	136
Stoddard Mountain	1	0	0	717	718
Superior Valley	1	0	0	134	135
Tunawee	250	20	41	97	408
Valley Well	0	0	0	1	1
Walker Pass Common	88	47	19	15	169
Warren	7	5	0	0	12

3.9.3.3 Methodology to Increase Information

The BLM, in consultation with the California SHPO and the Advisory Council on Historic Preservation (ACHP), has determined compliance with 43 CFR 8342.1 and Section 106 of the National Historic Preservation Act will be accomplished through the negotiation of a WEMO specific Programmatic Agreement (PA). As part of this process, the BLM is developing a GIS-based predictive model, a summary of cultural inventory completed to date, and a phased approach to additional cultural resource inventory in the planning area. The details of the PA will be determined in further consultation with the SHPO, ACHP, Tribal partners, and interested parties.

3.10 Visual Resources

Visual resources refer to the visible features and objects, natural and man-made, moving and stationary, which comprise the character of the landscape observed from a given location. These resources contribute to the scenic or visual quality/visual appeal of the landscape. Visual impact is the creation of an intrusion or perceptible contrast that affects the scenic quality of a landscape. A visual impact can be perceived by an individual or group as either positive or negative, depending on a variety of factors or conditions, such as personal experience, time of day, and weather or seasonal conditions.

3.10.1 Visual Resource Management System

The BLM's Visual Resource Management (VRM) System provides a way to identify and evaluate specific scenic values to determine the appropriate levels of management. It provides a way to analyze potential visual impacts, apply visual design techniques to ensure that resource uses and management activities are in harmony with their surroundings, and to meet the assigned VRM Class Objectives. VRM is a tool to identify and map essential landscape settings on public lands to meet public and community preferences and recreational experiences.

The VRM system consists of an inventory (Visual Resources Inventory, or VRI), an analysis, and the designation of visual resource management classes. The inventory stage involves identifying the visual resources of an area and assigning them to inventory classes using BLM's VRI process. The process includes rating the visual appeal of an area, measuring public concern for scenic quality, and determining whether the area is visible from travel routes or observation points. The process is described in BLM Handbook H-8410-1, Visual Resources Inventory (BLM 1986).

The inventory class descriptions are as follows:

I. Objective: Preserve landscape character. This class provides for natural ecological changes but does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

II. Objective: Retain existing landscape character. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract a casual observer's attention. Any changes must repeat the basic elements of line, form, color, and texture found in the predominant natural features of the characteristic landscape.

III. Objective: Partially retain existing landscape character. The level of change to the characteristic landscape should be moderate (or lower). Management activities may attract attention but should not dominate a casual observer's view. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

IV. Objective: Provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these

activities through careful location, minimal disturbance, and repetition of the basic landscape elements.

Visual resource inventory classes are assigned through the landscape rating inventory process. The exception is Class I, areas remain Class I where a management decision has previously been made to maintain a natural landscape. This includes areas such as national wilderness areas, the wild section of national wild and scenic rivers, and other congressionally and administratively designated areas where decisions have been made to preserve a natural landscape. Classes II, III, and IV are assigned based on a combination of scenic quality, sensitivity level, and distance zones. This is accomplished by combining the 3 overlays for scenic quality, sensitivity levels, and distance zones and using the guidelines specified in BLM Handbook H-8410-1 to assign the proper class. The end product is a visual resource inventory class overlay. Inventory classes are informational in nature and provide the basis for considering visual values in the planning/NEPA process. They do not establish management direction and should not be used as a basis for constraining or limiting surface disturbing activities.

The area's visual resources are then assigned to management classes with established objectives in the applicable land use plan, in conformance with other land use allocations made in the plan. VRM classes may differ from VRI classes, based on management priorities for land uses. These area-specific objectives provide the standards for planning, designing, and evaluating future management projects. The VRM class assigned to an area provides the standard by which to measure proposed resource uses and management activities and determine if visual impacts would meet the management objectives, or whether design adjustments would be required. A visual contrast rating process is used for this analysis, which involves comparing the project features with the major features in the existing landscape using the basic design elements of form, line, color, and texture.

3.10.2 Current Conditions and General Visual Setting

The topography within the WEMO Planning area is varied, and ranges from valley floor elevations of approximately 1,700 to 4,000 feet above sea level to mountain elevations of over 8,000 feet above sea level. The principle mountain ranges border the western side of the planning area, and include the San Gabriel, San Bernardino, Sierra Nevada, and Tehachapi Mountains. The mountains are generally oriented in a north-south direction, with broad alluvial fans at their bases. The mountain ranges tend to be rugged, providing a good visual effect, but they are also monochromatic. Between the mountain ranges are broad valleys which are also oriented north-south, and many have flat dry lakes in the valley bottoms. The valleys generally have large, uninterrupted panoramic vistas of the surrounding mountain ranges.

Vegetation types in the planning area depend on the topographic setting. The valley floors tend to be dominated by creosote bush, cholla, and yucca. Vegetation in washes in the mountains includes cat claw, mesquite, and shrubs, perennials, and grasses. Vegetation within the mountain ranges is sparse, and much of it is not visible from a large distance. However, it is visible from viewing points within the mountains, and includes Joshua trees, barrel cactus, and beavertail.

3.10.3 Visual Resource Inventory Classes

The Barstow, Ridgecrest, and Needles Field Offices have all completed visual resource inventories covering the nearly the entire WEMO Planning area. The acreage included in each VRI class is summarized in Table 3.10-1.

Table 3.10-1. Visual Resource Inventory Classes in the WEMO Area

VRI Class	Surface Acres	Percent of Planning Area
I	229,535	7
II	514,969	16
III	979,808	30
IV	1,235,137	38
Not Inventoried	285,346	9
Total	3,244,795	100

3.10.4 Characterization

The WEMO Planning area is highly fragmented, with a landscape experiencing a high degree of human modification due to urban development, its associated infrastructure and uses, and energy development. In addition, recreation plays a major role in the economy of the area, and much of the area is viewed en-route to or from major tourist destination areas, such as national parks. As the state's population grows, more visitors will be attracted to public lands for recreation in natural landscapes.

With increases in both resident populations and in tourism, scenic values and visual open space have become more important. Management direction aimed at preserving sensitive viewsheds will continue to compete with other land use allocation decisions and management activities for urban development, infrastructure needs, energy development, recreation uses, and other surface-use activities.

The impact analysis in Chapter 4 evaluates not only on the total mileage of routes, but the mileage within each VRI Class in the planning area. In Class III and IV areas, routes and vehicles may not be dominant, or even noticeable, and while the impact would still be considered adverse, it would be limited in magnitude. In Class I and II areas, where the objectives are to avoid attracting the attention of a casual viewer, the magnitude of the impact becomes more severe. Also, much of the impact from the route network is from the presence of the routes, rather than their use. The presence of routes would not substantially vary among alternatives, since the rate of rehabilitation would be the limiting factor in the planning horizon (which would not vary among alternatives) rather than the number of routes to be rehabilitated. Although motorized vehicle access is considered to be an adverse impact to the resource, it is also necessary, in many areas, to provide access for viewers to enjoy the visual resources in the region. Therefore, the level of impact can be subjective, depending on the viewer. A separate visual resources inventory was not conducted for livestock grazing.

3.11 Special Designations

Specially designated areas within the WEMO Planning area include wilderness areas, Wilderness Study Areas (WSAs), Areas of Critical Environmental Concern (ACECs), and Desert Wildlife Management Areas (DWMAs). These areas are managed to protect specific resources and values that were associated with their designation. The locations of ACECs are shown in Figure 3.11-1, and wilderness areas and WSAs are shown in Figure 3.11-2. The locations of DWMAs were shown in Figure 3.4-44. Information on designated wilderness areas and ACECs in grazing allotments is displayed in Table 3.7-3.

In addition, as required in Section 603 of FLPMA, BLM has inventoried lands with wilderness characteristics as defined in Section 2 of the Wilderness Act of 1964. Such lands do not, in and of themselves, imply particular land uses or management requirements. However, the alternatives and their effects on these lands are being considered in the WMRNP.

3.11.1 Wilderness

By enacting the California Desert Protection Act of 1994 (P.L. 103-433), Congress designated 69 wilderness areas in southern California and directed that they be administered by the BLM pursuant to the Wilderness Act of 1964 (P.L. 88-577). Seventeen of these areas are within or partially within the planning area. Subsequently, Congress enacted the Omnibus Public Land Management Act of 2009 (P.L. 111-11), which designated three additional BLM-managed wilderness areas in southern California, including the Pinto Mountains Wilderness within the WEMO Planning area. Table 3.11-1 lists these 21 wilderness areas, together with the amount of public land ownership within each. More information on each of these Wilderness Areas can be found at http://www.blm.gov/ca/st/en/prog/wilderness/wa/list_wa.html.

Table 3.11-1. Wilderness Areas within the WEMO Planning Area

Wilderness Area Name	Acres Managed by BLM
Argus Range	18,392
Bighorn Mountain	26,626
Black Mountain	20,929
Bright Star	8,738
Cleghorn Lakes	39,797
Coso Range	52,309
Darwin Falls	8,812
Death Valley	70
El Paso Mountains	24,279
Golden Valley	36,553
Grass Valley	32,835
Joshua Tree	9
Kelso Dunes	15

Table 3.11-1. Wilderness Areas within the WEMO Planning Area

Wilderness Area Name	Acres Managed by BLM
Kiavah	21,910
Mojave	3
Newberry Mountains	27,746
Owens Peak	50,860
Pinto Mountains	24,950
Rodman Mountains	34,239
Sacatar Trail	34,087
San Gorgonio	41,460
Sheephole Valley	33,887
Total = 21 areas	**538,506 acres**

The purpose of wilderness, as defined in section 2(a) of the Wilderness Act, is "...to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas in the United States...leaving no lands designated for preservation and protection in their natural condition...". Further, wilderness is defined in Section 2(c) of the Wilderness Act to be areas "...where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions…".

Section 4(c) of the Wilderness Act prohibits certain uses of wilderness. These prohibitions include commercial enterprise, permanent roads, temporary roads, use of motor vehicles, motorized equipment or motorboats, landing of aircraft, use of other forms of mechanical transport, and structures or installations. There are three classes of exceptions to some or all of the prohibitions. These include private existing rights (e.g., rights associated with a lease for a microwave tower that existed at the time of wilderness designation), actions necessary to meet the minimum requirements for the administration of the area, (e.g., use of motorized equipment to remove hazardous materials), and "Special Provisions" (e.g., livestock grazing that was established prior to designation).

The California Desert Protection Act of 1994 (CDPA), at Title I for BLM Wilderness, provides for motorized vehicle access for (1) fish and wildlife management activities by appropriate State agencies and (2) law enforcement. At Title VII, the CDPA establishes explicit federal water rights, allows access for Indian religious purposes, and provides mandates and procedures for acquiring State and private inholdings.

Wilderness areas are managed according to several internal policies, including BLM Manual MS-6340, Management of Designated Wilderness Areas (BLM 2012), in addition to 43 CFR 6300, Wilderness Management, and Principles for Wilderness Management in the California Desert (Desert Managers Group 1995).

Wilderness areas in the WEMO Planning area include important habitat of several West Mojave species of concern, particularly bighorn sheep, prairie falcon, and golden eagle. The majority of the known golden eagle and prairie falcon nest sites are within wilderness areas.

Five of the 21 wilderness areas are encompassed or partially encompassed within critical tortoise habitat. These include the Rodman Mountains, Newberry Mountains, Black Mountain, Grass Valley, Pinto Mountains, and portions of Golden Valley wilderness areas.

Wilderness Study Areas (WSA)

There are four designated wilderness study areas in the planning area. These include the Cady Mountains WSA, the Soda Mountains WSA, the Sacatar Meadows WSA and the Great Falls Basin WSA.

To fulfill direction from Congress, under Section 603 of FLPMA, the BLM conducted its wilderness review process. This process was carried out by first inventorying public lands to determine which lands had wilderness characteristics, which was done with extensive public involvement. Lands found to have wilderness characteristics were administratively designated as WSA. For the CDCA this was documented in the Wilderness Inventory Final Descriptive Narratives, completed in March 1979 (BLM 1979). That inventory identified 138 Wilderness Study Areas comprising more than 5.5 million acres. Section 603 of FLPMA requires that, until the Congress determines otherwise, the Secretary of Interior shall manage these lands so as not to impair the suitability of these lands for preservation as wilderness.

The CDPA and the Omnibus Public Land Management Act of 2009 designated wilderness based in part on these WSA. The CDPA also released some public lands from WSA status, and identified some existing WSA that would continue to be managed to the non-impairment standard until Congress makes a future decision on these lands. The WEMO Planning area contains approximately 315,230 acres within seven WSA identified by Congress in the CDPA.

All WSA are managed so not to impair the suitability of the area for preservation as wilderness and prevent unnecessary or undue degradation, in accordance with the BLM Wilderness Study Area Manual MS-6330 (BLM 2012), and will continue to be managed in that manner until Congress either designates them as wilderness or releases them for other uses.

As with wilderness, allowable pre-existing use as described in FLPMA, only apply to grazing, mining, and mineral uses, or as specifically identified in the legislation, and do not include other uses such as recreational activities. Although most recreational activities (including hiking, horseback riding, fishing, hunting and trapping, camping, and other primitive forms of recreation) are allowed in WSA, some activities may be prohibited or restricted if they do not meet the non-impairment standard or one of the exceptions.

While access on primitive routes or ways in WSA is allowed, BLM policy does not provide for motorized use of these routes unless continuous use and designation of that use has been established from 1976 onward. The result of the policy is that routes, once eliminated from the travel network, cannot be established in the network again until Congress releases the land for other uses.

WSA Guidance directs BLM to comply with the wilderness non-impairment mandate (FLPMA Section 603(c)). BLM must monitor and regulate the activities of off-highway vehicles (OHVs) in WSA to assure that their use does not compromise these areas by impairing their suitability for

designation as wilderness. The BLM's Off Road Vehicle Regulations (43 CFR 8342.1) require that BLM establish off-road vehicle designations of areas and routes that meet the non-impairment mandate. BLM's policy is that cross-country vehicle use in WSA does cause the impairment of wilderness suitability. As described in BLM Manual 1626—Travel and Transportation Manual, "Any motorized/mechanized linear transportation feature located within [WSA] will be identified in a transportation inventory as a motorized/mechanized 'primitive route'...Primitive routes will not be made a part of the transportation system, classified as a transportation asset, or entered into the Facility Asset Management System (FAMS) unless one of the following conditions is met:

A. The routes are designated as non-motorized and non-mechanized trails, or

B. Congress releases the WSA from Wilderness consideration."

Motorized/mechanized primitive routes may be signed only to the extent necessary to prevent resource damage or users getting lost; they may not be assigned names or numbers that would appear to create a de facto route system.

Though motorized and mechanical transport may be permitted to continue along existing primitive routes, "closed" designations may be appropriate for WSA, or portions of WSA, where LUP planning goals are to provide primitive recreational opportunities, or where needed for the protection of an identified natural resource.

3.11.2 Lands Inventoried for Wilderness Characteristics

In accordance with Section 201 of FLPMA, the BLM is required to prepare and maintain on a continuing basis an inventory of public lands and their resources and other values. Per Section 603 of FLPMA, this includes lands with wilderness characteristics as defined in Section 2 of the Wilderness Act of 1964. Such lands do not, in and of themselves, imply particular land uses. All lands that are not currently designated as wilderness or WSAs are assessed during the LUP process to determine if they possess one or more wilderness characteristics. These characteristics generally include naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive and unconfined recreation.

Considering wilderness characteristics in the land use planning process may result in several outcomes related to land use, including, but not limited to: (1) emphasizing other multiple uses as a priority over protecting wilderness characteristics; (2) emphasizing other multiple uses while applying management restrictions (conditions of use, mitigation measures) to reduce impacts to wilderness characteristics; (3) the protection of wilderness characteristics as a priority over other multiple uses. This process is described by BLM policy in Manual MS-6320, Considering Lands with Wilderness Characteristics in the Land Use Planning Process, and BLM Land Use Planning Handbook, H-1601-1, Appendix C, (K) Wilderness Characteristics.

Management of lands with wilderness characteristics is part of BLM's multiple-use mandate, and is recognized within the spectrum of resource values and uses within the WEMO Planning Area. Lands with wilderness characteristics are defined for this planning effort as areas:

- Having been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.

- Having outstanding opportunities for solitude or a primitive and unconfined type of recreation.
- Potentially containing ecological, geological, or other features of scientific, educational, scenic, or historical value.

These lands may be managed for the use and enjoyment of area visitors and may be devoted to the public purposes of recreation, scenic, scientific, educational, conservation, and historical use. In addition, they could augment multiple-use management of adjacent and nearby lands through the protection of watersheds and water yield, wildlife habitat, natural plant communities, and similar natural values.

The process for these inventories is described in BLM Manual MS-6310, Conducting Wilderness Characteristics Inventory on BLM Lands. In addition to review and maintenance of existing lands with wilderness characteristics data, the inventory incorporates new data concerning resource conditions for lands previously determined not to possess wilderness characteristics; newly acquired lands; and citizen information (public nominations of the lands with wilderness characteristics) meeting the minimum standard for further review, to establish an updated, current inventory of lands with wilderness characteristics.

To address lands inventoried for wilderness characteristics, the BLM is updating its inventory for the CDCA, including lands within the West Mojave Planning area. The current inventory, summarized in Table 3.11-2, includes 87 units totaling more than 4 million acres. This comprises 44 percent of the WEMO Planning area. Within the WEMO SEIS the BLM is not proposing to determine how to manage lands inventoried for wilderness characteristics, this decision is outside the scope of this SEIS.

Table 3.11-2. Lands Inventoried for Wilderness Characteristics

Unit Number	Acres
1	6181.7
1027	656.3
1053	10.2
124	2.2
129	5.7
130	23303.1
131	164617.6
132	60251.1
132A	28551.3
132B	34849.3
133	3876.9
142	65755
157	36579.2
157A	2217.1
157B	1064
158	67450.8
159	25273.2

Table 3.11-2. Lands Inventoried for Wilderness Characteristics

Unit Number	Acres
159A	3787.3
160	15280.5
160A	24811.2
160B	15286.1
160C	880.7
161	4435.2
162	5016.7
163	31501.3
164	86803.9
165	19291.7
165A	17540
166	3951.2
167	23055.8
168	74449.5
169	18255.9
170	12305.6
171	13716.8
172	18233.7
173	19150
173A	16683.1
174	21745.7
175	11928.4
176	12953.3
177	5578.9
178	7777.7
179	33252.4
179A	58063.4
180	43100.3
181	19425.5
182	62398.7
182A	13254.3
183	39801.4
184	67463.4
185	33875.9
185A	27512.5
186	116675
186A	24482.8
186C	45572.7

Table 3.11-2. Lands Inventoried for Wilderness Characteristics

Unit Number	Acres
187	1029.6
188	47209.7
189	92368.1
190	35938.2
191	19322.3
192	6525.9
192A	3973.5
193	30835.2
194	18868.5
195	72121.9
196	8651
197	24972.3
189	67135.3
199	11125.9
200	19492.6
201	37903
202	8644.9
20.3	27345.9
204	28859.2
205	42870.2
206	66547.6
207	49144.2
207A	18952.7
208	15217.7
209	40656.3
210	51163.5
210A	27765.7
211	10179
212	18376.37
213	27858.9
214	26708
215	65325.8
216	147592.1
217	183143.1
217A	10969
217B	21896.6
218	94501.4
218A	819.6

Table 3.11-2. Lands Inventoried for Wilderness Characteristics

Unit Number	Acres
221A	1596.5
242	123610
243	69225.5
250	62.8
251	297747.9
251A	464.2
252	91104.4
252A	23391.7
253	27686.8
254	24055
254A	17612.2
255	24738.8
255A	2.3
256	4.7
3	3521.9
301	87.4
301A	0.2
302	209.9
304	81771.4
304A	25798.1
305	36126.2
335	96789.7
339A	6587.2
339B	20456.1
Total Number of Units = 87	Total Acres = 4044604.87

3.11.3 Areas of Critical Environmental Concern and Desert Wildlife Management Areas

Thirty-one Areas of Critical Environmental Concern (ACECs) wholly or partially within the WEMO Planning area were established by the BLM through the CDCA Plan and amendments prior to 2005. Of these, the Darwin Falls ACEC was later incorporated into Death Valley National Park.

The 2006 WEMO Plan made numerous changes to the system of land designations for protection of resources in the WEMO Planning area. Many of these overlapped with each other. The 2006 WEMO Plan established four Desert Wildlife Management Areas (DWMAs), totaling 1,523,936 acres for the protection of the desert tortoise, and four conservation areas totaling 1,726,712 acres for protection of other species. In addition, the 2006 WEMO Plan made modifications to MUC classifications, boundaries, and management objectives of the existing ACECs, and acted as an amended management plan for 25 of these ACECs to incorporate provisions to conserve protected species. In addition, the Plan also brought forward from existing ACEC Plans, where

they existed, or adopted modified route networks for each of the areas. Finally, the 2006 WEMO Plan established 10 new ACECs within the planning area. The current list of ACECs and conservation areas, and their current acreages, are provided in Table 3.11-3.

Table 3.11-3. Acreage of ACECs and Conservation Areas in the WEMO Planning Area

ACEC/Conservation Area Name	Total Acreage
Afton Canyon	8,830
Amboy Crater	639
Barstow Woolly Sunflower	19,079
Bedrock Springs	786
Bendires Thrasher Conservation Area	11,719
Big Morongo Canyon	24,934
Black Mountain	51,261
Calico Early Man Site	834
Carbonate Endemic Plants Research Natural Area	4,380
Christmas Canyon	3,445
Coolgardie Mesa	9,837
Cronese Basin	8,469
Desert Tortoise Research Natural Area	22,230
Fossil Falls	1,630
Great Falls Basin	9,539
Harper Dry Lake	485
Jawbone/Butterbredt	147,832
Juniper Flats	2,387
Kelso Creek Monkeyflower Conservation Area	1,865
Last Chance Canyon	5,135
Manix	2,907
Middle Knob	17,768
Mohave Monkeyflower	36,500
Mojave Fishhook Cactus	637
Mojave Fringe-Toed Lizard Conservation Area	22,173
Parish's Phacelia Conservation Area	512
Pisgah Crater	18,096
Rainbow Basin	4,103
Red Mountain Spring	718
Rodman Mountains Cultural Area	6,208
Rose Springs	838
Sand Canyon	2,583
Short Canyon	754
Soggy Dry Lake	184
Steam Well	41
Trona Pinnacles	4,058
Upper Johnson Valley Yucca Rings	331
Western Rand Mountains	31,102

Table 3.11-3. Acreage of ACECs and Conservation Areas in the WEMO Planning Area

ACEC/Conservation Area Name	Total Acreage
West Paradise	239
Whitewater Canyon	13,973

3.11.3.1 ACECs Designated Prior to 2006 WEMO Plan

Information on these ACECs is summarized below. A CD of the complete ACEC Managnement Plans for each of these ACECs is available from the California Desert District Office.

Afton Canyon

This ACEC protects a sensitive Mojave River riparian community and the scenic canyon in which it is located. Originally 4,726 acres, in 2006 the WEMO Plan expanded the ACEC southward. An Afton Canyon Natural Area management plan (1989) was prepared in cooperation with the CDFW under the Sikes Act and covers a larger area than the ACEC. The plan protects the ACEC and the adjacent desert habitat in the Cady Mountains, which is occupied habitat for bighorn sheep and contains nest sites for prairie falcon and golden eagle. Visitor facilities include two campgrounds, an equestrian campground, the Mojave Road, and interpretive signs and kiosks.

The 2006 WEMO Plan adopted the 1989 management plan recommendations, amending the MUC Class from M to L on 1,225 acres. The plan also adopted the provisions of the WEMO Plan for protection of bighorn sheep, prairie falcon, golden eagle, vermilion flycatcher, yellow-breasted chat, yellow warbler, summer tanager, least Bell's vireo, western pond turtle, desert tortoise, Mojave fringe-toed lizard, and all species of bats.

Amboy Crater

BLM designated the Amboy Crater as an ACEC within the Amboy Crater National Natural Landmark in 1987.

Barstow Woolly Sunflower

BLM established a botanical ACEC northeast of Kramer Junction to protect the Barstow woolly sunflower. Although the area protects a relatively large population of this species, the ACEC represents only a small proportion of the overall range, which is limited to the western Mojave Desert. The desert tortoise and Mohave ground squirrel are also found within the ACEC. The State of California owns nine sections of land to the east and west, which CDFW manages for protection of desert plants and animals.

The 2006 WEMO Plan adjusted the boundary to encompass additional public lands northwest of Kramer Junction.

Bedrock Springs

Bedrock Springs ACEC, located at the edge of the Golden Valley Wilderness, was established by the CDCA Plan to protect prehistoric values.

The 2006 WEMO Plan included this ACEC within the Mohave Ground Squirrel Conservation Area, and applied all conservation measures to the ACEC.

Big Morongo Canyon

BLM established the Big Morongo Canyon ACEC to protect habitat qualities for least Bell's vireo and triple-ribbed milkvetch. The Big Morongo Canyon ACEC is managed as a wildlife reserve, with emphasis on strict protection of the flora and fauna. This desert oasis is known internationally for its bird diversity, and opportunities are provided for wildlife viewing and photography, including boardwalk trails, interpretive displays and brochures. The ACEC was established in the 1980 CDCA Plan. Expansion of the ACEC in 1996 created a habitat linkage between the Little San Bernardino Mountains and the San Bernardino Mountains, though several private parcels remain to be acquired.

Black Mountain

The Black Mountain ACEC is one of the largest areas in the western Mojave Desert to protect the prehistoric and Native American values of this area northwest of Barstow. A management plan was approved in 1988. The ACEC lies entirely within the Superior-Cronese and Fremont-Kramer DWMAs. The southeastern half is within the Black Mountain Wilderness. The ACEC includes critical habitat for the desert tortoise, and known occupied habitat for the Mojave ground squirrel, LeConte's thrasher, desert cymopterus, and Barstow woolly sunflower. Nest sites are present for golden eagle and prairie falcon.

The 2006 WEMO Plan included amending this ACEC plan to include species protection as a goal.

Calico Early Man Site

This National Register Property was established as an ACEC in 1980, and a management plan was prepared in 1984. The plan designated a vehicle route network and specified ways to protect the evidence of ancient human occupation.

The 2006 WEMO Plan modified the ACEC Management Plan to require that all provisions for surveys, minimization, mitigation, and compensation for adverse impacts to biological resources that apply to the Superior-Cronese DWMA would also apply to this ACEC.

Christmas Canyon

The Christmas Canyon ACEC protects prehistoric values. Most of the ACEC lies within the Spangler Hills Open Area in San Bernardino County. The 1988 ACEC management plan prescribed ways that the archaeological resources could be protected within an area open to recreational vehicle use.

In the 2006 WEMO Plan, a small portion of the southern edge of this ACEC was included within the Mohave Ground Squirrel Conservation Area. All conservation measures associated with the Conservation Area apply to the ACEC.

Cronese Basin

The BLM designated the Cronese Lakes, north of Interstate 15 between Barstow and Baker, as an ACEC to protect valuable cultural and natural resources. Ephemeral wetlands are present on

the lakes, which serve as stopover points for migratory waterbirds and nesting sites for many species during very wet years. Mesquite hummocks and desert willow washes add to the biological importance, and the dunes and sand sheets are occupied habitat for the Mojave fringe-toed lizard. The desert tortoise is found in low densities. A management plan was published in 1985.

In the 2006 WEMO Plan, the southeastern portion of this ACEC was included within the Superior-Cronese DWMA. The 2006 WEMO Plan amended the ACEC Management Plan to incorporate protection of blowsand areas for the Mojave fringe-toed lizard.

Desert Tortoise Research Natural Area

The CDCA Plan of 1980 designated lands north of California City in Kern County as an ACEC and a Research Natural Area. A management plan for the ACEC, prepared under authority of the Sikes Act, was approved in 1988. The ACEC is jointly managed by the BLM, CDFW and the Desert Tortoise Preserve Committee, a non–profit group established to acquire and manage lands for protection of the desert tortoise.

The 2006 WEMO Plan expanded the boundaries of this area to include lands acquired by the Desert Tortoise Preserve Committee. The ACEC was also included within the Mohave Ground Squirrel Conservation Area and the Fremont-Kramer DWMA.

Fossil Falls

The Fossil Falls ACEC was established in 1980 to protect prehistoric values. A management plan was approved in 1986.

The 2006 WEMO Plan amended the management plan for this ACEC by recognizing provisions applicable to the Mohave Ground Squirrel Conservation Area.

Great Falls Basin

The Great Falls Basin ACEC management plan was prepared in 1987 in cooperation with the CDFW under the Sikes Act. The ACEC adjoins the Indian Joe Canyon Ecological Reserve and the northern portion is within the Argus Range Wilderness. The southern portion is within a BLM wilderness study area. The western boundary is contiguous with the China Lake Naval Air Weapons Station. The ACEC protects unique and valuable wildlife and scenic resources, particularly the dozens of seeps and springs that serve as habitat for the threatened Inyo California towhee. Designated critical habitat for the towhee is present within the ACEC. In addition, large populations of quail and chuckar are present, as is a remnant population of bighorn sheep. Raptors nesting within the ACEC include golden eagle, prairie falcon, and long-eared owl. Potential habitat exists for the Panamint alligator lizard.

The 2006 WEMO Plan amended the management plan to prohibit travel on certain routes that were previously designated as open. The area was included within the Mohave Ground Squirrel Conservation Area and the Argus Range Key Raptor Area.

Harper Dry Lake

The ACEC was established to protect the remnant marshes at the southwestern edge of Harper Dry Lake. The marsh and alkali wetland community bordering Harper Dry Lake hold potential for discovery of several rare and restricted-range plant species. The playa bordering the marshes

supported nesting Western snowy plovers in the past, and surveys conducted in 2001 found these birds to be present and probably nesting. Harper Dry Lake is an important area for the conservation of Western snowy plover nesting habitat. Harper Dry Lake is recognized as a Key Raptor Area by the BLM, which has designated 223 such areas nationwide. Key Raptor Areas are places known to be significant habitats for selected species of birds of prey, and Harper Dry Lake is one of seven Key Raptor Areas in the Mojave Desert. The species known to utilize the habitat at Harper Dry Lake are northern harrier, short-eared owl, ferruginous hawk, and long-eared owl. Harper Dry Lake has been improved as a Watchable Wildlife site, a program to provide access and facilities to visitors for birdwatching, photography and passive recreation. Arrangements are now being made to supply surface water to the remnant marsh, and interpretive kiosks, restrooms, and trails have been installed.

The 2006 WEMO Plan adjusted the boundary of this ACEC by adding 110 acres of the Watchable Wildlife Site on the southern boundary and deleting 110 acres of barren lakebed on the northern boundary. The plan also included revised management objectives for conservation of plant and animal species, including the Western snowy plover and several restricted-range alkali wetland species. The area was also recognized as a Key Raptor Area.

Jawbone/Butterbredt

The 1982 Sikes Act Plan for Jawbone/Butterbredt ACEC addressed the Sierra/Mojave/Tehachapi Ecotone Wildlife Habitat Management Area, a designated “special area” in the CDCA Plan. The ACEC plan incorporated all of the Rudnick Common Grazing Allotment and the vehicle management boundary agreement between the BLM and the Rudnick Estate Trust. Motorized vehicle routes of travel were designated within the ACEC, which includes both designated wilderness and the Jawbone Canyon and Dove Springs Open Areas. The Pacific Crest Trail crosses the ACEC as well. The ACEC was established to manage and protect significant cultural and wildlife values of this transition zone between the mountains and the northwestern Mojave Desert. Among the wildlife habitats present are Butterbredt Springs, an important migratory bird stopover site, habitat for the yellow-eared pocket mouse in Kelso Valley, and the raptor and vulture migratory corridor between the Kern River Valley and the Mojave River. Nearly the entire range of a West Mojave endemic, the Kelso Creek monkeyflower, is located within the ACEC.

In 1995 Jawbone Station Visitor Center opened its doors to the public to serve as a public information and outreach center to those coming to the Jawbone/Butterbredt ACEC and the surroundings public lands. The facility’s goal is to educate the public about the agency, its mission, the sensitive resources in the area, and responsible use of the public lands.

The 2006 WEMO Plan added protection of the Bendire’s thrasher, Mohave ground squirrel, yellow-eared pocket mouse, and Kelso Creek monkeyflower as specific objectives of the ACEC management plan. Three new conservation areas, including the Mohave Ground Squirrel, Kelso Creek Monkeyflower, and Bendire’s Thrasher Conservation Areas, were also established within the ACEC.

Since the approval of the 2006 WEMO Plan, an intensive effort has been underway to implement the designated route system and manage OHV use within the Jawbone/Butterbredt ACEC and surrounding areas. The efforts have included signing and resigning all designated open routes as needed, regular patrols and monitoring in the Jawbone area, installation of additional information

kiosks at main entry portals to the management area, building boundary fences around the Dove Springs Open Area and along the northern boundary of the Jawbone Canyon Open Area, and continued focused restoration efforts.

For the last eight years BLM has partnered with a local non-profit, the Friends of Jawbone (FOJ), to assist with management plan implementation efforts in the Jawbone area. The FOJ is able to maintain a staff of between eight and twenty individuals for field work crews, without funding from BLM. These crew members take on many different tasks including regular monitoring patrols, replacement of route signs, trash pickup, and implementation of approved habitat restoration activities, route and trail maintenance, and recreation facility maintenance.

Juniper Flats

An ACEC was established for the Juniper Flats Cultural Area in 1980, and a management plan was prepared in 1988. The foothill area south of Apple Valley containing springs and riparian habitat in a dense stand of junipers was an important Native American habitation and special use site. Juniper Flats also provides important habitat for the San Diego horned lizard and the gray vireo. The Willow fire in 2000 burned the entire ACEC, leading to a temporary closure of the area until vegetative recovery had begun. Juniper Flats is an important equestrian riding area and provides access to the Deep Creek hot springs in the San Bernardino National Forest.

The 2006 WEMO Plan included construction of a multi-use trailhead to allow parking and staging for equestrian users.

Last Chance Canyon

The CDCA Plan designated Last Chance Canyon in the El Paso Mountains as an ACEC in 1980. A Plan Amendment in 1984 adjusted the boundaries to include additional prehistoric sites. This amendment implemented a recommendation of the ACEC management plan, which was completed in 1982. The archaeological sites are part of a larger archaeological district placed on the National Register of Historic Places in 1971.

The 2006 WEMO Plan adopted an interim route network until a revised motorized vehicle access network could be established for the El Paso Mountains. The ACEC was also included within the Mohave Ground Squirrel Conservation Area.

Manix

The Manix ACEC, located 20 miles northeast of Barstow along the Mojave River, was established in 1990 to protect paleontological and cultural resources. This site contains blowsand habitat for the Mojave fringe-toed lizard.

The 2006 WEMO Plan designated public lands along the Mojave River as a conservation area for the Mojave fringe-toed lizard.

Mojave Fishhook Cactus

A CDCA Plan Amendment established the Mojave Fishhook Cactus ACEC in 1984. The ACEC is composed of two separate parcels in the Brisbane Valley. The purpose of the ACEC is to protect the yellow-spined form of the Mojave fishhook cactus. Subsequent studies have shown that this area may be important to the Mohave monkeyflower as well. A management plan was completed in 1990, which designated motorized vehicle routes within the ACEC.

The 2006 WEMO Plan amended the MUC Class from U to L for 628 acres. The plan also designated Brisbane Valley as a tortoise Special Review Area.

Rainbow Basin

The Rainbow Basin ACEC, established in 1980, lies ten miles north of Barstow and includes two campgrounds, a scenic loop drive, hiking trails, and an interpretive trail. The area is popular with visitors that come to see the colored geological formations. The ACEC protects two nest sites for the prairie falcon. The ACEC management plan, completed in 1991, addressed both the ACEC and a larger surrounding area where route designation was accomplished and recommendations were made for campground and trail improvements and closure to target shooting. Hunting is allowed in the ACEC.

This area is part of the Coolgardie Mesa conservation area and ACEC, the Mohave Ground Squirrel Conservation Area, and the Superior-Cronese DWMA. The 2006 WEMO Plan closed routes that served as links to regional routes in order to reduce disturbance to the Lane Mountain milkvetch. Objectives of the management plan were also revised to include protections for the Lane Mountain milkvetch and prairie falcon.

Red Mountain Spring

This area was designated as an ACEC by the CDCA Plan to protect prehistoric values. A 1982 CDCA Plan Amendment listed this area as closed to vehicle travel. A management plan was completed in 1987. This ACEC was included in the route designation inventory and designation process for the Red Mountain subregion.

The 2006 WEMO Plan formally changed the name of this ACEC from Squaw Spring to Red Mountain Spring. The ACEC was included in the Mohave Ground Squirrel Conservation Area and the Fremont-Kramer DWMA.

Rodman Mountains Cultural Area

A 1988 CDCA Plan Amendment established this ACEC to protect cultural resources. Most of the ACEC is within the Rodman Mountains Wilderness. Portions outside the wilderness are part of the Ord-Rodman route designation subregion. The site contains raptor nests and limited desert tortoise habitat.

The 2006 WEMO Plan incorporated most of the ACEC into the Ord-Rodman DWMA.

Rose Springs

An area surrounding Rose Springs in Inyo County was designated as an ACEC by the CDCA Plan to protect prehistoric values. Access is limited by a gate, which has been vandalized in the past. A management plan was prepared in 1985 that recommended closure of the ACEC to motorized vehicles. Access to the ACEC is available via a transmission line road and the Los Angeles Aqueduct road.

The 2006 WEMO Plan incorporated this area into the Mohave Ground Squirrel Conservation Area.

Sand Canyon

The Sand Canyon ACEC was established to protect riparian habitat and wildlife in a canyon on the eastern slope of the Sierra Nevada Mountains. The ACEC is one of the most diverse areas in the West Mojave for species of small mammals and supports a wide variety of reptiles and birds. Two species nearly endemic to the West Mojave are found within the ACEC: the Ninemile Canyon phacelia and the yellow-eared pocket mouse. Riparian habitat in the ACEC is important to migratory birds, including the willow flycatcher. An ACEC management plan was prepared in 1989.

The 2006 WEMO Plan modified the ACEC management plan to incorporate protections for the yellow-eared pocket mouse.

Short Canyon

The Short Canyon ACEC was established by an amendment to the CDCA Plan in 1988. Most of the ACEC lies within the Owens Peak Wilderness. The purpose of the ACEC is to protect the unusual vegetation and diverse flora. Short Canyon is known to support occurrences of Charlotte's phacelia (*Phacelia nashiana*), a limited-range plant whose distribution falls almost entirely within the western Mojave Desert. In addition, a significant population of the state-listed Mojave tarplant (*Deinandra [Hemizonia] mohavensis*) was detected in the canyon in 1998. A management plan was prepared in 1990. The primary management action was to exclude grazing from the ACEC, which has been implemented through fencing and placement of cattle guards.

The 2006 WEMO Plan modified the ACEC management plan to incorporate protections for the Charlotte's phacelia and Mojave tarplant.

Soggy Dry Lake

BLM established the Soggy Dry Lake ACEC in the 1980 CDCA Plan. The Soggy Dry Lake Creosote Rings Preserve was established to protect ancient vegetation in the Fry Valley, where creosote bushes have developed as clonal rings, attaining an age of up to 11,700 years. A management plan for this ACEC was approved in 1982. The CDFW owns 488 acres adjacent to the ACEC, managed as the King Clone Ecological Reserve.

Steam Well

This ACEC protects historic and prehistoric values within the Golden Valley Wilderness in San Bernardino County.

The 2006 WEMO Plan incorporated this area into the Mohave Ground Squirrel Conservation Area.

Trona Pinnacles

The 1989 management plan for the Trona Pinnacles ACEC focused on protection of the outstanding scenery and geological features of this area, which is located ten miles south of Trona. The site is used for commercial filming and sightseeing. At least one prairie falcon nest site was reported within the ACEC, but falcons have not been recorded there for the past ten years.

Upper Johnson Valley Yucca Rings

The CDCA Plan of 1980 established this ACEC for the unique clonal yucca rings found near the Fry Mountains within the Johnson Valley Open Area. The yucca plants are believed to have grown in a manner similar to the ancient creosote rings near Soggy Dry Lake and represent a stable, old plant community. A management plan was completed in 1982, and a Plan Amendment in 1984 adjusted the boundary along parcel lines. The ACEC Management Plan was developed to provide for continued use to meet the recreational needs of the Johnson Valley Open Area while protecting the sensitive resources. This area is within an OHV Open Area, and is completely fenced, so it would not be affected by designation of the route network.

Western Rand Mountains

The Western Rand Mountains ACEC (RMMA) formerly supported high densities of desert tortoises, though tortoise numbers have declined substantially from historical levels. The ACEC is believed to support the Mohave ground squirrel, and is known to harbor burrowing owls and LeConte's thrasher. A Rand Mountains Fremont Valley Management Plan was completed in 1993, and adopted in 1994. This plan, which also addressed surrounding lands such as Koehn Lake and lands to the northeast, was prepared in cooperation with the CDFW under authority of the Sikes Act. The plan received a "no jeopardy" Biological Opinion from the USFWS. The plan recommended several amendments to the BLM's CDCA Plan:

- Expand the Western Rand Mountains ACEC by 13,120 acres
- Change Class M lands in the ACEC expansion and adjacent alluvial fan areas to Class L.
- Withdraw 32,590 acres within the RMMA from mineral location and entry. The 6,090-acre Koehn Lake and an additional 8,320 acres within the management area will remain as class M and open to mineral entry.
- Change the RMMA OHV network from an "existing routes" system to a designated trail system that was mapped and marked in the field. The network of available routes of travel adopted in the plan reduced the network from the existing network of 764 miles down to 129 miles of designated Open routes..
- Categorize portions of the RMMA as Desert Tortoise Category I habitat. These lands lie on both sides of the Randsburg-Mojave Road southwest of Red Mountain and are shown on Illustration #9 in the 1993 management plan.

Implementation of the Rand Mountains Fremont Valley Management Plan related to the management of off-highway vehicle use within the area has included:

- Mapping, marking, and maintaining of the designated trail network with brown numbered post to identify the trail system.
- Installing a 17-mile long fence on the southern boundary of the RMMA with portals allowing entry only on the designated trail system.
- Installing fences along both side of designated routes R5 and R50 within the ACEC to prevent off route travel by motorized vehicle.
- Installing fencing along the northern boundary of ACEC to control access into the area. Through the connection of the boundary fence lines and the R5 and R50 fence lines about

5,700 acres of desert tortoise habitat have been encircled and protected from uncontrolled vehicle trespass.

- Installing 12 information kiosks around the management area with maps, rules, and information brochures for the public.
- Performing active desert restoration on 50 miles of closed trails at roughly 700 sites, covering 32 acres of desert tortoise habitat restoration. Active restoration efforts have included ripping, barricading, vertical mulching, and replanting areas with desert vegetation.
- Performing outreach efforts on major holiday weekends during the use season to inform visitors of the vehicle-use regulations within the management area.
- Conducting patrols of the area by both Law Enforcement staff and Resource staff to make public contacts about the management area. The Rand Mountains Fremont Valley Management Plan proposed a goal of ranger patrols eight hours per week plus eight hours each weekend from March 1 to June 30, September 1 to November 1, and holiday weekends. Ranger staffing levels were not adequate to consistently to so until 2002. In 2002, a ranger was specifically assigned primary patrol responsibilities for the Rand Mountains, Fremont Valley, and the Desert Tortoise Natural Area in order to facilitate implementation of other plan goals.

The 2006 WEMO Plan adopted the recommendations of the management plan, including adjustment of the boundary; amending the MUC Class from M to L for 34,835 acres; adopting the route network; designating Category 1 tortoise habitat as DWMA; implementing mineral withdrawal; and implementing an OHV-use permit program. The adoption of the route network was vacated by the Court in its Remedy Order of 2011, but the other actions were kept in place.

Since the adoption of the 2006 WEMO Plan, the first phase of a permit system has begun. The permit is required for all persons desiring to operate a motor vehicle within RMMA, as specified in the 2006 WEMO Plan.

Whitewater Canyon

BLM established the Whitewater Canyon ACEC in the 1980 CDCA Plan. The Whitewater Canyon ACEC straddles the WEMO Planning area boundary, with the upper elevations lying within the planning area. All of the ACEC within the WEMO Planning area lies within the San Gorgonio Wilderness. Wildlife protection is a goal of the ACEC Plan, and the ACEC protects a substantial herd of bighorn sheep and harbors golden eagle and prairie falcon nests. Significant riparian areas are found in lower Whitewater Canyon, and these are known to support several species of riparian birds as well as the arroyo toad. Potential habitat exists for the triple-ribbed milkvetch within upper Whitewater Canyon. The Pacific Crest Trail and the California Riding and Hiking Trail cross the ACEC.

3.11.3.2 New ACECs Designated in the 2006 WEMO Plan

The 2006 WEMO Plan established 10 new ACECs within the planning area, as discussed below.

Bendire's Thrasher Conservation Area

The conservation strategy for Bendire's thrasher is based on conservation of habitat on public lands where thrashers were seen in 2001 or were abundant in the mid-1980s and conditions appear unchanged. Four public land conservation areas were established. These are within Joshua Tree National Park (106,710 acres), the Jawbone/Butterbredt ACEC (7,678 acres), northern Lucerne Valley (9,805 acres), and Coolgardie Mesa (7,646 acres).

Carbonate Endemic Plants Research Natural Area

BLM designated public lands within an area east of Highway 18 in the foothills of the San Bernardino Mountains as a Research Natural Area and manages the land as an ACEC to protect four federally listed and one unlisted species of plants, as well as the San Diego horned lizard, gray vireo, and bighorn sheep.

Coolgardie Mesa

The Coolgardie Mesa ACEC lies within the Superior-Cronese DWMA and contains conservation areas for the desert tortoise, Mohave ground squirrel, Bendire's thrasher, and Lane Mountain milkvetch. The ACEC serves as a multispecies reserve for these four species as well as the Barstow Woolly sunflower.

Kelso Creek Monkeyflower Conservation Area

The Kelso Creek Monkeyflower Conservation Area was established by the 2006 WEMO Plan. The plan included conservation prescriptions such as maintaining regional rangeland health standards, requiring botanical surveys for proposed projects, and monitoring of habitat.

Middle Knob

The BLM designated the Middle Knob area as a new ACEC in the 2006 WEMO Plan. Management of this area includes requirements for avoidance of all listed species of plants and animals, designation of vehicle routes of travel to ensure compatibility with the purposes of the ACEC and with the Pacific Crest Trail, and prohibition of new wind energy development on public lands. Surveys for flax-like monardella in suitable habitat would be required for any ground-disturbing projects in the Middle Knob ACEC.

Mohave Monkeyflower

Conservation of Mojave monkeyflower is based on establishment of two reserve areas that include the majority of the known populations. These reserves, including southern Brisbane Valley and an area near Daggett Ridge, were designated as an ACEC in the 2006 WEMO Plan. The plan amended the MUC Class from U to L for 10,448 acres, and amended the MUC Class from M to L for 25,351 acres. Part of the ACEC lies within the Ord-Rodman DWMA.

Mojave Fringe-Toed Lizard Conservation Area

Two separate areas were designated as conservation areas for the Mojave fringe-toed lizard and are managed as an ACEC. The ACEC is found along the Mojave River east of Barstow and in and adjacent to the Sheephole Wilderness east of Twentynine Palms. Three other ACECs (Pisgah, Manix, and Cronese Lakes) serve to protect the Mojave fringe-toed lizard as well.

Parish's Phacelia Conservation Area

BLM established a new ACEC for conservation of Parish's phacelia northeast of Barstow along the Manix Trail. The plan designated 898 acres as a conservation area for this species of which 386 acres (43%) are located on private land and 512 acres (57%) are located on BLM land.

Pisgah Crater

BLM designated a portion of the Pisgah Crater and surrounding area as an ACEC in the 2006 WEMO Plan. This crater and lava flow, an uncommon landform in the western Mojave Desert, was previously designated as a Research Natural Area. The Pisgah Crater contains lava tubes of several types, some of which are used as bat roosts. The mix of dark lava and white sand has resulted in interesting color adaptations in the reptiles and small mammal fauna, called cryptic coloration or background color matching. These white and dark forms occurring together represent a location of high genetic biodiversity within species. The ACEC includes areas where populations of crucifixion thorn, white-margined beardtongue, sand linanthus, and Mojave fringe-toed lizard occur. Desert tortoise also occurs in the area.

West Paradise

The West Paradise ACEC lies within the Superior-Cronese DWMA and contains conservation areas for the desert tortoise, Mohave ground squirrel, and Lane Mountain milkvetch. The ACEC serves as a multispecies reserve for these three species.

3.11.3.3 DWMAs Designated in the 2006 WEMO Plan

The 2006 WEMO Plan established four Desert Wildlife Management Areas (DWMAs), totaling 1,523,936 acres for the protection of the desert tortoise. The boundaries of these DWMAs correspond to the general boundaries identified by the Desert Tortoise (Mojave Population) Recovery Plan (Recovery Plan): the Fremont-Kramer (803 square miles) and Superior-Cronese (1,003 square miles) DWMAs, which are adjacent; the Ord-Rodman DWMA (392 square miles); and the Pinto DWMA (183 square miles). Tortoise DWMAs are managed for tortoise conservation and recovery until which time the tortoise may be delisted as per criteria given in the Recovery Plan.

Public lands administered by the BLM within Tortoise DWMAs are designated as ACECs. The 2006 WEMO Plan serves as the ACEC management plan for the four Tortoise DWMAs. Existing ACECs that lie within the boundary of the Tortoise DWMAs ("included ACECs") are still maintained for the purpose of their original designation, unless specifically deleted by the 2006 WEMO Plan. Management provisions for resource protection in the Tortoise DWMAs augment, rather than replace, the pre-existing ACEC provisions.

The 2006 WEMO Plan also established the Mohave Ground Squirrel (MGS) Conservation Area comprising 1,726,712 acres for the long-term survival and protection of the MGS. The MGS Conservation Area includes portions of the Fremont-Kramer and Superior-Cronese Tortoise DWMAs, and additional, essential habitats located west and north of the two tortoise DWMAs.

3.11.4 Eligible Wild and Scenic River

Appendix F of the 2005 WEMO Final EIS included an analysis of the eligibility of the Mojave River for inclusion in the National Wild and Scenic River System (NWSRS) per Section 5(d) of the Wild and Scenic Rivers Act of 1968 (16 United States Code1271-1287, *et seq*). The Mojave River is the focal hydrologic system of the central portion of the West Mojave Desert planning area. It is a closed groundwater basin and the free-flowing segments of the Mojave River are largely subterranean. It begins its northerly, largely underground flow near Hesperia at the boundary of the San Bernardino National Forest and the CDCA. The two primary forks of the upper watershed, Deep Creek and the West Fork of the Mojave River, converge at the Mojave Forks Dam to form the mainstem of the Mojave River.

The eligibility report determined that a 22.5 mile long reach of the river near Afton Canyon were eligible for inclusion in the NWSRS. The report recommended a classification of "Recreational" for this segment. The area was cited for its outstanding and remarkable scenic, geologic, recreational, wildlife, cultural and historic values. Seven miles of the river are within Afton Canyon ACEC and one mile is within Manix ACEC. Afton Canyon is one of the most heavily used recreation areas of the California desert. The area is used by OHV enthusiasts, equestrians, rockhounds, campers, picnickers, hikers, hunters and birdwatchers. The segment identified as eligible on public lands contains Outstandingly Remarkable Scenic Values (ORVs), i.e., Class "A" scenic quality, per BLM Manual guidelines. Public lands in this segment have been previously designated as an Area of Critical Environmental Concern in part because of spectacular scenery. Regionally rare plant communities such as Cottonwood-Willow Riparian Forest, Willow Riparian Scrub, Mesquite Bosque, as well as alkaline meadow, and emergent plant communities can also be found along this portion of the river. Wildlife supported by these plant communities includes a high percentage of neotropical migrant birds and local or regional disjuncts. The threatened desert tortoise occurs near this segment, as well as a host of sensitive and/or special concern species. The presence of flowing water in this segment has served to attract humans for thousands of years. The high relief, stark topography and lush riparian vegetation provided by this segment continue to offer many opportunities for non-intrusive recreation.

3.12 Noise

This section describes the existing ambient noise conditions and sensitivities in the West Mojave Planning area, and applicable laws and regulations. Individual sources of noises and the potential sensitive receptors of noises in the planning area are discussed. See also the biological section for a discussion of sensitive biological receptors. Most noise studies that quantify ambient noise conditions are based on chronic sustained noise levels that occur throughout the day, and have limited application to the planning area. Transportation noise studies assume route usage levels and a sustained usage level that are significantly higher than those found on public lands, unless adjacent to major freeways or highways. The types of noises from use of routes on public lands in the West Mojave planning area are generally intermittent noises created by the passage of single vehicles or vehicles in small groups on an irregular and infrequent basis. Higher levels or frequencies of intermittent noise are present along arterial routes and routes used for organized activities, particularly adjacent to start and staging areas on weekends in OHV Open Areas. Organized events can result in modestly higher noise levels along popular routes outside of Open Areas, as well as on the arterial access roads to OHV Areas before and after the events.

3.12.1 General Information on Noise

Noise is defined as unwanted sound. The Environmental Protection Agency (EPA, 40CFR205.166) has set noise emissions standards for many types of sources, under the Noise Control Act (1972). Noise can be described in terms of three variables: amplitude (loud or soft), frequency (pitch), and time pattern (variability), and its potential effects can be described in terms of a noise generating source, a propagation path, and a receiver (FTA 2006). The ambient sound level of a region is defined by the total noise generated within the specific environment and is usually composed of sound emanating from natural sources such as birds and wind blowing through leaves, and from human activities, including traffic on roads and highways. Ambient sound levels vary with time of day, wind speed and direction, and level of human activity. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location. Ambient noise levels will generally vary across a region. Because traffic on roads constitutes a substantial part of ambient noise levels, the ambient noise levels will generally be higher in close proximity to major transportation arteries such as urban centers and Interstate highways, and lower in undeveloped and remote areas.

Noise is defined as unwanted sound that exceeds the ambient level. Noise can be described in terms of three variables: amplitude (loud or soft), frequency (pitch), and time pattern (variability), and its potential effects can be described in terms of a noise generating source, a propagation path, and a receptor (FTA 2006). Excessive noise exposure has been shown to cause interference with human activities at home, work, or recreation; community annoyance, hearing loss, and affect people’s health and well-being. Even though hearing loss is the most clearly measurable health hazard, noise is also linked to other psychological, sociological, physiological, and economical effects, either temporary or permanent (EPA 1974).

Potential human annoyance and health effects associated with noise may vary depending on factors such as: (1) the difference between the new noise and the existing ambient noise levels; (2) the presence of tonal noise, noticeable or discrete continuous sounds, such as hums, hisses, screeches, or drones; (3) low frequency noise (frequency range of 8 to 1,000 Hertz [Hz]); (4)

intermittent or periodic sounds, such as a single vehicle passing by, backup alarms, or machinery that operates in cycles; and (5) impulsive sounds from impacts or explosions (Brüel and Kjaer 2000). In some cases, noise can also disrupt the normal behavior of wildlife. Although the severity of the effects varies depending on the species being studied and other conditions, research has found that wildlife can suffer adverse physiological and behavioral changes from intrusive sounds and other human disturbances (NPS 2012).

With respect to the transportation network in the WEMO Planning area, the types of noises from use of routes on public lands are generally intermittent noises created by the passage of single vehicles or vehicles in small groups on an irregular and infrequent basis. In developed areas or areas near major highways that have higher ambient noise levels, the additional noise created by these vehicles is expected to have little or no adverse impact. However, in remote areas with low ambient noise levels, the additional noise may have an adverse impact on wildlife or sensitive receptors. This can especially be the case where routes used for organized activities create greater use levels, and therefore greater noise impacts, even if these impacts are only intermittent.

3.12.2 Noise Measurement

To describe environmental noise and to assess impacts on areas sensitive to community noise, a frequency weighting measure that simulates human perception is customarily used. The frequency weighting scale known as A-weighting best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. In general, a difference of more than 3 dBA is a perceptible change in environmental noise, while a 5 dBA difference typically causes a change in community reaction. An increase of 10 dBA is perceived by people as a doubling of loudness, and almost certainly causes an adverse community response. Noise containing discrete tones (tonal noise) is much more noticeable and more annoying at the same relative loudness level than other types of noise, because it stands out against background noise (BLM 2005).

Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. Therefore, the cumulative noise level from two or more sources will combine logarithmically, rather than linearly (i.e., simple addition). For example, if two identical noise sources produce a noise level of 50 dBA each, the combined noise level would be 53 dBA, not 100 dBA.

The predominant rating scales for noise impacts to human communities in the State of California are the equivalent continuous sound level (Leq) and Community Noise Equivalent (CNEL) based on A-weighted decibels (dBA). Leq is the total sound energy of time-varying noise over a sample period. CNEL is the time-varying noise over a 24-hour period, with a weighting factor of 5 dBA applied to the hourly Leq for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and with a weighting factor of 10 dBA from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). The noise adjustments are added to the ambient noise levels occurring during the more sensitive hours. Day-night average noise (Ldn) is similar to the CNEL but without the adjustment for nighttime noise events. CNEL and Ldn are normally exchangeable and within 1 dB of each other. Other noise-rating scales used to assess an annoyance factor include the maximum instantaneous noise level, or Lmax, and percentile noise exceedance levels, or LN.

Lmax is the highest exponential time-averaged sound level that occurs during a stated time period. It reflects peak operating conditions and addresses the annoying aspects of intermittent noise. LN is the noise level that is exceeded "N" percent of the time during a specified time period. For example, the L10 noise level represents the noise level exceeded 10 percent of the time during a stated period. The L90 noise level represents the noise level exceeded 90 percent of the time and is considered the lowest noise level experienced during a monitoring period. It is normally referred to as the background noise level.

Community noise levels are closely related to the intensity of human activity and land use. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In wilderness areas, the Ldn noise levels can be below 35 dBA. In small towns or wooded and lightly used residential areas, the Ldn is more likely to be around 50 or 60 dBA. Levels around 75 dBA are more common in busy urban areas (e.g., downtown Los Angeles), and levels up to 85 dBA occur near major freeways and airports. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be adverse to public health.

The surrounding land uses dictate what noise levels would be considered acceptable or unacceptable. Most of the surrounding land use within close proximity to transportation routes in the WEMO Planning area is rural.

3.12.3 Typical Sound Levels

People experience a wide range of sounds in the environment. Table 3.12-1 shows the relative A-weighted noise levels of common sounds measured in the environment and industry for various sound levels, including transportation sources. Excessive noise cannot only be undesirable but may also cause physical and/or psychological damage. The amount of annoyance or damage caused by noise is dependent primarily upon the amount and nature of the noise, the amount of ambient noise present before the intruding noise, and the activity of the person working or living in the area. Environmental and community noise levels rarely are of sufficient intensity to cause irreversible hearing damage, but disruptive environmental noise can interfere with speech and other communication and be a major source of annoyance by disturbing sleep, rest, and relaxation.

Table 3.12-1. Typical Sound Levels Measured in the Environment and Industry

Noise source at a given distance[1]	A-Weighted Sound Level (dBA)	Noise Environments	Qualitative Description
Carrier deck jet operation	140	Carrier flight deck	Painfully loud
Civil defense siren (100 feet)	130		
Jet takeoff (200 feet)	120		Threshold of pain
Military jets (200-500 ft) flying through the sound barrier	110-120	Rural open space	
Loud rock music	110	Rock music concert	
Diesel Train (50 ft)	105	Rural open space	Very loud / very annoying
Pile driver (50 feet)	100		
Ambulance siren (100 feet)	90	Boiler room	

Table 3.12-1. Typical Sound Levels Measured in the Environment and Industry

Noise source at a given distance[1]	A-Weighted Sound Level (dBA)	Noise Environments	Qualitative Description
Dirt Bike[2]	86-96	Dirt Bike	Annoying
Motorcycle (50 feet)[3]	80	California State Standard for post-1985 motorcycles	
Pneumatic drill (50 feet)	80	Noisy restaurant	
Motorcycle (25 feet)	80	Rural open space	
Freeway traffic (50 feet)	70		Intrusive / Moderately loud
Air conditioning unit (20 feet)	60	Data processing center	
Typical Conversation	60	Average Living Room	
Single auto	60	Rural open space	
Light auto traffic (100 feet); rainfall	50	Private business office	
Bird calls	40	Average living room library	Quiet
Soft whisper (5 feet); rustling leaves	30	Quiet bedroom	Very Quiet
Broadcasting/Recording studio	20		
Normal breathing	10		Threshold of hearing

(1) Source is California Energy Commission 2008, except where otherwise noted.
(2) Source is Dirt Bike Rider 2009
(3) Source is California Code 27202; Realistic Bomber Training Initiative Final EIS, Appendix G. 2000. Dept of Defense, USAF Air Combat Command.

Sound is generally propagated by spherical spreading according to the “inverse square law”. For noise, the sound energy decreases with the square of the distance. As such, the sound pressure level would be reduced by 6 dB per doubling of distance from a ground-level stationary or point source. For a noise source which is relatively long, such as a constant stream of highway traffic (line source), the sound pressure spreads at a rate of 3 dB per doubling of distance. The drop-off rate also varies with both terrain conditions and the presence of obstructions in the sound propagation path. At very large distances, beyond several hundred feet (ft), wind and temperature gradients influence sound propagation. Changes in noise levels due to wind are generally short-term without persistent directional winds, where some hours may be a decibel or two louder than others within the margin of precision of such an assessment.

Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less. Areas with full-time human occupation that are subject to nighttime noise are often considered objectionable because of the likelihood of disrupting sleep. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (EPA 1974).

3.12.4 WEMO Planning Area Ambient Noise Conditions

Noise Sources

Generally, transportation-related noise sources, including road traffic, railroads, and aircraft, characterize the ambient noise environment of the Planning area (SCAG 2003). The magnitude of noise generated by a given roadway depends upon the overall traffic volume, fleet mix (particularly the percentage of trucks), and average vehicle speed. According to a noise study conducted in 2003 by SCAG on road segments with the highest traffic noise levels in the region (based on data on daily traffic volumes), maximum noise levels (Ldn) in roadways in Southern California, such as the Interstate 15, ranged from 61.5 to 78.1 dBA (SCAG 2003). In addition, on arterial roadways with typical daily traffic volumes of 10,000 to 40,000 vehicle trips, noise levels typically range from Ldn 65 to 70 dB at 50 feet from the roadway centerlines. The two major freeways and a handful of highways through the planning area do experience a continuous or near-continuous stream of traffic and associated noise levels, which may fluctuate with diurnal and nocturnal cycles. Other, major projects, during construction periods can last anywhere from days to months, and experience diurnal noise levels that may be substantial and continuous.

Most public lands in the planning area are rural and are subject primarily to much lower levels of background noise interrupted by intermittent natural and human-caused noises. Noise in rural areas varies considerably over the course of a day or throughout the year. This noise level variation makes it difficult to accurately determine background noise levels, levels that include natural but not human-caused sounds. Background noise levels in wilderness areas or very rural areas typically range between 35 and 45 dBA (Ldn) (Department of State 2007). The majority of the OHV use would be located in rural areas where there are few other existing human-caused noise sources. However, these areas also have fewer sensitive receptors in the planning area.

Due to the extent and nature of adjacent military uses in the West Mojave, one intermittent source of loud noise on public lands is from overflights of military aircraft; another is from training activities on adjacent military lands. Hunters utilize high-pitched whistles directed at specific targeted bird species that may disrupt other species. Land uses on public lands tend to generate substantially less noise during operation activities than during construction, and operational noises are limited in extent and localized in nature. Some maintenance activities may result in loud, but very infrequent noises.

The most regular, another consistent, intermittent noise source on public lands is from motor vehicles and trains. Motorcycles are the primary source of loud intermittent transportation-related noise off of highways and major arteries throughout the planning area. The Environmental Protection Agency (EPA, 40CFR205, 1980) under the Noise Control Act set noise emissions standards for large truck and motorcycle exhaust systems to manage their noise levels. The standard for street-legal exhaust noise emissions is 80 dB(a). All motorcycles manufactured after 1985 must operate at 80 dBA or lower. Since 1990, noise levels from motorcycle dirt bikes have decreased from 96 to 88 decibels.

A major issue on public lands is the illegal modification of motorcycle exhaust and muffler systems that can substantially increase noise levels above legal standards. There is currently no legally acceptable way for a law enforcement officer to measure noise emission upon stopping a vehicle. Testing must be conducted through a complex and expensive controlled-setting

procedure, as identified in EPA regulations (40 CFR205, App. I, Subpart D). Testing procedures are currently under reconsideration to address this issue.[4]

Railroad operations generate high, relatively brief, intermittent noise events. These noise events are an environmental concern for sensitive uses located along rail lines and in the vicinities of switching yards. Locomotive engines and the interaction of steel wheels and rails primarily generate rail noise. The latter source creates three types of noise: (1) rolling noise due to continuous rolling contact; (2) impact noise when a wheel encounters a rail joint, turnout, or crossover; and (3) squeal generated by friction on tight curves. For very high speed rail vehicles, air turbulence can be a significant source of noise as well. In addition, use of air horns and crossing bell gates contribute to noise levels in the vicinity of grade crossings (SCAG 2003).

These ambient noise levels associated with traffic and railroads are expected to be limited to areas near these major transportation arteries, and are likely not applicable to most of the planning area. Most of the public land in the area is relatively remote from these noise sources, and would be expected to exhibit ambient noise levels that are more characteristic of rural areas.. The majority of the OHV use would be located in these rural areas where there are few existing noise sources. These areas would also be expected to have fewer sensitive human receptors, but may also have a larger number of wildlife receptors.

Military and commercial aircraft also incrementally contribute to existing ambient, and these noises would occur in both developed and rural areas of the Planning area. Aircraft noise generates occasional, but intrusive noise levels for the occupants of property adjacent to airports and/or under the flight patterns of aircraft using airports (San Bernardino General Plan 2007). There are 12 commercial airports within the planning area, including large jet operations at Mojave Airport and the Southern California Logistics Airport. Military aircraft operations occur at Edwards Air Force Base, Twentynine Palms Marina Corps Base, and China Lake. Military operations result not only in ambient noise from jet engines, but sonic booms associated with military and experimental aircraft. A literature synthesis of the effects of aircraft noise on wildlife summarized numerous experimental studies in which sonic booms were simulated (USFWS and USAF 1988), and the simulations ranged from 72 to 156 db in magnitude.

OHV manufacturers have made huge strides in improving their vehicles to minimize excessive noise. Since 1990, noise levels from motorcycle dirt bikes have decreased from 96 to 88 decibels. Noise reduction can be accomplished by utilizing specific design and construction techniques in OHV areas, through careful trail planning and construction of berms to impede or dissipate sound. Further technological innovations are being made to reduce noise, and air, pollution. At the same time, some individual users have deliberately modified the exhaust systems of their vehicles in order to increase their noise level, a practice which was addressed in California Senate Bill (SB) 435, or Motorcycle Anti-Tampering Act.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others due to the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, natural areas, parks, and outdoor recreation areas are

[4] *Noisy Motorcycles, a Quality of Life Issue, August 25, 2013. Institute of Noise Control Engineers and Noise Control Foundation Roundtable Report.*

generally more sensitive to noise than are commercial and industrial land uses. Consequently, the noise standards for sensitive land uses are more stringent than those for less sensitive uses, such as commercial and industrial (SCAG 2003).

Certain human activities and sensitive land uses (e.g., residences, schools, and hospitals) generally require lower noise levels. A noise level of Ldn 55 to 60 dB on the exterior is the upper limit for speech communication to occur inside a typical home. In addition, social surveys and case studies have shown that complaints and community annoyance in residential areas begin to occur at Ldn 55 dB (SCAG 2003).

For purposes of impact analysis among route network alternatives, BLM compared the proximity of motorized routes to sensitive receptors and residences. Sensitive receptors were defined as schools and health facilities. The number of sensitive receptors within the WEMO Planning area is presented in Table 3.12-2.

Table 3.12-2. Sensitive Receptors in WEMO Planning Area

Type of Sensitive Receptor	Within ¼ miles of a Route	Within 1 mile of a Route
Public School	12	43
Private School	0	6
Colleges	1	4
Health Facilities	0	7

In the impact analysis in Chapter 4, BLM identified the mileage of motorized routes within various distances of these receptors. The distances evaluated were 0.25 and 1.0 miles from the receptors.

To estimate the impacts to residences, BLM used the “developed area” layer of the vegetation database as a surrogate for areas where residences exist. In the analysis is Chapter 4, mileage of routes within 300 feet of the developed areas was used as a conservative assessment of the potential for noise impacts to residents.

Wildlife Receptors

Noise from motorized vehicles can affect wildlife by altering movement patterns, causing behavioral changes, and causing stress. The sensitivities of various groups of wildlife to noise varies substantially, and may be affected by ambient conditions as well as season. FHWA, in its study of traffic noise and wildlife (http://www.fhwa.dot.gov/environment/noise/noise_effect_on_wildlife/effects/wild04.cfm), summarized the following relative sensitivities:

- Humans 20Hz to 20kHz; sensitivity at 10-20 dB
- Mammals < 10 Hz to 150 kHz ; sensitivity to -20 dB
- Birds (more uniform than mammals) 100 Hz to 8-10 kHz; sensitivity at 0-10 dB
- Reptiles (poorer than birds) 50 Hz to 2 kHz; sensitivity at 40-50 dB
- Amphibians 100 Hz to 2 kHz; sensitivity from 10-60 dB

In its review of the effect of aircraft noise the authors identify a number of at least potentially, deleterious effects that accompany these sound levels in both domestic and wild species ranging from alert reactions to physiological indicators of stress (e.g. changes in hormonal levels, organ function, etc.). It should be noted that noise levels in these studies are generally intermittent and occur at levels greater than that typically encountered for road or motorcycle traffic (i.e. aircraft sounds generally > 100 dB).

A study conducted by Bowles et al. (1999) showed very little behavioral or physiological effect on desert tortoises of loud noises that simulated jet over flights and sonic booms. They also demonstrated that tortoise hearing is fairly sensitive (mean = 34 dB SPL) and was most sensitive to sounds between 125 and 750 Hz, well within the range of the fundamental frequency of most of their vocalizations. The authors concluded that tortoises probably could tolerate occasional exposure to sonic boom level sounds (140 dB SPL), but some may suffer permanent hearing loss from repeated longterm exposure to loud sounds such as from OHV and construction blasts. Boarman (2002) also indicated noise or vibration might affect tortoises that live alongside railroads, but found there were no studies to document the impact. He concluded, it is not known if train noise negatively affects the behavior, audition, or reproductive success of these tortoises.

3.12.5 Noise Regulations and Standards

Ambient noise standards are maintained at the Federal, state, and local levels. In 1974, the U.S. Environmental Protection Agency (EPA) published "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety" (USEPA 550/9-74-004). This document provides information for state and local agencies to use in developing their ambient noise standards to assist state and local government entities in development of state and local ordinances, regulations, and standards for noise (Department of State 2007).

Federal

Noise and land use guidelines have been produced by a number of federal agencies including the Federal Highway Administration, the EPA, the Department of Housing and Urban Development, and the American National Standards Institute. These guidelines are all based upon statistical noise criteria such as Leq, Ldn or CNEL.

The EPA "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety" identified outdoor and indoor noise levels to protect public health and assets (Table 3.12-3). A Leq (24) of 70 dB was identified as the level of environmental noise that would prevent any measurable hearing loss over a lifetime. An Ldn of 55 dBA outdoors and 45 dBA indoors were identified as noise thresholds that would prevent activity interference or annoyance (Department of State 2007).

Table 3.12-3. EPA Noise Control Guidelines

Use	Measure	Indoor activity interference (dBA)	Hearing loss consideration (dBA)[b]	To protect against both effects (dBA)[c]	Outdoor activity interference (dBA)	Hearing Loss consideration (dBA)[b]	To protect against both effects (dBA)[c]
Residential with Outside Space	Ldn Leq(24)	45	70	45	55	70	55
Residential with No Outside Space	Ldn Leq(24)	45	70	45			
Commercial	Leq(24)	[a]	70	70[d]	[a]	70	70[d]
Inside Transportation	Leq(24)	[a]	70	[a]			
Industrial	Leq(24)	[a]	70	70[d]	[a]	70	70[d]
Hospitals	Ldn Leq(24)	45	70	45	55	70	55
Educational	Ldn Leq(24)	45	70	45	55	70	55
Recreational Area	Leq(24)	[a]	70	70[d]	[a]	70	70[d]
Farm Land and General Unpopulated Land	Leq(24)				[a]	70	70[d]

Source: City of Rialto 1992

Notes:

[a] Since different types of activities appear to be associated with different levels, identification of a maximum level for activity interference may be difficult except in those circumstances where speech communication is a critical activity.

[b] Level of hearing loss is defined as the exposure period which results in hearing loss at the identified level is a period of 40 years.

[c] Based on lowest level

[d] Based on hearing loss

A Leq of 75 dBA during 8 hours may be identified in these situations so long as the exposure over the remaining 16 hours per day is low enough to result in a negligible contribution to the 24-hour average.

EPA has regulations that are specific to motor vehicle and motorcycle noise emissions. These regulations apply to motorcycles manufactured after 1982, except for motorcycles designed for closed-course competition only. Under 40 CFR Part 205, both street and off-road motorcycles manufactured after 1986 meet a noise standard of 80 dB, and must be labeled to indicate compliance with the standard.

State

California Government Code section 65302(f) encourages each local governmental entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure.

The California Department of Health Services has established the Office of Noise Control, which has prepared studies associated with noise levels and their effects on various land uses. Based upon these studies, the State has established interior and exterior noise standards by land use category and standards for the compatibility of various land uses and noise levels (Table 3.12.-4). In addition, noise limits for highway vehicles are regulated under the California Vehicle Code, §§23130 and 23130.5. The limits are enforceable on the highways by the California Highway Patrol and the County Sheriff's Office.

Motorcycles registered in the state that are manufactured on or after 2013 or have an aftermarket exhaust system manufactured on or after 2013 must have the federal EPA noise emission label affixed to it in order to be operated, used, or parked in the state.

Table 3.12-4. Noise/Land Use Compatibility Matrix for Community Noise Environments

Land Use Category	Community Noise Exposure Level (CNEL, dBA)						
	50	55	60	65	70	75	80
Residential – Low density single-family, duplex, and mobile homes							
Residential – Multi-family							
Transient Lodging – Hotels, motels							
Schools, Libraries, Churches, Hospitals, Nursing homes							
Auditoriums, Concert halls, Amphitheaters							
Sport arenas, Outdoor spectator sports, amusement parks							
Playgrounds, neighborhood parks							
Golf courses, riding stables, Cemeteries							
Office and Professional Buildings, Retail Commercial, Banks, Restaurants							

Table 3.12-4. Noise/Land Use Compatibility Matrix for Community Noise Environments

Land Use Category	Community Noise Exposure Level (CNEL, dBA)						
Industrial, Manufacturing, Utilities, Service Stations, Warehousing, Agriculture							

Source: State of California Office of Noise Control, Department of Health Services 1976

Normally acceptable: Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Conditionally acceptable: New construction or development should be undertaken only after a detailed analysis of the noise requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air systems or air conditioning, normally suffices.

Normally unacceptable: New construction or development should generally be discouraged. If it does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly unacceptable: New construction or development should generally not be undertaken.

3.13 Travel and Transportation Management Network

Two of the BLM's greatest management challenges are providing reasonable and varied routes for access to public lands and providing areas for a variety of motorized and non-motorized recreation. The various landscapes, user interests, equipment options, weather conditions, transportation infrastructure, and resource constraints all must be considered. Travel and transportation are an integral part of virtually every activity that occurs on public lands, including recreation, livestock and wildlife management, commodity resources management, ROWs to private inholdings, and public land management and monitoring. Comprehensive Travel and Transportation Management (TTM) is the planning, management, and administration of motorized and non-motorized roads, primitive roads, and trails to ensure that public access, natural resources, and regulatory needs are considered.

Comprehensive travel management planning should address all resource use aspects, such as recreational, traditional, casual, agricultural, commercial, and educational, and accompanying modes and conditions of travel on public lands, not just motorized or off-highway vehicle (OHV) activities.

3.13.1 Relationship to Other Plan Elements

There is considerable overlap of travel management and all BLM uses on public lands. For example, many users of public lands are there for recreation. For visitors, a route system may serve as either a route to a destination or as the recreation location itself. For destination recreation, vehicle routes are the means to get to a starting point to engage in the activity, such as a parking area or trailhead. The route itself also can serve as the focus of the activity, (e.g., pleasure driving, four-wheel vehicle driving, motorcycling, all-terrain vehicle (ATV; see definition below) riding, biking, horseback riding, hiking, snowmobiling, and cross-country skiing). To reduce the duplication of narrative between travel management and the other sections of this Supplemental EIS, this section addresses only public travel and access concerns; discussion of how other resource programs use the BLM's transportation system are found in those programs' respective sections.

For the purposes of land use planning, Comprehensive TTM can be considered as two basic components, the designation of OHV Areas and the designation of individual routes. OHV Area designations represent the land use planning level decisions and can only be modified though a land use plan amendment or revision. The route designations are considered implementation level actions and occur in unison with many site-specific actions and projects. Route designations are presented in this plan amendment to establish a baseline upon which subsequent site specific activities can work from. The travel network resulting from the route designations should be viewed as dynamic, with changes and modifications occurring with new authorizations throughout the life of the plan.

3.13.2 Modes of Travel and Access Points

3.13.2.1 Transportation Methods

Traditionally, the BLM's travel management program focused primarily on motor vehicle use. Within the framework of Comprehensive TTM, this program is significantly expanded to

encompass all forms of travel, including travel by foot, horseback and other livestock, mechanized vehicles (such as bicycles), motorized vehicles (such as two-wheeled motorcycles and four-wheeled OHVs, cars, and trucks), and motorized and nonmotorized boats. Mode of travel refers to the mechanisms used to move across the land. It is broadly defined in three categories, those that use motors, those using some mechanical method and those reliant only on the movements of the human (or animal) bodies. Examples are provided below.

Motorized Travel—Motorized travel includes standard passenger vehicles on maintained roads and OHVs on primitive roads and trails. OHVs include off-road motorcycles, ATVs, jeeps, specialized 4x4 trucks, and snowmobiles.

Mechanized Travel—Mechanized vehicles primarily include mountain bikes and specialized equipment such as mountain skateboards.

Non-mechanized Travel—Non-mechanized modes of travel include cross-country skiing, snowshoeing, horseback riding, pack animal driving, hiking, boating, hang-gliding, paragliding, and ballooning.

Transportation methods in the West Mojave are not unlike those of other communities. The movement of humans and agricultural and industrial products in and out of the planning area is provided by a variety of systems associated with smaller urban centers and rural areas. The planning area serves as a major transportation corridor taking goods and people in and out of the Los Angeles and Kern County metropolitan areas. With the completion of the Alameda Corridor rail line, the movement of goods is expected to continue to increase. Relatively inexpensive housing and the rural lifestyle of the planning area make commuting into the more populated coastal area attractive for many residents. This trend is expected to continue with the large increase in population that is expected. The planning area has a number of different means of transportation and these systems have been developed to connect farm/industrial/commercial centers to cities, and cities to communities within the County and State, and in other states and other nations.

3.13.2.1.1 Motorized Travel

Automobile, truck, and motorcycle traffic can use the varied network of roads and highways developed by the State and Counties. This mode of transportation is by far the most used system in the planning area, with roadways under State, County, service area, and private entity control. In addition to the movement of goods by rail, the planning area is a major corridor for the movement of goods by truck, again connecting Southern California to the rest of the United States. Caltrans, the Counties of Inyo, Kern, Los Angeles, and San Bernardino, and each incorporated community, manage motor vehicle systems in the planning area. The counties maintain many of the roadways within cities by contract.

The increase in the use of motorized vehicles has created several issues on public lands in the planning area. First, the increasing capability of motorized vehicles to traverse difficult terrain allows easier access to remote parts of the planning area, thereby increasing the likelihood of impacts on otherwise protected resources. Second, as the popularity of recreational OHV use continues to grow, there can be conflicts with other public land users. Lastly, the expansion of unauthorized cross-country OHV use is creating additional resource damage in the planning area. The route system within the planning area is widely scattered and disconnected; many BLM parcels within the planning area have little or no legal or physical access. Routes in the planning

area have been created and improved by trail and trailhead building, increased administrative access, energy development, and various ROWs. Over the years, many of these routes have also become part of the roads and trail system frequently used by visitors who are engaged in mechanized and motorized recreation. In addition, due to conditions in the desert, a single rider going off trail can develop a new route that remains on the ground for a substantial period of time. Livestock grazing operations also depend on the current route network for access within grazing allotments and access to range improvements. Because livestock grazing operations have decreased overall within the planning area, the dependency on the route network has also decreased.

The management of motorized activities within the planning area includes monitoring and maintaining trails, maintaining a database of use, ongoing training for OHV-related issues, issuing citations and warnings for violations, and coordinating with user groups, local officials, and other agencies.

State System - California Department of Transportation (Caltrans)

The State of California has established a series of state-constructed and maintained routes in accordance with the Street & Highway Code, Art. 3, Sec. 300 et.seq. State roadways in the planning area consist of Interstate freeways, freeways, expressways, highways and surface streets. For more than 100 years, Caltrans and its predecessors have been responsible for designing, building, operating and maintaining the California state highway system. Over time, as the population of California has increased, Caltrans' role has expanded to include rail and mass transit systems. In addition to a changing mix of transportation modes, such as highways, rail, mass transit and aeronautics, Caltrans professionals must consider the integration of various transit issues with land use, environmental standards, and the formation of partnerships between private industry and local, state and federal agencies.

Caltrans operates and maintains 15,000 miles of roadways included in the State Highway System with a budget of over $10 billion (Caltrans 2012). Caltrans is also responsible for ensuring proper distribution of the State Transportation Improvement Program.

Mass Transit

Mass transit and rapid transit systems in the planning area are limited to more conventional modes, specifically bus. There are many sources of bus public transit within the planning area. The largest providers in the area include:

- Victor Valley Transit Authority: The Victor Valley Transit Authority (VVTA) serves the cities of Adelanto, Hesperia and Victorville; the Town of Apple Valley; and the unincorporated communities of Phelan, Wrightwood, Pinon Hills, and Helendale. This transit system carries more than a million passengers annually. Service includes standard bus operations, plus curb-to-curb service for disabled persons.
- Morongo Basin Transit Authority: The Morongo Basin Transit Authority transports nearly 143,000 passengers each year in the City of Twentynine Palms, Town of Yucca Valley, and the unincorporated communities of Joshua Tree, Landers, Flamingo Heights, and Yucca Mesa.

- Barstow Area Transport: The City of Barstow administers the operation of the Barstow Area Transit, as well as two San Bernardino County-supported specialized services for seniors and persons with disabilities in the communities of Big River and Trona. The system carries more than 144,000 passengers each year.
- Antelope Valley Transit Authority: The Antelope Valley Transit Authority serves the Lancaster/Palmdale area. They provide a variety of services including local and commuter services. The transit system carries more than a million passengers annually.
- Kern Regional Transit (KRT): KRT operates a fleet of 30 vehicles ranging in size from 15 passenger paratransit minibuses to thirty-foot, heavy duty transit buses, with service in excess of 1.2 million miles. The KRT connects Taft, Frazier Park, Lancaster, Mojave, Wasco/Shafter, Delano, California City, Tehachapi, Ridgecrest, Inyokern, and Bakersfield with a ridership of over 450,000 passengers.

Rail

The WEMO Planning area is a major rail corridor for bringing goods in and out of the Southern California ports and metropolitan area. The entire rail network is operated by the private sector with the Southern Pacific and the Burlington Northern – Santa Fe rail systems carrying freight through and beyond the boundaries of the planning area. With the completion of the Alameda Corridor rail line, rail traffic is expected to increase to even higher levels in the future.

Aviation

There are several airports operating in the planning area. These facilities provide opportunities for air traffic and the movement of goods. A wide variety of air flights originate from the region, including small private plane operations, passenger flights and freight movement. In addition to the municipal and community airports, there are several military airfields located within the planning area.

3.13.2.1.2 Mechanized Travel

The climate in the West Mojave is well-suited for bicycle travel at many times of the year. Bikeways exist in most cities and in some unincorporated portions of the planning area. Most bikeways exist as marked lanes on surface streets within the communities. Many of the more recently developed portions of the planning area provide for foot traffic along sidewalks in residential areas while some of the older subdivisions make no provisions for pedestrians. Generally speaking, foot traffic pathways between unincorporated communities are nonexistent.

Mechanized travel, such as mountain biking, is becoming increasingly popular on public lands, and several areas in the WEMO Planning area are considered premium destinations. Throughout the planning area, mechanized use is not limited to designated routes, unless otherwise specified. Mechanized use is primarily occurring on old motorized routes, game trails, and user-created trails, as well as on planned single-track routes. Popular mountain biking areas in the planning area include Juniper Flats, Lucerne Valley, Calico Mountains, Sierras, El Paso Mountains, South Searles, Red Mountain, and the Rademacher Hills. The Rademacher Hills are an area within the Ridgecrest subregion where a Special Recreation Permit has been issued for a competitive mountain bike race for the last few years (2011-13) and was the sight of races for about ten years straight in the 1990s.

3.13.2.1.3 Non-Mechanized Transportation

Hiking and horseback riding have been increasing in popularity within the planning area. The high rate of population growth and sprawl of communities in Southern California, including Los Angeles, Ventura, and Santa Barbara, have subsequently added overflow pressure to public lands in the vicinity.

Hiking, Mountain climbing, and Rock Climbing are all popular forms of Non-mechanized travel. Hiking occurs both cross country and on established pathways. Those pathways used include roads and trails that are currently used by other vehicles, trails that are no longer in use by vehicles, livestock and game trails, plus historic pack and transportation trails. Some of the locations that are currently popular for hiking include Grapevine Canyon, Little Tahiti Falls, Deep Creek, Rainbow Basin, Mitchell Mountain, Sunrise Canyon, Fairview Mountains, Sand Canyon, Short Canyon, Rademacher Hills, Pacific Crest Trail, Fossil Falls, Centennial Canyon, Sacatar Trail, Great Falls Basin, and the Trona Pinnacles.

Another popular activity is hiking to scale a mountain to its highest point/peak often referred to as mountain climbing or peak bagging. Popular mountains to scale in the WEMO Planning area include Cave Mountain, Fremont Peak, Bell Mountain, Quartzite Mountain, Ord Mountain, Owens Peak, Black Mountain, Red Mountain, Chuckawalla Mountains, Butterbredt Peak, and Morris Peak.

The activity of rock climbing in which participants climb up, down or across natural rock formations is gaining popularity on the public lands. Some of the popular locations for people to rock climb include Sawtooth Canyon, Horseman Center, Margaritaville east of Apple Valley, Mule Canyon, Fairview Mountains, Fossil Falls, Five Fingers, School House Rocks, Robbers Roost, Poison Canyon, Great Falls Basin, and Wagon Wheel area.

Horseback riding is common, but dispersed throughout the planning area on trails and roads. No routes have been specifically constructed for equestrian use, but equestrian use occurs on routes that were constructed for other modes of travel. In the planning area, popular horseback riding areas include Mojave Riverbed, Afton Canyon, Juniper Flats, Rattlesnake Canyon, Morongo Valley, Rainbow Basin, Owl Canyon, Calico Mountains, McCloud Flat, Searles Valley, Red Mountain, Rand Mountains, El Paso Mountains, and the Rademacher Hills. In addition to these areas, horseback riding is popular in and around many of the desert communities including Trona, Ridgecrest, Inyokern, Victorville, Hesperia, and Roy Roger's home community of Apple Valley.

The use of horses as part of grazing operations also occurs within the planning area. Because livestock grazing operations have decreased overall within the planning area, the dependency on the use of horses has also decreased; however their use is still key, particularly in grazing allotments which overlap designated wilderness areas.

Corral type facilities have been developed at the Afton Canyon, Rainbow Basin, and Owl Canyon campground group sites.

In addition to casual use the Ridgecrest Field Office annually authorizes about six Special Recreation Permits for equestrian endurance events and long distance tours. The long distance tour takes riders from the community of Ridgecrest all the way to Furnace Creek in Death Valley National Park. While the endurance events challenge the conditioning of horse and rider to see if they can cover from 50 to 100 miles in less than 24 hours. These events occur within the

following subregions Ridgecrest, El Paso, Sierra, Red Mountain, Rand Mountains, and South and North Searles.

3.13.2.2 West Mojave Planning Area Roads

The road system within the planning area is mostly composed of four classifications of roads: major highways, arterials, collectors and local streets. Design, construction, and maintenance of the surface road system is the responsibility of each local jurisdiction's roads department or Caltrans.

The following road standards are left purposefully vague due to the numerous jurisdictions within the planning area. Specific road standards are available from each local jurisdiction.

Major Highways

There are many major roadways that connect this large planning area. Most of the major highways are two to four lane roads with some expanding to eight lanes in the more urban section of the planning area. These roads are state and US routes and are maintained by Caltrans and include:

- State Route 14: This route is classed as a major conventional highway/freeway. It is a north-south route located in Los Angeles County.
- State Route 18: This route is classed as a major conventional highway. It is an east-west route located in the southern portion of the planning area in San Bernardino County, with a short section in Los Angeles County.
- State Route 58: This route is classed as a major conventional highway/freeway. It is an east-west route located in San Bernardino and Kern Counties. This highway has many four-lane sections along its alignment.
- State Route 62: This route is classed as a major conventional highway. It is an east-west route located in San Bernardino County.
- State Route 127: This route is classed as a conventional highway. It is a north-south route located in San Bernardino and Inyo Counties.
- State Route 138: This route is classed as a major conventional highway/expressway. It is an east-west route located in Los Angeles and San Bernardino Counties.
- State Route 178: This route is classed as a conventional highway. It is an east-west route located in Inyo, Kern, and San Bernardino Counties. This highway expands to four lanes through Ridgecrest in the planning area.
- State Route 190: This route is classed as a conventional highway. It is an east-west route located in Inyo County.
- State Route 202: This route is classed as a conventional highway. It is an east-west route located in eastern Kern County.
- State Route 223: This route is classed as a conventional highway. It is an east-west route located in Kern County.

- State Route 247: This route is classed as a conventional highway. It is a north-south route located in San Bernardino County.
- U.S. Route 95: This route is classed as a major conventional highway. It is a north-south route located in eastern San Bernardino County.
- U.S. Route 395: This route is classed as a major conventional highway/expressway. It is a north-south route passing through San Bernardino, Kern, and Inyo Counties.
- Interstate Route 15: This route is classified as a major interstate. It runs northeast through San Bernardino County from the southwest corner of the planning area to the northeast.
- Interstate Route 40: This route is classified as a major interstate. It runs east-west through the southern section of the planning area through San Bernardino County.

Major highways are important to grazing operations with the planning area. Major highways not only connect these rural operations to towns and cities for meeting the needs of the rancher and their families, but also provide access to auction barns and other livestock markets. Major highways are essential for the transportation of sheep from the Bakersfield area out to grazing allotments in the planning area.

Arterials

Arterials are routes with high traffic carrying capacity. An arterial might be defined as a road that is used, designed to be used, or is necessary to carry high volumes of traffic. An arterial, when constructed to its ultimate standard, is typically two lanes of traffic and a parking lane each way separated by a median with additional right-of-way on either side. Access is typically limited in order to minimize potential conflicts. Subdivision standards limit access to two intersecting local streets between arterials and collectors (1/2 mile distance), with no intersection closer than 660 feet to another. Also, developers are usually required to abandon the right of vehicular access from lots adjacent to arterials. Actual listing of arterial locations is too numerous for this document. Arterials are usually within a 110 foot right-of-way and provide a connecting route between population centers and major highways. Arterials may also form the boundaries for neighborhoods. At present, numerous arterial alignments, especially in the rural areas, exist at local street standards (approximately 60-foot right-of-way). It is anticipated that development and traffic demand would result, ultimately, in the widening of these roads.

Collectors

Collectors are the next lower level of traffic carrying capacity. These routes carry lower volumes of traffic than arterials, but more than local streets. Collectors serve as collections for local street systems directing traffic to the arterials. These roads occasionally serve as boundary streets for neighborhoods and as a general rule are located along mid-section lines. The collectors usually have two-travel lanes and a parking lane each way with minimal additional right-of-way. While some residential lots may have access to collectors, it is preferable that access is limited and access to properties is directed to local streets.

Local Streets

Local circulation routes generally provide access directly to abutting properties. Under existing standards, these roadways consist of approximately 40 foot traveled way improved sections and

10-foot parkways on each side. The width of these roads varies a great deal with newer developments usually having wider travel lanes.

3.13.3 Travel and Transportation Inventory Update

The existing baseline inventory of routes is a combination of the 1985 and 1987 inventory, the 2001 and 2002 inventory that was conducted for the 2005 WEMO planning effort, and the inventory update conducted in 2012 and 2013, in support of this plan amendment. This plan amendment supersedes Appendix R of the 2005 EIS.

In 2012 and 2013, BLM updated the inventory of linear features by tracing additional features from USDA's one meter-resolution National Agriculture Imagery Program (NAIP) aerial photography into the Ground Transportation Linear Features (GTLF) geospatial database. The inventory consisted of the West Mojave network (as corrected), which serves as the No Action Alternative, and other linear features that currently exist on the ground, to ensure that all existing features were included in the analysis. Note that this inventory reflects the on-the-ground features existing as of 2013, and thus includes features that were developed after 1980, either as a result of BLM authorizations or through the unauthorized proliferation of routes. It also reflects substantial improvement in technical accuracy—many of the "new" features are simply the result of better photography since 1980 and were not detected at that time. Inventory updates since the 2005 WEMO planning effort have included using aerial imagery to digitize linear features within the WEMO Planning area in an effort to update the baseline inventory to include as many known routes and translinear disturbances as possible. In some areas, OHV crews have identified route locations by using GPS devices.

Off-Highway Vehicle Management Areas

All public lands within the WEMO Planning area are currently designated as either Open to OHVs, Closed to OHVs, or OHV Limited. The Open Areas were shown in Table 3.6-2, in the discussion of recreation. Most of the WEMO Planning area, 73.6 percent, is designated as OHV Limited.

Closed Areas do not allow motorized vehicle travel within the boundaries. Areas designated as Closed within the WEMO Planning area include congressionally designated Wilderness units, land in ACECs and Special Areas where provided for in management plans, and in certain sand dune and dry lakebeds.

Open Areas allow for motor vehicle travel anywhere in the area if the vehicle is operated responsibly in accordance with regulations. Even though within Open Areas vehicle travel is not restricted to a designated route system, sometimes routes are designated within the boundaries to assist the public in navigation through the areas and to locations of public interest. The Open Areas include designated OHV Open Areas (Table 3.6.2) and certain sand dune and dry lakebeds (see CDCA Plan, 1999, p. 78, Table 9.)

Limited Areas allow for motor vehicle travel to occur only on certain "routes of travel," which include roads, ways, trails, and washes, unless as identified on specific dune systems or lakebeds. At a minimum, use is restricted to existing routes of travel. An existing route of travel is a route established before approval of the Desert Plan in 1980, with a minimum width of two feet, showing significant surface evidence of prior vehicle use or for washes, history of prior use. When necessary, other limitations may be stipulated.

Due to higher levels of resource sensitivity vehicle access may be directed toward use on approved routes of travel. Approved routes include primary access routes intended for regular use and for linking desert attractions for the general public as well as secondary access routes intended to meet specific user needs. The Western Mojave Desert Off Road Vehicle Designation Project (2003) along with the 2006 WEMO Plan both reviewed route of travel within the planning areas and established an approved network of routes of travel.

In general the designated routes of travel are available for use by the public by all modes of travel including motorized, mechanized, and non-mechanized. At times as needed to protect and manage resources or to provide a varied recreational experience further limitations maybe placed on the designated routes. Some examples of these further restrictions that maybe implemented include modes of travel, periods of use, and types of user, such as authorized users (e.g., grazing permittees, right-of-way holders) or are limited to administrative access for agency purposes.

3.13.4 Characterization and Trends

Indicators to measure trends in travel management include the size of designated areas for motorized use (e.g., open, limited, or closed), miles of routes and trails in limited use areas, miles of routes and trails where motorized, mechanized, and non-motorized uses are allowed, restricted, or not allowed depending on resource and use considerations.

Demand for OHV use rapidly increased in the 1990s and continued into the first few years of the 2000s (Cordell and others 2008). In 1995, approximately 368,600 OHV and ATV were sold. By 2006, that number had almost tripled to approximately 1,034,966 OHV. Over a 10-year period, the total number of OHV grew from fewer than three million to more than eight million in 2003. Sales from 2004 through 2006 totaled almost 3.25 million vehicles. Assuming at least one million new vehicles were sold in 2007 and that 80 percent of all vehicles are still operable, there would be as many as 9.8 million ATV and off-road motorcycles in the US as of January 1, 2008 (Cordell and others 2008). Since 1980, OHV “green sticker” registrations in California have increased by 108%. Attendance at the State of California’s State Vehicular Recreation Areas (SVRAs) increased from 1985 to 2000 by 52%. Registration of OHVs through the California Department of Motor Vehicles increased from 235,003 in 1980 to a peak of 1,135,919 in 2008.

The sales of OHV peaked in 2008, according to recent figures, and began to drop off with the economic downturn. Since 2008, the number of OHV registrations in California has declined every year to 905,366 in 2013. However, over the long-term, OHV use is expected to continue to increase in the planning area because of its proximity to southern California population centers and other popular recreation destinations, and based on the anticipated growth of populations in the high desert. Non-mechanized and non-motorized use close to urbanizing areas is also expected to grow as population grows. Demand for equestrian, hiking and mountain biking trails is expected to continue to increase on public lands next to all of the municipalities in the planning area, as well as in areas close to major subdivisions outside of incorporated towns.