

Chapter 3–Affected Environment

This chapter describes those physical, biological, social, and economic characteristics of the land, water, and air resources affected by the issues and management concerns within this plan. Much of the material in this chapter summarizes information developed in the *California Desert Conservation Area Plan* (CDCA Plan) and the current Desert Tortoise Management Status in the Northern and Eastern Colorado Desert planning area.

This chapter serves as baseline data for identifying and analyzing the impacts of the four alternatives in the plan. The alternatives are described in Chapter 2, while the effects of these alternatives on the environment are described in Chapter 4. The following material describes the resources affected by this plan.

3.1 Air Quality

Air quality is affected by the amount of contaminants emitted into the atmosphere, topography, and meteorological conditions. In the eastern Colorado Desert, stable atmospheric conditions, low mixing heights, and light winds during evening and morning hours result in contaminants accumulating. In addition, the Los Angeles Air Basin contributes photochemical smog such as ozone (O₃) to most of the planning area through long-distance transport.

The Clean Air Act established National Ambient Air Quality Standards for concentrations and durations of pollutants which may cause adverse health effects. National primary ambient air quality standards define levels of air quality, with an adequate margin of safety, to protect public health. National secondary ambient air quality standards define levels of air quality, with an adequate margin of safety, to protect the public welfare from any known or anticipated adverse effects of pollutants.

Carbon monoxide is produced primarily by incomplete fuel combustion in motor vehicles. The major effects of carbon monoxide occur near its sources (busy streets and freeways). In the planning area, carbon monoxide standards have not been exceeded due to the low levels of traffic and development.

The primary contributor of particulate matter less than 10 microns (PM₁₀) is fugitive dust, occurring both naturally in a desert environment and from human causes such as mining operations, OHV use, and grazing. The latter are largely responsible for excesses of both the national and state PM₁₀ Air Quality Standards within the planning area (see Figure 3-1).

Ozone is produced through a series of chemical reactions. Reactive hydrocarbons and nitric oxides emitted by motor vehicles react to form nitrogen dioxide and other compounds. The formation of nitric oxide and an oxygen atom follows the photodissociation of the nitrogen dioxide by sunlight. The oxygen atom then combines with oxygen molecules to form ozone. Ozone is an irritant of the respiratory system and inhibits proper functioning of the lungs. The primary source of ozone is from the Los Angeles Basin and additionally from traffic throughout the area. Currently all of the NECO Planning area is in non-attainment with both federal and state Ambient Air Quality Standards for ozone (Figure 3-2).



Figure 3-1. State Area Designation, PM10

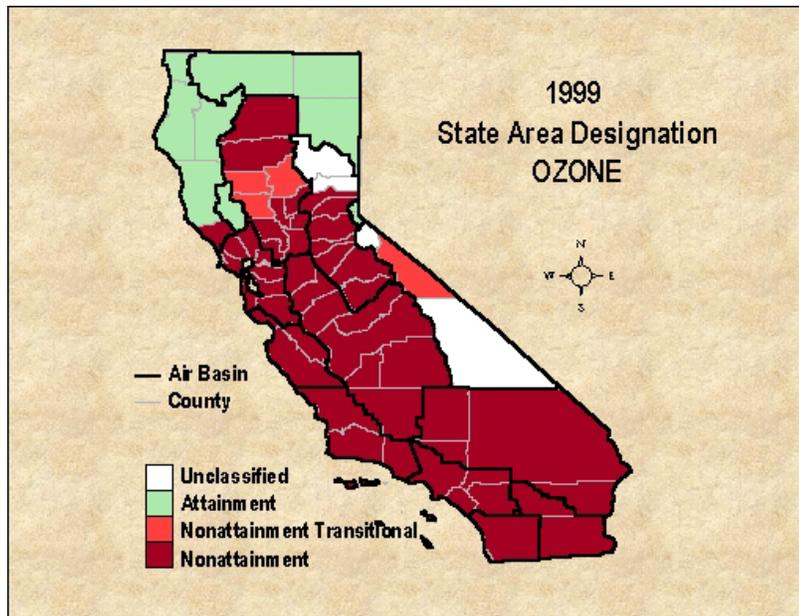


Figure 3-2. State Area Designation, Ozone

Air pollutants have the potential to affect several components of the environments including, but not limited to, humans, wildlife, fish, and vegetation. Air pollutants affect wildlife through inhalation, adsorption and/or ingestion. Populations can be directly affected through injury or death or indirectly through contamination of their food chain or loss of habitat.

Visibility is generally referred to as the relative ease with which objects can be seen through the atmosphere under various conditions. Particulate matter and gases introduced into the atmosphere either absorb or scatter the light, reducing the amount of light a person can receive from a viewed object. Visibility is impaired by dust (especially fine particulates such as PM₁₀) and sulfates. Impact to visibility from pollutants transported from the major urban centers takes the form of widespread regional haze and frequently impairs visibility in the vicinity of Joshua Tree National Park (JTNP).

Local pollution in the desert is primarily particulate matter from off-road vehicles, windblown soil, mining operations, and agricultural activities.

3.2 Water Quality

The planning area contains portions of six watersheds: Havasu-Mohave Lakes, Piute Wash, Southern Mojave, Imperial Reservoir, Southern Mojave, Salton Sea, and the Lower Colorado. There is little information about the water quality in the planning area.

Since there are no perennial streams, wildlife seek out natural springs for water during times of drought and low rain months. Guzzlers (man-made springs) also are used by wildlife. These guzzlers have been designed with an underground vault to catch and store water runoff for wildlife. Washes, springs, and guzzlers are located throughout the planning area with the highest concentration of guzzlers and springs in the mountains and washes distributed throughout the planning area (Map 3-2 Appendix A). Some springs and seeps are susceptible to fecal coliform contamination from livestock grazing, wild horses, burros, and wildlife.

Other water issues include human consumption for agriculture, as in the Coachella Valley and in Blythe, and development demands that require water wells. Human use of water could cause the water table to become lowered in vegetated areas such as Desert Dry Wash Woodland.

The amount and seasonal distribution of precipitation is the most important physical condition in the Sonoran desert. Most parts of the Sonoran desert receive less than 10 inches of rainfall per year. Most of the region's water is taken from the ground or diverted from the Colorado River.

For plants there is a wide difference between rainfall events. The increase in soil moisture content by a brief torrential downpour is much less than that from a gradual rain of the same amount (Shreve, Wiggins 1964). Of particular importance to plants are the number and duration of drought periods, which may be defined as periods without rain or not enough rain to affect the soil moisture. Drought periods lasting 30 to 60 days occur almost every year in the Sonoran desert. Large nonsucculent perennials are able to survive using moisture deep in the soils.

Rainfall during the heavy summer monsoons flows downstream through a system of desert washes. Surface water can occur in bedrock controlled channels (Graf 1988).

3.3 Soil Quality

Two major processes shape the desert landscape: (1) erosion by wind and water and (2) deposition of aeolian or fluvial sediments. Erosion is a natural and important process in the desert. Due to the lack of vegetation in desert systems, erosion is a major cause of changes in land forms. Erosion also affects biostatic processes such as nutrient cycling and biogeochemical cycling in soil and water. Factors affecting temporal and spatial variation in erosion are rainfall, vegetation, soils, and slope.

Erosion by water results in high sediment loads in desert streams. Sediment is derived from direct contributions from slopes and materials from the bed and banks. Large streams tend to carry more of the slope materials, small streams more bed and bank material. Sediments are largely sand and gravel with little silt, clay, or large debris.

Sediment transport in desert streams can reveal much about a stream channel's processes. Particle size, shape, and deposition pattern reflect distance traveled, strength and duration of flood, and volume of water moved. Smaller particles are moved farther than large boulders. Large assemblages of boulders indicate past catastrophic flooding. Deposition of fine particles increases as water moves down valley in desert streams. Infiltration and evaporation increase as sandy substrate and width of wetted channel increase, such that flood peaks and total discharge eventually decrease to zero (Graf 1988).

Sediment that is carried by desert washes and flood plains contribute to the nutrition and moisture content of the soil. In turn, this richer, moister soil supports unique vegetation communities such as dry wash woodlands that support associated fauna such as migrant birds. Map 3-3 Appendix A shows the vegetation coverage with the desert dry woodlands being represented by the light green color.

An example of a landform that has been shaped by water and erosion is desert pavement. The desert pavement surface is generally flat and smooth and lacks fine particles such as sand in its upper layers. Desert pavements originated as stream deposits millions of years ago, perhaps during the Tertiary period (Peel 1960). The surface of these deposits has been leveled and lowered over time by wind and water erosion of finer sediments creating the "pavement" of larger stones on the surface that we see today.

Other landforms that can be found in the planning area are sand-covered alluvial fans, dissected alluvial fans, mountains, hills, pediments, sand dunes, playas, river washes, lava flows, plateaus, and plains (Map 3-4 Appendix A).

3.4 Biological Resources

Biological resources of the NECO Planning Area are described in this section. The section is divided into four main subsections: management tools, special status wildlife, special status plants, and natural community types.

3.4.1 Biological Resources Management Tools

The CDCA Plan outlines management tools available to meet the objectives of managing species and habitats. These tools include the designation of multiple-use classes, designation of Areas of Critical Environmental

Concern (ACECs), Habitat Management Plans (HMPs), and Special Areas (SA). This section describes these designated areas, as well as research and monitoring, desert tortoise management, and bighorn sheep management.

Wilderness Areas, enacted through the Wilderness Act of 1964, can be considered advantageous to species and habitats because the uses are limited to non-motorized and low-impact recreation. The areas are a minimum of five thousand acres, and the management goals of wilderness are consistent with the needs of many species and habitats (see section 3.5 Wilderness Management).

Multiple-Use Classes

Four multiple-use classes (MUC) were developed in the CDCA Plan:

MUC C	Controlled
MUC L	Limited
MUC M	Moderate
MUC I	Intensive

Each describes a different type and level or degree of use which is permitted within that particular geographic area. The multiple-use guidelines were set up to provide for uses in areas that would enhance those inherent values (BLM 1980). In areas with high sensitive, natural, scenic, ecological, or cultural resource values, low intensive use is appropriate to enhance these values. In areas where intensive use such as mining or motor-vehicle recreation was present, an intensive value would be assigned. The classes are detailed in Section 3.8.1.

Areas of Environmental Concern

There are six ACECs (Map 2-4 Appendix A) which are managed for biological resources within the planning area. They include, Bigelow Cholla ACEC, Chuckwalla Bench ACEC, Dos Palmas ACEC, Desert Lily Preserve, Chuckwalla Valley Dune Thicket, and Corn Spring ACEC. The prescriptions applied to an ACEC direct the types of uses and protection that a specific area will have. Although an ACEC might limit uses to benefit a single species such as the desert tortoise or the desert lily, many species that co-exist with these plants or animals also benefit. A good example of this is the Chuckwalla Bench ACEC, which consists of 92,592 acres in southeastern Riverside County. The CDCA Plan designated this ACEC primarily for desert tortoise and big horn sheep in the Chuckwalla Mountains. Many other species such as burro deer and a wide variety of birds have overlapping habitats that are conserved by the ACEC designation.

ACECs have a multiple-use Class L. However, there are exceptions where conflicts or pre-existing uses exist.

Habitat Management Plans

There are five HMPs (Map 2-4 Appendix A) that prescribe management for species and habitats in the planning area. Orocopia HMP, Marble Mountain HMP, Whipple Mountain HMP, and Sheephole Mountain HMP are plans that address big horn sheep and are in wilderness areas. Milpitas HMP is a multi-species habitat management plan located in Imperial County. This 180,800 acre HMP is approximately one third

multiple-use Class M, and the remaining two thirds is Class L. Management objectives include consolidation, protection, and enhancement of wildlife habitat and habitat for plants of special management concern, expansion of habitat used by burro deer and other native wildlife species, consideration of all wildlife species in development and management decisions, and obtaining “good” ecological condition for 70 percent of the HMP.

Proposed HMPs from the CDCA plan that have not been initiated include Fenner/Chemehuevi Valleys, Chemehuevi Wash, Stepladder Mountains, Vidal Wash, Whipple Mountains, Cadiz Dunes, Eagle Mountains, Coxcomb Mountains, Granite Palen Mountains, Rice Valley Dunes, McCoy Wash, Ford Dry Lake, Palo Verde Mountains, and Indian Wash.

The Orocopia Mountains Habitat Management Plan and Chuckwalla Mountains Native Ungulate Habitat Management Plan include management actions addressing needs of burro deer and bighorn sheep. The two plans cover 80,000 and 296,000 acres, respectively (Map 2-4 Appendix A). The Orocopia Mountains HMP proposed five new water developments, improvements to existing springs, tamarisk removal, monitoring, and improved coordination among agencies. The Chuckwalla Mountains Native Ungulate HMP proposed new and improved water developments, improvements to tenajas (natural rock basins), mitigations for mining, reduction of the Ford Dry Lake Allotment (accomplished), and monitoring. These plans were prepared and implemented in cooperation with the California Department of Fish and Game (CDFG).

Research and Monitoring

The CDCA Plan outlined a research and “monitoring system” that would gauge the effectiveness and overall success of wildlife management and the entire plan. Baseline studies and research needs included:

- The impact of approved access routes, particularly in habitats of officially listed species, sensitive species, and raptors;
- Effectiveness of increased surveillance in controlling vandalism;
- Effects of grazing practices on desert bighorn sheep and desert tortoise and their habitats;
- Effects of burro populations and reductions on species such as the desert bighorn sheep;
- Conditions of fish and wildlife water sources, particularly those used by people, livestock, horses and burros, and mining interests;
- Effects of continued vehicle use on wildlife habitats and populations in areas designated as “open” for vehicle free play;
- Condition and trends for officially listed, sensitive, and certain other species; and
- Effectiveness of HMPs and ACECs in stabilizing or improving populations and habitats for officially listed, sensitive, and certain other species and their habitats.

Although the monitoring plan has never been fully developed and implemented, there are individual monitoring and research efforts going on throughout the planning area.

Desert Tortoise Management

Each of the three federal land management agencies (BLM, NPS, USMC) has land use plans or programs that incorporate some type of zoning and special management prescriptions. For the BLM, the land use plan is

the California Desert Conservation Area Plan (BLM 1980). For Joshua Tree National Park (JTNP), there is a General Management Plan (NPS 1999). For the Chocolate Mountains Aerial Gunnery Range (CMAGR) there is a Final Environmental Impact Statement for the Yuma Training Center Complex (USMC 1999). All of these plans address desert tortoise needs to some degree.

In addition, the BLM has a Rangewide Plan entitled *Desert Tortoise Habitat Management on the Public Lands: A Rangewide Plan* (BLM 1988). This plan sets forth a series of 14 management objectives and policies to be implemented on public lands in the range of the desert tortoise. The Rangewide Plan established the Desert Tortoise Management Oversight Group (MOG) consisting of top-level managers from most land management and wildlife agencies in the tortoise range. The Rangewide Plan directed BLM to categorize desert tortoise habitat into three zones reflecting BLM's tortoise management goals.

The BLM also has a Statewide Policy for desert tortoise management; it is entitled *California Statewide Desert Tortoise Management Policy* (BLM 1992). The Statewide Policy established a desert tortoise Category (Map 2-3 Appendix A), which has also been incorporated into the CDCA Plan. BLM has about 1,040,000 acres in Category I habitat and about 211,000 acres in Category II habitat in the NECO Planning Area. BLM's goal in Category I and II habitat is to maintain viable populations of desert tortoise .

In 1994 the U.S. Fish and Wildlife Service (USFWS) designated critical habitat for the desert tortoise Mojave Population (USFWS 1994) (see Map 3-5 Appendix A). At that time Joshua Tree National Monument was not included as critical habitat because USFWS believed that current management policies provided adequate protection for the desert tortoise. Subsequently, the Monument was designated a National Park and was expanded. Hence, it now includes some desert tortoise critical habitat. Table 3-1 shows the total amount of critical habitat and the amount in various ownerships and jurisdictions. Critical habitat encompasses 42 percent of the planning area. Federal agencies are required to conserve critical habitat, and federal agencies and all others must comply with USFWS requirements before disturbing critical habitat.

Table 3-1. Acres and percentages of desert tortoise critical habitat in various federal and state jurisdictions and private ownership

Landowner	Acres in critical habitat	Percent of critical habitat	Percent of planning area
Federal			
BLM	1,275,316	69	25
JTNP	161,691	7	3
CMAGR	186,423	9	3
State			
CDFG	5,776	<1	<1
State Lands Commission	62,762	2	1
Private			
Catellus	132,578	2	1
Metropolitan Water Dist.	10,607	1	<1
Cadiz Land Company	3,526	<1	<1
Other	192,159	9	3
Total Private	338,870	12	4
Total in NECO Planning Area	2,332,960	100	36

Several diseases occur in desert tortoises (Jacobson 1993, Homer et al. 1994, 1996). At least two diseases--upper respiratory tract disease (URTD) and shell disease--and perhaps others are significantly affecting wild populations of desert tortoise. To prevent the spread of disease, the BLM, USFWS, CDFG, and other agencies have developed policies on tortoise handling and relocation of tortoises. USGS and others are conducting research on diseases to determine the pathology and epidemiology of tortoise diseases.

Only about nine tortoises from the planning area have been tested for URTD. Several, including two from JTNP, showed clinical signs of URTD and tested positive for the Mycoplasma causative agent.

Two shell diseases have been identified in the planning area: cutaneous dyskeratosis (Homer et al. 1994, 1996, Jacobson et al. 1994), and shell necrosis (Homer et al. 1994, 1996). The causes of these diseases are not known. Cutaneous dyskeratosis is present in higher frequencies in the planning area than in other areas

of California. It is believed to be associated with population declines in Chuckwalla Bench and Upper Ward Valley (Berry 1988, unpubl.).

Compared to other parts of the state, there are relatively few fires in the planning area and most are small. In the 15 years between 1980 and 1995, a handful of fires burned a total of about 6,000 acres. Of this amount, about 900 acres in the Chemehuevi Critical Habitat Unit and about 11 acres in the Chuckwalla Critical Habitat Unit burned. No fires have been reported from CMAGR in the last 10 years. Most fires in the desert are caused by lightning or vehicles.

BLM and NPS have collaborated in the development of the *Fire Management Activity Plan (FMAP) 1996 for the California Desert*. The FMAP brings together fire management goals for biological resources, wilderness, and other sources and establishes fire management standards and prevention and protection programs. The FMAP includes limitations on fire suppression methods in critical habitat and other tortoise habitat; the limitations are designed to limit habitat disturbance while keeping fires small.

The BLM outlined its desert tortoise *Public Education Plan* in the Statewide Policy (BLM 1992). Much of that plan has been implemented, but some is continuing. The Public Education Plan recognized the contributions of other federal and state agencies and private organizations, such as the Desert Tortoise Council, Desert Tortoise Preserve Committee, and California Turtle and Tortoise Clubs. The plan consists of brochures, slide presentations, public tours, videos, children's printed materials, signs, kiosks, and public forums and conferences.

BLM and JTNP rangers and CDFG wardens conduct an active public contact program informing visitors about the desert tortoise. JTNP provides an education program presented to about 12,000 children per year, and over a million people a year visit the visitor center where there is information about the desert tortoise. The BLM has tortoise educational displays at visitor centers at the Santa Rosa Mountains Visitor Center just outside the NECO Planning Area.

Included in the mitigation measures for all projects in desert tortoise habitat is a worker education program. Workers view a presentation or video describing tortoise ecology and threats, legal status, etc. Aircrews and visitors to CMAGR participate in a similar environmental program.

In 1979 and 1980, the BLM established four population distribution permanent study plots, each one square mile in size, for measuring trends in tortoise populations size and changes in age and size structures. Table 3-2 shows the plot locations and years surveyed. The plots have provided valuable data on general biology and impacts. Survey responsibilities on the plots have been transferred to U.S. Geological Survey (USGS).

Table 3-2. List of desert tortoise permanent study plots in the planning area and the years surveyed using standard protocols.

Study plot name (Plot No.)	Years surveyed
Upper Ward Valley (16)	1980, 87, 91, 95
Chemehuevi Wash (20)	1979, 81, 88, 92, 99
Chuckwalla Bench (23)	1979, 82, 88, 90, 92, 97
Chuckwalla Valley II (26)	1980, 87, 91

In JTNP, one permanent study plot was surveyed in 1978 according to standard protocols. In subsequent years (e.g., 1991-1996) various surveys were done using non-standard methods. About 10 other plots of varying sizes were surveyed on an experimental basis throughout JTNP.

A revised monitoring program using a distance-sampling methodology has been approved by the Desert Tortoise Management Oversight Group (MOG). The new methodology has been initiated on CMAGR, but it has not yet been implemented on other areas due to funding constraints.

Desert Bighorn Sheep Management

There are five BLM/CDFG habitat management plans in the NECO Planning Area that address habitat needs of bighorn sheep (Map 2-4 Appendix A, and Table 3-3). All five plans were prepared and implemented in cooperation with CDFG. The Whipple Mountains HMP prescribed three new water developments and the reintroduction of bighorn sheep. This plan was fully implemented. The Sheephole Mountains HMP prescribed population augmentation and monitoring. This plan has been fully implemented. The Orocopia Mountains HMP prescribed five new water developments, improvements to existing springs, tamarisk removal, monitoring, and improved coordination among agencies. The Chuckwalla Mountains Native Ungulate HMP prescribed new and improved water developments, improvements to tenajas (natural rock basins), militations for mining, reduction of the Ford Dry Lake Allotment (accomplished), and monitoring. The Marble Mountains HMP prescribed one new water development, monitoring, hunting, and coordination. Other HMPs were proposed in the CDCA Plan for bighorn sheep in the Eagle Mountains, Coxcomb Mountains, and Granite/Palen Mountains. These plans will not be prepared because the first two are now largely in JTNP and the last has a low priority for bighorn sheep planning.

Table 3-3. Existing bighorn sheep habitat management plans in the NECO Planning Area

Bighorn sheep HMP (year approved)	Size (ac.)
Whipple Mountains HMP (1982)	64,000
Sheephole Mountains HMP (1984)	6,000
Orocopia Mountains HMP (1986)	80,000
Chuckwalla Mountains Native Ungulate HMP (1989)	296,000
Marble Mountains HMP (1989)	102,000

BLM guidance for management of bighorn sheep throughout its range is contained in *Mountain Sheep Ecosystem Management Strategy (EMS) in the 11 Western States and Alaska* (BLM 1995). For California, eight desert bighorn sheep metapopulations are identified. The NECO Planning Area includes the eastern two thirds and 60 percent of the animals of the Southern Mojave metapopulation and all of the Sonoran metapopulation (Torres *et al.* 1994, 1995). The EMS's aim is to "ensure sufficient habitat quality and quantity to maintain and enhance viable big game [including bighorn sheep] populations, and to sustain identifiable economic and social contributions to the American people." "Viable populations" of bighorn sheep are defined as those having a 99 percent chance of surviving for 30 years. The Strategy presents goals and recommended strategies addressing partnerships, planning, habitat inventory, habitat monitoring, land tenure adjustment, habitat protection, habitat improvement, research, and outreach.

In 1997, BLM and CDFG signed a Memorandum of Understanding (MOU) for Wildlife Management Activities in Wilderness. The purpose was to establish a framework for cooperation and procedures for CDFG maintenance of wildlife facilities, wildlife management activities, and research in BLM wilderness where vehicles and mechanical equipment are needed. These activities in wilderness are authorized specifically by the California Desert Protection Act of 1994 (Sec. 103(f)). The MOU aids in maintaining a strong partnership between BLM, CDFG, and bighorn sheep and deer conservation groups.

Throughout the planning area, numerous artificial waters have been developed, generally at remote, mountainous sites, to stabilize and increase populations of bighorn sheep by providing not only more water but also access to useable forage through nearby water (see proposals and discussion for bighorn sheep in Chapters 2 and 4 and Map 3-1 Appendix A). The work has gone on for decades. The need is created in part by human intrusions on a landscape scale, including development along the Colorado River, barriers to movement created by freeways, and sheep losses to drowning in the Coachella Canal. Almost 80 of these artificial waters are located south of I-10. The designs of these developments include spring boxes, complicated pipe-tanks, windmills-tanks, and modifications of natural tenajas. Some of the waters are highly visible, are old and worn out, and require high maintenance. Nine waters are wells, all of which no longer produce water. Most of these facilities are now located deep into wilderness areas.

Habitat fragmentation and hazards have greatly increased over the years for bighorn sheep throughout the planning area. Prior to the imposition of modern day intrusions (e.g., freeways, canals, farming, various forms of recreation, and tamarisk vegetation along the Colorado River) bighorn sheep were able to range

across the landscape as a common herd. Today interstate freeways (I-10 and I-40) have effectively fragmented and isolated the population into the Sonoran metapopulation and Southern Mojave metapopulation. The Coachella Canal and tamarisk along the Colorado River provide additional artificial conditions. Bighorn sheep will not attempt to penetrate the uniformly dense tamarisk thickets to feed, drink, or migrate. Long stretches of the Canal, which attract bighorn sheep to drink, are unfenced and serve as death traps. Additional developments and permanent and transitory human occupations reduce the occurrence of bighorn sheep movement. Finally, the presence and management of wild burros and some domestic sheep grazing add more stresses through competition for water and forage and possible disease transmission (sheep to sheep). All together, these factors and forces diminish the ability of bighorn sheep to survive on a metapopulation level.

Table 3-4 shows the acres and percent of the occupied range, unoccupied former range, and movement corridor in the four livestock grazing allotments (Map 2-5) in the NECO Planning Area. None of these allotments has an allotment management plan.

Table 3-4. Acres (and percent of area) for three categories of bighorn sheep use in livestock grazing allotments in the NECO Planning Area

Bighorn Sheep Use Categories	Lazy Daisy Cattle	Chemehuevi Cattle	Rice Valley Sheep	Ford Dry Lake Sheep
Occupied Range	125,644 (7)	2,643 (<1)		
Unoccupied Former Range			195 (<1)	
Movement Corridor	105,438 (18)	61,942 (10)		

3.4.2 Wildlife

The desert that makes up the NECO Planning Area is a large and diverse region containing parts of two major deserts and a complex combination of soil, topographic, vegetation, and climatic types. This intermingling across the length and breadth of the planning area has produced a number of major ecosystems, resulting in the species occurrences discussed briefly here. Special status species include the following (see Appendix N for further species information):

Desert bighorn sheep (*Ovis canadensis subspecies nelsoni*)

There are two metapopulations of bighorn sheep in the NECO Planning Area: the Southern Mojave and Sonoran (Map 2-17 Appendix A). Bighorn sheep metapopulations have been fragmented by highways, roads, railroads, and aqueducts. Major barriers to bighorn sheep movements are Interstate 10 and Interstate 40. Bighorn sheep likely do not cross these major interstate highways and apparently do not travel under bridges of these high-traffic-volume highways. The Colorado River Aqueduct is a major barrier in those places where it is above ground.

Within these metapopulations, bighorn sheep occur in small, isolated subpopulations known as demes. There are about nine demes in the Sonoran Metapopulation and about 28 demes in the Southern Mojave Metapopulation (Map 2-17 Appendix A). The size of demes can range from about 10 to 200 individuals, depending on many factors. Specific population trend data for the demes are not available, but some have declined in recent years (Vern Bleich, CDFG, pers. comm.).

Demes consisting of few sheep are more likely to experience extirpation than larger demes. Although the possibility of inbreeding in small demes exists, stochastic events are more likely to influence small populations than are genetic factors. Bighorn sheep move between demes, resulting in gene flow between demes, and provide opportunities for recolonization of vacant or formerly occupied areas. These movements between demes are considered vital to the maintenance of genetic variability necessary to sustain a viable metapopulation (Bleich et al. 1990, Schwartz et al. 1986) and to recolonizing of extirpated demes.

Transportation corridors of Highways 66, 62, 177, 95, and 78, the AT&SF Railroad (parallel to Old Highway 66) and the Eagle Mountain Railroad (scheduled for reactivation) inhibit bighorn sheep movements between demes. Nevertheless, bighorn sheep are known to cross these and other linear features such as transmission lines and fences (Vern Bleich, CDFG, pers. comm.). They even cross broad valleys (Bleich et al. 1990).

Desert bighorn sheep is a BLM California Sensitive Species, a State Fully Protected Species, and a State Game Species.

Burro deer (*Odocoileus hemionus eremicus*)

Burro deer is a subspecies of mule deer found in the Colorado Desert of Southern California (Map 3-7 Appendix A). They are found primarily along the Colorado River and in Desert Wash Woodland communities away from the River. Some burro deer are resident along the Colorado River, but a significant portion move into desert areas in response to water and forage. During the hot summers, water is critical, and deer concentrate along the Colorado River or the Coachella Canal where water developments have been installed and where the microphyll woodland is dense and provides good forage and cover. With late summer thundershowers and cooler temperatures, deer move away from the River and Canal up the larger washes into mountains or wash complexes in the foothills.

Mountain Lion (*Felis concolor*)

In the planning area, mountain lions inhabit primarily the low mountains and extensive microphyll washes in and around Chuckwalla Bench, Chuckwalla Mountains, Chocolate Mountains, Picacho Mountains, Milpitas Wash, Vinagre Wash, and other washes in that area (Map 3-6c Appendix A). Mountain lions generally require extensive areas of riparian or shrubby vegetation interspersed with irregular terrain, rocky outcrops, and community edges.

Within the planning area mountain lions are restricted to the southern Colorado Desert from Joshua Tree National Park south and east to the Colorado River. They are found in very low numbers primarily in the mountains and wash systems in Imperial County. Burro deer, the primary prey, are known to spend the hot summer and fall in riparian areas along the Colorado River and in dense microphyll woodlands near the Coachella Canal. In winter and spring they move up major washes north from the Coachella Canal and west

from the Colorado River. Presumably, mountain lions respond to these movements. It may be that mountain lions in the planning area are merely transient individuals wandering out of other areas and not part of a resident population of mountain lions.

Habitat fragmenting factors, such as Interstate Highways (especially Interstate 10) and aqueducts (especially the Coachella Canal), that affect the distribution and movements of burro deer are probably important to the distribution of mountain lions in the planning area. Deer populations along the Colorado River have declined as tamarisk has replaced native riparian vegetation. Mountain lion numbers have probably declined with this primary prey.

The mountain lion in the planning area is sometimes referred to as Yuma puma (f.c. browni). Under that name it is a State Species of Special Concern.

California leaf-nosed bat (*Macrotus californicus*)

California leaf-nosed bats occur in the deserts of California, southern Nevada, Arizona and south to northwestern Mexico. In California, they are now found primarily in the mountain ranges bordering the Colorado River Basin, with some records occurring as far west as the Eagle Mountains. In California, surveys showed about 20 maternity colonies and about the same number of winter roosts (Map 3-6c Appendix A). The two largest roosts (each sheltering 1500 bats in winter) are in mines in extreme southeastern California.

California leaf-nosed bats occur in lowland desert habitat in California in close proximity to desert wash vegetation. They are dependent on either caves or mines for roosting habitat. All major maternity, mating, and overwintering sites are in mines or caves.

Due to restrictive temperature requirements, California leaf-nosed bats seek out mines that provide roost temperatures of approximately 80°F. In the Colorado River Basin, all known winter roosts are in geothermally heated mine workings, and the areas used by the bats may be over a half-mile underground.

The primary factors responsible for the declines are roost disturbance, the closure of mines for renewed mining and hazard abatement, and the destruction of foraging habitat. The combination of limited distribution, restrictive roosting requirements, and the tendency to form large, but relatively few colonies make this species especially vulnerable.

California leaf-nosed bat is a State Species of Special Concern.

Occult little brown bat (*Myotis lucifugus subspecies occultus*)

Occult little brown bat is a medium-sized myotis that is difficult to distinguish from other *Myotis* species. In California, they are associated with desert riparian vegetation along the Colorado River. Females form large maternity roosts. Although males have been found associated with colonies in late summer, they are not present when the females are rearing a single young. They forage close to water and riparian vegetation, primarily on flies, moths, beetles, and other small flying insects.

They have a relatively limited distribution from the southwestern United States to central Mexico. In California, they are known from only a few localities along the Colorado River between Needles and Yuma (Map 3-6c Appendix A). The only maternity colony in California was located under a bridge near Blythe until 1945 when the bridge was demolished. It was the largest maternity colony ever known for this species. The species has not been seen in California since 1969. Occult little brown bats are probably extirpated from California, even though the species is the most common bat in the U.S.

In addition to destruction of its major roost site in California, the loss of riparian vegetation to agriculture and tamarisk along the Colorado River may also be a factor in the species' decline.

Occult little brown bat is a State Species of Special Concern.

Cave myotis (*Myotis velifer*)

Cave myotises are relatively large bats that occupy desert scrub, desert succulent shrub, microphyll woodland, and desert riparian habitats along the Colorado River (Map 3-6c Appendix A). They roost primarily in caves and mines but have also been found in buildings and under bridges.

Most historic records in California are from abandoned mines in the Riverside Mountains. The mines that once housed these large colonies no longer have them. Up to the 1950's, very large colonies were present in these mines from early April through August. Despite extensive survey work in the planning area over the past 25-30 years, there are currently only two known maternity roosts for cave myotis along the Colorado River: one with approximately 300 animals, and the other about 200. A mine in the Cargo Muchacho Mountains and a mine in the Riverside Mountains have large deposits of cave myotis guano, but surveys in 1993 showed none and few bats, respectively, at these sites.

The loss of extensive native vegetation to agriculture and tamarisk along the Colorado River may explain the dramatic declines of this species in California. The use of pesticides in the agricultural areas could have reduced the prey base and/or poisoned the bats.

Cave myotis is a USFWS Species of Special Concern.

Fringed myotis (*Myotis thysanodes*)

Fringed myotises are widespread in much of the West. They occur irregularly throughout the state, primarily in pinyon-juniper woodlands, coniferous forests, and oak woodlands, except in the Central Valley and the deserts, where they are known from only a few places. In the planning area, only two roosts in the Old Woman Mountains have been found. One of these is a significant maternity roost (Map 3-6d Appendix A).

Closure of mines could disturb the few desert sites known for the species. They are easily disturbed at roosting sites.

Fringed myotis has no special status.

Pallid bat (*Antrozous pallidus*)

Pallid bats are known from Cuba, Mexico, and throughout the southwestern and western United States (Map 3-6b Appendix A). Population trends are not well known, but there are indications of decline. Urbanization, destruction of old buildings, disturbance in caves and old mines, and eradication as a pest are threats to the species.

Pallid bat is a State Species of Special Concern.

Townsend's big-eared bat (*Plecotus townsendii*)

Townsend's big-eared bats are distributed throughout the western United States. Recent surveys show marked population declines for this species in many areas of California (Map 3-6b Appendix A). A combination of restrictive roost requirements and intolerance of roost disturbance or destruction has been primarily responsible for population declines of Townsend's big-eared bats in most areas. The tendency for this species to roost in highly visible clusters on open surfaces near roost entrances makes them highly vulnerable to disturbance. Roost loss in California has usually been linked directly to human activity (e.g., demolition, renewed mining, entrance closure, human-induced fire, renovation, or roost disturbance). The loss of foraging habitat is also a probable factor in declines of populations along the Colorado River, where the native floodplain community has been lost to agriculture and tamarisk infestation.

Townsend's big-eared bat is a State Species of Special Concern.

Pocketed free-tailed bat (*Tadarida femorosaccus*)

Despite only a limited number of records, pocketed free-tailed bats are known to occur in the desert from March through August, when they then migrate out of the area. They have an uneven distribution in the southwestern United States and Mexico. In California, they are found primarily in creosote bush and chaparral habitats in proximity to granite boulders, cliffs, or rocky canyons. Recent observations in California show that this species occurs at only isolated locations in the southern third of the state (Map 3-6b Appendix A).

Rockclimbing and pesticide spraying may be threats, but specific information is lacking.

Pallid bat is a State Species of Special Concern.

Western mastiff bat (*Eumops perotis*)

Historical records for the western mastiff bat were primarily in southern California between the Colorado River to the coast, but populations are now known to occur throughout the state (Map 3-6b Appendix A). Current population trends are not known. They are found in a variety of plant communities, but they roost in cliff faces of granite, sandstone, or basalt.

Potential threats to the roosting and foraging habitat of western mastiff bats include urban expansion, rockclimbing, blasting, vandalism, extermination for pest control, and pesticide spraying. These large, noisy bats are vulnerable to the hysteria which often surrounds bat colonies.

Western mastiff bat is a State Species of Special Concern.

Colorado Valley Woodrat (*Neotoma albigula venusta*)

The range of Colorado Valley woodrat is from southern Nevada, southeastern California, northeastern Baja California, to western Arizona (Map 3-6c Appendix A). Historically, the range of the Colorado Valley woodrat appears to have changed little, even though portions of the range are lost to agriculture and urban development.

Colorado Valley woodrats (California subspecies of White-throated woodrat) are found in a variety of habitats including low desert, pinyon-juniper woodlands, and desert-transition chaparral. Areas such as washes where organic debris gathers are particularly attractive. They are often found where prickly pear cactus and mesquite occur. In rocky areas, they prefer using crevices in boulders for cover and nest sites.

The most important threats are the loss of habitat and reduction in habitat quality by removal of nest material such as cactus and woodland. Habitat quality could be reduced by fires or conversion to exotic annuals.

The Colorado Valley woodrat is a state Species of Special Concern.

Mountain Plover (*Charadrius montanus*)

Mountain plovers do not breed in California, but they winter from northern California south to north-central Mexico and east to central Texas. In California they are found in the Central Valley, Antelope Valley, San Jacinto Valley, Imperial Valley, and Palo Verde Valley (Map 3-6d Appendix A). They begin to arrive on their wintering grounds in southern California in October. On their wintering grounds plovers forage for ground insects in loose flocks ranging from 2 to over 1,000 birds. Individuals change flocks and foraging areas frequently during the winter. Mountain plovers run or freeze from perceived harm rather than fly. Most individuals head northward around mid-February to mid-March. Migratory routes are unknown.

The Mountain Plover is proposed for federal listing as a threatened species.

Golden eagle (*Aquila chrysaetos*)

Golden eagles are the largest raptor in the planning area. They forage over rolling foothills and valleys and nest on cliffs in mountainous terrain (Map 3-6e Appendix A). Golden Eagles are found throughout North America. They are uncommon, permanent residents throughout the state, but they are most common in Southern California. In the NECO Planning Area only a few eyries are known.

Some golden eagles migrate through the NECO Planning Area in spring and fall. Some may winter in and near mountains. A few nest in the NECO Planning Area. Nests, referred to as eyries, are usually on secluded

cliffs with overhanging ledges. The large platform of sticks at the eyrie may be used for many years. Usually two young are raised in late spring and early summer.

The major threat is disturbance at the eyrie, especially in the early stages of nesting.

Golden eagle is a State Species of Special Concern and is protected by the Bald Eagle Protection Act.

Ferruginous hawk (*Buteo regalis*)

Ferruginous hawks do not breed in California. They migrate from their breeding grounds in the plains of Canada and the U. S. south to wintering grounds in eastern Colorado and western Kansas to southern Texas. They winter in very low numbers throughout the West. They are known to migrate through California in September and April. They overwinter in very small numbers from mid-October to mid-March in the lower Colorado River Valley, Yuma Basin, West Mesa, and the agricultural areas of Imperial Valley (Map 3-6e Appendix A).

Ferruginous hawk is a State Species of Special Concern.

Prairie Falcon (*Falco mexicanus*)

Prairie falcons breed throughout the arid West from southern Canada to central Mexico. The overall distribution appears to be stable. In the 1970's, 35 eyries were found within the California Desert District with approximately 12 in the planning area. It is unknown whether these eyries are currently occupied.

Prairie falcons are uncommon residents and migrants of open grassland, savannah, and desert scrub habitats. They are found in areas of the dry interior where cliffs provide secure nesting sites. In the desert they are found in all vegetation types, although sparse vegetation provides the best foraging habitat (Map 3-6d Appendix A).

Within the planning area it is not known to what extent they move seasonally, but wintering populations in the planning area are larger than breeding populations.

Historic impacts have included eggshell thinning from pesticide residues, conversion of habitat to agriculture, robbing of eyries by falconers, and shooting.

Prairie falcon is a State Species of Special Concern.

Elf owl (*Micrathene whitneyi*)

The elf owl breeding range extends from southwestern California east to Texas and south into Mexico. Historically, the elf owl was found along the lower Colorado River and at oases as far west as Cottonwood Springs in Joshua Tree National Park (1940-1970) and Corn Spring (latest in 1994) in the Chuckwalla Mountains. Currently, its California range is only along the Colorado River from just north of Needles to Imperial Dam. They are very rare in California and occur only in spring and summer along the Colorado

River Valley (Map 3-6d Appendix A). Most of the suitable riparian habitat has been cleared for agriculture or lost to tamarisk since the mid-1970's.

The loss of mature, riparian habitat is the most important reason for this species' decline. Habitat loss has consisted of clearing and flooding for agriculture and water management and invasion by tamarisk. Frequent fires have also reduced suitable habitat and increased tamarisk.

The elf owl is state-listed as an endangered species.

Burrowing owl (*Speotyto cunicularia*)

Burrowing owls range from Texas west to California and from southern Canada south into Mexico. In northern climates they migrate south into the area in the winter. Burrowing owls were formerly common throughout much of California prior to the 1940's, but populations in central and southern California have declined in many areas due to agricultural development and urbanization. Little is known of the status of the burrowing owl in the California desert. Concentrations probably occur in agricultural drainage ditches of the planning area, just as they do throughout the Imperial and Coachella Valleys (Map 3-6e Appendix A).

Threats to burrowing owls are habitat conversion and destruction of ground squirrel burrows. Other threats may be accumulated pesticides, direct mortality from ground squirrel poisons, roadside shooting, and burrow destruction from canal and road maintenance.

The burrowing owl is a State Species of Special Concern and a USFWS Sensitive Species.

Gila woodpecker (*Melanerpes uropygialis*)

Gila woodpeckers range from the extreme southeast of California through Arizona south into western Mexico. They were formerly found along the entire lower Colorado River and in cottonwood groves in Imperial Valley. Now the species is found only at scattered locations along the Colorado River from Needles to Yuma, and they have disappeared in the Imperial Valley, except for a few pairs in Brawley. Within the planning area, Gila woodpeckers were known to occur in desert riparian washes (microphyll woodland) extending from the Colorado River as far as one mile away, but they are currently known only from scattered groups on the riparian corridor of the Colorado River (Map 3-6d Appendix A). They are more widespread in Arizona.

Major threats to Gila woodpecker are loss of habitat to agricultural development, urbanization, tamarisk infestation, and competition with European starlings for nest sites.

The Gila woodpecker is state-listed as an Endangered Species.

Vermilion flycatcher (*Pyrocephalus rubinus*)

Vermilion flycatchers are small flycatchers with the male having a brilliant vermilion-colored front and head. They live in large riparian areas with a high canopy and grassland under-story. They are sometimes found in parks and golf courses that have this same structure.

Habitat loss is the primary reason for declines in California. Nest parasitism by cowbirds may also be a factor.

Vermilion flycatcher is a State Species of Special Concern.

Willow flycatcher (*Empidonax traillii*) and Southwestern willow flycatcher (*Empidonax traillii extimis*)

Willow flycatchers are found throughout most of the U.S. The southwestern subspecies nests in southern California, Arizona, New Mexico, western Texas, and northwestern Mexico. Little is known about migration or wintering in the NECO Planning Area.

Southwestern willow flycatchers have declined precipitously throughout the southwest. Major causes for decline are the loss of riparian habitat to urbanization, agriculture, and tamarisk infestation. On the breeding grounds, brood parasitism by cowbirds is common.

The Southwestern willow flycatcher is a federally Endangered Species, and the willow flycatcher is a State-listed Endangered Species.

Bendire's Thrasher (*Toxostoma bendirei*)

Bendire's thrashers arrive in the breeding area from late March to early April. Some leave the breeding grounds by the end of July, with others departing through August. They migrate to southern Arizona, southwestern New Mexico, or Mexico for the winter. Wintering individuals have also been observed at the Salton Sea, coastal California, Bard, and Lancaster.

The largest breeding area in California lies just east of Essex from the south side of the Piute Mountains to the center of the Old Woman mountains. It is disjunct from another large breeding area near Cima Dome. The Essex population area lacks Joshua trees, but has dense stands of Mojave yucca and other succulents. There are a few records of Bendire's thrashers from JTNP in the planning area.

Bendire's thrasher is a State Species of Special Concern.

Crissal Thrasher (*Toxostoma crissale*)

Crissal thrashers occur from southwestern Utah, southern Nevada, and southeastern California east to southern New Mexico and southwestern Texas and south into Sonora. They are found along the Colorado River Valley, but elsewhere in California populations are highly local and uncommon (Map 3-6e Appendix A). Crissal thrashers are also found in Milpitas Wash, Indian Wash, and Chuckwalla Bench and in the Chuckwalla Dune Thicket. Inventory data elsewhere are scant. Agricultural and urban development have greatly reduced the distribution in the Coachella and Imperial Valleys.

Agricultural development, urbanization, and tamarisk invasion have greatly reduced numbers. The species is highly vulnerable to noise and other disturbances. Crissal thrashers can be parasitized by brown-headed cowbirds, but they will eject cowbird eggs from their nests.

Crissal thrasher is a State Species of Special Concern.

LeConte's Thrasher (*Toxostoma lecontei*)

Le Conte's thrashers are distributed from the Mojave Desert east into southern Utah and northern Arizona, and south into northern Mexico. A disjunct population occurred in the San Joaquin Valley, but most of that range has been lost to agricultural and urban development. Le Conte's thrashers are distributed throughout the planning area, but many areas with suitable habitat are unoccupied (Map 3-6e Appendix A).

LeConte's thrasher is a State Species of Special Concern.

Yellow warbler (*Dendroica petechia*)

Yellow warblers formerly nested in the Colorado River Valley, but they no longer breed there or elsewhere in the planning area. They migrate commonly through the planning area near the end of March through mid-April and again in September and October (Map 3-6e Appendix A). These migrants will stop at any size woodland or oases. Regularly spaced woodlands and oasis with open water for drinking are essential for migrants. A few yellow warblers spend the winter in the planning area. Found throughout the U.S., populations in the West have experienced severe declines. For example, they have been totally extirpated from the California side of the Colorado River Valley.

Yellow warbler is a State Species of Special Concern.

Chuckwalla (*Sauromalus obesus*)

Chuckwallas occur throughout the Mojave and Colorado Deserts in California, Nevada, Utah, Arizona, and Mexico. They are found in appropriate habitat throughout the planning area (Map 3-6a Appendix A). Little is known about population size or trends. Primary threats to the species are from overcollecting and destruction of habitat by collectors.

The Chuckwalla has no special designations.

Colorado desert fringe-toed lizard (*Uma notata*)

Colorado desert fringe-toed lizards are found from northeast San Diego County southward through Imperial County, east to the Colorado River, and south into Baja California. Within the planning area they occur only in the extreme south adjacent to the Algodones Dunes (Map 3-6a Appendix A). Little is known about trends in population size or distribution.

Their sandy habitats are fragile and have been heavily impacted by off-road vehicles. Their diving-under-sand escape response makes them particularly vulnerable to injury from off-road vehicles. Potential indirect impacts on habitat are associated with the disruption of ecosystem processes involving sand sources, wind transport, and sand corridors.

Colorado desert fringe-toed lizard is a State Species of Special Concern.

Mojave fringe-toed lizard (*Uma scoparia*)

Mojave fringe-toed lizards are found only in California and a small area of western Arizona, where they are restricted to dune habitats in the deserts of Los Angeles, Riverside, and San Bernardino Counties in California and La Paz County in Arizona. In the planning area they are known from the following areas: Bristol Dry Lake, Cadiz Dry Lake, Dale Dry Lake, Rice Valley, Pinto Basin, Palen Dry Lake, and Ford Dry Lake (Map 3-6a Appendix A).

Impacts are similar to those described for the Colorado Desert fringe-toed lizard. Mojave fringe-toed lizard is a State Species of Special Concern.

Flat-tailed horned lizard (*Phrynosoma mcallii*)

Flat-tailed horned lizards occur throughout the southern portion of the Colorado Desert from the Coachella Valley southward and eastward into Arizona and south into neighboring Sonora. Large portions of the historic range have been lost to inundation of the Salton Sea, urbanization, and agricultural development. Within the planning area, suitable habitat occurs only along the southern edge (Map 3-6a Appendix A). The subpopulation that occurs in the planning area is not in any of five Management Areas designated as part of an overall strategy to conserve the species. Despite considerable effort over the past 15 years, population sizes and trends are unknown due to difficulties in finding an effective population estimation procedure.

The flat-tailed horned lizard is a BLM California Sensitive Species and a State Species of Special Concern.

Desert rosy boa (*Lichanura trivirgata*)

Although widely distributed, rosy boas are uncommon throughout their range. Desert rosy boas are found only in southeastern California and southeastern Arizona (Map 3-6e Appendix A). The most significant threats are from overcollection for the pet trade and the destruction of habitat by collectors.

Desert rosy boa has no special designation.

Desert tortoise (*Gopherus agassizii*)

Desert tortoises are widely distributed in the desert, from as far north as Olancho south to the Mexican border and from the Colorado River west to near Lancaster. The Desert Tortoise (Mojave Population) Recovery Plan shows two major populations or *recovery units* in the planning area. These are the Northern Colorado Desert and Eastern Colorado Desert Recovery Units. The highest densities of tortoises are in Chemehuevi and Ward Valleys, on Chuckwalla Bench, and in JTNP. The USFWS has designated *critical habitat* for the desert tortoise (Map 3-5 Appendix A). Populations have declined precipitously in some parts of the range, such as Chuckwalla Bench. Causes for declines include habitat loss, diseases, excessive predation on young tortoises by ravens, collecting, shooting, highway and vehicle kills, and other factors.

The desert tortoise is a Federal Threatened Species (Mojave Population only) and State-listed Threatened Species.

Couch's spadefoot toad (*Scaphiopus couchi*)

The range of Couch's spadefoot extends from extreme southeastern California eastward through Arizona, New Mexico, Texas, and Oklahoma, and southward into Mexico. In California, they occur in the planning area from Chemehuevi Wash south to the Ogilby area in Imperial County (Map 3-6a Appendix A).

The population size is unknown. This species is of concern because it has a small range in California, populations are declining in other states, it has a precarious life history, and the capability of sites to impound runoff is easily destroyed. Road construction has created some pond habitat in Imperial County, but these are often subject to off-highway vehicle driving which can destroy soil impoundment capability. In addition to habitat disturbance, vehicles create noise similar to rainfall, resulting in emergence when conditions are not favorable. Vehicles may also crush vegetative debris which is essential as daytime cover.

The Couch's spadefoot toad is a State Species of Special Concern.

3.4.3 Special Status Plants

The planning area contains 32 special status plant species, one of which is federally listed as endangered. All of these plants have federal or state designations as threatened, candidate, or sensitive. Table 3-5 names these plants and briefly describes the habitats in which they are found. The known or predicted ranges of these plants are shown on Maps 3-7a through 3-7d Appendix A.

Table 3-5. Special Status Plant Species in the NECO Planning Area

<i>Scientific name</i> Common name Family CNPS List /Fed. Or State Status ¹	Brief description and known locations (note that a single record can include several individual plants). Plant communities are from Holland (1986) and Sawyer and Keeler-Wolf (1995).
<i>Acleisanthes longiflora</i> Angel trumpet NYCTAGINACEAE 2/ none	A perennial herb associated with Sonoran Desert Scrub (Brittlebush Series). Found in mountainous areas on rocky, carbonate/limestone soils. It is common elsewhere but rare in California. There is one record just outside the Plan boundary NE of Blythe.
<i>Astragalus insularis var. harwoodii</i> Harwood's rattleweed FABACEAE 2/ none	An annual herb associated mainly with Sonoran Desert Scrub (Desert Sand-verbena Series) and distributed throughout the Colorado desert. Little is known about its habitat preference or distribution within California. We have six records for this plant, scattered throughout the southern two thirds of the plan area.
<i>Astragalus lentiginosus var. Borreganus</i> Borrego Milkvetch FABACEAE 4/ none	An annual herb that prefers fine sandy soils associated with Sonoran Desert Scrub (Desert Sand-verbena Series) and Dunes. We have four known locations within the Plan area, all in the Cadiz Valley/Iron Mountains/Danby Dry Lake region.

<p><i>Scientific name</i> Common name Family CNPS List /Fed. Or State Status ¹</p>	<p>Brief description and known locations (note that a single record can include several individual plants). Plant communities are from Holland (1986) and Sawyer and Keeler-Wolf (1995).</p>
<p><i>Astragalus lentiginosus var. coachellae</i> Coachella Valley milkvetch FABACEAE 1B/ FE and BLM Sensitive</p>	<p>A winter annual or short-lived perennial associated with low-elevation Sonoran Desert Scrub (Desert Sand-verbena Series). It prefers the fine sandy soils of dunes and sandfields. This is an aeolian endemic with fewer than 25 occurrences in the Coachella Valley and four recent records in the Chuckwalla Valley. Natural disturbance from fluvial or aeolian processes are apparently necessary for seedling establishment. Blooming period is from February to May. In the Coachella Valley, heavy vehicle use can destroy plants, and development can result in loss of habitat or disruption of natural processes. The sites in Chuckwalla Valley may also be subject to vehicle use.</p>
<p><i>Bouteloua trifida</i> Red grama POACEAE 2 / none</p>	<p>A tufted perennial grass found at higher elevations and associated with Mojavean Pinyon and Juniper Woodland (Singleleaf Pinyon Series, Utah Juniper Series). It is found in mountainous areas on rocky, carbonate/limestone soils and in crevices. It is common elsewhere but rare in California. We have one record from the Whipple Mountains and one from the Turtle Mountains.</p>
<p><i>Calliandra eriphylla</i> Fairyduster FABACEAE 2 / none</p>	<p>A deciduous, perennial shrub of Desert Dry Wash Woodlands (Blue Palo Verde-Ironwood-Smocketree Series), this plant prefers the sandy, rocky soils of washes, gullies and mesas. It is a species of the Sonoran desert and ranges into Arizona and Mexico. We have 21 records for this species, all from Imperial Co.</p>
<p><i>Carnegiea gigantea</i> Saguaro CACTACEAE 2 / none</p>	<p>A large succulent shrub of Sonoran Desert Scrub (Foothill Palo Verde-Saguaro Series) and a signature species of the Sonoran Desert. It prefers rocky soils or gravelly slopes and flats on mountains and bajadas. We have 13 records, all from within 15 miles of the Colorado River.</p>
<p><i>Castela emoryi</i> Crucifixion thorn SIMAROUBACEAE 2 / none</p>	<p>A deciduous shrub of Sonoran Desert Scrub and Mojave Desert Scrub (Crucifixion Thorn Series, Mesquite Series). It prefers fine, slightly alkaline or gravelly soils along playa margins. It is found in locally restricted sites in the southern Mojave and Sonoran deserts. There are 13 records throughout the Plan area.</p>
<p><i>Colubrina californica</i> Los Animas colubrina or snakebush RHAMNACEAE 2 / none</p>	<p>An evergreen shrub associated with Sonoran Desert Scrub (Creosote Bush Series) and Joshua Tree Woodland. It prefers dry canyons and sandy, gravelly soils. There are 27 records, mostly around the Chocolate Mountains.</p>
<p><i>Condalia globosa pubescens</i> Spiny abrojo RHAMNACEAE 4 / none</p>	<p>A deciduous, spreading shrub of Sonoran Desert Scrub (Creosote Bush Series). It prefers sandy gravelly soils in low-elevation canyons and ravines. We have 47 records from the Chuckwalla Bench through the Chocolate Mountains.</p>

<p><i>Scientific name</i> Common name Family CNPS List /Fed. Or State Status ¹</p>	<p>Brief description and known locations (note that a single record can include several individual plants). Plant communities are from Holland (1986) and Sawyer and Keeler-Wolf (1995).</p>
<p><i>Coryphantha alversonii</i> Foxtail cactus CACTACEAE 4 / none</p>	<p>(formerly <i>Escobaria vivipera</i> var. <i>alversonii</i>). A low-lying cactus associated with Sonoran and Mojave Desert Scrub (Creosote Bush Series). This plant prefers rocky soils on hills, mountains, and bajadas. We have 32 records in NECO, mainly in a swath across the middle of the Plan Area.</p>
<p><i>Croton wigginsii</i> Wiggins' croton EUPHORBIACEAE 2 / SR</p>	<p>A perennial shrub associated with Sonoran Desert Scrub (Desert Sand-verbena Series) and Desert Dunes. It prefers the fine sandy soils of dunes and sandfields. It is endemic to the Algodones Dunes. There are three records for this species, all to the west of the NECO boundary</p>
<p><i>Cryptantha holoptera</i> Winged cryptantha BORAGINACEAE 4 / none</p>	<p>An annual herbaceous plant of Sonoran and Mojave Desert Scrub (Creosote Bush Series). It seems to prefer sandy and gravelly soils on hills and mountains. We do not have any records for this species in the NECO area.</p>
<p><i>Ditaxis clariana</i> Glandular ditaxis EUPHORBIACEAE 2 / none</p>	<p>A perennial herb of low-elevation Sonoran Desert Scrub (Creosote Bush Series, Desert Sand-verbena Series), this plant seems to prefer rocky, gravelly soils on hills and along washes. Its distribution is poorly understood. We have four points for this species, scattered throughout the Plan Area.</p>
<p><i>Ditaxis serrata</i> var. <i>californica</i> California ditaxis EUPHORBIACEAE 3 / none</p>	<p>(previously <i>Ditaxis californica</i>). This perennial herbaceous plant is associated mainly with Sonoran Desert Scrub (Brittlebush Series, Creosote Bush Series, White Bursage Series) and Desert Dry Wash Woodlands. It generally is found in the rocky, gravelly soils of washes, mountains, hills, and canyons. Like <i>D. clariana</i>, its distribution is poorly understood. We have 17 records, located inside or to the south of JTNP.</p>
<p><i>Echinocereus engelmannii</i> var. <i>howei</i> Howe's hedgehog cactus CACTACEAE 1b / BLM Sens.</p>	<p>A low-lying succulent shrub associated with Sonoran Desert Scrub and Mojave Desert Scrub (Creosote Bush Series). Little is known about the range or habitat preferences of this subspecies, primarily because of identifications problems with closely related taxa. There are three confirmed records just outside the northern NECO boundary.</p>
<p><i>Koeberlinia spinosa</i> ssp. <i>tenuispina</i> Crown-of-thorns KOERBERLINIACEAE 2 / none</p>	<p>A deciduous shrub associated with Sonoran Desert Scrub and Desert Dry Wash Woodland (Blue Palo Verde-Ironwood-Smocketree Series). This species is found in rocky or gravelly soils in washes and ravines. We have 10 records for this species, all south of I-10 and most in the Chocolate Mountains inside CMAGR.</p>
<p><i>Matelea parvifolia</i> Spearleaf ASCLEPIADACEAE 2 / none</p>	<p>This plant is a perennial herb of Sonoran and Mojave Desert Scrub (Creosote Bush Series). It is associated with gravelly, rocky soils in hills and mountains. There are four records in the Plan Area: one near Cottonwood Springs (JTNP), two on the Chuckwalla Bench, and one in the Orocopia Mountains.</p>

<p><i>Scientific name</i> Common name Family CNPS List /Fed. Or State Status ¹</p>	<p>Brief description and known locations (note that a single record can include several individual plants). Plant communities are from Holland (1986) and Sawyer and Keeler-Wolf (1995).</p>
<p><i>Monardella robisonii</i> Robison's monardella LAMIACEAE 1b / BLM Sens</p>	<p>This plant is a perennial herb found only in and around the Little San Bernardino Mountains associated with Sonoran Desert Scrub and Mojavean Pinyon/Juniper Woodland. Questions about its status as a species separate from another <i>Monardella</i> in the area have been raised, but not enough is known enough about the species to resolve the issue. It is found in gravelly, rocky soils. There is one record for this species in the Sheephole Pass area.</p>
<p><i>Opuntia munzii</i> Munz' cholla CACTACEAE 1b / BLM Sens</p>	<p>A cactus associated with Sonoran Desert Scrub (Unknown Series). This species is actually a stabilized hybrid and prefers sandy gravelly soils along washes canyon walls. The Chuckwalla Bench is the northern edge of the species range. We have 45 records for this species, mostly within CMAGR.</p>
<p><i>Opuntia wigginsii</i> Wiggins' cholla CACTACEAE 3 / none</p>	<p>An upright cactus associated with Sonoran Desert Scrub (Unknown Series). It seems to prefer low-elevation flats and sandy, gravelly soils. We have only one record for this species, in the Palo Verde Valley.</p>
<p><i>Palafoxia arida</i> var. <i>gigantea</i> Giant Spanish-needle ASTERACEAE 1b / BLM Sens</p>	<p>This is an annual or perennial herb associated with Sonoran Desert Scrub and Desert Dunes (Desert Sand-verbena Series). It requires fine, sandy soils and its distribution is restricted to the Algodones Dunes area. There are six records for this plant, one of which lies inside the NECO boundary.</p>
<p><i>Penstemon albomarginatus</i> White-margined beardtongue SCROPHULARIACEAE 1b / BLM Sens</p>	<p>An herbaceous perennial associated with Mojave Desert Scrub and Desert Dunes (Desert Sand-verbena Series). It requires stabilized, deep sandy and slightly alkaline soils. In California it occurs only in a four-mile long wash that crosses I-40. We have one record for this species in NECO.</p>
<p><i>Pholisma sonorae</i> Sand food LENNOACEAE 1b / BLM Sens</p>	<p>A parasitic perennial herb associated exclusively with desert dunes (Desert Sand-verbena Series). This plant requires fine, sandy soils and is restricted to the Algodones Dunes. There is one record for this species, outside and to the west of the NECO boundary.</p>
<p><i>Pholistoma auritum</i> var. <i>arizonicum</i> Arizona pholistoma HYDROPHYLLACEAE 2 / none</p>	<p>A succulent annual herb associated with Sonoran Desert Scrub (Creosote Bush Series). This plant prefers gravelly soils and mountains. In California it is found only in the Whipple Mountains, where there is one record.</p>
<p><i>Physalis lobata</i> Lobed ground-cherry SOLANACEAE 2 / none</p>	<p>An herbaceous perennial associated with Sonoran and Mojave Desert Scrub (Series Unknown). It is found along playa margins or where ponding occurs in washes on granitic soils. The southern edge of its range occurs in the NECO Plan Area, where there are two records in the Sheephole Pass area: one just outside the NECO boundary in the same area, and one record in Ward Valley.</p>
<p><i>Proboscidea althaeifolia</i> Desert unicorn plant MARTYNIACEAE 4 / none</p>	<p>A spreading, perennial herb associated with the Sonoran Desert Scrub (Creosote Bush Series). It is primarily found in sandy soils along washes. We have 13 records in NECO, in Milpitas Wash, and the Chuckwalla and Chemehuevi Valleys.</p>

<i>Scientific name</i> Common name Family CNPS List /Fed. Or State Status ¹	Brief description and known locations (note that a single record can include several individual plants). Plant communities are from Holland (1986) and Sawyer and Keeler-Wolf (1995).
<i>Salvia greatae</i> Orocopia sage LAMIACEAE 1b / BLM Sens	An evergreen shrub associated with Sonoran Desert Scrub and Desert Dry Wash Woodland (Creosote Bush Series, Blue Palo Verde-Ironwood-Smocketree Series). This species prefers sandy gravelly soils and is found along dry washes, alluvial slopes and fans. It is known only from the Orocopia Mountains, where we have 26 records.
<i>Senna covesii</i> Coves' cassia FABACEAE 2 / none	A low, perennial herb associated with Sonoran Desert Scrub (Series Unknown). It is found along dry washes and slopes and prefers sandy soils. Its distribution is poorly understood. We have three records in the Chuckwalla Mountains and one record in the Whipple Mans.
<i>Stylocline sonorensis</i> Mesquite neststraw ASTERACEAE 1a / none	A low-lying herbaceous annual of Sonoran Desert Scrub (Series Unknown). It prefers sandy soils in open washes and dry slopes. It has not been seen since 1930 in California and is possibly extirpated from the state, although it has a disjunct distribution in other desert states. The 1930 record was from Hayfield Dry Lake.
<i>Wislizenia refracta ssp. palmeri</i> Jackass clover CAPPARACEAE 2 / none	An erect annual associated with low-elevation Desert Chenopod Scrub, Sonoran Desert Scrub, and Desert Dunes (Allscale Series, Bush Seepweed Series, Desert Sand-verbena Series). It prefers sandy, alkaline soils along playas or in sandy flats. It is toxic but seldom eaten and valued as a honey plant. All eight NECO records for this species are in the Palen Dry Lake and Dunes area.
<i>Xylorhiza cognata</i> Mecca-aster ASTERACEAE 1b / BLM Sens.	A perennial shrub associated with Sonoran Desert Scrub (Creosote Bush Series). Rare and found only in Riverside Co., this species prefers low-elevation dry canyons and gypsum, clay soils. There are seven records for this species, all from the Mecca Hills.

¹ Sensitivity classifications developed by the California Native Plant Society, Pavlik 1994, and federal or state status. The codes are described as follows:

CNPS 1a = Extinct

CNPS 1b = Rare in California and elsewhere

CNPS 2 = Rare in California but common elsewhere

CNPS 3 = Review list (need more information)

CNPS 4 = Watch list (plants of limited distribution)

FE = Federal Endangered

BLM Sens. = BLM Sensitive, includes all CNPS 1b plants, CNPS 2 plants that are locally threatened or in unusual populations, plants that are newly described and likely to be listed as CNPS 1b, or other compelling criteria.

SR = State Rare

3.4.4 Natural Communities

The natural communities found in the planning area are subdivisions of the Sonoran and Mojave desert floras. In geologic terms, both regions are relatively young. Evidence from ancient woodrat middens reveals that the entire California desert was dominated by pinyon-juniper woodlands as recently as 9,000 years ago (Axelrod 1995). During the late Pliocene and Quaternary, the Mojave ecosystem gradually lost more dry-

adapted species, while the Sonoran ecosystem continued to add new species as a result of fluctuating glacial-pluvial climates and localized mountain building during the Quaternary (Axelrod 1995).

Invasion of exotic plants has degraded most natural communities in the southwestern U.S. Common species include tamarisk (*Tamarix* sp.), Mediterranean splitgrass (*Schismus barbatus*), red brome (*Bromus madritensis rubens*), storksbill (*Erodium* sp.), Tournefort's mustard (*Brassica tournefortii*). In the planning area, tamarisk occurs as scattered plants in Desert Wash Woodland, Playas, and Seeps and Springs communities. Tamarisk trees can lower water tables or soil moisture sufficiently to eliminate native riparian vegetation around Seeps and Springs.

Exotic grasses such as Mediterranean splitgrass and red brome form a complete ground cover in some places, where they have displaced native annual and perennial grasses and forbs. There are indications that the increase in exotic annual grasses might be enhanced by nitrogen deposition from air pollution originating outside of the planning area (e.g., Los Angeles Basin, Coachella Valley) (Brooks 1998, Allen et al. 1997, Environmental Protection Agency 1996). There is some evidence that disturbances such as livestock grazing, OHV use, and fire have contributed to the spread of exotic annuals (see Photos #4 and #6 Appendix Q) (Brooks 1998, Malo and Suarez 1995).

We have chosen to use the Holland vegetation classification system developed for The Resources Agency in the early 1980's (Holland 1986). The eight Holland community types mapped for the NECO Planning Area (Map 3-3 Appendix A), listed in decreasing order by acreage are: Sonoran Desert Scrub, Mojave Desert Scrub, Desert Dry Wash Woodland, Playas, Developed Areas, Sand Dunes, Desert Chenopod Scrub, and Pinyon and Juniper Woodland. Four of these, Desert Dry Wash Woodland, Playas, Sand Dunes and Desert Chenopod Scrub, are considered sensitive.

Sonoran Desert Scrub

Sonoran Desert Scrub, or Creosote Bush, is characterized by widely spaced shrubs, 0.5 to 3 yards tall, on well-drained secondary soils of slopes, fans, and valleys. The growing season is from winter to early spring, with a flowering period for ephemerals in late February to March, depending on rainfall. It is the dominant plant community below 3,000-foot elevation throughout the Colorado desert, occurring from the Little San Bernardino Mountains south and east into Baja California (see photos #3 and #4 Appendix Q).

Sonoran Desert Mixed Scrub, another type of Sonoran Desert Scrub, includes members of the cactus and agave families and is generally found above 1,000-foot elevation on rocky, well-drained slopes and baguets. Succulent scrub areas typically have higher floristic and structural diversity than surrounding areas, which attract more wildlife.

Sonoran Desert Scrub is the dominant community type within the NECO Planning Area, covering 3.8 million acres, or 69 percent of the total area. The large majority of its distribution (86 percent) is on public lands. Major threats to this community type include fire, grazing, off-road vehicles, and invasions of alien species.

Mojave Desert Scrub

Mojave Desert Scrub can be found from Death Valley to the Little San Bernardino Mountains in California and east into southern Nevada and northwestern Arizona. Mojave Desert Scrub typically occurs on well-drained, non-alkaline soils of desert flats, baguets, and slopes, and is generally not found above 4,000-5,000 foot elevation. Mojave Desert Scrub is similar in appearance to Sonoran Desert Scrub, but generally occurs in places of lower winter temperatures and with a correspondingly later growth and flowering season (late March to April for the ephemerals). Like Sonoran Desert Scrub, there are two distinct annual floras for the winter and summer seasons.

Another subtype of Mojave Desert Scrub in the Palen area, Mojave Mixed Scrub and Steppe, occurs on shallow granitic or sandy soils on slopes between 2,000 and 5,000 foot elevation. A third subtype, Mojave Wash Scrub, occurs in some washes.

Mojave Desert Scrub covers approximately 14.5 percent (nearly 800,000 acres) of the NECO Planning Area. Seventy-one percent of its distribution occurs on public lands, and 49 percent occurs within BLM or NPS wilderness areas. Threats to this community are similar to those for Sonoran Desert Scrub.

Desert Dry Wash Woodland

Desert Dry Wash Woodland, also called microphyll woodland, consists of drought-deciduous, small-leaved (microphyllous), mostly leguminous trees of riparian or wash areas. The trees can reach 30 feet or more in height, but typically do not exceed 15 feet. Some assemblages are very dense woodlands, while others are more open and dispersed. This community is typically found in sandy or gravelly washes or adjacent baguets under 2,500 foot elevation throughout the Mojave and Colorado Deserts (see photos # 5 and #6 Appendix Q).

Large expanses of Desert Dry Wash Woodland can be found east of Algodones Dunes, Milpitas Wash, within CMAGR, McCoy Wash, and at the east end of Chuckwalla Bench. Desert Dry Wash Woodland becomes less common and constricted to long, narrow strips in the northern half of the planning area. Overall, the Desert Dry Wash Woodland community covers approximately 675,000 acres (12.3 percent) of the planning area. Seventy-nine percent of its mapped distribution lies within public lands, including 20 percent within CMAGR. This plant community is considered sensitive by the California Resources Agency. Wildlife species richness is much higher in this than other community types in the desert, and this community is slow to recover from disturbance. Threats include invasive exotics (particularly *Tamarix*), impacts related to heavy recreational use, and altered water flows.

Playas

Each closed basin in the California desert contains a playa, or dry lake bed. This community occurs at lower elevations at the edges or interior of ancient lakebeds, or where groundwater is close to the surface and heavily mineralized. Plants in this type of environment tend to be low, microphyllous species which exhibit varying degrees of succulence, and are able to tolerate salts and periodic flooding. Chenopod Scrub is always associated with playas, but not all playas support chenopod scrub, which is mapped as a separate community (see below, and see photo #7 Appendix Q).

There are six major dry lake beds totaling 8,700 acres (1.6 percent of the planning area), 73 percent of which is on public lands. Each lake has a different character and use. Danby Dry Lake has a “puffy” surface composed of clay and salt mixtures, while Bristol Lake has a layer of saline water below a thin clay surface. Small mineral and salt mining operations operate at Bristol, Cadiz, and Danby Lakes. Although relatively barren, playas are a unique habitat that is considered sensitive by the state Resources Agency. Playas provide habitat for rare and endemic (i.e., found only at that place) invertebrates such as fairy shrimp. They are resistant to change from small impacts, but their flora and fauna may be affected greatly by heavy impacts. Plants and animals reside mostly in a thin layer at the surface.

Sand Dunes

Most of the mapped “dunes” are stabilized or partially stabilized desert dunes, where sand accumulates and becomes somewhat anchored by plants (shrubs, annuals and grasses). Pockets of microphyll woodland and chenopod scrub vegetation are often found within dunes as well (see photo #8 Appendix Q).

One area of active desert dunes and several areas of desert sand fields are also included in the planning area. Active dunes are barren expanses of actively moving sand. The size and shape of these dunes are primarily determined by abiotic factors. Vegetation, where it occurs, consists of low to medium shrubs and seasonal annuals. Sand fields are areas where sand accumulates in non-dune forms. They are typically found along the toes of bajada slopes throughout the California desert. Vegetation structure is similar to adjacent creosote scrub areas on less-sandy soils.

Large tracts of dunes can be found in Cadiz, Ward, Rice, and Chuckwalla Valleys, usually adjacent to playas. In these areas, westerly winds tend to form dune deposits on the eastern side of valleys. A small portion of the Algodones Dunes, the largest active desert dune system in California, lies within the southwest corner of the planning area. About 62,000 acres (1.1 percent) of dune and sandfield habitat is in the NECO Planning Area, mostly on public lands (82 percent).

Sand dunes provide habitat for rare and endemic animals, especially invertebrates.

Desert Chenopod Scrub

This community consists of areas of low, sparse, microphyllic shrubs growing in or around dry lake beds. Soils of these areas are highly alkaline, fine-grained, and poorly drained, resulting in salt crusts and occasional pools of standing water. They are found at low elevations scattered throughout the Mojave and Sonoran deserts (see photo #9 Appendix Q).

This community type is rare within the planning area, covering only 2000 acres (<0.1 percent). Most of this (71 percent) is on private lands.

Mojavean Pinyon and Juniper Woodland

This community is an open woodland of low, bushy trees, with typically no more than 50 percent cover of tree species. The understory is usually more developed than in other Pinyon-Juniper woodlands. Pinyon-Juniper woodlands are generally found on rocky, well-drained soils on dry slopes between the 4,000 and

8,000 foot elevations. They grow best in areas of cool winter temperatures and precipitation of 12-18 in/year (see photo #10 Appendix Q).

There are only 2,000 acres of Pinyon-Juniper woodlands within the planning area, all in the Old Woman mountains. Eighty-eight percent lies within public lands, and nearly all (98 percent) is in BLM Wilderness areas.

Springs and Seeps

Springs and seeps are scattered throughout the NECO Planning Area. Most are found in or at the perimeter of mountain ranges. If the water flow is sufficient, there may be a small stream of flowing water or even a basin of water. For many others, the flow is sufficient only to saturate the soil in the vicinity. Most sites are only a few feet in diameter. Very few springs and seeps may be a thousand square feet in size (see photo #11 and #12 Appendix Q).

Some springs and seeps have been improved to impound water for drinking by wildlife or cattle, or they have been fenced to prevent damage by burros or cattle. Artificial water sources (e.g., guzzlers and windmills), generally constructed for wildlife or cattle, may have soil, flora, and fauna similar to natural springs and seeps. Natural water catchments of rock in canyons, called tenajas, are not included in this community because of the absence of associated vegetation. Vegetation at springs and seeps is widely varied, but generally includes some wetland or riparian species.

Springs and seeps are especially critical to migratory birds for resting, feeding, and drinking. Resident birds, such as pyrrhuloxia, Gambel's quail, and mourning doves, depend upon these scattered waters or the vegetation present there. Resident mammals, especially bighorn sheep and deer, are dependent on drinking water at these sites. Other species, such as rosy boa, are found primarily near water, but their dependence is uncertain. Some springs and seeps have endemic aquatic snails. They are easily altered by numerous human and animal activities that focus around water. Recovery of riparian vegetation may be rapid where water flow is sufficient. Species diversity is high, especially during bird migration.

Desert Washes

Except in sand dunes and playa plant communities, nearly all other plant communities are characterized by a pattern of braided washes made up of channels where waters tend to focus, join, and flow to termini at playas, sand dunes, or the Colorado River. Washes may be a few inches to several hundred yards wide. They are generally dry on the surface (to possibly deep levels) for long periods of time, even years, and then for short periods (a few hours or days), with rare episodes of rain, they carry small to enormous amounts of water and sediment and then dry up again. In their upper reaches washes, may appear to be functionally little different from adjacent communities. The greater the amount of water carried and frequency of rains, the more washes constitute special features of habitat, exhibiting different and diverse characteristics of channel, vegetation (cover, food, canopy layers, and rare plants), and wildlife (higher biodiversity, rearing of young, and animals) (see photos #2, #5 and #6 Appendix Q).

Developed

The developed community type includes Holland's Agriculture and Urban areas. Urban habitats typically include a mix of native and cultivated species, a mix of structural forms (trees, lawns, agriculture, etc.), artificial water sources, and a mosaic of edges and patch types (see photo #13).

Developed lands constitute a total of 1.4 percent (75,000 acres) of the NECO Planning Area. They include the agricultural areas in the Palo Verde Valley, around Desert Center in the Cadiz Valley, the populated areas around Blythe and Needles, the smaller settlements, and two small airstrips. The majority (97 percent) is in private ownership.

Biological Soil Crusts

In arid and semi-arid lands, the cover of vegetation is often sparse or absent. The soil surface in open spaces between the higher plants is generally not bare of life, but covered by a community of highly specialized organisms. These communities are referred to as biological soil crusts, or cryptogamic, cryptobiotic, microbiotic, or microphytic soil crusts. They may constitute up to 70 percent of the living cover in some plant communities (Belnap 1994), including substantial portions of the planning area.

Biological soil crusts consist of cyanobacteria, algae, lichens, mosses, microfungi, myxomycetes, and streptomycetes, and other bacteria. Composition can vary widely from site to site. Cyanobacterial and microfungus filaments weave throughout the top few millimeters of soil, gluing loose soil particles together and forming a matrix which stabilizes and protects soil surfaces from erosive forces. (Cameron 1966, Friedman and Ocampo-Paus 1976, Belnap and Gardner 1993, West 1990)

Biological soil crusts conduct many important functions in arid and semi-arid lands. In the large interspaces between plants, biological soil crusts are an important source of fixed carbon. Interspace soils between plants are often stabilized by biological soil crusts. Biological soil crusts protect soils from both wind and water erosion by binding the soil particles. Microbiotic crusts can be an important source of fixed nitrogen for plants and soils in desert ecosystems. They modify soil temperature regimes and control water infiltration (Rowlands 1980, West 1990).

3.5 Wilderness Management

The Wilderness Act of 1964 provides for the establishment of a National Wilderness Preservation System with areas to be designated from public lands within the national forests, the national parks, and the national wildlife refuges. Public lands administered by the BLM are inventoried and evaluated for wilderness potential in accordance with the Federal Land Policy and Management Act of 1976 (FLPMA). In the CDCA, 137 areas covering 5.7 million acres were determined to have wilderness characteristics; these areas were designated Wilderness Study Areas (WSAs) in May 1978.

Following the identification of WSAs, consideration was given to all resource values and opportunities, and a determination of "highest and best use(s)" for each WSA was made. This analysis led to preliminary recommendations for each WSA as suitable or non-suitable for wilderness designation by Congress.

Subsequent amendments to the CDCA Plan revised the suitability determinations for certain WSAs, or portions thereof.

The CDCA Plan, as amended, established the following goals for wilderness management (Amendment Six, January 15, 1987):

1. Until Congressional release or designation as wilderness, provide protection of wilderness values so that those values are not degraded so far as to significantly constrain the recommendation with respect to an area's suitability or non-suitability for preservation as wilderness.
2. Provide a wilderness system possessing a variety of opportunities for primitive and unconfined types of recreation, involving a diversity of ecosystems and landforms, geographically distributed throughout the Desert.
3. Manage a wilderness system in an unimpaired state, preserving wilderness values and primitive recreation opportunities, while providing for acceptable use.

3.5.1 California Desert Protection Act (Public Law 103-433)

On October 31, 1994, Congress enacted the California Desert Protection Act (CDPA), thereby designating certain lands in the California desert as wilderness in furtherance of the purposes of the Wilderness Act and sections 601 and 603 of FLPMA. Of the 69 areas designated as BLM wilderness through the CDPA, 23 occur within the NECO Planning Area (Map 2-38 Appendix A), as shown in Table 3-6.

Table 3-6. Acres of BLM Wilderness in the NECO Planning Area

Wilderness	BLM Field Office	Acres*
Bigelow Cholla Garden	Needles	15,947
Cadiz Dunes	Needles	21,298
Chemehuevi Mountains	Needles	84,902
Clipper Mountain	Needles	35,864
Old Woman Mountains	Needles	183,524
Piute Mountains	Needles	50,325
Sheephole Valley	Needles	195,244**
Stepladder Mountains	Needles	84,370
Trilobite	Needles	39,693
Turtle Mountains	Needles	182,676
Whipple Mountains	Needles	78,482
Big Maria Mountains	Palm Springs	46,164
Chuckwalla Mountains	Palm Springs	88,183
Little Chuckwalla Mountains	Palm Springs	28,708
Mecca Hills	Palm Springs	30,363
Orocopia Mountains	Palm Springs	54,683
Palen-McCoy	Palm Springs	224,419
Rice Valley	Palm Springs	43,422
Riverside Mountains	Palm Springs	24,186
Indian Pass	El Centro	32,967
Little Picacho	El Centro	35,853
Palo Verde Mountains	El Centro	30,999
Picacho Peak	El Centro	8,837
Total Acreage		1,621,109

* Acres include federal, state, and private lands within wilderness area boundaries. Acres are derived from maps produced through the Geographic Information System (GIS).

** Acres reported constitute the entire Sheephole Valley Wilderness, a portion of which occurs outside the NECO Planning Area.

The following provisions under Title 1, Sections 103 and 104 of the CDPA, are particularly relevant to the NECO Plan:

- Subject to valid existing rights, each wilderness area shall be administered in accordance with the provisions of the Wilderness Act.
- Within wilderness areas, the grazing of livestock, where established prior to the date of enactment of the CDPA, shall be permitted to continue subject to such reasonable regulations, policies, and practices as deemed necessary, as long as such regulations, policies, and practices fully conform with and implement the intent of Congress regarding grazing in such areas as such intent is expressed in the Wilderness Act and section 101(f) of Public Law 101-628.
- The Congress does not intend for the designation of wilderness areas to lead to the creation of protective perimeters or buffer zones around any wilderness area. The fact that non-wilderness activities or uses can be seen or heard from areas within a wilderness area shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area.
- As provided in section 4(d)(7) of the Wilderness Act, nothing in the CDPA shall be construed as affecting the jurisdiction of the State of California with respect to wildlife and fish on the public lands.
- Management activities to maintain or restore fish and wildlife populations and the habitats to support such populations may be carried out within wilderness areas and shall include the use of motorized vehicles by the appropriate state agencies.
- Nothing in the CDPA may be construed to preclude federal, state, and local law enforcement agencies from conducting law enforcement and border operations as permitted before the date of enactment of the CDPA, including the use of motorized vehicles and aircraft, on any lands designated as wilderness.
- All lands not designated wilderness in the NECO Planning Area are no longer subject to the requirements of section 603(c) of FLPMA pertaining to the management of WSAs.

3.5.2 Wildlife Water Developments in Wilderness

BLM Manual 8560 (04-27-83), *Management of Designated Wilderness Areas*, states the following:

Although construction of facilities to enhance an area's value for wildlife or fish is not generally consistent with the free operation of natural processes, there are situations where such measures may be necessary for the continued existence or welfare of wildlife or fish living in wilderness. This is particularly true in the case of species adversely affected through human activities in and around such areas. Certain permanent installations to maintain conditions for wildlife and fish, upon consideration of their design, placement, duration, and use, may be permitted if the resulting change is compatible with preserving wilderness character and is consistent with wilderness management objectives for the area, and if the installations are the minimum necessary to accomplish the task. Permissible actions under these criteria may include: installations to protect sources of water on which

native wildlife depend, such as exclosures; and water sources such as springs, wells, and guzzlers.

Upon development of site-specific project plans for new artificial waters in wilderness, separate environmental review--including a "minimum tool analysis" which specifies the manner in which projects are to be completed--will be necessary. Guidelines furnished in BLM Handbook H-8560-1 (07-27-88), *Management of Designated Wilderness Areas*, include building new wildlife management structures in a manner that minimizes visual impacts on the landscape (see Appendix M). The array of existing artificial waters in wilderness areas is shown on Map 3-1 Appendix A.

3.5.3 Reintroduction of Native Species in Wilderness

In accordance with BLM Manual 8560, reintroduction of native species may be allowed:

In some instances, wildlife species once native to the wilderness have been forced from their original habitat by encroachment of human beings and human activities. To the extent that these factors can be altered or managed within the intent of the Wilderness Act, native species no longer established in the wilderness area may be reintroduced and managed as a part of the wilderness resource. Care must be exercised to be certain that the species is native. Such programs are addressed in the wilderness management plan.

Guidelines furnished in BLM Handbook H-8560-1 indicate that motorized methods and temporary holding and handling facilities may be permitted if they are the minimum necessary to accomplish an approved transplant.

3.5.4 Research in Wilderness

Title 43 CFR 8560.4-5(a) states that gathering information about natural resources in wilderness may be allowed provided it is carried on in a manner compatible with the preservation of the wilderness environment. This provision is reiterated in BLM Manual 8560. The manual further provides for research and scientific activities that use wilderness areas for study of natural environments and ecosystems. It requires that such research and collection of information be conducted in an unobtrusive manner by methods compatible with the preservation of the area's wilderness character. Research and other studies must be conducted without use of motorized equipment or construction of temporary or permanent structures, except when approved by the State Director for projects that are essential to managing the specific wilderness when no other feasible alternatives exist. Such use, when approved, must be the minimum necessary and must not degrade the area's wilderness character. Relative to structures and facilities proposed by other agencies conducting activities within BLM wilderness, such agencies are equally constrained by provisions of the Wilderness Act that are applicable to the BLM.

The CDCA Plan (1980), as amended, requires approval of the authorized officer for research activities conducted on public lands, including those within designated wilderness. Whenever required, all permits, authorizations, and/or licenses will be issued at the discretion of the authorized officer.

3.5.5 MOU and Policy on Wildlife Management Activities in BLM Administered Wilderness

On September 24, 1997, the BLM and California Department of Fish and Game (CDFG) entered into a Memorandum of Understanding to establish a framework for cooperation and procedures for CDFG maintenance, management, and research activities in BLM wilderness where motorized vehicle and equipment use is involved. Section 103(f) of the CDPA states:

Management activities to maintain or restore fish and wildlife populations and the habitats to support such populations may be carried out within wilderness areas designated by this title and shall include the use of motorized vehicles by the appropriate state agencies.

Through the Memorandum of Understanding, both agencies agreed to protect and preserve the wilderness character and values of the areas while carrying out CDFG's wildlife management mission.

3.6 Livestock Grazing

This section discusses the background of grazing in the planning area and the rangeland improvements and administration necessary for grazing to continue to be successful.

3.6.1 Background

Livestock grazing has occurred in the planning area for many decades. In general, cattle and sheep grazing has declined since World War II (BLM, 1980), and grazing within the planning area has declined since allocations for livestock use were made in the *California Desert Conservation Area Plan*, 1980. After enactment of the Taylor Grazing Act of 1934, open range grazing became restricted to geographical areas allotted to one or more livestock producers based on historical or current grazing. Until publication of a grazing rule on December 7, 1968, the BLM allocated long-term grazing based on perennial forage production. However, there were many areas of the Southwest, including the planning area, that did not produce perennial forage, and grazing was based on consumption of annual grasses and forbs or ephemeral production. This new rule authorized BLM field offices in Arizona, California, and Nevada to modify ill-suited perennial classified allotments from perennial designation to ephemeral or ephemeral/perennial designation.

This administrative modification drastically changed the way livestock producers requested authorization of grazing on ephemeral rangelands. The change no longer required an annual application for perennial forage grazing nor required substantial use of base property (privately controlled non-BLM grazing lands), and grazing would be based on a reasonable potential for growth of annual plants. Those allotments with perennial forage have an established amount of annual grazing, based on the quality of the perennial plants, stated in animal unit months (AUMs) for a defined period of grazing. Perennial grazing is typically authorized at the same level from year to year unless forage production does not meet seasonal norms. However, grazing in allotments with ephemeral forage do not have an established level of use nor a period of use instead the amount of AUMs and the length of the grazing season are determined prior to authorized grazing.

A typical ephemeral livestock operation requires two circumstances to be present before grazing occurs. First, sufficient forage of annual grasses and forbs must be available. Second, the lessee must have livestock for turnout. Surprising as it may seem, these two conditions do not easily coincide because livestock producers during any year may have abundant numbers of livestock to graze forage on the allotment, but there could be insufficient feed, and vice-versa. When weather conditions have been favorable and the livestock producer submits a written request for grazing, the BLM reviews plant and soil conditions throughout the allotment in preparation for potential grazing. This field review will determine the amount of available forage, potential grazing areas, and potential restrictions of grazing.

3.6.2 Rangeland Improvements

Livestock facilities or range improvements are necessary for livestock to remain in an area to graze. Cattle can easily wander throughout the allotment without supervision, whereas sheep must be supervised. Very few facilities are needed to manage sheep because a herder or his sheep dogs direct sheep bands from one area of the allotment to another. Consequently, there are no range improvements for sheep management on Ford Dry Lake and Rice Valley Allotments. While Chemehuevi is a cattle allotment, it has only one major improvement. This is due in large part to the limited needs of spring grazing of ephemeral forage. Lazy Daisy Allotment has the largest number of improvements of the four allotments.

Sheep have a limited need for water while grazing upon succulent ephemeral vegetation, and can graze for weeks without drinking, but when the ephemeral plants become dry, water must be supplied. Water is supplied by trucks that carry light transportable troughs so they can be easily set up and removed. The truck will move as close to the band of sheep as possible and setup troughs. Water is supplied once a day, usually in the afternoon, and sheep may bed down in warmer weather before returning to graze. Once the feed becomes dry or other feed becomes available elsewhere, the livestock producer transports the flocks to other pastures outside of the area. Cattle's requirements for water are reduced when they consume succulent ephemeral forage. On the Lazy Daisy Allotment, cattle obtain water from undeveloped or developed springs or seeps, and wells. Wells and some springs supply water through pipe to troughs found at the higher elevations. Barbed wire fence is used to exclude cattle from grazing an area or to prevent movement beyond a certain area. Lazy Daisy Allotment is the only allotment with any appreciable amounts of fencing. Sheep movement in Rice Valley and Ford Dry Lake Allotments is directed by a herder and fences are not needed. Corrals are used to sort, administer medicines, brand or mark animals, and ship animals to and from the area. Portable metal and wire corrals are used with sheep operations and permanent corrals are necessary with cattle operations.

3.6.3 Grazing Activities

The Chemehuevi, Ford Dry Lake, and Rice Valley Allotments are classified for ephemeral grazing use, and the Lazy Daisy Allotment is classified for ephemeral and perennial grazing use. The Lazy Daisy and the Chemehuevi Allotments are designated for cattle use; they cover 332,886 and 137,321 acres, respectively. The Ford Dry Lake and Rice Valley Allotments are designated for sheep; they cover 49,682 and 85,565 acres, respectively. When there is a good year for ephemeral growth, about 11 percent of the planning area is grazed, however in normal to dry years about 6 percent is grazed.

BLM’s grazing season starts on March 1 and concludes the last day of February of the following year. All grazing activities are to be carried out in conformance with grazing regulations, standards for rangeland health, guidelines for grazing management, allotment management plans, and direction provided in the CDCA Plan. Current grazing activities in all four allotments are further constrained by mitigation measures listed for the desert tortoise and their habitat listed in biological opinions. Table 3-7 shows the area of desert tortoise critical habitat and BLM-Category I, II and III habitat within each allotment. Chemehuevi and Lazy Daisy Allotments are in the desert tortoise Northern Colorado Desert Recovery Unit. Map 2-5 Appendix A shows the location of these four areas.

Table 3-7. Acreage (and percent) of Grazing Leases in Tortoise Critical Habitat and BLM Tortoise Categories

Allotment Name	Acres in Critical Habitat	Acres in BLM Category I & II	Acres in BLM Category III
Chemehuevi	94,050 (10)	91,975 (12)	45,346
Ford Dry Lake	0	0	49,682
Lazy Daisy	250,834 (27)	228,579 (29)	104,307
Rice Valley	0	0	85,565
Total All Allotments	344,884 (37)	320,554 (40)	284,900

* % is relation to total amount of Critical Habitat and Category I & II.

The Lazy Daisy Allotment occupies an area south of Highway 40, and east of Route 66 in the most northern portion of the planning area. The Chemehuevi Allotment is south of Needles, straddles Highway 95, and borders the eastern boundary of planning area. The Ford Dry Lake Allotment is located immediately north of I-10 in the Ford Dry Lake area, west of the southern end of the McCoy Mountains, and south of the Palen Mountains. The Rice Valley Allotment is south of the ruins of Rice along Highway 62 and straddles the Rice-Midland Road and the Arizona-California Railroad spur.

The Lazy Daisy Allotment, #CA-069-9076, has a potential use level of 3,192 AUMs of perennial forage for 266 head of cattle to graze all year long. The current lessee has grazed cattle on the allotment since March of 1979. The total area of the allotment is 332,886 acres composed of 304,103 acres of BLM and 28,783 acres of state and private land. Refer to Table 3-8 for past grazing use.

Table 3-8. Past Grazing Use

Grazing Year	AUMs Consumed	Grazing Period	Average Number of Cattle/Sheep
Chemehuevi Valley Allotment			
1989	15	10/1 - 10/31	15
Ford Dry Lake Allotment			
1972	600	12/1/72 - 2/28/73	1000
1976	1700	10/22/76 - 4/8/77	1847
1977	2708	9/1/77 - 6/5/78	1472
1978	2700	12/1/78 - 4/30/79	2700
1979	200	10/1/79 - 11/30/79	500
1998	586	2/24/98 - 4/17/98	2660
Lazy Daisy Allotment			
1990	1200	3/1 - 2/28	100
1991	1500	3/1 - 2/28	125
1992	1500	3/1 - 2/28	125
1993	1927	3/1 - 2/28	196
1994	1500	3/1 - 2/28	125
1995	1500	3/1 - 2/28	125
1996	1275	3/1 - 2/28	113
1997	1500	3/1 - 2/28	125
1998	1500	3/1 - 2/28	125
Rice Valley Allotment			
1983	260	4/1 - 4/30	1300
1992	441	3/22 - 4/27	2200
1998	626	2/21 - 4/2	2700

Presently, utilization of perennial forage plants in the northern and southern portions of the allotment is constrained by the lack of water sources. There are places throughout the allotment that need fences constructed to maximize available water sources. Cattle are currently feeding in three major areas located

in the central portion of the allotment; Paramount, Sunflower, and Tye Cabin. As daytime temperatures drop and cattle demand less water and/or there is an increase in ephemeral plants, most of the cattle that leave the central portion of the allotment tend to move east and south toward the flats, and graze as long as forage conditions permit. The northeastern (Ward Valley) portion of the allotment is not normally used by cattle due to lack of perennial forage and the consistent lack of ephemeral feed. Cattle have direct access to I-40 at the overpass at Water Road and I-40, and historic Route 66. Installation of a cattle guard is necessary to prevent cattle from wandering onto the freeway. Cattle are unable to make effective use of the northern and northwestern portion of the allotment due to a lack of one mile of fence at Mountain Springs overpass on I-40. Fenner and Barrel Springs are found in the northern portion of the allotment and need to be developed further.

When cattle graze in the eastern portion of the allotment, most use occurs adjacent to Homer Wash south of the gas pipeline. The lessee indicates “chamise” brush and galleta are the primary forage species. In the southern portion, abundant feed in Nine Mile Canyon is used only during cooler and wetter periods of the year. The lack of a permanent water source in this canyon precludes prolonged grazing use. The ephemeral springs in the canyon cannot be trusted to provide water throughout the year. To avoid cattle deaths from thirst, the livestock is removed from this area sometime during May or June. Depending on the weather, they are returned when water and forage conditions permit.

Water sources in the central portions of the allotment, especially the eastern side, are developed. As southern water sources are developed, fencing the southeast quadrant of the allotment may be necessary to prevent cattle from drifting off the allotment and toward the Colorado River. Moisture from winter storms tends to fall on the mountain tops, and summer rains fall primarily in the middle of the allotment (west of Pilot Peak), except on top of Old Woman Mountain (pers. comm. M. Blair).

Scanlon Wash is a large canyon located on the west side of the Lazy Daisy Allotment, and cattle have limited or no access to the wash due to a land ownership dispute. This dispute has complicated current and future grazing use of the wash and surrounding area. To make matters worse, about 20 head of cattle were shot during this recent period and the shooter has not been found.

Cattle are gathered, sorted, branded, medicines administered, and shipped each spring. Cattle are herded during the fall as need arises and cattle numbers dictate. Cattle are gathered at corral facilities located at Flat and Old Ranch, and corrals at the home place may be used if Weaver’s Well becomes operational.

The Chemehuevi Allotment sometimes produces forage during late fall, winter, early spring, and sometimes after summer storms. The lessee reported that past cattle use ranged from 35 to 50 head for the allotment, and they would like to maintain that herd size if possible. Grazing use has not been authorized since 1989 grazing season primarily due to the lack of feed and an available herd. Refer to Table 3-8 for past grazing use. Cattle can reach most portions of the allotment, and during exceptionally wet years, cattle can wander west of highway 95. Cattle do not need to drink water as long as forage remains succulent. Cattle move and graze east to west until plant growth reaches its maximum extent.

The Chemehuevi Wash drains approximately west to east through the center of the allotment. The wash is wide and flat, and is heavily used by OHV’s at the lower end during cooler times of the year. Cattle use the wash to access side drainages that traverse the watershed in a general north and south direction. When there are conflicts with OHV’s along Chemehuevi Wash, cattle will move to higher ground and to side drainages

until noise and activities have subsided. The main water source for the allotment is West Well. This large open well can be found at the lower end of the Chemehuevi Wash about four miles west of the Colorado River. West Well is a hand dug well with an adjacent depression that allows cattle direct access to the water. Camping by OHV visitors near the well is a potential problem that has been averted by the availability of a superior campsite located several hundred yards downstream. A corral surrounds the well and can be used for handling and shipping cattle. This corral is the only facility built on the allotment to ship cattle to and from the allotment. The lessee stated that cattle are typically shipped to and from the allotment via small trailers and trucks (pers. comm. Michael Smith).

During the 1980's, excessive temperatures at or near the Colorado River, on the Chemehuevi Indian Reservation, or at the Havasu National Wildlife Refuge led to cattle evasion from allotted grazing areas. The lessee recommended development of the existing Whipple Well, a water source near the southern boundary of the allotment and north of War Eagle Mine. A reliable water source in this area would provide better cattle distribution and access to the northern slope of the Whipple Mountains, and also serve bighorn sheep. Potential range improvements are limited due to the size and topography of the allotment and watershed.

Ford Dry Lake Allotment and Rice Valley Allotment are ephemeral allotments and only domestic sheep are allowed to graze in these units. The weather patterns for these allotments tend to produce forage from rainfall in January, February, and March, and with summer rains. Sheep are not in the general area of the allotments during late spring and summer. Livestock producers have bands of sheep wintering on private lands in nearby Palo Verde Valley and the Casa Grande, Arizona, area. If forage conditions are appropriate, sheep are moved to the allotments. Bands of sheep are transported by several livestock trucks to the allotment from nearby agricultural fields and unloaded in the allotment adjacent to a road. Once the band (usually 600-1,000 sheep) has been unloaded and collected in one area, herders allow the sheep to move and graze in a general area adjacent to their camp and sometimes may travel quite a distance from camp. The herder directs the movement of sheep with the assistance of sheep dogs. When forage is succulent, sheep do not need to drink water, and can therefore graze and walk a long distance from camp. In the evening, the flock will stop and bed down, and around sunrise will get up and start moving and grazing for the day. When the sheep graze through an area, they the sheep tend to spread out looking for the tips of the growing plants to consume. When hotter weather arrives and the feed starts drying, sheep must be supplied water.

3.6.4 Grazing Administration

The BLM conducts a series of actions to authorize cattle and sheep grazing use. Depending on the type of lease, livestock producers apply to graze livestock annually or as conditions permit. Grazing use is permitted with written authorization, and terms and conditions for grazing use are listed as necessary. The BLM conducts field visits throughout the grazing period to ensure grazing is occurring as authorized. Range improvements are inspected as prescribed to determine condition and future utility.

Vegetation and soil conditions are reviewed via rangeland health assessments and monitoring. All allotments have been assessed for health standards. Riparian/wetland vegetation along the Chemehuevi Wash in the Chemehuevi Allotment did not meet standards due to excessive grazing use from burros and infestation of tamarisk. It is anticipated that removal of burros from this area in the near future and institution of a tamarisk control program will quickly improve vegetative conditions. Otherwise, resource conditions in the four allotments meet all standards. California BLM has made a concerted effort to categorize allotments into four

areas based on successful attainment of rangeland health standards (see Appendix B). This categorization process is coupled with an existing selective management strategy of allotments based on their potential to improve resource conditions with less funding (see Appendix B).

Monitoring of rangeland resources has changed over the last decade. In the past, monitoring attempted to obtain general soil or vegetation information, but this vague information could not answer specific questions about subtle changes. Consequently, there was a natural split to collect general and specific resource information. Both types of information have their advantages and disadvantages, and field specialists and management need to decide which method is superior in what situation. The qualitative assessment process could be an inexpensive way to approach monitoring with specific questions needing answers. Under the assessment process, monitoring efforts have narrowed to specific resource conditions in areas of allotments that do not meet standards.

3.7 Wild Horse and Burro Management

Management of wild free-roaming horses and burros was authorized by Congress under the Act of December 15, 1971, (PL 92-195) 16 U.S.C. 1331-1340 (Act) as amended by The Federal Land Policy and Management Act of 1976 (PL 94-579) and The Public Rangelands Improvement Act of 1978 (PL 95-514). The regulations found at 43 CFR Part 4700 and the 4700 BLM Manual series prescribe the authorities, objectives, and policies that guide the protection, management, control, and disposition of wild free-roaming horses and burros in accordance with the Act. Through the Act, Congress declared that: "It is the policy of Congress that wild free-roaming horses and burros shall be protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found as an integral part of the natural system of the public lands" and are to be managed "in a thriving natural ecological balance". The policy of the BLM is to manage wild horses and burros in a manner that will ensure healthy herds for future generations of Americans and contribute to the diversity of life forms on public lands administered by the bureau. The Act does not apply to lands managed by the Department of Defense (except for the stipulations cited in the California Desert Protection Act 1994 for the China Lake Naval Air Weapons Station) nor the National Park Service. Herd management is not prohibited on those lands. In the NECO Planning Area neither JTNP nor CMAGR has ever managed herds of wild horses and burros, and it is not in the scope the NECO Plan that this change, even though burros do exist on CMAGR.

The areas where wild horses and burros were known to exist at the time of the passage of the Wild Horse and Burro Act for the California Desert District are managed by California BLM. The narrow strip of California which lies alongside the Colorado River is managed by Arizona BLM. These two areas are addressed in separate land use plans: the 1980 *California Desert Conservation Area Plan* (see Wild Horse and Burro Management Area map no. 8), and the Yuma District Resources Management Plan (RMP). Both Plans are as amended. Separate herd management area plans (HMAPs) provide more specific burro management guidance. The two plans use different program technical terminology. The meanings of these terms are clarified as follows:

Wild Horse and Burro Range or Herd Area

Both terms have the same meaning, but Herd Area is in universal use today. Herd Areas are areas of public lands identified as being habitat used by wild horses and burros at the time of the passage

of the Act in 1971. The CDCA Plan uses wild horse and burro range. The Yuma RMP uses Herd Area (HA).

Herd Management Area (HMA)

Herd Management Areas are areas designated in land use plans for long-term management of wild horse or burro herds. In these areas wild horse and/or burro herds shall be managed as integral components of public land ecosystems as part of the basic BLM multiple use mandate. Management activities shall be conducted with the intent of maintaining the herds within the boundaries of the HMAs. Both the CDCA Plan and the Yuma RMP use this term.

Retention Area

Retention Areas are mapped as areas within HMAs but are not defined and have no specific management prescriptions. This term is not in program usage today. This term is used only in the CDCA Plan.

Concentration Area

Concentration Areas are areas where wild horse and burro herds tend to congregate and a high probability of encountering the herds is expected. These areas are typically located near water sources where herds would congregate, especially during the dry season. If populations are maintained at appropriate management levels in the concentration areas, more than adequate forage is expected to exist for that population throughout the remainder of the HMA. While a useful management tool, Concentration Area is not an official designation. Concentration Areas are mapped only in the CDCA Plan.

Proposed Population or Appropriate Management Level (AML)

Both terms have the same meaning but the latter is in universal use today. AML is the optimum number of wild horses and burros which achieves a thriving ecological balance and avoids a deterioration of the range (109 IBLA 118 API 1989). AML shall be expressed as a single number which is the highpoint of acceptable upper and lower limits of the population range. The lower limit shall allow for a self-sustaining population. The upper limit must be consistent with objectives of maintaining a thriving ecological balance. The CDCA Plan uses Proposed Population. The Yuma RMP uses Appropriate Management Level (AML)

3.7.1 Herd Areas

There are six HAs in the NECO Planning Area which are listed in Table 3-9 and displayed on Map 2-25 Appendix A. Four of these are covered in the CDCA Plan and two in the Yuma RMP. Five are for burro herds and one is a horse herd. Even though Arizona and California offices separately designated the Chemehuevi (California) and Havasu (Arizona) burro HAs, the same herd of animals is common to both. The same situation exists with the Chocolate/Mule Mountain (California) and Cibola/Trigo (Arizona) burro HAs. Ignoring the administration duplication, there are actually only three burro herds involved in the scope of this

plan, the third being the Piute Mountain HA, located south of I-40 near Essex, California. The one horse HA, Picacho, overlaps part of the Chocolate/Mule Mountain burro HA in the CDCA and does not have a complementary Arizona BLM-administered HA.

3.7.2 Herd Management Areas (general)

All but one of the HAs described above were designated as HMAs in the respective BLM land use plans and the more specific herd management area plans (HMAPs) which followed. Only Piute Mountain HA is not an HMA; therefore the target management number (AML) for that HA is zero. While Table 3-9 shows that there are currently 37 burros in the Piute Mountain HA, the current management intent is that there be none.

Table 3-9. Characteristics of Herd Management Areas

Wild Horse and Burro Herd Management Areas	Size (acres)	Estimated Population	Management Levels	Excess or (Deficit)	Removals 1985 - 2001	Sex Ratio M / F	Average Recruitment (%)
Piute Mountain (Burro) (Herd Area, only)	39,781	37	0	37	14 males <u>15 females</u> 29 burros	1 / 1.07	10
Chemehuevi (Burro)	406,894	598*	150*	448*	269 males <u>313 females</u> 582 burros	1 / 1.16	10
Chocolate/Mule Mtn. (Burro)	386,069	26**	22	4	69 males <u>79 females</u> 148 burros	1 / 1.14	10
Picacho (Horse) (Burro)	45,928	0 12**	42 0	(42) 12	The data collected were incorporated into the Choc./Mule Mtns. HMA		
Havasu (Burro)	78952	598*	150*	448*	763 males <u>808 females</u> 1,571 burros	1 / 0.91	15
Cibola/Trigo (Burro)	36530	82**	190	-108	763 males <u>808 females</u> 1,571 burros	1 / 1.06	17

* Population census conducted March 2001, two sets of numbers are common to both HMAs.

** Population census conducted September 2001, a total population estimate of 120 burros for the 3 HMAs.

Table 3-9 also shows the AMLs for the HMAs. The AMLs for the Chemehuevi and Havasu HMAs are the same number. Animals are the same herd, and the AML is not doubled. The AMLs for the Chocolate/Mule Mountains and Cibola/Trigo HMAs are not the same number and are added, even though the subject burros are of the same herd. HMAs for horses and burros are separate areas even though the Chocolate/Mule Mountains HA/HMA for burros and the Picacho HA/HMA for horses overlap. It is the policy of BLM to manage and remove excess and nuisance animals through humane, live-capture means and place them in private maintenance through BLM's Adopt-a-Horse/Burro program. The age composition of burros in HMAs is presented in Table 3-10.

Table 3-10. Age Composition of Burros in Herd Management Areas

Age	Herd Area				
	Chemehuevi	Picacho Choc./Mules ^a	Piute Mountains	Havasu ^b	Cibola-Trigo ^c
(yrs)	(%)	(%)	(%)	(%)	(%)
<1	10	10	10	15	17
1	21	18	7	19	19
2	23	17	28	15	12
3	13	14	14	16	11
4	7	9	3	12	12
5	13	15	10	9	10
6-8	8	13	14	9	14
9-12	3	3	10	3	4
+12	2	1	0	2	1

- a Gather data for the Chocolate/Mule Mountains HMA and Picacho HMA were combined for this analysis.
- b This information was derived from gather data which includes the Arizona and California side of the Havasu HMA.
- c This information was derived from gather data which includes the Arizona and California side of the Cibola-Trigo HMA.

3.7.3 Chemehuevi and Havasu HMAs

The Chemehuevi and Havasu HMAs, located in southeastern California along the Colorado River between Needles, CA and the Colorado River Indian Tribes (CRIT) tribal lands, provide habitat for wild free-roaming burros. The burros are under the jurisdiction of the Lake Havasu (Arizona) and Needles (California) BLM Field Offices. The burros also roam onto federal land in the Havasu National Wildlife Refuge (NWR), managed by USFWS, Park Moabi (San Bernardino County), Metropolitan Water District land and facilities, and tribal lands belonging to Chemehuevi and Colorado River Indian Tribes.

Management of wild burros within these HMAs is guided by two herd management area plans (HMAPs), the Colorado River HMAP (California Desert District, 1984) and the Havasu HMAP (Lake Havasu Field Office, 1979). The management plans recognized that the same populations of burros use lands in each jurisdiction and called for coordination between the two BLM offices. Very little coordination occurred before 1995. Neither plan has been fully implemented. As of March 2002, there was an estimated population of 598 burros.

Both BLM offices signed a Memorandum of Understanding with the Chemehuevi Indian Tribe allowing for joint burro management, where portions of the Chemehuevi tribal lands would be managed as part of the HMA. However, in 1995 the Chemehuevi Tribal Council rescinded the MOU and all entities are currently operating under a new cooperative agreement for burro removal on the Chemehuevi tribal lands.

The Havasu Herd Management Area (HMA) includes the Havasu National Wildlife Refuge, which at this time does not desire to remain a part of the HMA.

3.7.4 Chocolate/Mule Mountains, Picacho and Cibola/Trigo HMAs

The Chocolate/Mule Mountains and Cibola/Trigo HMAs provide habitat for wild free-roaming burros along the Colorado River in Imperial and Riverside Counties in California. These burros are under the jurisdiction of the Yuma, Arizona and El Centro, California BLM Field Offices. The burros also roam on federal lands managed as the Imperial and Cibola NWRs, state lands managed by the State of California (Picacho state Recreation Area), and private land owners including irrigated farmland in the lower Palo Verde Valley.

Management of these HMAs is guided by two HMAPs, the Colorado River HMAP (California Desert District, 1984) and the Cibola-Trigo HMAP (Yuma District, 1980). Each land use plan set different AMLs for their respective jurisdictions at the same time that it was recognized that only one herd was involved. The AML for the Chocolate/Mule Mountains HMA is 22 burros and is 190 for the Cibola-Trigo HMA. The management plans also called for coordination between the two BLM offices. Little coordination occurred before 1995. Neither plan has been fully implemented. Currently there are an estimated 120 burros in the common herd. Wild horses which once roamed in the Picacho HMA appear to have left the HMA over 20 years ago and have not returned. An AML of 42 horses was established in the 1980 CDCA Plan. The area is entirely within the CDCA, but it does lie against the CDCA boundary.

The Cibola-Trigo HMA includes the Imperial and Cibola NWRs. The intention was for BLM and USFWS to cooperate on managing burros over the greater area. In the last year, USFWS has indicated a desire to not have NWRs be a part of HMAs. The Cibola-Trigo HMA also includes the Picacho State Recreation Area, which includes both state land and federal BLM land leased to the state through the Recreation and Public Purposes (R&PP) Act. The leased lands fall under the definition of public lands in FLPMA and the Act, and can be included in a designated HMA. The Yuma BLM Field Office has been working with the Superintendent of the Picacho State Recreation Area to remove nuisance animals from state-owned lands.

BLM and California Department of Fish and Game are using radio transmitters on burros to collect information on the seasonal distribution and extent of movements of burros in these HMAs. This data, along with water assessments, vegetative monitoring and population census data (burro, bighorn sheep and deer) will be used in the updated herd management area plans (HMAPs). This data will also be used in determining locations of water developments and water exclosures that would achieve the management objectives and keep burros within the HMA boundaries.

Several data and planning documents that predate the 1980 CDCA Plan indicate that the Chocolate/Mule Mountains burro HA developed in the CDCA Plan (Map 2-25 Appendix A) is incorrectly mapped and should be mapped as shown on Map 2-26 Appendix A. These documents include the following:

- 1974 Unit Resource Analysis (URA), developed by BLM's Yuma District.
- 1992 draft Natural Resource Management Plan for CMAGR prepared by the University of California, Riverside depicts the distribution of burros in 1969.
- 1967 map developed by Riverside Land Office (now the California Desert District Office).

The Picacho HMA is the only wild horse HMA in the planning unit. This HMA borders the Cibola/Trigo HMA and is adjacent to and within the Chocolate/Mule Mountain HMA. It is speculated the wild horses may have crossed the Colorado River to Arizona. Currently, the HMA has a population of wild burros.

3.7.5 Population Controls

Population control involves conducting a periodic census of the burro population and removing excess burros.

Population Census

Burro census should be conducted every 3 years, in accordance with Bureau policy and dependent on funding. The methodology is always being evaluated for the most efficient, accurate and cost effective ways of conducting burro counts. The current population census method utilized by the CDD and Arizona BLM is the simultaneous double count method. Infra-red census techniques are being evaluated.

Removal of Excess Burros

Burros are commonly removed from the range and placed in private maintenance through BLM's Adopt-a-Horse/Burro program. A decision to remove burros is based on the following reasons:

- Land use plan decisions
- Excess Burros. If it is determined there is an excess population of burros, animals must be removed from an area in order to preserve and maintain a thriving natural ecological balance and multiple use relationship.
- Nuisance Burros
 - Burros that stray off of the public lands onto private lands
 - Burros that are causing damage to private and/or public property
 - Burros that through their habits create health and safety risks which could lead to death or injury to the public and/or the animals
- Outside Herd Area--wild burros located on Public lands outside the herd areas

Removals are accomplished usually through one of two means: passive self trapping with food/water as bait, or active wrangler/helicopter driving/roping methods. Both methods require periodic access, vehicles, and permanent or portable facilities.

Burros are commonly removed from the range and placed in private maintenance through BLM's Adopt-a-Horse/Burro program. A decision to remove burros usually is made when either the number of animals exceeds the AML for an HMA or animals are present in a nuisance situation in areas outside HMAs. Removals are accomplished usually through one of two means: passive self trapping with food/water as bait, or active wrangler/helicopter driving/roping methods. Both methods require periodic access, vehicles, and permanent or portable facilities.

3.7.6 Management Complexity

The burro management situation along the California side of the Colorado River is complex. In two instances, BLM offices in two states have common management responsibilities for the same herd of burros by the nature of burros roaming both sides of administrative units. Coordination on management actions has been difficult. Both burro herds also roam over different jurisdictional areas. BLM's multiple use

management includes wild horses and burros. The mandates of the USFWS, State Department of Parks and Recreation, tribal lands, and private land owners do not yet include horses and burros. These lands comprise most of the area mapped as concentration areas, where forage and water are most abundant. The number of mandates and their differences create additional complexity for coordinated management.

3.7.7 Species Description--Burros (*Equus assinus*)

Burros along the Colorado River are typically grey, with some being black brown, white pinto or piebald. Almost all possess the shoulder cross characteristic of the ancestral Nubian wild ass (although this sign is faint on dark browns and some whites) and many have leg barring associated with the Somali wild ass. The mean shoulder height of adult burros is 48 inches and the mean weight is approximately 350 pounds. The life expectancy for a burro in these herds is between 5-8 years.

The social structure of wild burros is different from wild horses in that wild burros do not form breeding bands or harems. There are no apparent personal bonds, other than jenny-foal relationships, between individuals. The animals occur in male groups known as bachelor bands, in female groups known as jenny-foal groups, and in mixed groups. All of the groups are variable and their composition may change at any time. Groups may form for several hours or for several weeks. Some of the older studs become territorial, but they do not prevent other males from entering their territory unless there is an estrous female present. Within this type of organization there is no order of dominance or leadership other than within these limited territories. All adult members seem to be of equal rank, and only the jenny and her foal ever search for each other when they are separated. It is more common for males to roam freely throughout their habitat and breed upon encountering an estrous female. Large male groups may form in the vicinity of an estrous female. In dispersed populations in a desert environment, breeding efficiency increases as the population densities increase. As daily temperatures increase and water availability decreases, more and more animals must gather around remaining water sources. These areas become important areas for maximizing breeding. This temporary or seasonal increase in population density increases the chance for males to encounter estrous females. The loose social structure, where all animals are potential breeding partners, maximizes genetic diversity in small or dispersed populations. The breeding season is year long. The estrous cycle appears to be more common during the cool or wet seasons than the hot or dry months.

During the summer, a burro will drink from 2.5 to 4.0 gallons a day and generally will not travel more than 3 miles from an available water source. During times of moderate temperatures and especially when succulent annuals are prevalent, the burros may go without water for 3 to 5 days and travel longer distances from water sources.

The major perennial forage species along the Colorado River are: big galleta grass (*Hilaria rigida*), ocotillo (*Fouquieria splendens*), ironwood (*Olneya tesota*), palo verde (*Cercidium spp.*), mesquite (*Prosopis spp.*) and white bursage (*Ambrosia dumosa*). Studies conducted by Omart, Woodward and Seegmiller in the 1970's, indicated that diets of burros consist between 40 -60 percent shrubs, 30 percent forbs, and 4-20 percent grasses.

3.7.8 Population Viability Analysis

Singer and Zeigenfuss, 2000, studied genetic effective population size in the Pryor Mountain wild horse herd. They concluded that the minimum population size required to maintain genetic variation was in the range of 139 to 185 wild horses.

During the next four to five years, data will be collected on burro populations in preparation of a Population Management Plan. This process includes collection of blood samples to be analyzed for genetic baseline data. The data will be compared to similar data from both domestic and other wild horse/burro populations.

The primary value of this initial data is as a baseline against which future data can be compared to identify genetic drift and any narrowing of diversity through inbreeding. In the short term, diversity can be determined, herds may be separated or combined for management based on the data, and rare alleles may be identified. A report on the analysis will be provided by the University of Kentucky.

3.7.9 California Desert District Burro Herd Areas and Herd Management Areas

Herd Areas and Herd Management Areas in the California Desert Conservation Area are shown on Map 4-1 Appendix A. Table 3-11, below, shows characteristics of these areas. The table displays the following:

- All the burro herd areas recognized in the CDCA Plan (1980) and assigned acreage
- Herd management areas (HMAs) designated in 1980, associated acreage and appropriate management levels (AML). If the herd area was not designated to managed burros, 0 acreage and an AML of 0 were assigned
- Year 2001 status of herd area acreage. Herd areas with an (*) had a reduction in their acreage due to the transfer of Public lands to the National Park Service (NPS) through the 1994 California Desert Protection
- Year 2001 status of herd management area acreage and associated AMLs. Several amendments to the CDCA Plan (1980) removed the HMA designation and assigned 0 acres and reduced the AML to 0. HMA acreage affected by lands transferred to the NPS are shown with two asterisks (**), which advertently reduced their AML. The NPS does not manage for burros. Any herd areas or HMA transferred to the NPS are not applicable (NA) to the 1971 Wild Free-Roaming Horse and Burro Act
- The estimated burro population for the herd areas and herd management areas. The Piper Mountain and Chicago Valley HMAs, no longer have burro populations, but still have an assigned AML.

Table 3-11. Characteristics of Herd Areas and Herd Management Areas in California Desert Conservation Area

Burro Herd Areas	Herd Area Acreage, 1980	HMA Acreage 1980	AML 1980	Current Herd Area Acreage, 2001	Current HMA Acreage, 2001	AML 2001	Estimated Burro Population 2001
Piper Mountain*	104,661	104,661	82	97,434	96,303	82	0
LastChance / Sand Spg.*	240,837	0	0	43,569	0	0	0
Waucoba / Hunter Mtn.*	519,129	389,347	444	44,685	22,686**	29	80
Lee Flat*	135,505	123,310	30	88,523	73,330**	15	14
Centennial*	1,030,311	721,218	1,137	1,023,384	0	0	100
Panamint*	414,686	207,343	240	214,450	0	0	123
Slate Range*	512,951	487,303	408	492,020	0	0	70
Chicago Valley*	331,612	278,173	28	314,377	278,173	28	0
Clark Mtn.*	233,410	75,349	44	196,140	75,349	44	170
Lava Beds*	179,254	173,876	75	Transferred to NPS	NA	NA	NA
Granite / Providence Mtn*	192,735	0	0	Transferred to NPS	NA	NA	NA
Woods / Hackberry*	56,540	0	0	Transferred to NPS	NA	NA	NA
Cima Dome*	93,199	93,199	55	Transferred to NPS	NA	NA	NA
Piute Mtn.	39,781	0	0	39,781	0	0	37
Dead Mtn.	42,757	0	0	42,757	0	0	19
Chemehuevi	406,894	406,894	150	406,894	406,894	150	598
Chocolate / Mule Mtns.	386,069	386,069	22	641,419	386,069	22	26
Kramer	14,024	14,024	16	14,024	0	0	0
Morongo	39,159	39,159	16	39,159	0	0	0
Total	4,973,514	3,500,465	2,747	3,698,616	1,338,804	370	1,292

3.8 Recreation Management

The *California Desert Conservation Area Plan* (1980) stated the following:

The California Desert attracts millions of visitors annually to its wide spectrum of recreational opportunities. Its diverse landscapes create a variety of physical and psychological settings which provide a desert experience of natural beauty, solitude, and freedom from the structure and regulations of the urban areas of southern California, where 85 percent of these visitors live.

With expanded leisure time and growing affluence of southern Californians, conflicts have arisen between those who use vehicles as a means of access and those who operate vehicles as a recreational activity. Access can be for a variety of purposes, including economic pursuits and for recreation such as hunting and rockhounding. In addition, recreationists compete for space with other resource users. While strongly advocating that recreational facilities and regulations remain minimal, desert recreationists increasingly demand the protection of the natural and cultural values which are essential to most desert recreation. Scenic values are often cited by the public as the Desert's most important resource.

The California Desert is already important as a reservoir of open space and as a place for outdoor recreation. While the BLM as an agency is not readily known, lands managed by the Bureau are especially significant to recreationists. The public lands will become increasingly important since they are closer to urban centers than most other recreation areas, such as Death Valley, and offer a wider variety of recreational experience.

A substantial increase in demand for facilities and services, especially educational and interpretive programs, will occur primarily because of increased population growth in southern California. Other factors include:

- An emerging awareness of desert resources and values
- Saturation of other outdoor recreation areas in southern California
- Energy shortages and economic stresses which will cause more people to come to the relatively close Desert and stay longer
- Technological innovation in recreational equipment which will influence user trends and consequently the demand for various resources

Such was the view regarding recreation in the California Desert more than two decades ago. Have some facets of this overview changed since then? Certainly it is no longer true that leisure time is increasing, at least for much of the working population. Harvard economist Juliet Schor (1989) predicted that Americans would have less free time as we move to the next century. This trend can be attributed, in part, to individuals holding multiple jobs, part-time workers who are stay-at-home parents, and other tasks which occupy increasing amounts of time.

On the other hand, one would expect that given our aging population, a large group of individuals will have more free time than ever before as they leave the work force. Heath (1997) indicated that many people over

age 40 are starting to engage in “high risk” activities. This demonstrates that the “retired” population is not content to spend their remaining years in an inactive mode. Rather, they increasingly desire to continue a life of activity. Census Bureau projections show the elderly of the future will be more educated than previous generations. It is conceivable that this group may have a strong desire to engage in learning about nature and viewing wildlife, activities that may well lead them to the unconfined open spaces of the NECO Planning Area.

Has there been continued growth of affluence since 1980 which might lead to additional expenditures on recreational equipment and increased visitation to the California Desert? Data reported at the national level from the Outdoor Recreation Coalition of America (1996) showed substantial increases in recreation equipment purchases. With the dramatic rebound of the California economy (since the economic recession of the early 1990s), it is likely that some of this increased purchase activity is occurring in this state. If this is true, Californians at least have the intent to engage in outdoor recreation activities. This, in conjunction with an increasing preference for natural and undeveloped areas (from 26.5 percent of Californians in 1987 to 39.4 percent in 1997; CIC Research, Inc., 1997), could translate to increases in visitation to the California Desert, especially the remote, less-frequented areas such as those within the NECO Plan boundaries.

Relative to trends for specific recreation activities which are of primary importance to visitors in the NECO Planning Area, the following levels of participation have been observed since 1987:

- General nature study has steadily increased.
- Off-highway vehicle use of 4-wheel drive vehicles dropped in 1992, and then climbed back to the 1987 level by 1997.
- Use of motorcycles and ATVs was about the same between 1987 and 1992, but increased by about 30 percent in 1997.
- Camping in developed sites and primitive areas exhibited growth in 1992 and then declined to about their 1987 levels by 1997.

Californians were asked in 1997 which activities that took place in government-operated park and outdoor recreational areas were most important to them. Of the 43 activities listed, opportunities for 12 exist within the NECO Planning Area. The relative importance of these twelve activities was indicated as follows.

High Importance

Trail hiking
Camping in developed sites with tent or vehicle
Camping in primitive areas / backpacking
General nature study / wildlife viewing

Moderate Importance

Driving for pleasure
Horseback riding
Picnicking in developed sites

Low Importance

Mountain biking
Hunting
Target shooting
Motorcycle, dirt bike, ATV, and dune buggy use off paved roads
4-wheel drive vehicle use off paved roads

Opportunities for pursuing camping and backpacking activities in primitive areas were enhanced upon passage of the California Desert Protection Act of 1994 (16 U.S.C. 1132 *et seq.*), which designated certain lands in the California Desert Conservation Area as wilderness and, therefore, as components of the National Wilderness Preservation System.

It is important to recognize that a statewide survey regarding public opinions and attitudes on outdoor recreation may not be directly applicable to any particular region, much less an area like the NECO Planning Area that itself is home to relatively few people and generally requires a substantial effort to access. It may be reasonable to assume that a survey of populations residing near the NECO Planning Area (e.g., El Centro, Blythe, Needles, cities in the Coachella Valley) would yield different results. Therefore, a description of recreational trends for the area without a statistically valid survey is problematic. Anecdotal information from sources in the best position to observe recreational use in this part of the California Desert would then have to be considered.

3.8.1 Multiple-Use Classes

The CDCA Plan furnishes guidelines specifying the types of recreational activities allowed in each of the Multiple-Use Classes (BLM-administered lands only). These guidelines are as follows:

<p>Multiple-Use Class C <i>Controlled Use</i> <i>(Wilderness Mgt.)</i></p>	<p>Multiple-Use Class L <i>Limited Use</i></p>	<p>Multiple-Use Class M <i>Moderate Use</i></p>	<p>Multiple-Use Class I <i>Intensive Use</i></p>
<p>This class is suitable for nonmechanical types of recreational experience which generally involve low to very low user densities. Recreational opportunities provided include, but are not limited to, the following characteristic activities:</p> <ul style="list-style-type: none"> – backpacking – primitive, unimproved site camping – hiking – horseback riding – rockhounding – nature study and observation – photography and painting – rockclimbing – spelunking – hunting 	<p>This class is suitable for recreation which generally involves low to moderate user densities. Recreation opportunities include those permitted in Class C plus:</p> <ul style="list-style-type: none"> – landsailing on dry lakes – noncompetitive vehicle touring and events only on “approved” routes of travel <p>All organized vehicle events, competitive or not, require a permit specifying the conditions of use; these conditions will include, but are not limited to:</p> <ul style="list-style-type: none"> – approved routes – no pitting, start, finish, or spectator areas 	<p>This class is suitable for a wide range of recreation activities which may involve moderate to high user densities. Recreational opportunities include those permitted in Class L. Competitive motorized-vehicle events are limited to “existing” routes of travel and must be approved by the authorized officer. Pit, start, and finish areas must be designated by the authorized officer. All competitive events having 50 or more vehicles require permits.</p>	<p>This class is suitable for recreation activities which generally involve high user densities. A wide array of recreational opportunities will be found in this class. Off-road vehicle play will be allowed where approved and in open areas.</p> <p>Uses permitted are the same as Class M. In addition, motorized-vehicle play is allowed in areas designated “open.” All aspects of competitive events will be permitted except where specific limitations are stipulated by the authorized officer.</p>
<p>Permanent or temporary facilities for resource protection and public health and safety may be allowed at the discretion of the authorized officer or in accordance with approved Wilderness Management Plans.</p>	<p>Permanent or temporary facilities for resource protection and public health and safety are allowed.</p>		
<p>Trails are open for non-vehicular use and new trails for non-motorized access may be allowed.</p>			

3.8.2 Access

To engage in most desert recreational activities outside of open areas, visitors must use motorized vehicles and usually travel on some previously-used or marked motorized-vehicle route. Vehicle access is among the most important recreation issues in the desert. A primary consideration of the recreational program is to ensure that access routes necessary for recreation enjoyment are provided. Specific route identification will occur in conjunction with the NECO Plan.

3.8.3 Washes

Access to washes by motorized vehicles in the pursuit of recreational opportunities is a primary issue in the NECO planning effort. Washes provide motorized-vehicle access for hunting, sightseeing, nature study, and camping, and they also constitute important habitat for many wildlife species, among which is the desert tortoise. Opinions vary greatly about the effects of motorized vehicles traveling in washes, especially those where use is relatively low. (See Section 3.9.5, regarding washes as routes of travel).

Desert Wildlife Unlimited, Inc. (El Centro, California) characterized recreational use in Milpitas Wash and adjacent wash areas as follows:

Milpitas Wash area

- Approximately 150 hunters focus on the Milpitas Wash area during the deer hunting season, generally November.
- Hunters seeking quail, dove, and other game use the area during appropriate seasons, generally fall and winter.
- Most hunters favor existing roads, trails, and large, easy-to-drive washes.
- About one quarter of the hunters camp in the wash complex, mostly on private lands and usually on opening weekend of the deer season.
- Most hunters drive on existing roads, trails, and large washes, then walk on rougher terrain.
- Driving in washes during the hunting season occurs mostly with large vehicles such as sport utility vehicles.
- Very little cross-country travel from wash to wash occurs due to the extensive nature of existing roads, trails, and washes.
- Other recreational use (e.g., sightseeing, rockhounding) occurs mostly from October through April with about 25 recreationists visiting the area on weekends, 10 on weekdays, concentrating at specific sites such as the Hauser Geode Beds.

Wash area southeast of Highway 78

- Approximately 450 hunters focus on this area during the deer hunting season.
- Hunters seeking quail, dove, and other game use the area during appropriate seasons.
- Most hunters favor existing roads, trails, and large, easy-to-drive washes.
- Only 10-15 percent of the hunters camp in the washes; relative to the Milpitas Wash area, more motor homes are used for camping.
- Most hunters drive on existing roads, trails, and large washes, then walk on rougher terrain.

- Driving in washes during hunting season occurs primarily with large vehicles such as sport utility vehicles.
- Very little cross-country travel from wash to wash occurs due to the extensive nature of existing roads, trails, and washes.
- Other recreational use (e.g., sightseeing, rockhounding) occurs mostly from October through April with about 25 recreationists visiting the area on weekends, 10 on weekdays, but concentrating at specific sites.

In general, similar levels of activity in other parts of the NECO Planning Area on BLM-administered lands are believed to be occurring with some exceptions. At lower Chemehuevi Valley, immediately adjacent to the community of Havasu Lake, there occur moderate to high levels of off-highway vehicle activity, although much of the intense activity is just outside the NECO Plan boundary on public lands administered by the Lake Havasu Field Office, Arizona.

3.8.4 Organized Competitive Vehicle Events

The CDCA Plan allows for long-distance, point-to-point events by delineating competitive recreation courses. The two courses within the NECO Planning Area—Johnson Valley to Parker and the Parker 400 (Map 2-30 Appendix A)—were established exclusively for permitted competitive recreation, not for access or casual recreation unless specifically approved in later actions. Criteria for designing other race events are contained in the Multiple-Use Class guidelines (above) and the CDCA Plan under “Recreation Element”. Because of potentially sensitive resources in Multiple-Use Class L areas, race routes through these areas must comply with the following additional requirements:

- (1) All courses will remain on routes of travel that have been approved for motorized-vehicle use. Event routes on special areas such as dunes and dry lakes will be governed by the MUC L guidelines and any special management objectives identified for the area. Special limitations such as ACEC management prescriptions, speed limits, seasonal closures, and monitoring requirements may be needed to protect the resource values in the area.
- (2) Pit, start, finish, and spectator areas will not be allowed. Course verification points, or checkpoints, where race officials will monitor riders and verify that they have followed the prescribed course, are allowed. No mechanics’ services or fuel stores are allowed at these checkpoints.
- (3) Fragile and/or significant areas will be avoided unless environmental assessment shows that any potential impacts to these areas could be mitigated or would not occur. Such areas include, but are not limited to: (a) ACECs; (b) habitats of endangered, threatened, rare or protected species; (c) educational, and research areas; (d) archaeological and historical areas and features; (e) sensitive soils and susceptible wind-borne dust areas; (f) wetlands and riparian habitats; and (g) areas near urban populations.
- (4) The BLM will require the event sponsors to mitigate potential negative impacts and may require rehabilitation where feasible. For example, the sponsor may have to provide official observers at mandatory checkpoints to ensure that racers comply with the designated course. Also, damage to the route may need to be repaired.
- (5) All racecourses are temporary and may not be used on a continual basis pending specific resource studies. All approved competitive routes are temporary and exist only for the life

- of the specific event for which the route was designed. Pending resource studies on event routes in MUC L, which may or may not indicate that an area is suitable and capable of tolerating such use, no approved route may experience more than one event annually. In some cases, the route may be used even less frequently. It would be considered rare that an approved route could receive more than a single annual race event.
- (6) Long-term adverse impacts will not be allowed. Adverse impacts or scars predicted to remain on the resource beyond one to five years are, in general, considered “long-term” and are not tolerated in MUC L areas. All identified adverse impacts in MUC L areas will be avoided or complete mitigation will have to be shown to be possible within a reasonable time frame, not to extend beyond five years from the date of the event.
 - (7) Event participants may have to traverse MUC L under controlled (yellow flag) conditions (e.g., no passing, timed speeds, maintained roads) as appropriate for resource protection and public safety. This criterion is conditional and depends on such factors as management objectives for the area, special resources, length of the course, dust conditions, type of event, season of use, etc. This option provides not only protection of valuable resources, but also safety for the race participants where hazards may exist.
 - (8) Length (mileage) of the event passing through MUC L will be a key factor in determining use. As the approved route length increases, it can be generally expected that more controlled race requirements, such as yellow flag conditions, may be mandated.
 - (9) Width of the course will be the minimum practicable for resource protection and public safety. All approved routes must be capable of tolerating the number of persons and vehicles expected to enter the area.
 - (10) All other alternative routes have been considered.

All criteria are in addition to those required in accordance with 43 CFR 8372 (see “Special Recreation Permits” section 3.8.5).

Johnson Valley to Parker

The Johnson Valley to Parker corridor extends approximately 220 miles from the upper Johnson Valley Off-Highway Vehicle Recreation Area to the vicinity of Parker, Arizona. The last third of the corridor corresponds to the southern portion of the California loop of the Parker 400 corridor. The Johnson Valley to Parker corridor was used for the “Checkchase” sponsored by the AMA Checkers Motorcycle Club. The event last occurred in the 1980s.

Parker 400

The 105-mile California portion of the Parker 400 corridor generally circumnavigates the Turtle Mountains with the eastern leg skirting the Whipple Mountains. The remainder of the course occurs in Arizona. SCORE International was the primary sponsor for the event that historically took place in late January or early February. Of the participants, 75 percent were four-wheeled trucks and dune buggies. Based on post race evaluations (finding a significant amount of course widening, short cutting, and illegal cross-country travel) and the experience with the Barstow to Las Vegas race and application, the BLM decided to deny the application for the California loop of the 1990 event. Insufficient time to prepare an Environmental Impact Statement was an important consideration.

After the 1989 emergency and proposed listing of the desert tortoise as “endangered,” and the 1989 Barstow-to-Las Vegas (B-to-V) race, BLM’s February 13, 1990 Policy Paper regarding competitive off-highway vehicle events recommended that BLM “pursue a Plan Amendment(s) to eliminate the four competitive event courses and corridors from the *California Desert Conservation Area Plan* and deny any further applications for use of these corridors until the amendment process is complete.” The Johnson Valley to Parker and Parker 400 corridors comprise two of these four corridors.

A CDCA Plan amendment was initiated and there was some public scoping, but the amendment was never completed. BLM published a Notice of Intent to Prepare the Plan Amendment in the *Federal Register* on December 22, 1989. The American Motorcyclist Association (AMA) filed suit (April 6, 1990) challenging BLM’s adoption of the Policy Paper and BLM’s denial of AMA’s permit application for the 1990 B-to-V race (March 6, 1990). On June 8, 1990, the District Court (Findings of Fact and Conclusions of Law--SA CV 90-267-JSL {rwrX}) addressed BLM’s authority to deny a permit for the 1990 B-to-V race and how the inclusion of the competitive event courses in the CDCA Plan should influence BLM’s consideration of permits for individual events such as the B-to-V race.

There are two important rulings in the decision of the District Court: (1) BLM may deny a permit for a race after following proper procedures (preparing an EA); and (2) BLM should assume that permits for events such as the B-to-V race will be issued “absent a change in the circumstances which led to the establishment of the race courses.” The second aspect of the decision is the reason a plan amendment on competitive corridors needs to be analyzed. Despite good cooperation from AMA in its attempts to assure compliance with event stipulations for the 1989 B-to-V race, neither BLM nor AMA could provide such assurance. BLM and USFWS monitoring conducted after this event found that some participants strayed from the marked course in tortoise habitat. These incidents of straying were violations of the permit stipulations. For this reason, competitive event courses, designated before the federal listing of the tortoise, may conflict with tortoise recovery. Whereas the inclusion of competitive event corridors in the CDCA Plan “clearly contemplate that permits will be issued” (District Court, 1990), such assumption is qualified by the statement, “. . . absent a change in circumstances which led to the establishment of the race courses.” The listing of the tortoise may constitute this change.

3.8.5 Special Recreation Permits

In accordance with 43 CFR 8372.1-1, Special Recreation Permits are required for (a) commercial use, (b) competitive use, (c) off-road vehicle events involving 50 or more vehicles, and (d) special area use where the authorized officer determines the criteria of the Land and Water Conservation Fund Act, as amended; Sikes Act; Wild and Scenic Rivers Act; Federal Land Policy and Management Act; Taylor Grazing Act; or National Trails Act require their issuance.

The following definitions (from 43 CFR 8372.0-5¹) are pertinent to organized competitive vehicle events:

- (a) **Competitive use** is any formally organized or structured use, event, or activity on public land in which there are the elements of competition between two or more contestants, registration of participants, and/or a predetermined course or area is designated. The term also applies to one or more individuals contesting an established record such as speed or endurance.
- (b) An **event** is a single, structured, organized, consolidated, or scheduled meeting or occurrence for the purpose of recreational use of the public lands. An event may be composed of several related activities.
- (c) An **off-road vehicle** (or **off-highway vehicle**) is any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain excluding (1) any nonamphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is specifically authorized by the authorized officer or otherwise officially approved; (4) official use; or (5) any combat or combat support vehicle when used in times of national defense emergencies.

All applicants for Special Recreation Permits to conduct competitive off-highway vehicle events must comply with the application requirements and, upon issuance, permit conditions as indicated on Form 8370-1, *Special Recreation Application and Permit*. Generally, Special Recreation Permits for competitive events include stipulations that address various operational and resource protection issues, including course alignment and marking, safety, enforcement of rules, reclamation and cleanup, and monitoring.

3.8.6 Off-Highway Vehicle Recreation Areas

In developing the CDCA Plan, thirty-three potential motorized-vehicle free-play areas were evaluated by personnel from each resource division of the Desert Planning Staff. The inventory of potential choices included all such areas shown on the "Use" alternative, plus additional areas each resource division believed should be considered. The area-by-area impact analysis, decision criteria, opinions, and final boundary maps for motorized free-play areas were submitted to the Steering Committee for final decision on inclusion in the proposed CDCA Plan. Within these free-play areas, also recognized as "open areas" and "off-highway vehicle recreation areas," vehicle travel would be permitted anywhere if the vehicle is operated responsibly in accordance with regulations.

Two "open" areas within the planning area (Map 2-20 Appendix A) were approved through the CDCA Plan: Ford Dry Lake and Rice Valley Dunes Off-Highway Vehicle Recreation Areas, both of which are administered by the BLM Palm Springs-South Coast Field Office.

Ford Dry Lake

The McCoy Valley Area, which envelopes much of the Chuckwalla Valley inclusive of Ford Dry Lake, was among the areas evaluated through the CDCA Plan. This 251,400-acre area is bounded on the northeast by the lower foothill portion of the McCoy Mountains, on the north by the lower

¹ Note: On May 16, 2000, a proposed rule was published in the *Federal Register* (Volume 65, Number 95) to update the regulations at 43 CFR 8372. If the proposed rule is adopted, the new regulations would be found at 43 CFR 2930

foothills of the Palen Mountains, and along the south-southwest by the Little Chuckwalla and the Chuckwalla Mountains. A neck of land extending to the north is bounded by the Palen Mountains on the east, and the Palen Dry Lake and drainage basin on the west.

A major portion of the McCoy Valley Area was designated “open” in the Interim Critical Management Plan (1973). Many concentrated use zones occurred throughout the McCoy Valley Area and more than 94,000 visitor use days were recorded in 1978. The CDCA Proposed Management Plan recommended that no motorized-vehicle free-play occur in the McCoy Valley Area to protect sensitive resources, particularly bighorn sheep habitat because the McCoy Valley includes an important migration route between bighorn sheep ranges. The Environmental Impact Statement indicated that closure of this area to motorized-vehicle free-play would have a significant negative impact on this recreational activity. However, at the same time, it stated that vehicle free-play is probably less important in this area than other forms of vehicle use.

Based on public responses to the Proposed CDCA Management Plan, specific issues were reexamined by the Desert Planning Staff and changes were made to the Plan. As regards Ford Dry Lake, a public request for a free-play area near Blythe resulted in a portion of Ford Dry Lake being designated as an off-highway vehicle recreation area (1,135 acres).

Although no recent surveys have been conducted to ascertain levels of use on Ford Dry Lake, anecdotal information from the BLM's Palm Springs-South Coast Field Office staff indicates it receives little motorized-vehicle free-play use. This confirms the CDCA Plan's contention that vehicular free-play in this area is less important than other forms of vehicle use such as recreational touring on existing and approved routes of travel.

Rice Valley Dunes

The McCoy Valley Area was evaluated during development of the CDCA Management Plan for its potential to provide motorized-vehicle free-play opportunities, but the Rice Valley area was not likewise considered. Consequent to public response to the Proposed Plan, vehicular access for the Rice Valley Dunes was changed from “existing routes of travel” to “open” (2,790 acres).

The Rice Valley Dunes Off-Highway Vehicle Recreation Area lies in the center of Rice Valley, an expansive area bounded on the north by the southern tip of the Turtle Mountains, on the east by the West Riverside Mountains, on the south by the Little and Big Maria Mountains, and on the west by the Arica Mountains. No surveys have been conducted to determine use levels in this OHV area, but BLM staff indicate that, like Ford Dry Lake, the Rice Valley Dunes area is not frequently used as a motorized-vehicle free-play area.

Lower Chemehuevi Valley (not a designated OHV Recreation Area)

The lower Chemehuevi Valley area immediately south of Havasu Lake, California, was identified by the Needles Field Office staff as a “hot spot” in the California Desert Conservation Area. “Hot spots” are areas of intensive off-highway vehicle use where such activity is often not in conformance with existing management prescriptions and/or regulations and therefore require special management

consideration. In particular, the easternmost portion of Chemehuevi Wash exhibits evidence of considerable cross-country travel and hill-climbing activity by motorized vehicles in an area where vehicle use is restricted to existing and/or approved routes of travel. Such off-route activities may result in higher levels of erosion within the confines of the wash, ultimately leading to increased sedimentation in Lake Havasu itself. The easy accessibility of Chemehuevi Wash from the community of Havasu Lake, in conjunction with high levels of seasonal visitation of the resort by individuals not permanently residing there, is a prime contributor to the problem.

Most of the illegal activity (off-road travel and hill climbing) occurs within three sections of public lands administered by the BLM Lake Havasu Field Office (LHFO), Arizona. These lands occur outside critical desert tortoise habitat as designated by the U.S. Fish and Wildlife Service, and outside the NECO Plan boundary. Given these sections' isolation from the main body of public lands within jurisdiction of the LHFO, which is located on the Arizona side of the Colorado River, day-to-day management of the California lands is problematic.

The Chemehuevi Indian Tribe, whose lands are adjacent to public lands managed by the LHFO and Needles Field Office, is planning to expand its recreational facilities. Such expansion could intensify OHV-related problems in Chemehuevi Wash as increasing numbers of visitors are drawn to the area, including an increase of OHV use to the west, spreading beyond the reservation and LHFO public lands into the NECO Planning Area and critical tortoise habitat.

3.8.7 California Back Country Discovery Trails

The California Back Country Discovery Trails system, upon approval, will provide a network of long-distance, interconnected, off-highway vehicle trails from the Mexican border to the Oregon border. This network will be a shared-use trail system providing recreational opportunities for all persons, including those who use street-legal and non-street legal (Green Sticker) vehicles, hikers, bicyclists, and equestrians. It will also provide a back country opportunity for non-traditional trail users such as persons with disabilities, senior citizens, and families with small children. Alternate/discovery Routes that provide alternatives to principal routes or access to points of interest will also be identified. (*Trail Strategy: California Back Country Discovery Trails, An Element of the California Statewide Motorized Trail System*. State of California, Off-Highway Motor Vehicle Recreation Division. September, 1996)

The beginning of the Statewide Motorized Trail System goes back to 1971 with the passage of the Chappie-Z-Berg Off-Highway Motor Vehicle Act by the California legislature. This act called for identifying use areas and trails where motorized recreationists could experience the physiographic diversity and natural beauty of the entire state. In 1989, a Memorandum of Understanding was signed by the U.S. Forest Service, Bureau of Land Management, and the Off-Highway Motor Vehicle Recreation Division (OHMVR) of the California Department of Parks and Recreation to guide the development of the trail system. In 1994, the State's Off-Highway Motor Vehicle Recreation Commission adopted California Back Country Discovery Trails as the official name for California's off-highway vehicle trail system and designated the California Back Country Discovery Trails as an element of the Statewide Motorized Trail System.

Principal route segments of the California Back Country Discovery Trails system must be unpaved, full width (tread width in excess of 50 inches), single lane, primitive types of routes intended for use by high-clearance

vehicles that are open to Green Sticker vehicles. Upon designation, trails will be appropriately signed. OHMVR Division is the lead agency for the California Back Country Discovery Trail system, but resource management, law enforcement, maintenance, and operation of the system remain the responsibility of the appropriate land management agency.

Routes of travel in the NECO Planning Area have not yet been designated as Discovery Trails. Nevertheless a report published by The Resource Protection Institute in May 1999 identified proposed California Back Country Discovery Trails in the BLM's California Desert District. In the NECO Planning Area, these are identified as follows:

Route 2: This route coincides with the Bradshaw Trail National Back Country Byway.

Route 4: This route begins at the southwestern corner of the Old Woman Mountains Wilderness, proceeds over Skeleton Pass to Danby, then heads west towards Ludlow.

Route 9: This route begins at the border of Mexico and California just south of Pilot Knob, skirts the east side of the Cargo Muchacho Mountains, passes Black Mountain, and then proceeds east in Vinagre Wash. It continues north to Milpitas Wash and then towards Blythe. From Blythe, it proceeds through Palen Pass to Camp Coxcomb, then north and east to the Cadiz Valley, around the south end of the Turtle Mountains, east to the Whipple Mountains, then north to the Chemehuevi Mountains. Passing through the Sacramento Mountains, it continues north to cross Interstate Highway 40. Route 9 alternate routes and route options are identified.

3.8.8 Rockhounding

Rockhounding is the collection of rocks and minerals by amateur mineralogists for recreational enjoyment. The term "rockhound" includes people who casually pick up something that catches their eye and serious collectors who travel around the country to display their discoveries at rock and gem shows. Areas where certain rocks and minerals have historically been collected in the California desert were identified by a consortium of rockhound clubs about 20 years ago during preparation of the *California Desert Conservation Area Plan*. These areas are depicted on Map 4-2.

Rockhounding in the California desert relies heavily on motorized-vehicle access because of the remoteness of many collection sites and the nature of the activity. The weight of rocks and minerals necessitates that one not venture too far from a vehicle if more than small samples are to be collected. To the degree that motorized-vehicle access is constrained, opportunities for rockhounding are concomitantly limited. Upon enactment of the California Desert Protection Act of 1994, 25 percent of identified collection sites in the California Desert Conservation Area fell into newly designated wilderness areas wherein motorized-vehicle access by the general public is prohibited.

Enactment of the California Desert Protection Act also created the Mojave National Preserve managed by the National Park Service (formerly the East Mojave National Scenic Area managed by the BLM) and expanded Death Valley and Joshua Tree National Monuments, thereby encompassing lands formerly managed by the BLM. The National Monuments were also re-designated as National Parks in accordance with the Act. As

a result of the legislation, an additional 25 percent of identified rockhound collection sites fell into these new and expanded areas managed by the National Park Service wherein rock collection is not allowed.

3.8.9 Long-Term Visitor Areas

Every year thousands of visitors come to southern California and Arizona from all parts of the United States and Canada to take advantage of the mild winter climate and recreational opportunities offered in this desert region. While some visitors choose to isolate themselves from others, the vast majority of these people tend to congregate in relatively large, high-density communities. Traditionally, much of this use was in established campgrounds. In the late 1970s and early 1980s, there began a trend of establishing these communities in the open desert where facilities are rarely available. Here, the impact on the fragile desert environment can be severe, especially when visitors stay for extended periods in the same location.

In response to this situation, the BLM established several Long-Term Visitor Areas (LTVAs) along the lower Colorado River in 1983. Designated sites were selected using criteria developed during the land management planning process, and environmental assessments were completed for each site location. The designation of LTVAs assures that specific locations are available for long-term use year after year, and that inappropriate areas are not used for extended periods. In conjunction with establishing the LTVAs, a limit on camping on public lands outside LTVAs was enacted. Visitors could camp in one location outside an LTVA, unless closed to such use, for no more than 14 days in any 28-day period.

Within the NECO Planning Area, there are three LTVAs: Mule Mountains (2,554 acres) (Palm Springs Field Office); Midland (512 acres) (Palm Springs Field Office); and Pilot Knob (158 acres) (El Centro Field Office). In response to increasing interest in long-term camping in the Midland area, the Midland LTVA was expanded in 1996. While the Mule Mountains LTVA is very large, 90 percent of the use is contained in two campgrounds within areas about 3 miles apart from each other.

3.8.10 Joshua Tree National Park

In Joshua Tree National Park, natural and cultural resources provide outstanding recreational opportunities for the more than 1.2 million visitors that come to the area annually. The wilderness provides an opportunity for solitude in nature and for primitive recreation such as hiking, backpacking and horseback riding. Opportunities abound for viewing, studying, and photographing a diversity of flora and fauna. Massive boulders and rock outcrops provide some of the best rock climbing in the United States. Skilled and novice technical rock climbers from around the world are attracted to the challenging climbing routes.

3.8.11 Chocolate Mountain Aerial Gunnery Range

The Chocolate Mountain Aerial Gunnery Range is closed to public access. These lands are not available for recreational purposes.

3.8.12 Summary

Off-highway vehicle touring, hunting, primitive camping in undeveloped sites, and other recreation activities that rely on large expanses of relatively unpopulated and undeveloped desert landscapes continue to be important within the NECO Planning Area despite statewide survey results reported by California State Parks (1998)². In general, the overall level of recreational use is currently low throughout the planning area except on a site-specific, seasonal basis. For instance, use in developed campgrounds and long-term visitor areas, as well as on lands adjacent to the Imperial Sand Dunes Recreation Area, is often moderate to high during the cooler months of the year. As distances from concentrated use zones increase, there is generally a concomitant decrease in use. Regarding trends of popular recreation activities in the planning area, use appears to be neither substantially increasing nor diminishing.

² Statewide trends, statistical information, and survey results presented in this section are derived from Public Opinions and Attitudes on Outdoor Recreation in California 1997, California State Parks, 1998.

3.9 Off-Highway Vehicle Use / Motorized Vehicle Access

The *California Desert Conservation Area Plan* (1980), as amended, states the following:

Other than those who are simply crossing it, most users of the desert travel some of the time on its network of maintained gravel and dirt roads, ways, trails, and accessible desert washes. There are many of these "routes of travel" in the California Desert Conservation Areas (CDCA).

According to one study, the CDCA has 15,000 miles of paved and maintained roads, 21,000 miles of unmaintained dirt roads, and 7,000 miles of vehicle-accessible washes. However, these routes are not evenly distributed, and desert topography and vegetation do not prevent, and sometimes encourage, cross-country travel in motorized vehicles. Desert soils and vegetation retain the marks of this kind of travel for many years, except in a few places where occasional rains, windstorms, and flash floods erase them. Thus, one vehicle traveling cross-country can create a new route of travel. The proliferation of roads and trails in the CDCA has resulted in a serious problem in some areas and provides the most difficult management issue for BLM and the public.

Many of the desert's loveliest and most fragile resources can only be enjoyed by use of vehicle access routes, but these resources are quickly destroyed if vehicles travel everywhere. Most people who go to the desert revel in its spaciousness and the feeling of solitude and freedom it provides. However, growing numbers of vehicles and uncontrolled expansion of this network of roads and trails may damage this solitude, and heavy-handed regulations to control this traffic would certainly affect the sense of freedom.

The question of managing access to the desert is especially sensitive. Vehicle access is confused with the use of vehicles for play. Public comments make it clear that motorized-vehicle access and off-highway vehicle play need to be clearly separated and managed differently. . . .

While the Bureau is responsible for vehicle use on public lands, much of the control of vehicle travel in the desert is the responsibility of the user, whether the goal is recreational or commercial. The Bureau of Land Management does not and will not have the funds or staff to oversee vehicle use throughout the desert at all times. Therefore, rules for vehicle use must be fair, understandable, easy to follow, and reasonable if they are to be publicly accepted. Only commitment by the public, the owners of these lands, will insure success of rules and guidelines.

3.9.1 Issuance of Executive Orders and Development of Regulations

The increased popularity and widespread use of off-highway vehicles (OHVs) on federal lands in the 1960s and early 1970s prompted the development of a unified federal policy for such use. Executive Order 11644 ("Use of Off-Road Vehicles on the Public Lands") was issued on February 9, 1972 (87 F.R. 2877), to establish policies and provide for procedures to control and direct the use of OHVs on federal lands so as to

(1) protect the resources of those lands, (2) promote the safety of all users of those lands, and (3) minimize conflicts among the various uses of those lands. The order directs the agency heads responsible for managing the federal lands to issue regulations governing the designation of areas where OHVs may and may not be used. Under the order, OHV use can be restricted or prohibited to minimize (1) damage to the soil, watersheds, vegetation, or other resources of the federal lands; (2) harm to wildlife or wildlife habitats; and (3) conflicts between the use of OHVs and other types of recreation. It also requires the federal agencies to issue OHV use regulations, inform the public of the lands' designation for OHV use through signs and maps, enforce OHV use regulations, and monitor the effects of OHV use on the land.

Executive Order 11989 ("Off-Road Vehicles on Public Lands") was issued on May 24, 1977 (42 F.R. 26959), and contains three amendments to the previous order. While these amendments lift restrictions on the use of military and emergency vehicles on public lands during emergencies, they otherwise strengthen protection of the lands by authorizing agency heads to (1) close areas or trails to OHVs causing considerable adverse effects and (2) designate lands as closed to OHVs unless the lands or trails are specifically designated as open to them.

The BLM developed regulations (Title 43 of the Code of Federal Regulations [CFR] 8340) in response to the executive orders. These regulations require the agency to designate areas where OHVs may be used and to manage the use of OHVs on public lands through the resource management planning process, which allows for public participation. The regulations also require the BLM to monitor the use of OHVs, identify any adverse effects of their use, and take appropriate steps to counteract such effects.

3.9.2 Development of the CDCA Management Plan

Recognizing that resources of the California desert can and should "provide present and future use and enjoyment, particularly outdoor recreation uses, including the use, where appropriate, of off-road recreational vehicles," Congress, through Section 601 of the Federal Land Policy and Management Act of 1976 (FLPMA), directed the Secretary of the Interior to prepare and implement a comprehensive, long-range plan for the management, use, development, and protection of the public lands within the California Desert Conservation Area. In response, the Bureau of Land Management prepared the CDCA Management Plan (1980), an element of which addresses motorized-vehicle access.

Consistent with Executive Orders No. 11644 and No. 11989, all public lands in the California desert were designated as "open," "limited," or "closed" through the CDCA Plan. Subsequent to designation of areas for motorized-vehicle use, the Plan required on-the-ground route designation to occur within Multiple-Use Class (MUC) L (Limited), while existing routes of travel could be used in Multiple-Use Classes I (Intensive), M (Moderate) and C (Controlled), with MUC C being managed commensurate with MUC L guidelines until Congress designated these areas as wilderness. "Existing routes of travel" were defined as routes existing before December 31, 1978, the date of full aerial photo coverage of the CDCA.

Route designation criteria for MUC L were identified in the CDCA Plan as follows:

- Is the route new or existing?
- Does the route provide access for resource use or enjoyment?
- Are there alternate access opportunities?

- Does the route cause considerable adverse impacts?
- Are there alternate access routes which do not cause considerable adverse impacts?

3.9.3 1982 Amendment to the CDCA Management Plan

Subsequent to approval of the CDCA Plan in 1980, environmental organizations filed action in U.S. District Court, C.D. California, challenging its route designation criteria. In response, the BLM amended the CDCA Plan's Motorized-Vehicle Access element (1982 Plan Amendment Three, approved May 17, 1983) to conform with 43 CFR 8342.1. Route approval would be based on the following criteria:

- (1) 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 suitability.
- (2) 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.
- (3) 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.
- (4) 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 vehicle use in such locations will not adversely affect their natural, esthetic, scenic, or other values for which such areas are established.

3.9.4 MUC Guidelines for Motorized-vehicle Access

The 1982 amendment modified or reiterated prescriptions relative to motorized-vehicle access, including changes to the MUC guidelines established through the 1980 Plan. These guidelines are described below, and their application relative to the NECO Plan is discussed where clarification is necessary.

MUC C: Vehicle use on lands preliminarily recommended as suitable for wilderness, but not yet so designated by Congress, will be managed under guidelines described for Multiple-Use Class L.

NECO Plan: Congress designated certain public lands in the California desert as wilderness through the California Desert Protection Act of 1994 (CDPA). Therefore, interim guidelines for managing these lands prior to designation are no longer applicable to the NECO Planning Area. All Wilderness Study Areas were released from further consideration as wilderness. Vehicle access in designated wilderness will be allowed in accordance with provisions set forth in the Wilderness Act of 1964, the CDPA, the regulations at 43 CFR 8560, and applicable wilderness management plans.

MUC L: Vehicle access will be directed toward use of approved ("open" or "limited") routes of travel. Routes not approved in MUC L areas will be reviewed and, after opportunity for public comment, those routes deemed to conflict with management objectives or to cause unacceptable resource damage will be given priority for closure through obliteration, barricading, or signing. All

remaining routes of travel in these areas will be monitored for either inclusion as approved routes, or for closure to resolve specific problems.

NECO Plan: In the California Desert, washes are frequently used for motorized-vehicle access. Given the extent of washes accessible by motorized-vehicles--especially throughout the vast acreage of desert dry wash woodland in the southern portion of the planning area--the task of identifying individual wash routes for inclusion in the NECO inventory was considered unreasonable to undertake. Consequently, washes are addressed in terms of "wash zones."

The use of washes within "washes open zones" or "washes limited zones" is restricted to those considered "navigable," unless it is determined that vehicle use must be further limited. (See "Washes" below regarding navigability.) Navigable washes in "washes open zones" and "washes limited zones" are designated "open" and "limited" *as a class*, that is, washes are not individually designated unless they are identified as specific routes in the NECO route inventory. In "washes limited zones," navigable washes are available for use on a seasonal basis; the periods of use are established through the NECO Plan or subsequent designation process. The use of washes in "washes closed zones" is limited to those specifically approved for use; all other washes, whether navigable or not, are "closed" *as a class*. All MUC L areas are considered "washes open zones" unless specifically designated "limited" or "closed."

MUC M: Access will be on "existing" routes unless it is determined that use on specific routes must be further limited. An "existing" route is one 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.

NECO Plan: Navigable washes in "washes open zones" are considered "existing" routes *as a class* and available for motorized-vehicle use unless such use is restricted through route-specific designations of "limited" or "closed."

MUC I: Unless it is determined that further limitations are necessary, those areas not designated "open" will be limited to use of "existing" routes.

NECO Plan: Navigable washes in "washes open zones" are considered "existing" routes *as a class* and available for motorized-vehicle use unless such use is restricted through route-specific designations of "limited" or "closed."

ACECs: In ACECs where vehicle use is allowed, vehicle access will be managed under the guidelines for MUC L.

Undesignated Areas: In areas not assigned to a Multiple-Use Class, the route approval process will be applied as needed to resolve specific problems and to establish a cohesive program.

3.9.5 Washes, Sand Dunes, and Dry Lakes

The 1982 CDCA Plan amendment also addressed motorized-vehicle access on washes, sand dunes, and dry lakes:

Washes

Vehicle access using desert washes will be governed by the area designation for the vicinity in which the wash is located. In areas designated “closed,” vehicle access in desert washes will be prohibited. In areas designated “open,” vehicle access in desert washes will be permitted. In all “limited” areas, vehicle use in desert washes will be controlled in the same manner as for routes of travel in MUC L, M, and I. In other words, vehicle use in MUC L will be directed toward approved desert washes; access in MUC M will be in existing washes, unless it is determined that use of specific washes must be further limited; and access in MUC I will be limited to existing washes in areas not designated “open.” In addition, washes as access routes may have some type of travel limitation, such as speed limits or seasonal closure imposed to protect the resources found in or along the wash, or to minimize conflicts with other uses. [Also see discussion above under “MUC guidelines for motorized-vehicle access” regarding the use of washes *as a class*.]

In the context of motorized-vehicle access, the term “wash” is defined as a watercourse, either dry or with running or standing water, which by its physical nature--width, soil, slope, topography, vegetative cover, etc.--permits the passage of motorized vehicles, thereby establishing its “navigability” (Appendix VI, CDCA Plan 1980). The implication of this definition is that washes can be considered as routes of travel only if wash banks are not compromised (primarily a function of width), soil stability is not adversely affected, and vegetation is not destroyed consequent to the passage of vehicles. If access to a wash by motorized vehicles results in vegetative destruction, disturbance to the integrity of wash banks, or an unacceptable degree of soil erosion--the destruction of natural features--the wash is not considered to be a route of travel.

Sand Dunes and Dry Lakes

Due to the unique geography of these areas, “routes of travel” cannot be readily delineated. Therefore, significant sand dunes and dry lakes within the California desert are designated either “open” or “closed” to vehicular travel regardless of the Multiple-Use Class in which the dune system or dry lake is located. The management objective for each dune system or dry lake will dictate the area’s vehicle use designation.

3.9.6 Route Designation Definitions

The 1982 amendment defined route designations in the following manner:

Open Route

Access on the route by motorized vehicles is allowed.

Limited Route

Access on the route is limited to use by motorized vehicles in one or more of the following ways and limited with respect to:

- number of vehicles allowed
- types of vehicles allowed
- time or season of vehicle use
- permitted or licensed vehicle use only
- establishment of speed limits

The same exceptions to motorized-vehicle use of closed routes also apply to limited routes (see below, “Closed Route”).

Closed Route

Access on the 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 whose use is expressly authorized by an agency head under a permit, lease, or contract; and (4) vehicles used for official purposes by employees, agents, or designated representatives of the federal government or one of its contractors.

Except in Congressionally-designated wilderness areas, “open,” “limited,” and “closed” route designations may be made in each of the Multiple-Use Classes, in Areas of Critical Environmental Concern (ACECs), and in unclassified lands.

3.9.7 Route Designation and CDCA Management Plan Implementation

From 1973 to approval of the CDCA Plan in 1980, BLM managed access under the Interim Critical Management Program (ICMP). An integral part of that program was the release of a series of 22 maps covering the entire CDCA. These maps illustrated the ICMP designations and delineated a network of access routes compiled from existing maps, public input, and field review.

With approval of the CDCA Plan, the new OHV area designations became effective, and the ICMP maps and designations became invalid. Until implementation of the CDCA Plan’s Motorized-Vehicle Access Element is complete, existing routes of travel may be used in all MUC L and M areas, in unclassified lands, and in those MUC I areas not designated “open” to motorized-vehicle access. In some areas, certain routes were closed under ICMP guidelines. These will remain closed. As implementation proceeds, inclusive of the route designation process associated with the NECO planning effort, some old limitations, including closures, may be revoked and others added.

NECO Route Inventory Process

Route designation for the NECO Plan began with developing an inventory of existing routes within the planning area. The inventory process is described in Appendix L. Inventoried routes are shown on Map 2-29 Appendix A.

Recreational Touring Routes

Much recreational motorized-vehicle activity in the California desert consists of driving for pleasure, or “touring.” Such touring ranges from travel on paved roads to traversing extremely difficult routes that require the use of four-wheel drive vehicles and winches. In the context of the NECO Plan, a network of routes that would satisfy the desires of the “touring” public becomes an important recreation resource to be considered alongside all other resource values. In identifying such a network, several criteria are considered:

- scenic quality
- challenge
- remoteness
- uniqueness
- historic value
- connectivity
- opportunity for exploration

In 1996, a request to the public was made to assist with identifying a network of routes for recreational touring. Three public workshops were convened (Riverside, El Centro, and Blythe) to provide further information about designating routes through the NECO Plan as well as to ask for help with identifying this touring network. No substantive assistance from the public occurred. BLM staff subsequently identified the recreational touring network as it appears on the routes of travel alternatives maps 2-31 through 2-34 Appendix A.

Route Designation Revisions

Decisions affecting vehicle access, such as area designations and specific route limitations, are intended to meet present access needs and protect sensitive resources. Future access needs or protection requirements may necessitate changes in these designations or limitations, or the construction of new routes. For mining operations, additional access needs will be considered in accordance with regulations pertaining to surface management of public lands under the U.S. Mining Laws (43 CFR 3809). Access needs for other uses, such as roads to private lands, grazing developments, or communication sites, would be reviewed on an individual basis under the authority outlined in Title V of FLPMA and in accordance with appropriate regulations. Each proposal would be evaluated for environmental effects and subjected to public review and comment. As present access needs become obsolete or as considerable adverse impacts are identified through the monitoring program, area designations or route limitations may be revised. In all instances, new routes for permanent or temporary use would be selected to minimize resource damage and use conflicts consistent with the criteria at 43 CFR 8342.1.

Proposals for additional access needs may be submitted at any time to the Bureau of Land Management Field Office which has jurisdiction over the subject lands.

3.10 Mineral Management

Within the Northern and Eastern Colorado Desert planning area, there are currently 16 mining operations and 12 significant exploration programs being conducted on combined private and public lands. Many varieties of mineral resources are present in the California Desert, including 45 different mineral commodities in the planning area.

The largest mining operations are the open pit, heap leach gold mines in Imperial County and the salt extraction mines on Bristol and Cadiz playas in San Bernardino County. The former are few in number and cover a few thousand acres. The latter are many small disturbances (e.g., roads and pits) occupying 1-2 percent of each playa surface but scattered over about 15 percent of the each of the two playas. While the active life of gold operations is relatively brief (5 to 15 years) - some are currently in rehabilitation phases, the current nature and level of salt extraction is expected to remain constant for decades.

In the Northern and Eastern planning area, minerals are disposed from public lands under federal laws, and guided by regulations promulgated pursuant to those laws. Most exploration and development activity on public lands, and associated with occupation and use of the surface resources are guided and authorized under the *General Mining Law of 1872* (30 U.S.C. 22 et seq). This law allows prospecting and development of valuable mineral deposits through a location/appropriation system. The law allows use of surface resources, qualified by compliance with appropriate federal and state laws and rules. Regulations developed pursuant to the Federal Land Policy and Management Act (FLPMA), and contained in Title 43, Code of Federal Regulations (CFR) Subparts 3802 and 3809, guide the Bureau in managing surface operations under the mining laws for purposes of preventing undue or unnecessary degradation to public land. Minerals subject to the operation of the General Mining Law are termed *locatable minerals*. When a discovery of a valuable mineral has been made by a mining claimant, he/she may acquire a possessor right to the mineral and may proceed with mining and acquisition of title to the land and minerals through a mineral patent. All activities on mining claims are reviewed by the BLM to ensure that operations will not cause unnecessary or undue degradation to public land and resources. In addition, other federal, state, and local permits or authorizations may be required to operate on a mining claim.

Common construction and building materials, such as sand and gravel, stone, cinders, pumice, and clay, found on public land, are permitted or sold by the BLM under the authority of the *Materials Act of July 31, 1947* (30 USC 601, et seq.). Material is sold by contract by the BLM at fair market value.

Certain federal lands, such as military reservations, national parks, and wilderness, are closed to mineral operations except for valid existing rights established at the time of withdrawal.

Maps 3-8, 3-9, and 3-10 Appendix A show potential for metallic, construction, and industrial minerals in the planning area.

3.11 Cultural Resources

3.11.1 Background

Much of our knowledge and understanding of the historic and cultural contexts for evaluating the affected environment and potential impacts to cultural resources is grounded in studies and assessments initially completed for the *California Desert Conservation Plan* in the late 1970s. The years between 1969 and 1980, culminating with the approval of the CDCA Plan, experienced an intensive and focused period of study for cultural resources in the California Desert. Cultural resources survey and site information, as well as the management proscriptions developed during the planning effort, continue to provide the principle management paradigm for cultural resources in the California Desert.

In addition to existing data, the CDCA planning effort carried out a systematic sampling program for the purpose of identifying and recording prehistoric and historic sites. One goal of that sampling program was to develop a predictive model for archaeological site locations desert-wide. During the CDCA planning effort, 179,200 acres (280 sq. mi.) were systematically inventoried throughout the CDCA using a variety of approaches, from stratified random sample surveys to intensive purposive surveys. Of that acreage, it is estimated that approximately 42,500 acres (66 sq. mi.) were located in the NECO Planning Area. This includes elements of those areas delineated in the CDCA plan as the Central Colorado, Picacho/Big Maria/Whipple Mountains, and Imperial study regions. In this area, survey coverage is described as ranging from 0.5 percent for 2.5 million acres in the Central Colorado region, to 1 percent for the Picacho/Big Maria/Whipple Mountains region. For these areas, 488 historic and archaeological sites, and other cultural resources loci had been identified and recorded as of 1980.

In conjunction with these field surveys, regional overviews and special studies were prepared that synthesized the regional archaeological, ethnological, ethno-historical, and historical data; discussed past and projected research; identified significant cultural and environmental relationships; and identified significant research and management questions and needs. Of the seven regional overviews completed, two overviews deal specifically with cultural resources located within the NECO Planning Area (East Mojave: King and Casebier, 1976; Colorado Desert: Crabtree, Warren, and Knack, 1980, and Gallegos, et. al., 1979). In addition, six of the special studies, which deal with mining (Shumway, Vredenburg, and Hartill, 1980), California Desert rock art (Eastvold, 1974), historic trails and wagon roads (Warren and Roske, 1978), early historic accounts (Casebier, 1978), early human occupation (Davis, Brown, and Nichols, 1980), and an assessment of impacts to cultural resources (Lyneis, Weide, and Warren, 1980), are germane to the NECO Planning Area.

The stated goals of the amended CDCA plan continue to form the basis of BLM cultural resources programs and activities. These goals include:

- Broadening the archaeological and historical knowledge of the CDCA through continuing inventory efforts and the use of existing data. Continuing the effort to identify the full array of the CDCA's cultural resources.
- Preserving and protecting a representative sample of the full array of the CDCA's cultural resources.
- Ensuring that cultural resources are given full consideration in land use planning and management decisions, and ensuring that BLM authorized actions avoid inadvertent impacts.

- Ensuring proper data recovery of significant (National Register quality) cultural resources where adverse impacts can be avoided.

To achieve the goals of the CDCA plan, seven basic actions were proposed and continue to form the basis of cultural resources management in the CDCA. These actions include: (1) Recognition through ACEC and other special designations; (2) Preservation and Protection; (3) Monitoring; (4) Inventory; (5) Mitigation Plans; (6) Research, and (7) Review and Coordination. The cornerstone to implementation of the cultural resources components of the CDCA plan was a Programmatic Agreement between BLM and the California State Historic Preservation Officer (Programmatic Memorandum of Agreement Among the Advisory Council on Historic Preservation, the Bureau of Land Management (DOI), and the California State Historic Preservation Officer Regarding the California Desert Conservation Area (1980)).

In addition to the 1980 Programmatic Agreement for the CDCA, BLM also carries out cultural resources program management activities under a National Programmatic Agreement (Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in which the BLM will meet its Responsibilities under the National Historic Preservation Act (1997)). The National Programmatic Agreement is implemented in California by a Protocol Agreement between BLM California and the California SHPO (State Protocol Agreement Between The California State Director of The Bureau of Land Management And The California State Historic Preservation Officer (1998)). The new Programmatic Agreement and Protocol continue to emphasize all of the goals and actions necessary to achieve the cultural resources management proscriptions outlined in the CDCA Plan, but provide BLM more authority and responsibility in carrying out these responsibilities. This new management paradigm places an emphasis on proactive cultural resources management and decision-making and implementation of the provisions of Section 110 of the NHPA, while providing greater flexibility and streamlining to Section 106 provisions of the act.

The CDCA plan led to the identification and establishment of Areas of Critical Environmental Concern (ACEC). Of the 118 ACECs currently established, seventeen are located within the NECO Planning Area. Of these seventeen ACECs, eleven are designated in part because of their significant cultural resources values (Table 3-12).

Table 3-12. Areas of critical environmental concern designated for cultural resources values

ACEC Name	Number
Marble Mountain Fossil Bed	48
Mopah Spring	75
Whipple Mountains	53
Pattons Iron Mountain Divisional Camp	52
Palen Dry Lake	55
Alligator Rock	78
Corn Springs	56
Mule Mountains	58
Gold Basin/Rand Intaglios	67
Indian Pass	68
Pilot Knob	73

Although the cultural resources data developed for the CDCA plan continue to provide the baseline for preservation planning, our information base for the planning area has expanded over the last twenty years as a result of survey and identification efforts completed for proposed land use actions as well as BLM cultural resource program initiatives. Current cultural resources data were obtained from records available in the California Historic Resources Information System and through a review of BLM cultural resources records.

3.11.2 Historic and Archaeological Sites

As of the year 2000, more than 3700 historic and archaeological sites have been identified and documented in the NECO Planning Area (Table 3-13). These resources represent the complete span of human occupation and activities in the desert over the past 10 - 12,000 years. Our current knowledge about these sites and the human behavior and history that they represent is based on the results of the systematic survey of approximately 3.9 percent (220,000 acres, 343 sq. miles)³ of the land base in the planning area, which covers an area of more than 5,547,000 acres. Results of these systematic surveys are reflected in approximately 1500 individual survey reports (Table 3-14). Based on known resources and survey coverage, it is evident that the number of sites present in the planning area will increase as additional surveys are carried out. Only one region-wide overview has been completed by BLM for this area since the CDCA Plan. This overview describes the historic context for the World War II era Desert Training Center--California/Arizona Maneuver Area (Patton's Camps). The overview was completed in 2000 (Bischoff, 2000).

³ Acreage projections are only estimates extracted from available data sources and are only presented for comparative purposes.

Table 3-13. Distribution of historic and archaeological sites in the NECO Planning Area

Sites	Number
Total historic and archaeological sites within NECO planning boundaries	3,305
Sites on BLM managed lands	2,539
Sites on State of California managed lands	471
Sites on National Park Service managed lands	110
Sites on Department of Defense managed lands	169
Sites on other lands	16
Sites within San Bernardino County	658
Sites within Riverside County	833
Sites within Imperial County	1,816

Table 3-14. Distribution of cultural resource survey activity in the NECO Planning Area

Surveys	Number of Surveys	Acres	Percent NECO
Total number of cultural resource surveys located with NECO planning boundaries (5,547,723 acres total)	1,523	220,000	3.9
Surveys on BLM managed lands	1,296	181,000	3.3
Surveys on other lands	234	39,000	0.6

Currently, there are 10 historic properties formally listed on the National Register of Historic Places located within the NECO Planning Area. These sites are identified as follows:

- Fages-De-Anza Trail/Southern Emigrant Road
- Blythe Intaglios (Earth Figures of California-Arizona Colorado River Basin)
- Piute Pass Archaeological District
- Topock Maze Archaeological Site
- McCoy Spring Archaeological Site
- North Chuckwalla Mountain Quarry District
- North Chuckwalla Mountains Petroglyph District
- Stonehead (Earth Figures of California-Arizona Colorado River Basin)
- Winterhaven Anthropomorph and Bowknot (Earth Figures of California-Arizona Colorado River Basin)
- Yuma Crossing and Associated Sites

3.11.3 Paleontological Resources

Major deposits within the CDCA known to contain paleontological resources have been described in reports prepared for the CDCA plan (Woodburne, 1979; Murphy, 1978; Axelrod, 1979). With the exception of Quaternary lacustrine strata, the majority of the known highly sensitive areas and predicted areas occur in areas of some relief where dissection has exposed the fossilized remains. These areas as a whole are randomly dispersed throughout the California Desert Conservation Area (CDCA Plan, 1980: E-43).

3.11.4 Traditional Cultural Properties

Native American tribal groups were the first inhabitants of the California Desert region and continue to hold lands in the desert today. Archaeological sites, plant collection areas, ritual and ceremonial areas, and sacred areas are significantly connected to specific desert resources and regions. Potential threats and impacts to these resources are of concern to these tribes. These resources, often difficult to identify, do not have associated physical or archaeological components. Locations may be held as closely guarded secrets by various tribes (CDCA Plan, 1980: E-43).

3.12 Land Use

BLM and JTNP have land acquisition programs although few inholdings remain in JTNP.. JTNP has recently received a large donation of land from the Wildlands Conservancy. BLM has significant inholdings, most notably for tortoises in the checkerboard ownership pattern in critical habitat in Imperial County (Map 1-3 Appendix A). In the past 10 years, the BLM has purchased lands primarily on Chuckwalla Bench using Land and Water conservation Funds and compensation funds. CDFG has purchased lands in Chemehuevi critical habitat using compensation funds. The CDCA Plan allows for disposal of MUC M lands and unclassified lands. In addition, BLM's Statewide Tortoise Management Policy prohibits disposal of Category I tortoise habitat and greatly restricts the disposal of Category II habitat.

3.12.1 Utilities

Probably the most significant use of the California Desert is for linear transmission facilities for electrical power, oil and gas products, water, and coaxial and fiber-optic cables. These facilities serve a critical need for infrastructure for people living in Southern California and the Southwest in general. On federal lands, rights-of-way for these facilities are granted under various land laws. To some extent all the federal agencies have rights-of-way crossing their lands.

By their design, type, operation, and maintenance, utilities create varying degrees of impact and population fragmentation. Pipelines create the most severe disturbance with a long period to recover and then re-disturbance for heavy maintenance (e.g., pipe replacement, pipe replacement, pipe recoating). Maintenance activities for several of the major pipeline systems have undergone desert-wide review by USFWS and have received programmatic biological opinions (e.g., Southern California Gas Company System, Arco Pipe Line)

Some of the electrical transmission systems have also received programmatic biological opinions for routine maintenance activities. Most of these utilities are contained within one or more of several utility corridors designated by the CDCA Plan (Map 2-1 Appendix A). The predominant orientation of the designated corridors is east-west, with a number of entry points to the planning area along the Nevada-Arizona border. Some of these utilities are outside of existing corridors (mostly low voltage distribution lines, private water pipelines and wells, telephone lines, etc.

There are also several communication sites within the planning area. Types of facilities include radio and TV broadcasting, microwave, cellular, commercial mobile radio, and private mobile radio.

3.12.2 Withdrawals

About 2,644,460 acres (48 percent) of federal land in the planning area are withdrawn, or segregated, from appropriation under various public land laws. Public uses in these areas are limited in some cases depending upon the particular withdrawal. In general, limitations focus on wilderness, military land, public access, mineral entry, land disposal, and rights-of-way. To varying degrees, these segregations eliminate some conflicts between use and conservation.

3.12.3 Colorado River Aqueduct

Based on the location of facilities and their operation, the Metropolitan Water District of Southern California (MWD) land can be put into three zones: (1) developed (concrete, chain-link fenced canal; pumping stations with shop, housing, and administrative areas); (2) semi-developed (service roads, barrow areas, flood protection dikes, power lines); and (3) undeveloped (areas for water wasting in the event the aqueduct needs to be drained, tunnel sections, old aggregate sources). These three zones have different effects and opportunities for species and habitat management. See Map 1-3 Appendix A for the location of the MWD right-of-way.

3.12.4 Other Land Uses

In addition to roads associated with utilities, there are access roads associated with private inholdings, both authorized and unauthorized, throughout the planning area, especially in the northeastern portion of Imperial County where there is an extensive checkerboard land pattern.

Authorizations have been issued for a variety of uses, such as rain gauges, seismic detection/recording devices, water wells, apiary sites, research and filming.

The military periodically requests use of lands for various exercises, including search and rescue, firearms qualifications, land navigation training, reconnaissance and surveillance, cargo drops, parachute tests, and vehicle tests.

A number of small landfills have been in operation for a number of years near urban centers. Two large regional landfills, Mesquite (near Glamis) and Eagle Mountain (near Desert Center and Joshua Tree National Park) have been authorized, but are not yet operational. Landfills are not included as an element of land management by federal land management agencies. Planning, proposals, environmental analysis, and approval occur under the authority of local jurisdictions. There is a considerable body of documentation regarding needs and environmental concerns (e.g., ground water, species/habitats, air quality, and park/wilderness management) that is beyond the scope of this plan to describe. This plan does not address future need or siting of landfills.