Cadiz Valley / Danby Lake

FINAL • • •
Environmental Assessment Record

U.S. Department of the Interior
Bureau of Land Management
Riverside District Office

UNITED STATES DEPARTMENT OF THE INTERIOR

ENVIRONMENTAL ASSESSMENT RECORD
FOR
INTERIM CRITICAL MANAGEMENT
PROGRAM AREA NO. 37
CADIZ VALLEY/DANBY LAKE

Prepared by

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1.1 INTRODUCTION

The Cadiz Valley/Danby Lake Open Area #37 was designated as part of the BLM Competitive Event System established by the Interim Critical Management Program, November 1, 1973, and is now referred to as the California Desert Vehicle Program. This open area, along with 14 others, represent about 6 percent of the public lands designated in that plan. It is located 83.2 km (52 miles) east of 29 Palms, on State Highway 62. The location and area boundaries are shown on Figure 1.1. The western boundary extends 16.8 km (10.5 miles) along Cadiz Valley Road, northwest from State Highway 62. The northern boundary runs northeasterly, following an imaginary line for 19.2 km (12 miles) to BM 858 on the southwestern side of the AT&SF Railroad right-of-way. The boundary is then the Cadiz Road for 38.4 km (24 miles) from BM 858 southeasterly to State Highway 62. It then follows Highway 62 west to Cadiz Valley Road, the point of beginning.

The Cadiz Valley/Danby Lake area contains about 71,200 ha (178,000 acres) of which approximately 166,500 are in Federal ownership. Of the remainder, the State of California owns about 66,600 ha (6,400 acres) and the Metropolitan Water District of Southern California (MWD) owns about 2084 ha (5,210 acres). The private land pattern is shown on Figure 1.1.

1.2 PROPOSED ACTION

The proposed action is to:

1. Continue the use of the Cadiz Valley/Danby Lake area as an open area for all unorganized off-road vehicle (ORV) activity.

2. Provide for competitive ORV use on 188.8 km (118 miles) of Bureau of Land Management designated courses (see Figure 1.2).

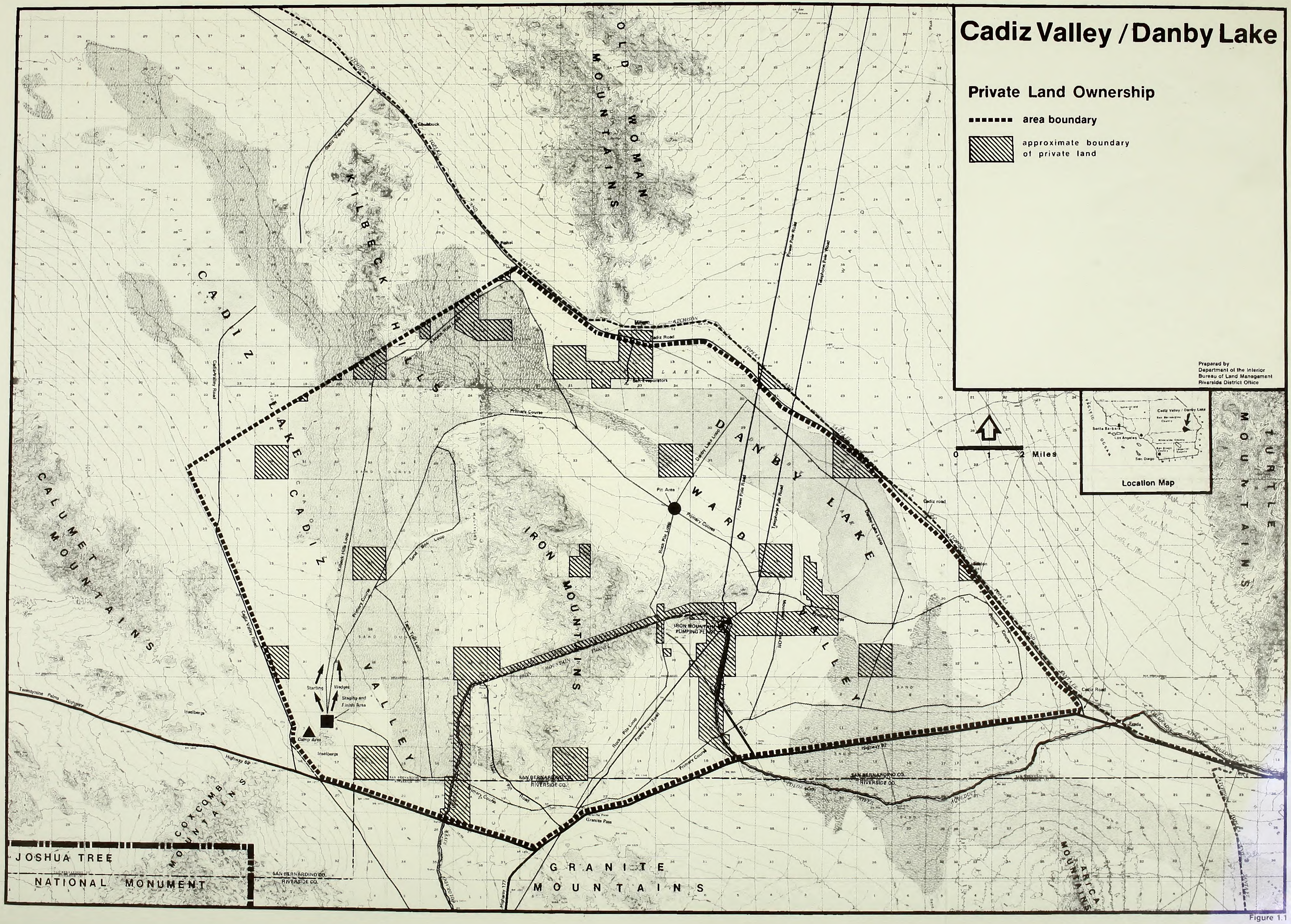
   The Bureau has established, with input from District 37 of the American Motorcycle Association, 188.8 km (118 miles) of ORV courses. These courses would be used by a possible maximum of 3,000 motorcycles in one event and nine times each year by an average of 550 motorcycles per event, plus an undetermined number of 4-wheel drive, dune buggies, and other competitive ORVs. The maximum total area that would be impacted by these courses will be about 1768 ha (4,420 acres) or 18.1 km^2 (7 sq. miles) which is roughly 2.5 percent of the Federal lands in the area.

   Table 1.1 shows the breakdown of the lands committed to the established courses.

Table 1.1

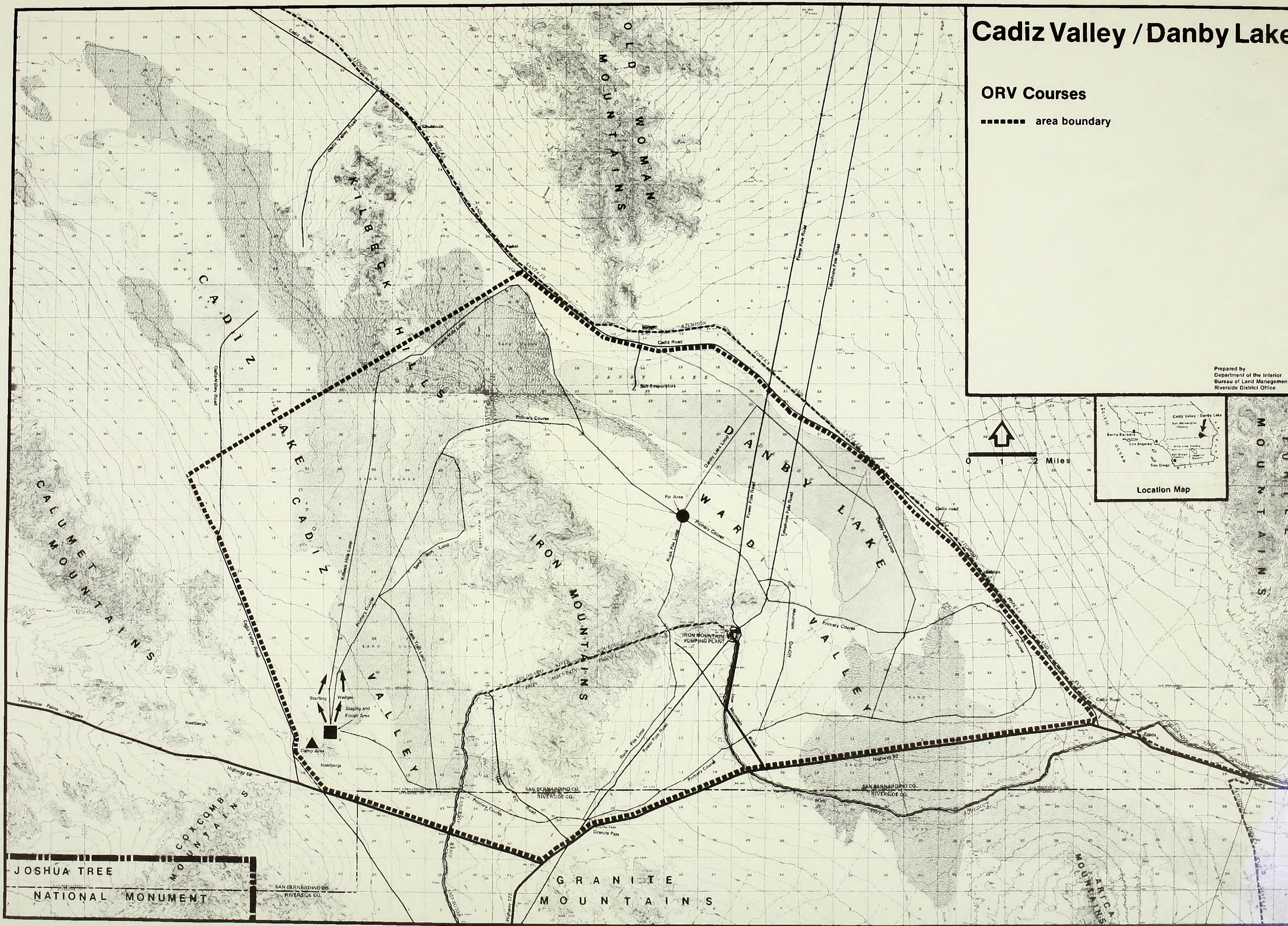
Land committed to the proposed action

LOCATION	Area	
	Hectares (ha)	Acres
Cadiz Valley camp and staging area	284	710
Cadiz Valley finish area	48	120
Two starting wedges	268	670
Remainder of Primary Course and six auxiliary loops 176 km (110 miles) long; 60 m (200 ft.) wide	1068	2670
Pit area, Ward Valley	20	50
Total Federal land area committed to competitive use	1688	4220
Federal land area committed to noncompetitive use	66,600	166,500
Private land impacted by proposed action	4,608	11,520
Total lands within boundary of area of proposed action	71,200	178,000



Cadiz Valley / Danby Lake
Private Land Ownership
area boundary
approximate boundary of private land
Prepared by Department of the Interior Bureau of Land Management Riverside District Office
0 1 2 Miles
Location Map
OLD WOMAN MOUNTAINS
KILBECK HILLS
CADIZ LAKE
CADIZ VALLEY
DANBY LAKE
WARD VALLEY
IRON MOUNTAINS
CALUMET MOUNTAINS
TURTLE MOUNTAINS
COXCOMB MOUNTAINS
GRANITE MOUNTAINS
JOSHUA TREE NATIONAL MONUMENT
IRON MOUNTAIN PUMPING PL.
Pit Area
Camp Area
Staging and Finish Area
Starting
Wedges
SAN BERNARDINO CO. RIVERSIDE CO.
Highway 62
Highway 177
Cadiz Road
Power Pole Road
Telephone Pole Road
Primary Course
Granite Pass
Twentynine Palms Highway

Figure 1.1



Cadiz Valley / Danby Lake
ORV Courses
area boundary
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0 1 2 Miles
Location Map
OLD WOMAN MOUNTAINS
KILBECK HILLS
CADIZ
CADIZ LAKE
DANBY LAKE
WARD
DANBY LAKE VALLEY
IRON MOUNTAINS
CADIZ VALLEY
CALUMET MOUNTAINS
COXCOMB MOUNTAINS
TURTLE MOUNTAINS
GRANITE MOUNTAINS
JOSHUA TREE
NATIONAL MONUMENT
IRON MOUNTAIN PUMPING PLANT
Pit Area
Primary Course
Staging and Finish Area
Camp Area
Starting
Wedges
Highway 62
Twentynine Palms Highway
Cadiz Road
Salt Evaporators
Power Pole Road
Telephone Pole Road
Rock Pile Loop
Danby Lake Loop
Sand Box Loop
Kilbeck Hills Loop
SAN BERNARDINO CO.
RIVERSIDE CO.
Granite Pass
COLORADO RIVER AQUEDUCT

Figure 1.2

3. Provide for continued consideration of enduro-event applications for sponsor designed courses.

   An enduro is a predetermined timed event over a course of varied terrain. The rider is given a set number of points at the start. Points are deducted at check points along the course for either early or late arrival. The rider with the most remaining points at the finish is the winner. At the start, two to six riders take off at 1 to 2 minute intervals until all riders are on the trail. Since there is no reason to compete for position, the vehicles remain on a narrow trail. Average overall speed is generally from 25 to 35 miles per hour.

4. Provide for consideration of applications for organized noncompetitive ORV events on sponsor-designed courses.

5. Provide for base line studies of vegetation, wildlife, scenic/visual resources, and soils in order to obtain quantitative values for each resource and to quantify any changes in those resources as a result of the proposed action or alternatives. This baseline data will determine the actual number of races to be held in the Cadiz Valley/ Danby Lake area and evaluate their impact.

1.3 ALTERNATIVES TO THE PROPOSED ACTION

1. Close the Cadiz Valley/Danby Lake Area to all ORV use.

2. Leave area open under the ICMP until the Desert Plan is adopted in 1980, but prohibit competitive events.

3. Close the Cadiz Valley/Danby Lake Area to all ORV use except competitive events on courses designated by Bureau of Land Management.

2. DESCRIPTION OF THE ENVIRONMENT

2.1 NONLIVING COMPONENTS

2.1.1 Topography

The topography of the Cadiz Valley/Danby Lake Open Area is varied, ranging from rugged granitic outcroppings along the Iron Mountains and Kilbeck Hills to gently sloping alluvial deposits and sand dunes at the base of the hills. Nearby are level basin bottom playas at Cadiz and Danby Dry Lakes. The elevation of the Open Area ranges from 168.1 m (545 ft.) at Cadiz Dry Lake to 1005 m (3,296 ft.) at the highest point in the Iron Mountains.

2.1.2 Climate

The general climate of the Open Area is arid. Contributing, climatic factors are low rainfall, low humidity, high summer temperatures, abundant sunshine, relatively cool winters, and frequent strong winds.

Weather records maintained since 1935 at the Iron Mountain Pumping Station show the average annual precipitation for the past 40 years was 7.7 cm (3.06 inches). As little as 0.66 cm (0.26 inches) fell in 1956, and as much as 24.3 cm (9.58 inches) was recorded for 1939. Precipitation occurs primarily during two periods of the year: from December thru February, and from July through September.

Rain in the winter months is slow and gentle, giving the moisture time to soak into the ground. During summer thunderstorms, rain falls hard and fast and results in heavy runoff and major flash flooding.

Temperatures range from a mean low of 5.5°C.(42°F.) in January to a mean high of 41.6°C. (107°F.) in July. The lowest temperature recorded in the past 40 years was -6.1°C. (21°F.) in August, 1967.

Prevailing winds are from the northwest most of the year. They blow stronger and more frequently from October to May. Wind velocities often reach in excess of 64 km (40 miles) per hour.

2.1.3 Geology and Minerals

The area lies within the eastern Mojave Desert Geological and the Range Physiographic Provinces. The topography of these provinces is typified by north-to-northwest trending mountain ranges separated by broad valleys and basins. The mountains are formed largely of marine sedimentary rocks of Precambrian and Paleozoic age and granitic intrusives of Precambrian and Mesozoic age. The shoulders of the mountains are flanked by erosional remanants of older alluviums (Pliocene, Pleistocene), with recent alluvial fans at the mouths of the present drainages. The valleys have deep alluvial fill and central playas, some of which were freshwater lakes in Pleistocene time. It is believed that in recent geologic times the Mojave River may have flowed southeastward through Cadiz and Danby Valleys (and Lakes) to the Colorado River. Today, however, the drainage has disintegrated and has

been broken into unconnected bits and pieces by faulting, warping, and the building of alluvial divides, primarily fans. This process created separate basins now occupied by Cadiz and Danby Dry Lakes.

Sodium chloride in Danby Dry Lake and calcium chloride in both Danby and Cadiz Dry Lakes are found in commercial quantities. Gypsum crystals are also found on the dry lake beds and have been mined in the past.

Two minor faults occur on the east and west sides of Iron Mountain. Seismograph data from the Iron Mountain Pumping Plant show that a few minor earth movements have occurred since the plant went into operation in 1942.

2.1.4 Water

The area includes portions of two local groundwater basins. In the west is the southern portion of the large Cadiz Valley groundwater basin, and to the east is the Danby Lake groundwater basin. Surrounding these basins are areas of nonwaterbearing materials, including the Iron Mountains.

The Cadiz Valley basin is a structural basin approximately 40 km (25 miles) long, 16 km (10 miles) wide, and filled with unconsolidated alluvial deposits from the surrounding highlands. Its lowest part is occupied by Cadiz Dry Lake. Recharge to the basin occurs mostly in alluvial fans in the northern part of the basin, outside of the area. This basin has no known outflow, and groundwater moves northwest, out of the area toward Cadiz Lake.

The Danby Lake groundwater basin occurs in the eastern portion of the area. The basin is filled with loose alluvium shed from the surrounding mountains and the fine sediments of the Danby playa. Recharge occurs mostly along the alluvial fans to the north, east and south of the valley. Ground water moves mainly northwestward on to the playa.

Groundwater near both basin bottoms has proven to be alkaline. Roughly 3.2 to 4.8 km (two to three miles) to the southwest of the Cadiz Lake bed, at a depth of 51 m (170 feet), wells have been drilled and potable water located. This water has been used mainly for the mining of calcium chloride on Cadiz Lake.

There is no natural surface water except standing water which is found on occasion in Cadiz Lake and Danby Lake after heavy rains. Normally dry washes may be flooded during these storms. Drainage lines in both basins consist of dry washes. Stream flow is nonexistent for most of the year, but floods can occur after sudden storms. Measurements of the quantity and quality of surface water within the area are not available.

Imported surface water is found along 9 miles of open canal along the Colorado Aqueduct. Since 1942, the aqueduct has been a major source of water for certain wildlife species found in the local area, and a hazard to others.

2.1.5 Soils

The data provided here is generalized from "River Basin Study Group," California Region Framework Study Committee, Berkeley, California, 1968, the "Environmental Analysis Record for the Interim Critical Management Program for Recreation Vehicle Use on the California Desert", U.S. Department of the Interior, BLM, 1973 and a personal letter from Dr. H. G. Wilshire of the USGS, April 29, 1977.

Four soil associations have been mapped in the study area. The boundaries of these associations are shown on Figure 2.1.

Granite Rockland Association. This assocation covers approximately 10 percent of the open area, and is a miscellaneous area that consists of granitic rock outcrops (Iron Mountains) and an excessively drained, very stony or very rocky, very shallow, moderately steep to very steep, unnamed sandy soil series. The rock outcrops occupy 40 to 90 percent of the area and the unusual soil series occupies 10 to 60 percent of the area. The soil component of the association is susceptible to erosion because of texture, shallow depth and slope gradient.

Thermal - Playas Assocation. This is an association that consists of 50 percent moderately well and well drained, very deep, thermal soils in nearly level lacustocine basins, and 50 percent poorly drained Playa areas. The Thermal soils formed in silty alluvium derived from mixed rock sources. Intermingled with the Playa areas are surface gypsum crystals and pedestals, 0.3 to 0.9 m (1 to 3 feet) high, that are capped with gypsum. The major portion of this association is located in areas of playas (Cadiz Lake and Danby Lake).

Carrizo - Riverwash Association. Approximately 45 percent of the open area falls into this soil association. These soils occur on nearly level to moderately sloping flood plains and recent alluvial fans and drainage ways. Surface and subsoil textures range from gravelly sand to sand. Soils are very deep and excessively drained. Susceptibility to compaction and erosion is variable for this association. Areas in this soil association were disturbed during WWII training and Desert Strike. Camp Young was located on these soils on the south of the Iron Mountains.

Aco-Acolita - Rositas Association. An estimated 35 percent of the Cadiz Valley/ Danby Lake Open Area falls into this soil association. These soils occur on nearly level to gently sloping terraces slightly above the flood plain or low dunes or dune ridges. Surface and subsoil textures vary from sandy loam to sand. They were developed in wind-modified coarse and moderately coarse textured sediments derived from mixed sedimentary and crystalline rocks. They are highly susceptible to wind erosion. Their susceptibility to compaction is variable but higher than most other series in the open area, and highest when wet. Some areas with desert pavement have a weak desert varnish. Soils are very deep, and are well to excessively drained.

2.1.6 Air quality

Present sources of petrochemical pollutants are minimal, with the major source being vehicle emissions from passing motorists along Highway 62. Suspended particulate matter is also minimal, except during windy conditions.

While the foregoing is based primarily on observations by BLM personnel, it is presently the best available air quality information on the area. The Southern California Air Pollution Control District does not have monitoring stations located such as to provide meaningful information about the open area.

2.1.7 Noise

Silence dominates most desert landscapes, and the area of desert considered in this EAR is no exception. The silence which man associates with pristine natural environments is perceived by the senses as solitude. The solitude of the desert is one of its greatest characteristics as well as one of its many valuable resources. The Cadiz Valley/Danby Lake area engenders this feeling of solitude in the visitor.

Existing intrusive noise in the subject area consists of automobile traffic noise along Highway 62 (29 Palms Highway) and the Iron Mountain Pumping Plant road, railroad traffic along the Atchison, Topeka, and Santa Fe Railroad, and occasional noise from the salt works on both dry lakes and from low-flying aircraft.

2.1.8 Ordnance contamination

Extensive military training maneuvers were conducted in the area during the early 1940's by General Patton's troops, and in the early 1960's by Desert Strike. As a result of these manuevers, the Cadiz Valley/Danby Lake Area is contaminated by unexploded ordnance.

Bureau of Land Management Land Status Records show that portions of the Cadiz Valley/Danby Lake area potentially contain unexploded military ordnance. Sixth Army maps also indicate that portions of the Cadiz Valley/Danby Lake area potentially contain unexploded ordnance. The BLM maps and the army maps do not agree on which areas are contaminated (see Figure 2.2). Thirteen land mines were found in the study area. These were determined to be live and dangerous by the Sixth Army E.O.D. Team and destroyed in the field. Twelve of the mines were located outside of both the BLM and army recorded contaminated areas. Considering possible overshoot with regards to the known ranges and the land mine sites, a very high percentage of the useable surface area could be comtaminated with unexploded military ordnance.

Quoting Meller, 1946, "Consideration was to be given to the location and disposal of unexploded shells. It was recognized that practically the entire maneuver area had been used for firing during a period of approximately one-and-a-half years. In a majority of cases no records were available detailing areas in which firing had actually been conducted. The training requirements and preparation for movement of troops prevented any extensive use of troops to search for duds. Headquarters and Headquarters Battery of the X Corps Artillery was to police the Iron Mountain Range."

Cadiz Valley / Danby Lake

General Soil Unit

- area boundary
- carrizo-riverwash
- aco-acolita-rositas
- granite rockland
- thermal-playas

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Riverside District Office

0 1 2 Miles

Location Map

Figure 2.1

2.1.9 Other hazards

Salt works on Cadiz and Danby Lake pose a potential hazard to vehicle-oriented recreation.

Crossings at the Atchison, Topeka and Santa Fe Railroad, Highway 62, and the Iron Mountain Pumping Plant road are hazards to recreationists. Barbed wire left in the field by the military presents a hazard to ORVs.

2.2 LIVING COMPONENTS

2.2.1 Sensitive and unique species

General

Seven major habitat types have been identified with the open area (see Figure 2.3). The term habitat is used in reference to a biotic community (all living organisms) within a specifically defined geographic location.

The boundaries between habitat types are usually difficult to define because plant species replace one another in a continuously varying response as dictated by the local environment. Thus, many species grade from one habitat type into another, and clearly distinct boundary lines are often not evident. Nevertheless, for purposes of presentation, habitat types were mapped, based on field studies, aerial flights, and personal knowledge. Plant species found in each habitat type are listed in Appendix A. Species nomenclature follows Munz (1974):

Sensitive plant species

A sensitive species is defined as an Endangered, Threatened, and/or Rare species that merits special attention in planning and decision making processes. The location of each sensitive species in the open area can be found in Figure 2.4. No species listed in the Federal Register as proposed Endangered or Threatened species were found in the open area. Sensitive plant species reported in this section are listed in the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants of California (1974). This list is recognized throughout the state as an authoritative source on the status of Rare and Endangered plant species in California.

In its inventory, CNPS ranked plant species according to their rarity, endangerment, vigor, and general distribution. Based on these criteria, four categories have been developed for sensitive species (BLM, 1977): Critical, High, Moderate, and Limited Ditribution.

The following is a brief description of the categories:

1. Critically sensitive plants. Refers to plant species that are very rare due to their highly restricted distribution, and that are generally endangered in part or all of their range.

2. Highly sensitive plants. Refers to plant species whose occurrence is confined to several isolated populations or one extended population, and that are endangered in part or all of their range.

3. Moderately sensitive plants. Refers to plant species that are generally confined in their distribution, but appear not to be endangered.

4. Limited distribution. Refers to plant species of low rarity or endangerment rating because their distribution is wide enough that the probability of their extinction is apparently low at the present time.

All sensitive species in the open area were placed in categories 1 through 4:

1. Critically sensitive plants:

   None.

2. Highly sensitive plants:

   (a) Borrego locoweed, Astragalus lentiginosus var. borregonus.

   An erect, white-silky annual or biennial herb with purple flowers, blooming from February to May. Occurs in dunes and sandy valleys of the eastern Colorado and Mojave deserts below 300m (1,000 ft.). Distributed throughout Cadiz open area in areas of relatively loose, sandy soils.

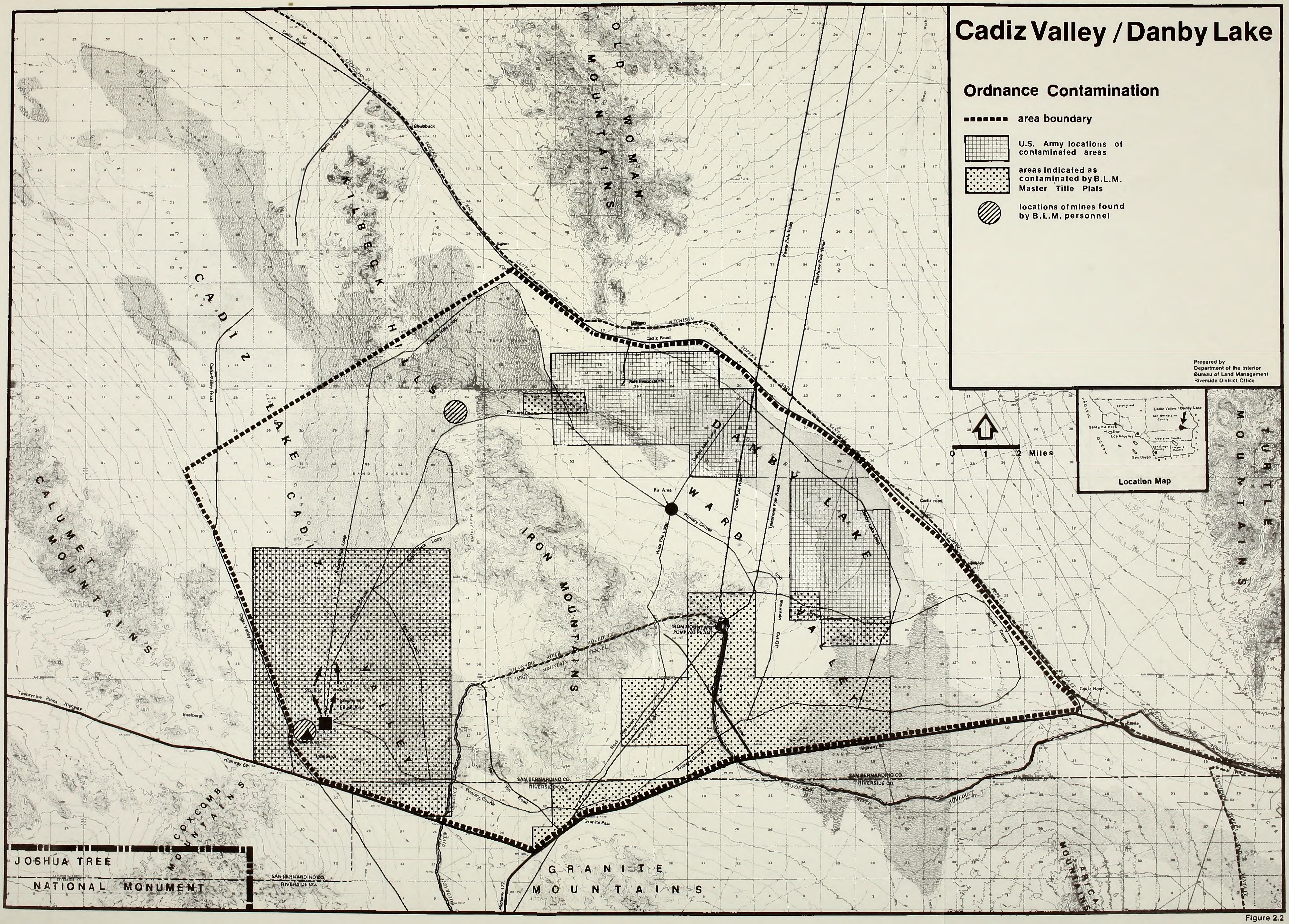
   (b) Scaly-stemmed sand plant, Pholisma arenarium. A fleshy, whitish herb parasitizing the roots of shrubs such as cheesebush, Hymenoclea salsola, and burroweed, Ambrosia dumosa. The flowers are smoky-purple with a white border, blooming from April to July and occasionally in October. Found infrequently in sandy places below 1500m (5000 ft.) in both the Mojave and Colorado deserts. Occurs in the sandy areas south of Danby Lake.

3. Moderately sensitive plants:

   None.

4. Limited Distribution:

   Twining snapdragon, Antirrhinum filipes. A climbing annual with long slender bright green stems and bright yellow flowers, blooming from February to May. Twining among low shrubs in sandy places below 1500m (5000 ft.) in both the Colorado and Mojave desert. One very small population occurs along the southeastern shore of Danby Lake.


Cadiz Valley / Danby Lake
Ordnance Contamination
area boundary
U.S. Army locations of contaminated areas
areas indicated as contaminated by B.L.M. Master Title Plats
locations of mines found by B.L.M. personnel
Prepared by
Department of the Interior
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Riverside District Office
0 1 2 Miles
Location Map
OLD WOMAN MOUNTAINS
SHIP MOUNTAINS
CADIZ
HILLS
CADIZ LAKE
DANBY
DANBY LAKE
WARD
CADIZ VALLEY
WARD VALLEY
IRON MOUNTAINS
CALUMET MOUNTAINS
TURTLE MOUNTAINS
COXCOMB MOUNTAINS
GRANITE MOUNTAINS
JOSHUA TREE
NATIONAL MONUMENT
IRON MOUNTAIN PUMPING PLANT
Pit Area
Highway 62
SAN BERNARDINO CO.
RIVERSIDE CO.
Cadiz Road
Granite Pass

Figure 2.2

Unique vegetation

During an aerial survey of the open area, several possible creosote rings were observed in Cadiz Valley. Such rings are formed by clonal expansion of a single parent plant. The common pattern of growth involves several stages, beginning with the development of a large clonal clump from a single-stemmed seedling. The center of the clump eventually dies and new stems and crowns form peripherally, thus producing a clonal ring. Over long periods of time, repeated fragmentation of the clonal ring results in a circle of satellite clumps around a barren center.

The clonal abilities of creosote are thought to be an important factor contributing to its survival in nature by allowing the perpetuation of a population to be independent of the hazardous process of seed germination (Sternberg, 1976). Age estimates of clonal rings indicate that vegetative persistence of creosote is enormous. Preliminary estimates by Vasek, et. al., (1975), based on size of the ring and growth rates, suggest ages of 1500 to 3000 years for creosote rings with a sterial center 1m (3.3 ft.) in radius. Sternberg (1976) estimates the ages of rings with an average radius of 7.8m (26 ft.) to be over 000 years old. The creosote rings may thus surpass the bristlecone pines as the oldest living things.

Because of their value in terms of shedding light on the origin, composition and stability of desert plant communities, creosote rings are of great interest for scientific study. The rings observed on the aerial survey of Cadiz Valley should be located on the ground, verified as true creosote rings, and their exact location mapped on standard U.S.G.S. 15 minute quads.

Wildlife

A nine-week field inventory of wildlife species associated with the Cadiz Valley/Danby Lake open area was conducted from March 7, 1977 to May 5, 1977. The inventory consisted of live trapping of small mammals, small mammal snap trapping, walking standardized bird transects in selected locations, night driving of roads associated with the open area, and the recording of wildlife observations made incidental to the above work. Voucher specimens collected have been sent to the Los Angeles County Museum, CA.

Mammal and bird population densities were calculated for some common species. These density figures were determined primarily for the purpose of monitoring mammal and bird populations. They are also useful in producing estimates of animals which would be impacted by the proposed action. Mammal trapping was done simultaneously in the control and test plots. All plots were sampled, using identifical traps, trap configurations, and bait. Bird transects were also done simultaneously in the control and test plots. Test plots are plots which lie upon proposed race courses and are expected to be heavily impacted. Control plots were chosen in adjacent areas of the same habitat type which are not expected to receive ORV impacts. Standard methods and data sheets were used throughout. Complete descriptions of bird and mammal population density study methodologies are available upon request at the BLM Office, Riverside, CA.

No population density estimates were made for reptiles. Several expected species escaped detection and are shown as probable species in the habitat-species lists on following pages. Probable mammals and birds are also listed in these tables. These species are mostly snakes and they escaped detection simply because of the secretive and unpredictable nature of many snakes. Further studies may confirm or disprove thepresence of the probable species, but at present, using knowledge of habitat reference and ranges, the probable species would be expected to exist on te open area.

In general terms, the mammal populations in the areaare predominantly rodents, such as kangaroo rats, pocket mice, woodrats and grond squirrels. Mammalian predators like kit fox, coyote, and bobcat have popuations present but are inherently smaller in numbers due to their position in the food chain. It was not possible to sample the bats in the area although they were commonly observed. The bird populations of the area are primrily migratory and usually appear in the spring and fall. There are possibly 2 species that use the area for breeding and probably 10 species that use the area throughout the year. Within the study area the Iron Mountain Pump Plant omplex and the Desert Drywash systems appear to be by far the most important habitats for bird species. Reptiles are present throughout the open area. Chuckwallas are common in the rocklands. In the sand flats, many Mojave fringe-toed lizards were seen. Zebra tailed lizards perhaps the most common reptile seen, were spotted in several habitats.

Significant species. Significant wildlife species are those animals which are considered to be special for reasons of rarity, postion on the food web, restriction to certain habitats, or recreational or commercial uses. Appendix B contains a complete list of criteria for significantwildlife species.

The Brown Pelican, sighted at the Iron Mountain Pump Plant pond for several days, was the only animal observed which is on the State and Federal endangered lists (CDFG, 1975; BLM, 1976). The following species found in the area are fully protected by the California Department of Fish and Game (CDFG, 1975): desert tortoise, kit fox, and ring-tailed cat. The following species are partially protected by the California Department of Fish and Game (CDFG, 1975) black-tailed jackrabbit, bobcat, red-tailed hawk, morning dove, banded gecko, desert iguana, chuckwalla, Mojave fringe-toed lizard, collared lizard, leopard lizard, desert horned lizard. A fully protected species is one which, according to California Department of Fish and Game may not be taken or killed. A partially protected species is one upon which a bag limit has been imposed.

The Audubon Blue List is compiled annually by ornithologists and indicates those birds which, for reasons of effects of chemicals onbreeding biology, reduction of breeding or wintering habitat, predato problems, (including man) or other causes are now or seem to be substantiallyreduced in numbers, either regionally or throughout their range (Arbib, 1976). The following Blue Listed birds occur in the Cadiz Valley/Danby Lake oen area: Western grebe, Swainson's hawk, marsh hawk, prairie falcon, sparrow hawk, short-eared owl, loggerhead shrike, yellow warbler, and vesper sparrow.

Cadiz Valley / Danby Lake

Vegetation and Habitat Classification

- area boundary
- dry lake bed
- lake edge:
- alkali sink scrub
- salt bush scrub
- creosote rockland
- creosote flats
- desert dunes and sandhills
- desert dry wash
- granite wash complex

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0 1 2 Miles

Location Map

Figure 2.3

Cadiz Valley / Danby Lake

Range of Sensitive Species

area boundary

Astragalus lentiginosus var: *borreganus*

Pholisma arenarium

Antirrhinum filipes

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0 1 2 Miles

Location Map

Figure 2.4

2.2.2 Specific habitats

Dry lake bed

Figure 2.5 Dry lake bed

Vegetation. Two dry lake beds are located in the open area: Danby Lake in southwestern Ward valley and the southern tip of Cadiz Lake in the center of Cadiz Valley. These alkali sinks are low places having very poor drainage and periodically receive runoff from washes draining the surrounding mountain ranges. Because precipitation is seasonal and alternates with extreme drought, much of the water deposited evaporates and leaves behind the salts it has carried from the surrounding areas, thus forming extremely alkaline soils that are inhospitable to most forms of life.

Vegetation inventories for the lake beds, as well as all habitats within the open area, included only the macrofloral elements. The salt concentrations in the soils of Cadiz and Danby Lakes are so high that no vascular plants can grow and the lakebeds appear totally devoid of vegetation. However, studies have shown that desert soils in general, and alkaline soils in particular, do support a substantial microflora (Bonar and Goldsmith, 1925; Fletcher and Martin, 1948; Nicot, 1960; Durrel and Shields, 1961; Durrel, 1962; Hunt and Durrell, 1966; and Friedmann and Galum, 1974). Hunt and Durrell (1966) found 22 species of algae and 48 species of fungi on the alkali sink of Death Valley, and it is highly probable that a considerable microflora also exists on Cadiz and Danby Lakes.

Both Cadiz and Danby Lakes show some signs of past ORV disturbance. Danby

Lake has been additionally impacted by construction of a powerline and several dirt roads. Currently, salt mines are in operation on both lakebeds.

Wildlife, Although invertebrate species were not studied in this project, it is probable that there are several invertebrates present in the Cadiz and Danby dry lake beds. Among the probable species are several species of fairy shrimp. These shrimp appear only when the dry lake beds fill with water during a large storm. The shrimp survive dry periods as eggs which may be dormant for 10 years (Stebbins, 1974). The life cycles, distribution, and even basic taxonomy of these shrimp have not been fully worked out yet.

During the wetter years; lake beds such as Cadiz and Danby provide ephemeral habitat for various species of water birds. Potential species using these ephemeral lakes would be drawn from the Pacific Flyway. Examples of some of the most probable ones to stop over on these lakes would be those water birds listed in the Species-Habitat tables and found under the column headed Iron Mountain Pumping Plant (Appendix C).

Except for the above, the dry lakes are not viewed as a significant wildlife resource. We define wildlife resource as being a combination of the wildlife species for an area and the wildlife habitat of that area.

Lake edge

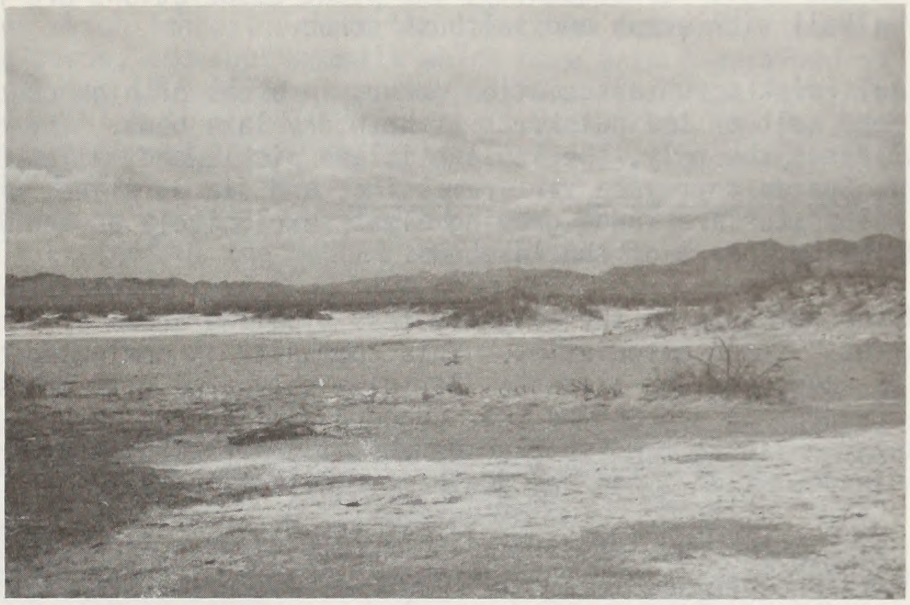

Figure 2.6 Alkali sink scrub

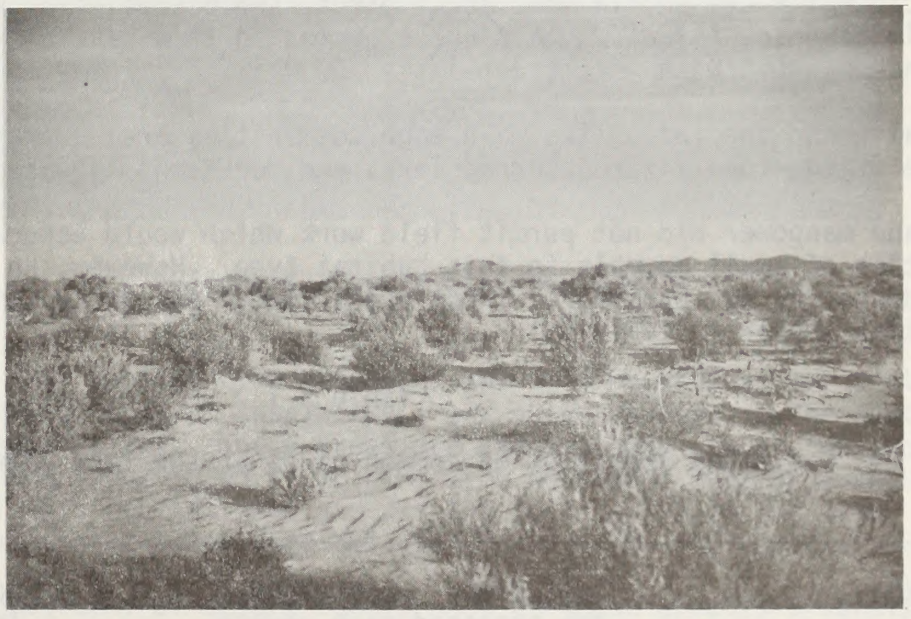

Figure 2.7 Saltbush scrub

Vegetation. Vegetation on the alkaline areas along the fringes of Cadiz and Danby Lakes consists of low, scattered perennial shrubs. Although most of the species are fleshy halophytes (salt-tolerant plants), not all of these species are equally tolerant and they are often found in zones adjusted to the concentrations of salts in the soil. Consequently, two plant associations are found on the lake edges: alkali sink scrub and saltbush scrub.

The alkali sink scrub association occurs in areas of high concentration of alkali and salt on the outskirts of both dry lake beds. The dominant, and in most cases the only, species are inland pickleweed, Allenrolfea occidentalis; inkweed, Suaeda torreyana var. ramossima; and sea purslane, Sesuvium verrucosum. These halophytes are found growing almost exclusively on the low hummocks scattered around the periphery of the lakebeds.

Behind the hummocks on the slightly less alkaline areas of the lakeshore is the saltbush scrub association. This community is dominated by wingscale, Atriplex canescens and allscale, Atriplex polycarpa with creosote bush, Larrea tridentata and mormon tea, Ephedra californica as occasional sub-dominants. Also, a few isolated groves of tamarisk, Tamarix ramosissima grow in this association along the southern edges of the lakebeds.

Alkali sink scrub and saltbush scrub associations are characterized by their extremely low species diversity. They consist primarily of fleshy halophytic perennial shrubs with very few annual species. Both of these associations are relatively rare and are found only near playas and dry lakebeds of the Mojave Desert, Death and Panamint Valleys, and in the Great Central Valley (Thorne, 1976).

Wildlife. The lake edge habitat types supports 23 unknown wildlife species: 6 species of reptiles, 11 species of birds, and 6 species of mammals. An additional 5 species of mammals are expected in this habitat type but their presence has not been verified.

typical known species of the lake edge communities are: zebra-tailed lizard, Mojave fringe-toed lizard, horned lark, and Merriam's kangaroo rats.

Time and manpower did not permit field work which would accurately estimate of densities of small mammals in this habitat type. However, an estimate of bird densities was possible. Those birds common enough to compute estimated densities appear in Table 2.1.

Table 2.1

Estimated densities of common birds of the lake edge habitat

SPECIES	Test site. Located on the proposed race course.	Control site. Located in an anticipated low ORV use area.
Hormed lark	246/100 hectares	5/100 hectares
Brewer's Sparrow	131/100 hectares	
Tree swallow		28/100 hectares

A complete list of known species and some of the expected species is provided in Appendix C.

Of the species which inhabit or use the lake edge community there are three reptiles, two birds, and four mammals which have been classified as significant species (BLM 1975a; see Appendix B). The reptiles include the desert tortoise which is a fully protected species, and the Mojave fringe-toed lizard and desert horned lizard which are partially protected. The birds include the loggerhead shrike which is a fully protected, Blue Listed species, and the red-tailed hawk which is partially protected. The mammals include the kit fox which is fully protected, the bobcat and jackrabbit, which are partially protected species, and the coyote.

Creosote rockland

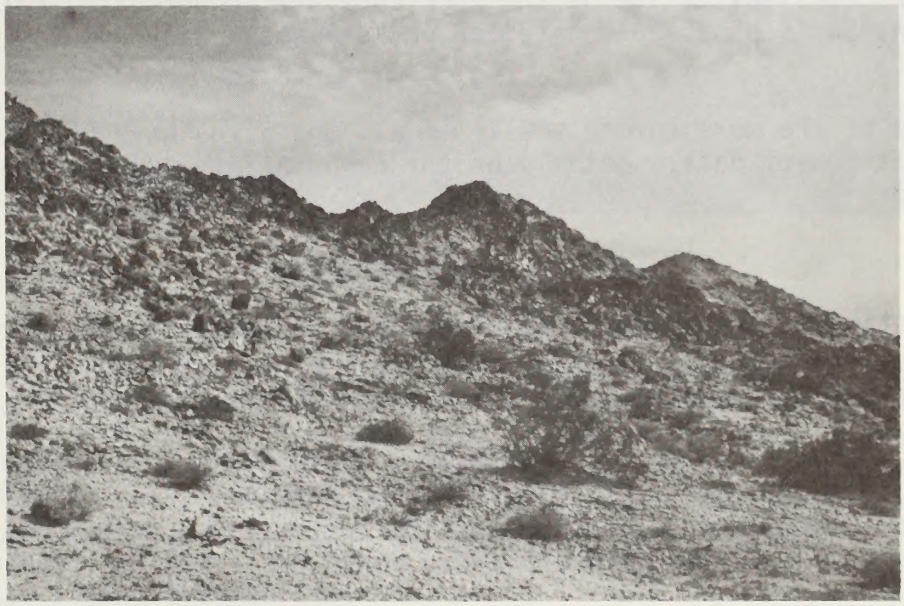

Figure 2.8 Creosote rockland

Vegetation. This habitat type occurs on the Iron Mountains, the southern tip of the Kilbeck Hills, and two inselbergs (rock outcroppings) in the southwestern portion of Cadiz Valley. These areas are steep craggy granite outcrops at elevations below 1000m (3300 ft.). The Iron Mountains represent approximately 95 percent of this habitat type and are the focal point of the study area. They serve to separate Cadiz and Ward Valley.

The rugged topography of desert ranges such as these creates diversified microclimates which in turn result in much higher diversity of plants than would occur on flatter ground. In spite of the fact that these rockland habitats have an extremely low density of plant species, they support elements

from both creosote bush scrub and desert dry wash plant communities. Many additional species were found in this habitat that occurred nowhere else in the open area. These included desert holly, Atriplex hymenelytra; fagonia, Fagonia laevis; desert aster, Macaeranthera tortifolia; trixis, Trixis californica; and barrel cactus, Ferocactus acanthodes.

Because of its rugged topography, this habitat has been subjected to fewer impacts than the surrounding low lands. Except for the aqueduct cutting through the southern portion of the Iron Mountains and the dirt road and transmission line crossing the eastern ridge of the Iron Mountains, the majority of this habitat remains undisturbed.

Wildlife. The rocklands of the open area are known to support 27 wildlife species: 7 species of reptiles, 15 species of birds, and 5 species of mammals. An additional, but unconfirmed, 13 species of wildlife are expected to occur in the creosote rocklands: 7 reptile species and 6 mammal species.

Known species illustrative of the rocklands are: chuckwalla, collared lizard, rock wren, Say's phoebe, long-tailed pocket mouse, canyon mouse, and desert woodrat.

Densities of the more common small mammals and birds have been computed from trap and transect data. Details on the computations are available upon request.

Table 2.2

Estimated densities of selcted birds and mammals, creosote rockland

SPECIES	Test site. Located on proposed race course.	Control site. Located in anticipated low ORV use area.
Mammals		
Long-tailed pocket mouse	8/hectare	8 hectare
Birds		
Say's phoebe	8/100 hectares	5/100 hectares
Rock wren	8/100 hectares	5/100 hectares

A complete list of known species and some of the expected species is provided in Appendix C. The reptiles are the desert iguana, chuckwalla, collared lizard, and speckled rattlesnake which are partially protected species. The birds are the prairie falcons which are a fully protected, Blue Listed species, and the red-tailed hawk which is a partially protected species. Both of these birds

probably nest in the Iron Mountains. The significant mammals are kit fox which is fully protected, the bobcat, which is partially protected, and the coyote.

Creosote flats

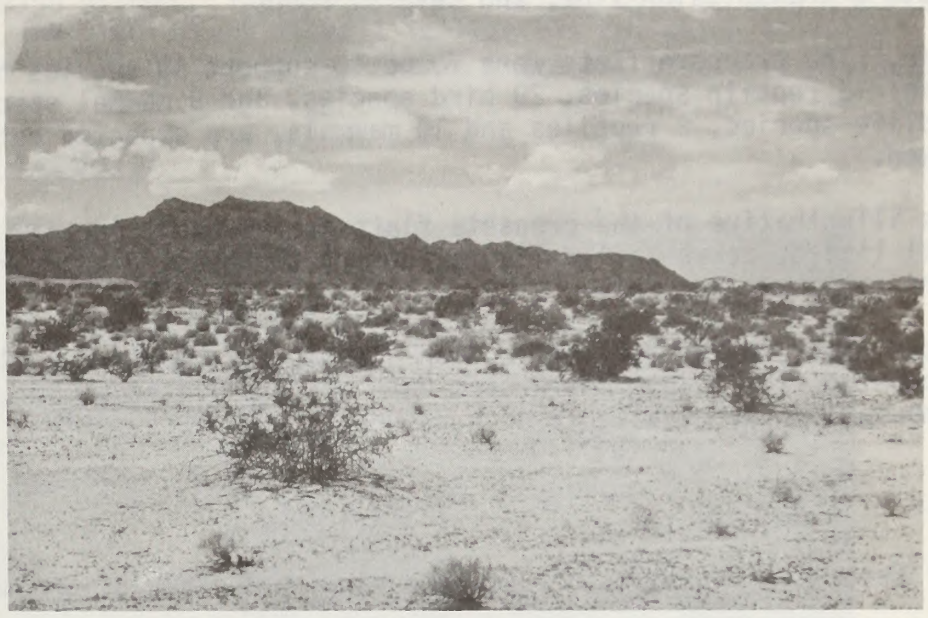

Figure 2.9 Creosote flats

Vegetation. This habitat type is found along the western edge of the open area (western Cadiz Valley), along the eastern and southern sides of the Iron Mountains, and along the eastern edge of the open area (southeastern Ward Valley). Creosote bush scrub is the characteristic plant community of the California deserts. It is usually found on well-drained soils of slopes, fans and valleys, where winter temperatures are seldom below freezing. Precipitation is generally less than 12.5 cm (5 inches) per year, and comes primarily with winter cyclones or as occasional late summer cloudbursts.

The creosote bush scrub community is characterized by a generally low density and diversity of perennial species. However, this habitat is extremely rich in annual species, which account for nearly 90 percent of the total flora (Hyrum Johnson, personal communication). Creosote bush, Larrea tridentata, and burrobush, Ambrosia dumosa are the dominant species. Other common species include: cheesebush, Hymenoclea salsola; brittlebush, Encelia farinosa; white ratany, Krameria grayi; plantain, Plantago insularis; and forget-me-not, Cryptantha spp..

As pointed out earlier, desert soils do support substantial populations of microscopic algae and fungi. Some of the soils of the creosote flats habitat type (primarily in Cadiz Valley) are overlain with a thin fragile crust. Studies of rain crusts on desert soils by Fletcher and Martin (1948), Shields et. al., (1957), and Durrell and Shields (1961) have established that algae and fungi in these crusts perform the following important functions: (1) stabilizing surface crusts by holding soil particles in place, (2) enhancing soil fertility by greatly increasing the organic carbon and nitrogen content of the soil, (3) improving infiltration, (4) retarding erosion, and (5) aiding in the establishment of plant seedlings.

Much of the creosote flats habitat has been disturbed in the past by ORV and military activities (World War II and Desert Strike maneuvers). Most of the other disturbances are centered in the vicinity of the Iron Mountain Pumping Plant and include the pumping plant complex, a portion of the Colorado River Aqueduct, a transmission line, and several roads.

Wildlife. The creosote flats were found to support 50 species of known wildlife: 13 reptile species, 29 bird species, and 9 mammal species. Another 18 wildlife species, 8 reptiles and 10 mammals, are expected but have not been confirmed.

Species illustrative of the creosote flats are: desert iguana, western whiptail lizard, zebra-tailed lizard, desert tortoise, black-throated sparrow, and Merriam's kangaroo rat.

Estimated densities of the more common species of mammals and birds have been computed from trap and transect data and are listed below. Details on the computations are available upon request.

Table 2.3

Estimated densities of selected birds and mammals, creosote flats

SPECIES	Test site. Located on proposed race course.	Control site. Located in anticipated low ORV use area.
Mammals		
Merriam's kangaroo rat	5/hectare	8/hectare
Birds		
Black throated sparrow	21/100 hectares	21/100 hectares
Horned lark	8/100 hectares	

A complete list of known species and some of the expected species is provided in Appendix C.

Of the species which inhabit or use the creosote flat habitat, 6 reptiles, 8 birds and 4 mammals have been classified as significant species (BLM 1975a). See Significant Species Table B.1 in Appendix B. The reptiles include the desert tortoise which is a fully protected species, the banded gecko, desert

iguana, Mojave fringe-toed lizard, leopard lizard, and desert horned lizard which are partially protected species. The birds include the marsh hawk, Swainson's hawk, prairie falcon, sparrow hawk, short-eared owl, and loggerhead shrike which are fully protected, Blue Listed species, and the red-tailed hawk and mourning dove which are partially protected. The above fully and partially protected and Blue Listed birds of prey utilize the creosote flats as a primary hunting ground. Therefore, this habitat type is very important to these birds. The significant mammals include kit fox which is fully protected, bobcat and black-tailed jackrabbit which are partially protected, and the coyote.

Desert dunes and sandhills

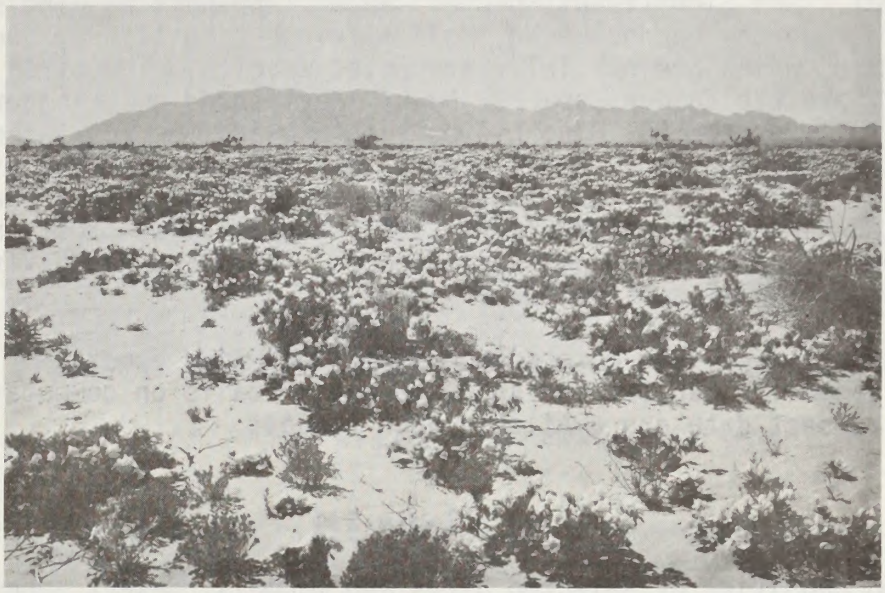

Figure 2.10 Desert dunes and sandhills

Vegetation. This habitat type is found along the eastern slopes of Cadiz Valley, in the in the pass between the Iron Mountains and the Kilbeck Hills, along the northwestern edge of Danby Lake, and south of both Cadiz and Danby Lakes. Although a few well-developed, moderately active dunes occur within the open area, the majority of this habitat consists of low, rolling sandhills and nearly flat, sand plains.

Sand dunes are a unique and rare biological environment, comprising much less than 1 percent of California's land area. These areas are formed by the accumulation of windblown sand and are characterized by their loose, unstable, sandy soils. Sandhills and sand plains are more stable and have more ground water than active dunes, thus allowing for the establishment of plants. These areas provide excellent habitat for many plant species. Many of the perennial species occurring on the dunes also occur on the creosote flats, but have a much more luxuriant habit here. Dunes are also very rich in annual species, supporting spectacular wildflower displays after wet winters. Some of the most common species in this plant community include burrobush, Ambrosia dumosa; coldenia, Coldenia plicata; desert croton, Croton californica; dyeweed, Dalea emoryi; desert lily, Hesperocaulis undulata; and creosote bush, Larrea tridentata.

Wildlife. These sandy areas were found to support 46 species of wildlife: 7 reptile species, 26 bird species, and 13 mammal species. Another 12 species of wildlife are anticipated in these sandy habitats but they are presently unconfirmed: 2 reptile species, and 10 mammal species.

Typical species of the Desert Dunes and sandhills habitat type include: Mojave fringe-toed lizard, western shovel nosed snake, sidewinder, horned lark, Brewer's sparrow, desert kangaroo rat and kit fox.

Of the animals which inhabit or utilize the desert dunes and sandhills, 3 reptiles, 7 birds, and 4 mammals have been classified as significant species (BLM, 1975a). See Significant Species Tables, Appendix B. The significant reptiles include the banded gecko, Mojave fringe-toed lizard, and desert horned lizard, which are partially protected species. The birds include the marsh hawk, prairie falcon, sparrow hawk, short-eared owl, loggerhead shrike which are fully protected, Blue Listed species, and the red-tailed hawk and mourning dove which are partially protected species. The significant mammals include the kit fox which is a fully protected species, the bobcat and black-tailed jackrabbit which are partially protected species, and the coyote. Of the above species, the Mojave fringe-toed lizard is the only species which is limited to a sandy substrate.

Computed densities of the more common mammal and bird species of the desert dunes and sandhills habitat are shown below. Details on computations from trap and transect data are available upon request.

Table 2.4

Estimated densities of selected birds and mammals, desert dunes and sandhills

SPECIES	Test site. Located on proposed race course.	Control site. Located in anticipated low ORV use area
Mammals		
Desert kangaroo rat	4/hectare	8/hectare
Birds		
Horned lark	90/100 hectares	74/100 hectares
Brewer's sparrow	78/100 hectares	57/100 hectares
Mourning dove	----	52/100 hectares
Sage thrasher	----	20/100 hectares

A complete list of known species and some of the expected species is provided in Appendix C.

Desert drywash

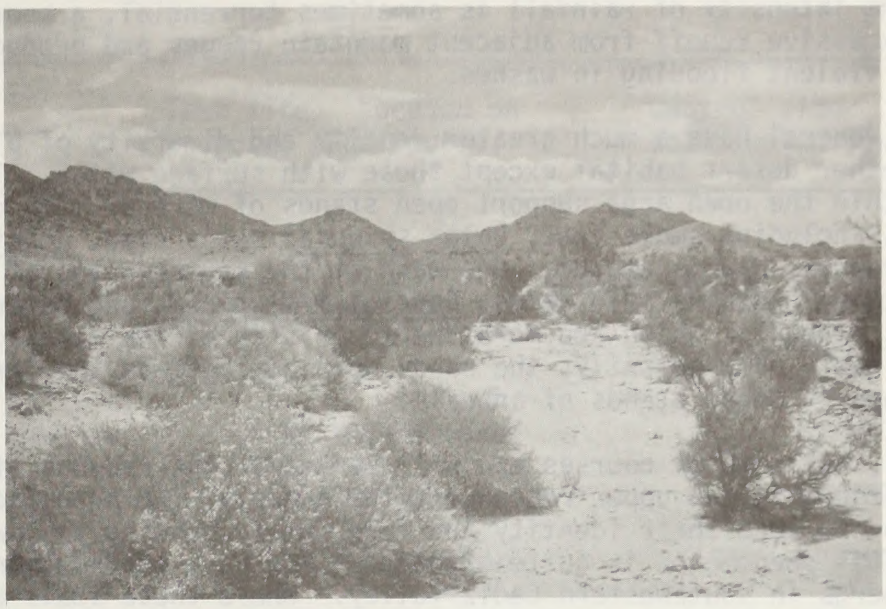

Figure 2.11 Desert dry wash

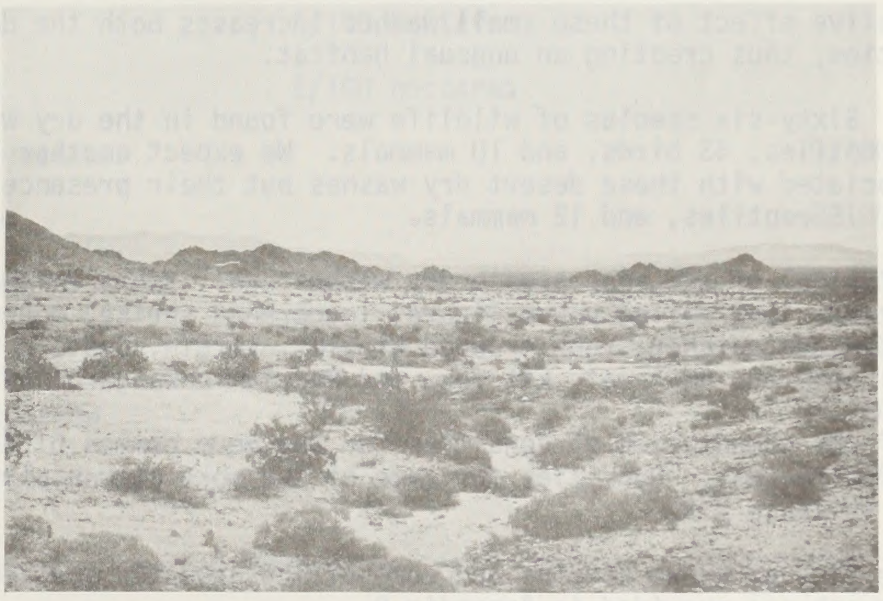

Figure 2.12 Granite wash complex

Vegetation. A number of washes drain the canyons of the Iron Mountains and empty into Cadiz and Danby Lakes. These major washes exhibit well-developed drainage patterns and form continuous channels from the steep slopes of the mountains to the troughs of Cadiz and Ward valleys. Washes typically have loose, sandy soils and are characterized by their ephemeral nature, flowing only during or after a rain. Because the intensity of rainfall is sometimes torrential, a sporadic storm can trigger excessive runoff from adjacent mountain ranges and produce abrupt and sometimes violent flooding in washes.

Washes in general have a much greater density and diversity of plant species than any other desert habitat except those with surface water. The well-developed washes within the open area support open stands of more or less deciduous trees and shrubs including smoke tree, Dalea spinosa; cat's claw, Acacia greggii; and desert lavender, Hyptis emoryi. One wash at the southern toe of the Iron Mountains also contains palo verde, Cercidium floridum; and desert willow, Chilopisis linearis; which are more characteristic of the Colorado Desert to the south and east. Periodically, the sandy openings between the large perennial species support dense stands of annuals.

In general, while water courses are well marked in the canyons of mountains and sharply defined in the upper reaches of the steeply sloping bajadas, many washes tend to lose their identity and fade out in passing to lower, flatter ground. This phenomenon is quite evident at the base of the Iron Mountains and the inselbergs in southwestern Cadiz Valley. Where these small arroyos flow into the lower valleys, an intergrade of vegetational types is created. Because these wash complexes include plant species of both the desert dry wash and creosote bush scrub communities, they are more diverse than the surrounding creosote flats.

The cumulative effect of these small washes increases both the density and diversity of vegetation, thus creating an unusual habitat.

Wildlife. Sixty-six species of wildlife were found in the dry washes of the open area; 13 reptiles, 43 birds, and 10 mammals. We expect another 17 species of wildlife to be associated with these desert dry washes but their presence remains to be confirmed: 5 reptiles, and 12 mammals.

Wildlife typical of the open area's dry washes are: zebra tailed lizard, desert horned lizard, long tailed brush lizard, loggerhead shrike, mourning dove, black-tailed gnatcatcher, ruby crowned kinglet, verdin, Costa's hummingbird, white tail antelope squirrel, kit fox, and Merriam's kangaroo rat.

Details of the computation of densities for the more common birds and mammals are available on request. Densities for some of the more common birds and mammals are shown in Table 2.5.

A complete list of known species and some of the expected species for the Desert Drywash are provided in Appendix B.

Of the animals which inhabit or utilize the desert drywash habitat, 6 reptiles, 6 birds, and 4 mammals have been classified as a significant species (BLM, 1975a) See Significant Species Tables, Appendix B.

Table 2.5

Estimated densities of selected birds and mammals, desert dry wash

SPECIES	Test site. Located on proposed race course.	Control site. Located in anticipated low ORV use area.
Mammals		
Merriam's kangaroo rat	10/hectare	8/hectare
Birds		
Black-throated sparrow	30/100 hectares	21/100 hectares
Mourning dove	10/100 hectares	80/100 hectares
Black-tailed gnatcatcher	12/100 hectares	22/100 hectares
Costa's hummingbird	26/100 hectares	62/100 hectares
Brewer's sparrow	8/100 hectares	14/100 hectares
Mockingbird	4/100 hectares	-
Gray flycatcher	6/100 hectares	-
Ash throated flycatcher	-	10/100 hectares
Wilson's warbler	-	8/100 hectares
LeConte's thrasher	-	6/100 hectares
Verdin	-	16/100 hectares
White crowned sparrow	-	32/100 hectares
Ruby crowned kinglet	-	14/100 hectares

The significant reptiles include the desert tortoise which is a fully protected species, and the desert iguana, Mojave fringe-toed lizard, and collared lizard which are partially protected species. The birds include the sparrow hawk, loggerhead shrike, and yellow warbler which are fully protected, Blue Listed species, the long-eared owl which is a fully protected species, and the red-tailed hawk and mourning dove which are partially protected species. Of these birds, the yellow warbler and long-eared owl were found only in the desert drywash. The significant mammals include the kit fox which is a fully protected species, the bobcat and black-tailed jackrabbit, which are partially protected species and the coyote.

Iron Mountain Pumping Plant complex

Figure 2.13 Iron Mountain Pumping Plant complex

Vegetation. The Iron Mountains, located in the center of the open area, are a north-to-south trending ridge with a secondary easterly trending ridge extending from the central portion of the mountains. Situated along the southern base of this easterly ridge is a pumping plant maintained and operated by the MWD. The plant facilities include an aqueduct, a stilling basin, the pump plant, and a residential complex. A large variety of nonnative plant species are being cultivated in the pump plant complex including Burmuda grass, Cynodon dactylon; rose, Rosa sp.; bougainvillea, Bougainvillea sp.; juniper, Juniperus sp.; elm, Ulmus sp.; carob, Ceratonia siliqua; and eucalyptus, Eucalyptus sp.. The lush vegetation and the abundance of surface water have created a man-made oasis within the open area.

Wildlife. No trapping or bird transect data for the MWD housing complex was obtained because no courses are proposed for the area. However, the complex and the 14.8 km (9.25 miles) of aqueduct in the open area attract a considerable number of bird species to the open area that would not otherwise be expected there. Some of these species would be expected to use lands adjacent to MWD lands which would be impacted by the proposed action.

Some of the unusual species associated with this man-made habitat are: red-spotted toad, raccoon, brown pelican, common loon, Forester's tern, eared grebe, Wilson's phalarope, black and white warbler, hooded warbler, indigo bunting, great-tailed grackle, American redstart, and many waterfowl species.

A complete list of birds observed at the pumping plant or along the aqueduct is given in Appendix C.

There are many animals which are exclusively associated with the Iron Mountain Pump Plant complex. Of these animals there are a few very noteworthy ones. The brown pelican is on the State and Federal Endangered lists (CDFG, 1975), BLM, 1976), the western grebe is a fully protected, Blue Listed species (CDFG, 1975; Arbib, 1976), and the raccoon is a significant species.

Aside from the above species, the pump plant complex is also used by many species of waterfowl (not enumerated here) which use the pump plant complex as a stopover point during migration. These waterfowl fit into the various categories of fully protected, partially protected, and Blue Listed species.

Insects. No field analysis of the insect life was made. Andrews and Hardy (1976) report that every dune system they have examined has been found to contain endemic insect species. Therefore, it is highly probable that the dunes in the Cadiz open area may also contain endemic species. Some insects are so highly adapted to living in sand that they can live nowhere else (Stebbins, 1974).

2.3 ECOLOGICAL INTERRELATIONSHIPS

Interaction of plant and animal communities with the nonliving environment

Climate. The geographical distribution of biotic communities is determined by limiting environmental factors. In southern California, the availability of water is the major limiting factor, with temperature and soil type exerting much less influence. Precipitation and availability of water are not equivalent. Slope and soil permeability influence the proportions of rainfall runoff penetration. In some places, the water table may be near or at the surface, even in the driest deserts. Rainfall, however, is the main determinant of the availability of water.

Arid climates are characterized not only by low rainfall, but also by large variation from year to year. This variability has important consequences for the plants and animals.

Desert vegetation is dominated by annual species. In the California deserts overall, nearly 50 percent of the plants are annual. Desert annuals grow only after enough rain has fallen to ensure survival to maturity; hence, they appear only in favorably wet years (Beatley, 1974). Perennials also grow little or not at all in dry years. Reproduction in desert animals is

dependent on the food supply. Since animals depend on plants directly (herbivores) or indirectly (carnivores) for food, they don't reproduce in dry years (Beatley, 1969; Mayhew, 1968). Many animals become dormant or migrate out of the desert during dry periods. Populations of both plants and animals, therefore, decline during dry periods, and boom following a wet year.

Soil. The soil provides physical support water and mineral nutrients for plants growing in it. It provides habitat or shelter for animals that burrow in it. These plants and animals provide organic materials to the soil with their defecation and dead bodies. These organic materials combine with the mineral soil to enrich it. However, this organic recycling is very poor in desert soils because of sparse plant and animal populations to provide organic material and because of long decay times due to lack of water.

Topsoil, which consists of mineral soil and decayed organic matter, is usually a better growing medium for the development of plants (Wilshire and Nakata, 1976). The organic elements traceable to plants and animals seem to loosen the soil and provide a substrate more easily penetrated by invertebrates and vertebrates which burrow through it in search of food, shelter, or the environment suitable for reproduction.

Interaction of plant and animal communities

General. Plants provide food and cover for wildlife. Cover can be a place to hide from enemies, a shelter for rearing offspring, and a place to seek shelter from sun, wind, precipitation, harassment, or predation. Animals, in turn, provide vehicles for distributing plant seeds and act as cultivators of the soil, improving it for further plant colonization. Each community then contributes to the welfare of the other, but not on equal terms.

Plants are considered primary producers in the food chain because they make their own food by the process of photosynthesis. Since animals cannot do this, they are dependent either directly or indirectly on plants for their food. Plants are dependent upon decomposers. These decomposers recycle the nutrients bound up in dead plant and animal material and animal excrement and return them to the soil and thus back to plants. This nutrient cycling is one example of plant-animal community interactions.

Interactions of plant and animal communities in the open area are manifold. Plants are used by animals as cover, as a medium in which they live, and as cover for burrows. Long-tailed brush lizards were found living in creosote bushes, cheesebushes and smoke trees in the desert dry washes on the open area. Likewise, desert spiny lizards were found almost exclusively in smoke trees. These two species use the shrubs and trees for cover and as hunting grounds.

Many species of lizards, snakes and mammals use the basal areas of perennials, especially creosote, for burrow sites. Notably, the desert tortoise often burrows at the base of creosote. Many rodents such as Merriam's and desert kangaroo rats also burrow at the base of creosote and other shrubs. The branches and foliage shade the entrance of burrows, as well as providing protection and camouflage for animals leaving or entering the burrow. In the desert drywashes, the burrows of white-tailed antelope ground squirrels are often observed under cheesebush covered by Brandegea, a vine-like plant.

Jackrabbits are frequently flushed from bushes under which they hide or take shelter from the sun. Plants, especially large shrubs, smoke trees, and palo verde trees, provide nesting sites for many birds. Mourning doves, Cost's hummingbirds, black-tailed gnatcatchers, and verdins nest in smoke trees, creosote and other shrubs. Many birds, such as the black throated sparrow, poor will, lesser night hawk and horned lark build their nests beneath or in the cover branches of shrubs.

Many animals, especially birds and flying insects, take refuge from high winds in the foliage of desert shrubs. For example, black throated sparrows and sphynx moths seek the branches of creosote during high winds. Finally, many animals, especially small mammals and lizards, hide from predators beneath plants. Birds perch in them and predators, such as fly catchers and shrikes, hunt from taller smoke trees and palo verde trees.

Food relationships. The productivity of plants is the foundation of any animal community whether or not a given individual utilizes plant tissue or animal tissue as its energy source. This primary productivity is dependent upon favorable combinations of moisture and temperature, and in some cases on the absolute quantity of moisture. In desert areas, the spring and early summer months are the most important and productive seasons of the year because this is the time when the plants and most animals go through their reproductive cycles. These are the months when wildflowers bloom and when the wildlife populations peak, because the animals' breeding season is linked to the spring vegetation. It is this vegetation that provides food, moisture, and shelter for wildlife.

Animal food webs utilimately rely upon plants (see Figure 2.14). Plants are the only food producers. Animals such as herbivourous insects, kangaroo rats, desert iguanas, and desert tortoises are primary consumers, i.e., they eat plants. Some species of migrating birds such as Lazuli buntings, chipping sparrows, and house finches are seed eaters and therefore also rely on plants directly for food.

The secondary consumers include all insectivorous birds and lizards, most of the snakes, kit fox, coyote, raptors and others.

The largest of the predators, such as hawks, owls, coyotes, badgers, and bobcats, may be either secondary or tertiary consumers. At any rate, the food web is rather truncated in the desert because the scarcity of food restricts the number and size of predatory species.

The spring and early summer population increase of desert animals can be outlined in a fairly predictable sequence. The winter and spring rains that trigger the display of annual wildflowers and other vegetation, also induce the emergence of desert insects, which have passed the dry season while lying dormant in the upper soil layers (Beatley, 1969; and Luckenbach, 1975).

The emergence of the plants and insects as food and cover stimulates the breeding season of most desert wildlife species. As the populations of herbivorous and insectivorous animals increase, they provide a food source for the reproduction of carnivores.

Generalized Food Web
of the
Cadiz Valley/Danby Drylake Area

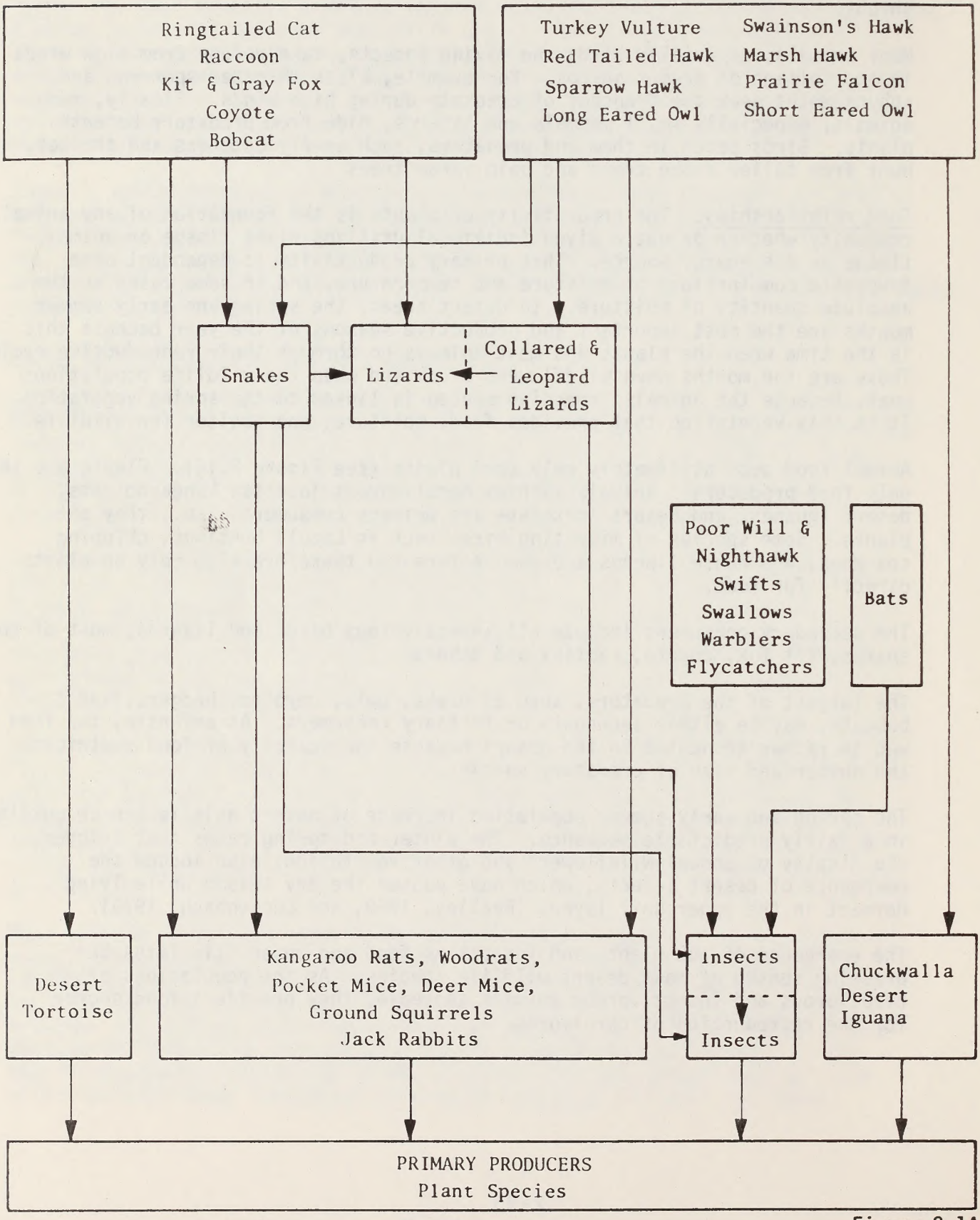

Figure 2.14

The breeding biology of many species is linked with the spring blooms of annual plants. Kenagy (1973) observed a correlation between body weights and reproduction. He states peaks in body weight of both male and female rodents correspond with greatest reproductive activity. These peaks in body weight and reproduction do not occur at the same time for all species, although they do follow the spring rains and corresponding bloom of annual plants. Luckenbach (1975) likewise states that the occurrence or failure of reproduction of desert rodents and birds is correlated with the presence or absence of winter annuals. Tortoises feed almost entirely on annual plants, and the ability of a female to survive depends on whether she can store enough energy to breed, lay eggs, and then survive the summer and following winter until the next spring bloom.

Luckenbach (1975) also notes that certain lizards prey mainly on insects associated with annual plants. Consequently the breeding of these lizards varies with the spring annual blooms, which vary with the amount of winter rainfall. On the other hand, lizards which prey mainly on insects associated with perennials show no seasonal change in their breeding.

As the various plants and animal populations have peaked, the summer season will have progressed, become hotter and drier. By the time the hottest part of the summer has arrived, the annual plants will have died and the perennials will have become dormant. With the loss of vegetation, their food and cover, the wildlife populations begin to decline, reaching their lowest level just prior to the breeding season.

In conclusion, it must be recognized that the spring and early summer months are biologically the most significant and vulnerable period in the annual cycle of the open area with regard to the proposed action. However, during the fall and winter, both wildlife and its habitat are still vulnerable to destruction from ORV use, second in significance only to the spring and early summer months.

Importance of biological diversity

Species diversity is a function of the number of species present (species richness) and the evenness with which the individuals are distributed among these species (Odum, 1963; Whitaker, 1965; Watt, 1972). The importance of species diversity has many ramifications in biological theory and is supported by several specific arguments. Most of these arguments fall into one of four categories:

1. Diversity promotes stability in an ecosystem.

2. Diversity provides a greater survival potential for a community, plant, or animal.

3. Diverse communities utilize radiant energy more efficiently and hence are more productive (over the long term) than less diverse communities.

4. Diverse communities tend to promote the mental well being of humans.

The most important value of diversity is its interrelationship with stability and survival value. This concept is derived from the fact that diverse communities have a greater potential for adaptation to changing conditions, whether these be short-term or long-term changes in climate or other factors. Hence, any reduction in diversity tends to weaken the whole ecosystem by decreasing its potential for change or survival.

The loss of individual plants and/or animals, leads to a general reduction in that community's diversity potential. Each species has a specific function with the ecosystem and provides that extra diversity necessary for the health, well-being, and ultimate survival of that system.

Natural succession

Biotic communities are continuously undergoing orderly change; the process is called natural succession. Succession is the gradual replacement of one community by another, starting with a pioneer and proceeding toward the climax community, which is the one best adapted to the climate and soils of the region. However, this process is not believed to occur in the traditional sense in most desert communities. In the more drier desert areas, very little is known of natural plants' succession. Some ecologists believe that the classical successional model does not exist. They believe rather that plants are strictly opportunistic. Others believe that many species within a climax desert area have some capability as pioneers and that the primary pioneer species form a small but significant fraction in the desert community (Vasek, et al, 1975a).

Any evaluation of an environment and impacts upon it must consider not only the existing environment, but its future potential. The probable future species composition and structure of some habitat types may be speculated upon, using knowledge of the pioneering and recovery potential of some plant species in the open area. The recovery of animal populations will follow the recovery of plant populations (see Section 3.3).

2.4 HUMAN INTEREST VALUES

2.4.1 Scenic/visual resources

Evaluation process

A scenic/visual evaluation must include the inventory and analysis of several factors. The inherent scenic quality of the landscape is the most obvious consideration, but of equal importance is an understanding of the people who view the landscape and under what conditions they view it. For this reason it is important to determine, among other things, the types of viewers that will see the area, the number of viewers at various locations and the distance from which they will be viewing. These factors and others have been considered in a two-part inventory process used to assess existing aesthetic values. The two-part inventory consists of: (1) an evaluation of Scenic Quality, and (2) a determination of Visual Sensitivity.

Briefly, the Scenic Quality of an area is a function of the landscape features present (landform, vegetation and water), the visual characteristics of these features, the extent to which they have been modified by human intrusion, and the relative uniqueness of these features within the region. This phase of the study, then, is an evaluation of the relative inherent scenic quality of the physical landscape without consideration of the potential viewer. Based on an evaluation of the above factors, a rating of A (most scenic and least altered), B, or C (lacking notable scenic features and/or significantly altered from the natural condition) is assigned to each rating area within the study area.

Visual Sensitivity, the second factor, is included as a measure of the anticipated response of the viewer to a particular scene. Landscapes differ in many respects and, likewise, the past experiences and expectations people bring to bear on the conscious or unconscious response to a particular landscape differ. In one sense, Visual Sensitivity is a measure of the sensitivity of the viewer while in another sense it is a measure of the sensitivity of the land itself to being viewed.

Visual Sensitivity then, is a measure of related conditions about the viewer and the scene he views which contribute to the viewer's response to that scene. The combined conditions of three factors: highway-use volume, recreation volume and values, and community land uses, attitudes and relationships, in any given area, determine an overall rating of High, Moderate, or Low visual sensitivity.

Sensitivity level criteria conditions were mapped within a 3 mile distance from the actual area of occurrance (foreground-middle-ground zone, BLM Manual 6310) (BLM, 1975e) to reflect the realistic extent of concern for protection of the visual resource given the high viewing exposure in this closest distance zone. Under certain conditions if sensitivity conditions were high for any criteria, the first 4.8 km (3 miles) of the background zone, i.e., 4.8 - 9.6 km (3-6 miles) from the area of occurrence, were eligible for a rating of Moderate, depending upon existing conditions of visibility and terrain within this secondary zone of influence.

Once the scenic quality and visual sensitivity inventory is complete, the two maps containing this information are overlayed and the conditions of these two factors for any area indicate its' Management Objective Class designation. Management Objective Classes I and V are special categories. Class I is applied at the outset to designated primitive, natural or cultural areas. Class V lands are those which are highly degraded and rehabilitation is needed to bring them back into character with the surrounding landscape. Each Management Class indicates appropriate objectives for management of the Visual Resource (BLM Manual 6310) with Class I being more restrictive in allowable visible modification and Class IV being least restrictive. These are to be used as tentative minimum management guidelines.

BLM's Contrast Rating Procedure, as applied to a specific management proposal, will later indicate more precisely the extent and nature of change (contrast) allowable to the landform, vegetation and structures on lands within each class designation. This procedure will be described in detail in the Environmental Impacts chapter.

Existing landscape overview

In order to conduct an evaluation of the aesthetic qualities of an area, one must first obtain a general visual impression of the area including a working knowledge of the existing features and their relationships with each other. As a reader reference, Appendix D contains a general visual overview of the study area with photographs accompanied by brief narratives pertaining to the composition and condition of the landscape features in the study area. Figure D.1, also in Appendix D, indicates the location and boundaries of the primary landscape features. The location and field of vision is also shown for each accompanying photograph.

The Cadiz EAR study area is composed primarily of two wide, north-south trending valleys that are divided by the Iron Mountains and the Kilbeck Hills. The viewshed of the study area is bounded east by the Turtle Mountains and to the west by the Calumet Mountains. Both valleys drop approximately 180m (600 ft.) from the bases of the bordering mountains to the lakebed surfaces. The general surface texture is relatively smooth with slopes averaging in the vicinity of 2 percent with a few wide, shallow washes but primarily sheet and rivulet drainage occurs. The mountains of this area are characterized as steep, rugged, sparsely vegetated rock masses of a dark grey-brown coloration that rise abruptly in sharp vertical contrast to the broad horizontal character of the valleys they bound. All ranges in this region are generally north-south trending but of different sizes and compositions. The larger ranges reach up to 600m (2000 ft.) above their foot slopes. Also found in this area are the Kilbeck Hills and an inselberg formation.

Major man-made features include lower State Highway 62 which passes through the southern end of the area in an east-west direction and intersects the northern terminus of State Highway 177 just south of the Iron Mountains. Highway 62 is an eligible State Scenic Route. The Colorado River Aqueduct crosses the southern part of the area with the Iron Mountain Pumping Plant and the associated community located on the eastern slopes of the Iron Mountains. The Atchison, Topeka, and Santa Fe Railroad passes through the area in a southeast-northwest direction and is paralleled by Cadiz Road, a maintained dirt road. There are active and inactive salt works on both Cadiz and Danby Lakes. Patton's camp, numerous dirt roads, wood-pole electric and telephone lines and one steel-lattice transmission line are the remaining evident man-made features.

In general, the entire area is composed of large-scale landscape features that have the ability to absorb the intrusions currently found in the area through a combination of distance, restricted angle of observation from key observer position, low vegetation density, and lack of soil color contrast, especially in the valleys.

Scenic quality. As shown in Figure 2.15, the only areas of Class A scenic quality within the immediate viewshed of the study area are the Coxcomb Mountains and Old Woman Mountains. The Coxcomb Mountains are extremely rugged with a craggy ridgeline from which they received their name. At present, they are nearly pristine in appearance, with complex interior valleys and ridges which add interest to this prominent range. The Old Woman Mountains are not as

Cadiz Valley / Danby Lake

Visual Resources Scenic Quality

area boundary

class A

class B

class C

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Riverside District Office

0 1 2 Miles

Location Map

JOSHUA TREE NATIONAL MONUMENT

Figure 2.15

high a range near the study area as are the Coxcomb's. However, their ruggedness combined with their diverse coloration to produce changing conditions of light and shadow in the changing desert light.

There are many examples of Class B scenic quality in this area. All other mountain ranges received B ratings because of their rugged, attractive and unspoiled nature. The Kilbeck Hills, with their colorful northern peaks and contrasting southern character of dark peaks connected by sand saddles, rated well within the Class B category. Cadiz Valley rated as Class B due to the combination of a lack of intrusions and their relationship to the surrounding vertically oriented features which combine to create an interesting landscape of diverse composition, but which, because of its enclosed nature, is perceived as a single visual unit. Danby Lake, with its unique bright white surface coloration and unusual gypsum deposits, combines with that part of Ward Valley bounded by the lake, the Kilbeck Hills, the Old Woman Mountains, and the Iron Mountains to present a high quality landscape composed of different yet complimentary elements much in the manner of southern Cadiz Valley. The dark, steep vertical elements are contrasted and accentuated by the vast, lighter colored, horizontal elements from which they seem to spring. The Arica Mountains, although small in extent, are steep and rugged forming a dark contrasting boundary to Rice Valley. Because of the Aricas and other surrounding ranges and the scattered dunes not found in adjacent valleys, the portion of Rice Valley within the study area rated a moderate (B) scenic quality.

The remaining lands are of Class C scenic quality. These lands lie generally in Ward Valley and are degraded by visual intrusions, have few if any distinguishing characteristics, or fail to either compliment or contrast with adjacent features of different characters in a scenically pleasing manner.

Because of the extensive intrusions near Milligan, adjacent to areas of high scenic quality, this area was identified as needing rehabilitation to bring it back into character with the surrounding landscape. Intrusions consist of concentrated roads, excavated earth, salt works, debris and machinery.

A more detailed account of the scenic qualities of specific areas within the study area can be found in Appendix D.

Visual sensitivity. The results of the visual sensitivity inventory are shown in Figure 2.16. Lands rated high include the Coxcomb Mountains due to their designation as a National Monument and associated wilderness area. The Old Woman Mountains and portions of the Turtle Mountains have been designated National Recreation Lands by BLM and as such are rated High. A portion of the Turtles have additionally been given a B.O.R. Class V primitive designation. The remainder of the Turtle Mountains and the Granite Mountains contain high natural and recreation values as is often the case in the larger, more diverse mountain ranges in this part of the desert.

Lands having moderate visual sensitivity fall into one of three groups. The first group is composed of those lands containing moderate natural and recreation values such as the Calumet and Iron Mountains, the Kilbeck Hills, the

Cadiz Dunes, and those lands immediately adjacent to these features. The second group is composed of those lands in Cadiz and Ward Valleys that lie within the immediate viewshed of Route 62, which is a primary recreational travel route to and from the Colorado River, an eligible State Scenic Route, and the primary viewer location for this area. The final group of lands is composed of those lands which become moderately sensitive due to their proximity, within 4.8 km (3 miles), to lands of high visual sensitivity.

The remainder of the lands within the immediate viewshed are considered to be of low sensitivity. These lands lie entirely within Cadiz and Ward Valleys and include Cadiz and Danby Lakes.

Visual Resource Management Classes. The Visual Resource Management Classes are shown in Figure 2.17. Class I lands are limited to Joshua Tree National Monument in the Coxcomb Mountains and the B.O.R. designated lands in the Turtle Mountains. Class II lands presently include the Old Woman Mountains, the Granite Montains and those portions of the Coxcomb and Turtle Mountains that are not Class I. Class III lands are composed of the Calumet Mountains, the inselburg area, the Kilbeck Hills, the Cadiz Dunes, the Iron Mountains, and thoselands within 4.8 km (3 miles) of Highway 62 in Cadiz Valley and portions of Ward Valley. Except for the Class V lands around Milligan, the remainder of the land within the immediate viewshed of the study area is Management Class IV. These are in Cadiz and Ward Valleys, including Cadiz and Danby Lakes.

2.4.2 Recreation

The existing recreation environment will be described in terms of the values present, The opportunities currently and potentially available, and the past and present recreational uses and activities found in the vicinity of the Cadiz Area.

Values

National Recreation Lands. The Old Woman Mountains National Recreation Lands encompass 51,533.6 ha (128,834 acres) of land immediately north of the Cadiz open area (Figure 2.18). The lands were designated on May 1972 by the Secretary of Interior under provisions in Title 43 of the Code of Federal regulations Part 2070. Most of the lands were identified as Class III natural environment area according to the Bureau of Outdoor Recreation classification system. The area is to be managed under the best principles of multiple use, with the emphasis on recreation (Recreation Lands of the California Desert).

Cadiz Dunes. The California Natural Area Coordinating Council (NACC) has identified, ..." an area of extensive sand dunes along the northeastern edge of the playa, Cadiz Dry Lake ..." as a natural area (Figure 2.18). Unusual features include pedestals of varying heights, the taller capped with gypsum and lower ones exhibiting clusters of potato-like concretions of celestite caping them. CNACC recognizes the integrity of the area as undisturbed, except for ORV tracks, and saw education, research, and observation as primary uses. (Inventory of California Natural Areas, 1975).

Cadiz Valley / Danby Lake

Visual Sensitivity

- area boundary
- high sensitivity
- moderate sensitivity
- low sensitivity

Prepared by
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Riverside District Office

0 1 2 Miles

Location Map

JOSHUA TREE NATIONAL MONUMENT

Figure 2.16

Uses

The intensity of recreational use (i.e., Annual visitor use days per square mile) in the Cadiz area has been very low. The distance and travel time required to reach the area, plus the availability of areas of equal or greater quality closer to the Los Angeles Area, and the absence of readily accessible visitor services probably have combined to account for the low use of the area.

The recreational use can be characterized as either dispersed, unorganized use or organized, competitive ORV events (Figure 2.19). Quantifiable information is available on the intensity of uses in the area but no qualitative, descriptive information is available on these users. Table 2.6 shows the estimated average annual visitor use days of recreation in the Cadiz Area for both the unorganized, dispersed use, and the organized competitive use.

Quantifiable visitor use data for the analysis area are available from aerial survey flights and organized event permits. Approximately ten flights per year are made over the area. All recreation use was observed on weekends. Organized event data is derived from information supplies by the event promoters. Estimated spectator attendance includes support crews for the entrants as well as family members.

Table 2.6

Average annual visitor use days (VUD)[a] of recreation in the Cadiz Valley/Danby Lake area, unorganized use

LOCAL AREA NAME	Number on Figure 2.19	Estimated annual VUD's
Cadiz Valley	1	100
Patton's Camp	2	100
Danby Dry Lake	3	50
	Subtotal	250

[a] One visitor use day is defined as twelve hours spent on site by a person engaged in recreational activities.

Table 2.7

Average annual visitor use days (VUD)[a] of organized event

DATE	Letter on Figure 2.19	Event	Participants	Number of spectators	Estimated VUD's in Cadiz Area
10-07-72	A	Check-chase	800	2,400	280
03-04-73	B	Chaparral's Enduro	450	100	360
03-03-74	C	Chaparral's Enduro	350	100	600
10-02-74	D	Check-chase	869	3,500	390
02-16-75	E	Desert MC	362	1,200	3,100
1976		None	Total 1972-1975		4,730
			Annual average		950
		Total Estimated Annual VUD's:	1,200		

a One visitor use day is defined as twelve hours spent on site by a person engaged in recreational activities.

Opportunities

Recreational opportunities refer to the ability of recreationists to pursue an activity in a given area. There are no opportunities if public access is limited or restricted as a result of private land holdings, or public lands that are restricted, such as military reservations. Where opportunities exist, they may be either consumptive or nonconsumptive. Consumptive recreation activities are those that consume or substantially alter the recreation resource, such as hunting (consumptive) and off-road vehicles (substantial alteration). The term consumptive is not used as a value term, i.e., "good" or bad," but rather to describe a use pattern that uses up or alters resource. Nonconsumptive activties are those that have low potential for altering or using up recreational resources. Activities such as hiking, camping and photography usually do not consume or significantly alter the recreation resource.

Cadiz Valley / Danby Lake

Visual Resources Management Objective Classes

- area boundary
- class I
- class II
- class III
- class IV
- class V

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Riverside District Office

0 1 2 Miles

Location Map

Figure 2.17

Cadiz Valley / Danby Lake

Wilderness Consideration Areas

area boundary

wildland values

- A. excellent
- B. good
- National Recreation Lands
- CNACC Cadiz Dunes Natural Area

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Riverside District Office

0 1 2 Miles

Location Map

Figure 2.18

The Cadiz Area is, for the most part, solidly blocked public lands. The area is accessible by paved state highways and improved and unimproved roads leading into the area. Major constraints on opportunities include the Iron Mountain Pumping Plant and Colorado River Aqueduct in the south central portion of the Area, and areas contaminated by military ordnance, (see Section 2.1.8).

The southeastern end of Cadiz Valley, the Iron Mountains, and Danby Lake were committed to consumptive opportunities under BLM's California Desert Vehicle Program by designating the area as open to any ORV use. The open designation is defined as follows: "Vehicle travel is permitted anywhere in the area if the vehicle is operated responsibly in accordance with regulations." (California Desert Vehicle Program Map, 1974). The open area has varied and challenging terrain well suited for ORV use.

Motorcyclists find varied terrain with especially challenging opportunities in the Iron Mountain rockland. Jeep enthusiasts can enjoy the sand hills at the south end of the Kilbeck Hills. Dune buggy drivers may use the area north and west of Iron Mountain which provides for long cross country runs, including small dunes.

Opportunities for wilderness experiences are high on the west side of the Cadiz open area. Wilderness opportunities are low on the south and east portions of the area (see Figure 2.18). The west side rated a low A for wildland values. Scenic quality throughout this portion of the open area was rated as B (see Scenic Visual). The impact of man in this area has been minimal and the works of man are noticeably absent. Few unimproved roads penetrate the area and there are excellent opportunities for solitude. Visually, the expansiveness of the Cadiz Valley leaves vivid impressions of pristine lowland desert landscapes, and the insignificance of man in this environment. The south and east portions of the Cadiz open area are affected by both internal and external intrusions wich greatly diminish opportunities for wilderness experiences. These intrusions include the Iron Mountain Pumping Plant, California Aqueduct, Santa Fe Railroad, and Highway 62.

2.4.3 Sociocultural Interests

Educational-scientific resources

Doctors Alan R. Hardy and Fred G. Andrews of the State of California Department of Food and Agriculture plan to include the Cadiz Dunes in their next group of dunes to be studied, as part of a project to investigate the anthropod fauna of sand dunes in the Western United States. (Andrews personal letter, dated March 22, 1977).

Cultural resources

Cultural resources are defined as sites, buildings, structures, objects, or districts that are associated with or representative of people, cultures, or human activities and events. They may be of prehistoric, historic, or contemporary cultural periods.

Prehistory. It has been hypothesized that until the late Pleistocene, the Mojave River filled Cadiz and Danby Lakes as it flowed to the Colorado River. Uplift and lava flows resulting from the formation of Pisgah Volcano eventually diverted the Mojave River into Lake Manly to the northeast. In addition, the climate became progressively drier, resulting in the formation of playa sediments (Hall and Barker 1975:10).

There has been no archaeological research in the study area directed at establishing periods and length of time of human occupancy. Research aimed at establishing man's presence prior to 10,000 years ago is currently in progress in the Mojave Desert to the north and the Colorado Desert to the south (Hall and Barker 1975:41-51; King and Casebier 1976: 21-23).

Artifacts around ancient Pleistocene lakes, such as Soda and Silver Lakes, support man's presence in the southern California desert back to 9,000 B.C. The distribution and artifact assemblages suggest that populations focused on the exploitation of the lake environments (King and Casebier 1976:23-25).

Around 4,000 B.C. man began exploiting both desert and lacustrine resources. The Pinto Basin site, one of the type sites that helps define the artifact assemblage for the desert exploitation, is located to the southwest of the study area in Joshua Tree National Monument (Campbell and Campbell 1963).

After A.D. 1000, brownware ceramics and Desert side-notched and Cottonwood series projectile points were introduced to the southern California desert. Hester (1973:127) believes that "these materials mark the advent of Paiute and Shoshonean peoples, ancestors of tribes found ... at the time of historic contact."

The Chemehuevi, a Shoshonean-speaking people, claimed what is presently the study area within their general territory. Their territory stretched from Las Vegas to the Maria Mountains and from the Walpai Mountains in Arizona to east of Twentynine Palms in California (Laird 1976). In spite of the large area exploited, the total Chemehuevi population was probably under 2000 individuals (King 1975:29; Kroeber 1975:595).

King (1975:22) indicates that the Chemehuevi's western boundary is to the west of the study area. Laird's (1976:7) discussion of the Salt Song, which described the hunting and gathering territories of the Chemehuevi owners of the Salt Song, suggests that the eastern border of the territory defined in the Salt Song may have crossed what is presently the study area.

The seasonal movement of the Chemehuevis was in response to available food resources. A number of families would gather together in winter villages. In the spring the families would disperse to exploit the resources and did not form into larger groups until the following fall (King 1975:28). The distribution and type of sites located in the desert reflect the movements and activities, over time and space, of the groups exploiting the environment.

Cadiz Valley / Danby Lake

Recreation Use

area boundary

— A — Check-Chase Oct. 7, 1972

— B — Chaparral's Enduro Mar. 4, 1973

— C — Chaparral's Enduro Mar. 3, 1973

— D — Check-Chase Oct. 2, 1974

— E — Desert MC Feb. 16, 1975

1 Cadiz Valley

2 Patton's Camp

3 Danby Lake

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Bureau of Land Management
Riverside District Office

0 1 2 Miles

Location Map

Figure 2.19

History. During the late 19th century and early 20th century the salt resources in Danby Lake were mined. The salt mining activities and the associated population focused around what was then called Ward. Around 1907, the salt mining activities ceased temporarily (Belden, April 13, 1958).

In 1910 the Arizona - California Railway Co. completed that portion of the railroad system from Rice to Cadiz. In 1911 the Atchison, Topeka and Santa Fe Railway Co. assumed control of the railroad and established a railroad station at Ward, later renamed Saltmarsh. With the completion of the railroad, salt mining began again on Danby Lake. According to Belden (May 28, 1961) salt mining continued on a very irregular basis up to the 1930's. The railway company eventually dismantled its station at Saltmarsh.

In March 1942, Major General George S. Patton established the location of the Iron Mountain Divisional Camp. It was to be one of several permanent divisional camps within the Desert Training Center area, later called the California - Arizona Maneuver Area (Meller, 1946).

For Patton's troops, final maneuvers took place between August 24, 1942 and October 18, 1942, and at that time the 3rd Armored Division had the area at Iron Mountain. Freda, a railroad siding on the southeast edge of the study area, served as the supply base and was located between the opposing forces (Meller 1946:18, 34). Immediately following the maneuvers, Patton and his troops left for North Africa (Meller 1946:18).

The Iron Mountain Division Camp served as a permanent camp and the surrounding area was utilized as a maneuver area until the end of April 1944. During maneuvers, service ammunition was fired and combat aviation dropped live bombs (Meller 1946:9, 13).

Following the orders to close the area, the Headquarters and Headquarters Battery of the X Corps Artillery was given the responsibility of destroying duds. Meller (1946:90-91) noted that in a majority of cases no records were available detailing areas in which firing had actually been conducted. The training requirements and preparations for movement of troops prevented any extensive use of trrops to search for duds. Records indicate that 208 duds were located and destroyed in the Iron Mountain Area.

During the summer of 1964, the U.S. Army conducted war games and training maneuvers around the Iron Mountains perimeter in conjunction with Operation Desert Strike.

Methodology. Three archaeological surveys were previously conducted through the Open Area. They include the Vidal survey, the Kaiparowits transmission line survey (see Figure 2.20) and a survey conducted by the Cima Resource Area Ranger/archaeologist on July 12-15, 1976. Aside from the Iron Mountain Divisional Camp, no cultural resources were located in these three surveys. A record search showed no recorded sites for the area.

For the purposes of the Spring 1977 field reconnaisance, the area was stratified and 22 0.2 X 1.6 km (1/8 X 1 mile) transects were randomly selected for systematic survey (see Figure 2.20). The number of transects selected amount to 1 percent of the total number of possible transects within a sample area. (For details on the methodology, see Appendix E).

In addition to systematically surveying the transects, specific areas were nonrandomly selected to be surveyed (see Figure 2.20). The archaeologist also participated in flagging the proposed motorcycle courses. All portions of the proposed course and loops were either walked or driven at a very slow speed.

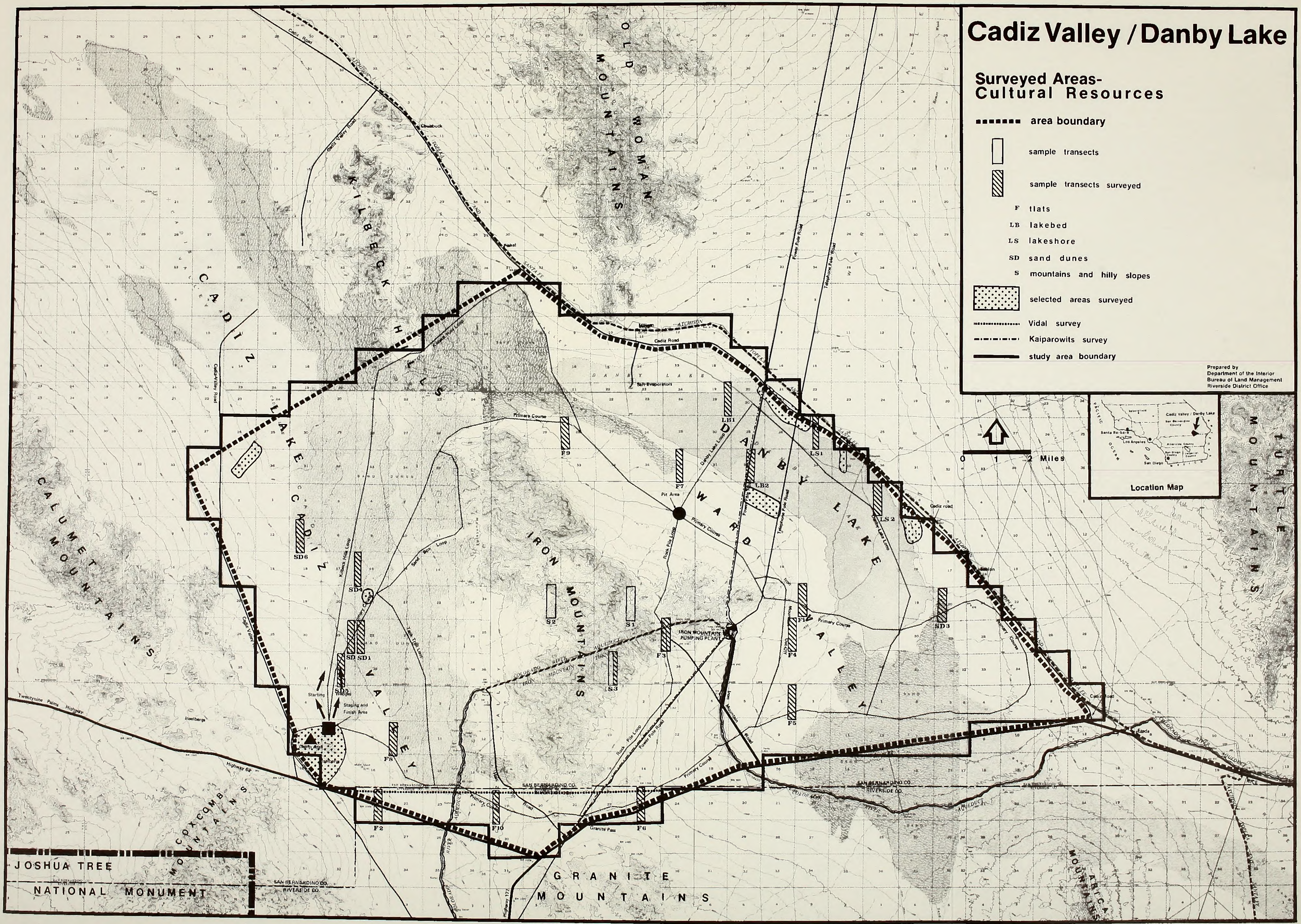
Results of the cultural survey. For sampling purposes, 720 km^2 (278 sq. miles) were determined to be in the study area. Of a possible 22 transects 20.5 sample transects were completed. A total of 6.63 km^2 (2.56 sq. miles were systematically surveyed in the randomly selected sample transects. Besides the sample transects, an estimated 8.73 km^2 (3.37 sq. miles) of selected areas were systematically surveyed. Figuring that a 12-m (40-foot) width of the proposed race course was survyed in the process of flagging and 188.8 km (118 miles) of proposed course was walked or driven. The area covered was 2.31 km^2 (0.89 sq. miles). The total area surveyed comes to 17.6 km^2 (6.82 sq. miles) or 2.4 percent of the total area. This does not include walking or driving to or from sample transects or selected areas of investigation.

Archaeological resources. The following sites were located and recorded. For detailed description of the sites and loci, see Appendix F.

1. Site A. Temporary camp.
2. Site AM1. Lithic scatter.
3. Site LS1-A. Lithic scatter.
4. Site F3-D. Roasting pit or hearth.
5. Site F8-A. Isolated find.
6. Site 4-20-A. Isolated find.
7. Site SD 5-A. Isolated find (possible).

The number, type and density of the archaeological, or prehistoric, sites located during survey indicate that the study area did not support a large sedentary or nomadic population. Ethnographic information (Laird 1976; King and Casebier 1976) supports the conclusion that only small groups, exploiting seasonal resources, entered the area for only short periods of time.

No definitive statement can be made about the age of the sites since none of the recorded artifacts could be assigned to a specific time period. The lack of recorded pottery does not necessarily date the sites prior to A.D. 1000. One pottery sherd was located by a member of the botany team, but it



Cadiz Valley / Danby Lake
Surveyed Areas-
Cultural Resources
area boundary
sample transects
sample transects surveyed
F flats
LB lakebed
LS lakeshore
SD sand dunes
S mountains and hilly slopes
selected areas surveyed
Vidal survey
Kaiparowits survey
study area boundary
Prepared by
Department of the Interior
Bureau of Land Management
Riverside District Office
0 1 2 Miles
Location Map
OLD WOMAN MOUNTAINS
KILBECK HILLS
CADIZ LAKE
CADIZ VALLEY
DANBY LAKE
WARD VALLEY
IRON MOUNTAINS
CALUMET MOUNTAINS
COXCOMB MOUNTAINS
GRANITE MOUNTAINS
TURTLE MOUNTAINS
JOSHUA TREE
NATIONAL MONUMENT
IRON MOUNTAIN PUMPING PLANT
Pit Area
Starting
Staging and Finish Area
Cadiz Road
Twentynine Palms Highway
Highway 62
SAN BERNARDINO CO.
RIVERSIDE CO.
Granite Pass
Primary Course
LB1
LB2
LS1
LS2
SD1
SD3
SD4
SD6
S1
S2
S3
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10

Figure 2.20

could not be relocated. An individual at the Iron Mountain Pumping Station also reported seeing pottery sherds in the general area. In addition, Laird (1976:5, 13) indicates that the Chemehuevi carried water in a bag made from animal gut, and baskets were common storage and cooking vessels.

The lithic remains and milling tools (e.g., manos and portable metates) suggest that the group(s) around Danby Lake were engaged in hunting and gathering activities. The proximity of the sites (LS 1-A and Site A) to the lakeshore suggests that the lake or resources (e.g., Saltbush) associated with the lake were the attraction. The lake may have occasionally filled as a result of heavy rains. However, the water would have probably been extremely saline.

Most of the lithic material used to manufacture the located artifacts are not found in immediate proximity to the study area. The Turtle Mountains to the east and north are probably the closest sources of material suitable for tool making.

Historical resources. The following historical sites were located and recorded. For a detailed description of the sites see Appendix F.

1. Site Saltmarsh/Ward. Settlement.
2. Site 4-25-A. Saltmine.
3. Site 4-12-B. Camp.
4. Site F3-B. Car and dump.
5. Site 3-24-A. Car.
6. Site 4-14-A. Car.
7. Site Iron Mountain Divisional Camp.
8. Site F3-C. Trashdump.
9. Site 4-4-A. Military Foxhole
10. Site 4-12-A. Military Foxholes.
11. Site 4-22-A. Military Foxholes
12. Site 5-9-A. Military Foxholes.
13. Site B. Land Mine.
14. Site C. Land Mines.

Most of the historic sites located reflect past mining, railroad and military activity in the Cadiz/Danby Lake area. Saltmarsh/Ward was the focus of human activity related to the salt mining and the railroad. Small camps and isolated finds, associated with the construction and maintenance of the railroad, are possibly located along the existing tracks.

During World War II, a large population of military personnel lived temporarily at the Iron Mountain Divisional Camp. The location of the fox holes and gun emplacements around the base of the inselbergs in Cadiz Valley do suggest that the base of the Iron Mountains and Kilbeck Hills may also have similar features, although none were noted in a brief aerial reconnaissance. In the rest of the study area, one can expect to find small camps (evidenced by ration cans), ordnance, and tank tracks that are reminders of the training maneuvers during World War II and Operation Desert Strike.

Potentially significant areas. Archaeologically, the lakeshore stratum is the most significant in the study area. However, due to extensive sheet wash and gullying, it is unlikely that sites would be found along all of the shoreline. Also, much of the lakeshore, particularly the southern end, has been altered by activities related to the operation of the Iron Mountain Pumping Station and the railroad. The northern lakeshore of Danby Lake differs from other portions of the lakeshore in that sheet washing is not as extensive as elsewhere. A portion of the southeastern edge of Cadiz Lake was surveyed and nothing was located. Sheet wash is evident here.

The base of the Iron Mountains should be considered potentially significant until survey proves otherwise. The potential significance is suggested by the presence of Site AM I, the presence of small natural tanks, and statements by an individual that he has found artifacts near the base of the Iron Mountains (specific locations could not be obtained). It is extremely unlikely that archaeological remains would be located on the slopes of the mountain, due to the terrain. In the rest of the study area, only an occasional isolated find is predicted or expected.

Historically, aside from known site locations within the study area, the general areas considered to be potentially significant in terms of historical resources are along the railroad tracks and the base of the Iron Mountains and Kilbeck Hills. Historic isolated finds can be expected throughout the study area.

Potential National Register Properties. The Iron Mountain Divisional Camp and Saltmarsh (see site descriptions) appear to meet the criteria established to evaluate potential National Register Properties. Both historic sites possess integrity of location, design, setting, materials, workmanship, feeling, and association.

Iron Mountain Divisional Camp also meets the following criteria: (1) it is associated with events that have made a significant contribution to the broad patterns of our history, and (2) it may be likely to yield information important in history. The Divisional Camp is representative of a significant period in the history of this country and the world. It is unique in that the camp possesses the topographic relief map, the two altars, the Presidential and Military Medical Seals. The rock-lined roads and pathways and the various

rock designs and company symbols add to the setting and feeling of the site. The Camp potentially has great interpretive value for the general public.

Saltmarsh was the focus of human activity in the area during the late 1800's. A detailed archaeological and historical investigation most likely would provide information relevant to the understanding of the railroad and mining phases in Ward Valley and the general mojave Desert.

Procedures have been initiated to nominate Iron Mountain Divisional Camp and Saltmarsh to the National Register of Historic Places.

Because of the lack of integrity of location, design, setting, materials, workmanship, feeling and association, and the likelihood of minimal information being retrievable, the following archaeological and historic sites are not considered to meet the National Register Criteria of evaluation:

1. Site A. Temporary camp.
2. Site AM 1. Lithic scatter.
3. Site F3-D. Roasting pit or hearth.
4. Site F8-A. Isolated find.
5. Site 4-20-A. Isolated find.
6. Site SD5-A. Isolated find.
7. Site 4-25-A. Salt mine.
8. Site 4-12-B. Camp.
9. Site F3-B. Car and dump.
10. Site 3-24-A. Car.
11. Site 4-14-A. Car.
12. Site F3-C. Trashdump.
13. Site 4-4-A. Military foxholes.
14. Site 4-12-A. Military foxholes.
15. Site 5-9-A. Military foxholes.
16. Site 4-22-A. Military foxholes.
17. Site B. Land mine.
18. Site C. Land mine.

Paleontological resources

A survey directed at specifically inventorying paleontological remains was not conducted in the Cadiz Valley/Danby Lake area. In the process of inventorying the cultural resources, no paleontological remains were located.

It was stated in the Cadiz Valley/Danby Lake Environmental Analysis Report (1976) that research into San Bernardino County Museum's paleontological records indicated a possibility for the existence of fossiliferous sediments within the area's boundaries. White marl over green lacustrine clay deposits, containing terrestrial fossils, have been recorded west of Chubbeck siding 12.8 km (8 miles) north of the study areas northern boundary line. However, none were found.

Fossil remains such as Chara, foriminifer and barnacles have been reported in cores taken from Cadiz and Danby Lakes. Fossils, which occur in limestone nodules and adjacent claybeds, are reported below a depth of 80.1 m (267 feet) in Cadiz Lake. Two cores were taken in Danby Lake and fossils were reported at depths of 134.7, 219.7, 221.5, 235.8 and 253.5 m (449, 732.4, 738.4, 785.9 and 845.0 feet) (Bassett et. al. 1959: 106, 108 and 109).

George Smith of the U. S. Geological Survey considers it unlikely that fossil-bearing sediments are located in the Iron Mountains. However, he did note during a brief reconnaissance of the area, that Pleistocene Lake sediments may be exposed on the southwestern side of Danby Lake. These sediments may yield lacustrine fossils and be correlative with the fossiliferous sediments in Cadiz and Danby Lakes (Verbal Communication, 1977).

2.4.4 Wilderness resource

The Federal Land Policy and Management Act of 1976 (PL-94-579) requires BLM to initiate a wilderness review of their lands to be completed by 1991. Further, the Act requires an accelerated review of BLM primitive areas established prior to July 1, 1975. In addition, the Act established the California Desert Conservation Area (CDCA) and requires that a comprehensive plan for the multiple use of the Desert be prepared by September 30, 1980. Under these provisions, two types of wilderness study areas will be recognized: (1) accelerated wilderness review areas, and (2) wilderness study areas. Accelerated review areas include primitive and natural area designations made prior to July 1, 1975. None of these are found within the Cadiz area.

Wilderness study areas will be identified within the CDCA through the inventory and planning process required to prepare a plan by September 30, 1980. Section 603(c) of PL 94-579, states that these areas shall be managed"...so as not to impair the suitability of such areas for preservation as wilderness..." until Congress has determined otherwise.

Six areas which meet the minimum criteria for wilderness consideration, as described in the Wilderness Act of 1969, have been identified in the Cadiz area (see Figure 2.18). These areas have been rated for their wildland values by weighing the minimum wilderness criteria to arrive at a ranked rating of excellent (A), good (B), and fair (C). See Appendix G for further details.

Cadiz Valley. The Cadiz Valley wildland polygon takes in portions of the Iron Mountains and Kilbeck Hills, the eastern slopes of the Calumet Mountains and Cadiz Valley north of the Twentynine Palms Highway. The area was rated as a low A.

Some minor intrusions exists within the area, including a salt mining operation on Cadiz Lake and graded access road leading to it. Minor outside intrusions include the Santa Fe Railroad, Highway 62, and the California Acqueduct and Iron Mountain Pumping Plant. One graded road leads into the area 11.2 km (7 miles). Otherwise, the area is roadless except for jeep tracks that lead into the Lebeck Hills and the sand dunes northeast of Cadiz Lake. The Cadiz ORV open area encompasses the southeastern third of the area, but has received little ORV use in the past.

Sheephole Mountains. Located immediately west of Cadiz Valley, this polygon takes in the west slopes of the Calumet Mountains, the Sheephole Mountains, and the intervening valley between these two ranges. A high A rating was given to this area.

Only one unimproved road leads into the area for a short distance. Opportunities for solitude are high due to the enclosed nature of the valley and the freedom from outside intrusions.

Ship Mountain. The Ship Mountain polygon encompasses the Old Woman Mountains. The area received a moderate A rating.

Old Woman Mountains. The Old Woman Mountains are, for the most part, undisturbed. The many enclosed valleys found within the range offer varied opportunities for solitude and freedom from intrusions.

Palen-McCoy. This extensive area, bounded by I-10 on the south, Highway 177 on the west, and Highway 62 on the north, includes the Granite, Palen Little Aria and McCoy Mountains, and the Palen and Chuckwalla Valleys. The area received a low A rating.

Granite Mountains. The Granite Mountains in the northwest portion of the polygon are directly south and east of Cadiz Valley. Few unimproved roads lead into the Granite Mountains. Interior valleys provide freedom from outside intrusions in the north. Opportunities for solitude are good in this area.

2.5 OTHER USES

2.5.1 Mining

Two salt mining operations are located on Danby Dry Lake. The Southwest Salt Company operates salt evaporators on the surface of Danby Dry Lake in an area approximately 3.2 km (2 miles) southwest of Milligan siding. Standard Salt operates in an area extending from Milligan southeast for approximately 4.8 km (3 miles).

Five calcium chloride salt mining operations are located on Cadiz Lake. Four are on leased Santa Fe Railroad lands, and one is on Public Land mining claims.

Although there are no other operations at present, mining claims have been located on all of the Public Lands at Cadiz Lake.

Each company uses large pits dug into the surface of the playa to evaporate water from a brine solution, leaving a salt residue. Processed in nearby plants, the salt is then transported from the area by railroad, and by truck.

Prospecting for gypsum crystals has occurred on Danby Lake, but currently there is no active mining.

2.5.2 Colorado River Aqueduct

The MWD has been granted title to Federal lands in the Iron Mountain area for the Colorado River Aqueduct which supplies water to the Los Angeles area. Within the subject area, MWD lands are used for pipelines, open aqueducts, and a pumping station.

The MWD lands are so situated that without their authorization no organized event could be routed around the southern end of the Iron Mountains and still stay within the open area. At this time, no satisfactory arrangement exists for routinely authorizing events to cross MWD lands within the open area.

The MWD currently requires a permit for an organized vehicle event to cross its lands. That permit is issued only after receipt of both a processing charge of not less than $200, and an insurance policy covering MWD.

2.5.3 Rights-of-way

Two parallel power line corridors run through the area passing through Iron Mountain and across Danby Dry Lake. A planned power line from a proposed nuclear generating plant near Vidal Junction would also pass through the southern portion of this area. MWD expects to see at least proposals, if not applications, for other rights-of-way through this area in the near future.

2.5.4 Grazing

Currently, there is no authorized grazing within the Cadiz Valley/Danby Lake Open Area (#37).

2.5.5 Roads and trails

State Highway 62 forms the southern boundary of the open area. Cadiz Road, maintained by San Bernardino County, lies just within the eastern boundary of the open area and closely parallels it. The County recognizes the roads in the subdivision located within section 36, T. 1 N., R. 15 E., but these roads don't appear to have been worked on since their construction because there has been no construction within the subdivision. A railroad right-of-way road occurs on the west side of the tracks which form the east boundary of the open area. The MWD maintains an access road to its pumping plant, roads along the aqueduct, and along its pole-line rights-of-way. A road from Highway 62 to Cadiz Lake

is maintained by the saltworks operator for use of semitrailer traffic to and from the Cadiz Lake saltworks. The operators of the saltworks on Danby Lake maintain a network of roads radiating out onto the lake from the Milligan area. Numerous unmapped trails permeate the open area. Some of these are remnants from the aqueduct construction; the majority appear to result from past military maneuvers, and one apparently was left by prospectors.

3. ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

3.1 NONLIVING

3.1.1 Topography

In general, the use of Cadiz Valley/Danby Lake area for competitive and noncompetitive ORV activities will have very little effect on the topography of the area.

There will be displacement or movement of soil and rock fragments. Some locations will experience an increase in erosion due to gullying of soil caused by concentration of runoff in ORV tracks. The areas most subject to this type of impact are slopes. Loss of vegetation in sandy areas will permit wind erosion and create the potential of dune formation.

3.1.2 Climate

Impact of the proposed action on the climate of the area is not expected to be significant. Microclimates will be altered to some degree in areas where use is concentrated due to loss of shading produced by vegetation that has been concentrated due to loss of shading produced by vegetation that has been destroyed, by changes in solar reluctance of the overall area, and by loss of temperature stabilizing pore space in compacted soils.

3.1.3 Geology and Minerals

Competitive and noncompetitive ORV activity will not significantly change the geological aspects of the area, or impact known mineral reserves or resources.

3.1.4 Water

The proposed action will have no direct impact on water sources in the area since none exist, except for occasional periods of standing water on both dry lakes.

An indirect impact will be that of adding turbidity to existing occasional overland flows where ORV tracks have concentrated runoff on the fine-textured soils. These occasional overland flows most likely would occur during summer or late winter. The impact of concentrated overland flow and increased velocity will be most apparent on ORV staging and camping areas where soil is compacted and vegetation is decimated or sometimes eliminated over several acres. At individual locations, similar compaction, concentration, and velocity increase will be caused where vehicles drop abruptly into dry washes from fine-textured soil terraces or benches.

Degradation of ground water supplies, as a result of ORV activity, is estimated to be negligible.

3.1.5 Soils

Carrizo-Granite

The Carrizo-Granite rock materials are stabilized by a very coarse lag gravel (to boulder size) on steep slopes adjacent to bedrock sources. This lag is easily broken by vehicle usage exposing a mix of boulders, cobbles, pebbles, and finer-grained materials. Once broken, the fines are exposed to water erosion which will carry them into the main drainages where they will be exposed to wind erosion. The more extensive gentler slopes underlain by Carrizo soils have extremely variable stabilizers that include mature pebble to cobble pavements, immature granule to small pebble pavements, chemical and/or adobe crusts, and small shrub communities of moderate to low density with or without intervening growths of annuals. The less protected surfaces show vivid signs of erosion in the form of deflation plains and root exposure of plants. All of these surface stabilizers are extremely vunerable to vehicle use. Use by ORV will accelerate erosion through exposure of wind-erodible materials upon removal of cover.

Regeneration of annual plant cover will likely be rapid, but a very large proportion of Carrizo soils do not appear to be stabilized by this type of cover. Moreover, accelerated erosion of adjacent areas may curtail annual growth by burial and sand-blasting. Degradation of perennials will have a long lasting effect. Their destruction will bring about rapid loss of organic and nutrient components of the soils. The chemical or adobe crusts are very thin (about 2 mm) and fragile. They regenerate with the first rain, but are likely to prove vunerable to sand-blasting which will expand the area of degradation of the more delicate stablizers.

Compaction and rutting of these soils by vehicles will increase runoff and induce erosion. Exposure of the fines beneath the protective cover will result in their removal at a greatly accelerated rate and deposition in the larger drainages where they will be susceptible to wind erosion. The larger use areas that are bared of plant and other protective covers will yield airborne fines directly.

Aco-Acolite-Rositas

The Aco-Acolita-Rositas association includes alluvium on low slopes around the playas and dune and sheet sand. On low slopes around the playas, the runoff channels from the Carrizo alluvial fans are broad and extensively braided. The finer materials consisting of silt and clay-size particles are concentrated here. The surfaces in the channels are poorly stabilized and evidence of wind erosion is prominent in root exposure and scour features. The dunes and sand sheets have moderately well developed plant cover. Active dunes make up only a small percentage of the areas mapped as dunes.

Vehicle use of these surfaces will cause large direct yields of airborne particulates. This direct mechanical erosion results from a nearly horizontal shear imparted to the soil as a consequence of vehicle motion. There appears to be a large proportion of material that may travel long distances once dislodged from the alluvial channel deposits.

Breakdown of the plant cover on the sand deposits will free large volumes of this material for lcoal movement by wind. This will result in scour and dislodgement of the fines capable of long-distance transport that occur in the adjacent drainage channels and on the playas. The potential for long-term regional air quality deterioration appears very great.

Loss of stability of the sand deposits also poses local problems such as highway hazards along 30 km of highways as well as greater lengths of local roadways. Levees of exposed parts of the Colorado River Aqueduct will bring about deposition of sand in the aqueduct as is plain from lee-side deposition along levees in the salt works of Danby Lake.

Thermal-playas

Danby Lake has extensive surface areas with the delicate puffy crusts that reflect "self-rise" effects of salt crystallization. In marginal areas, this grades into mudcracked fine silts that are very sensitive to vehicle impacts. Both surfaces yield very large amounts of wind-erodible fines with only light vehicle impact, both by direct mechanical erosion by the vehicles and by exposing loose dry fines beneath a thin crust. While these surfaces crust over again with the first rain, rutting by vehicle use is likely to accelerate erosion even after crusting (Wilshire, 1977).

On Danby Lake Bed, unusual features of pedestals one to two feet high, capped with gypsum, are found. These pedestals also occur in the Cadiz Dunes Area. Vandalism will occur through use of these areas by ORV's.

3.1.6 Air

Increase of wind erosion and subsequent fine particle emissions into the atmosphere will have a negative impact upon the air quality of the Cadiz Valley/ Danby Lake area. Some very susceptible areas containing many fine particles which are crossed by proposed race courses include Danby dry lake bed, desert pavement areas on the terraces at the base of the Iron Mountains and between Danby Lake, the railroad tracks at the east edge of the open area, and the lake margins which have high concentrations of silt with a surface crust. Large areas of sandier soil contain sufficient fine particles to have a vesicular (porus) structure which, when fractured, can cause an increase in dust production, although probably less than the previously mentioned soils. In addition, the Cadiz area contains some fairly large areas of loose sand with few or no fine particles. These soils will provide a minimal amount of dust in comparison to the soils previously discussed, although destruction of vegetation could cause an increase in movement of sand.

Nakata et al (1976) reported that six dust plumes were photographed in the Mojave Desert of California on January 1, 1973 by Landsat/ERTS-1 satellite. The plumes ranged from 15 to 75 km in length and covered an area of 1,735km^2. The origin of the wind erosion was reported to be due to destabilization of the natural surface through road building, ORV recreation, agriculture, urbanization, and stream channel modification. As an example of the amount of soil fines which may be blown into the air, Gillette (1977) reported that some vertical fluxes of particles smaller in size than 0.02 mm (those most susceptible to long-distance transport) were greater than $10^{-6}g/cm^2$/sec from sand and loamy sand in West Texas. The rates would correspond to an erosion rate in excess of 5 tons/acre/day if such erosion were maintained for 24 hours.

Gillette et al (1974) also reported that particles (especially less than 0.02 mm) may act as pollutants far from their source (as much as hundreds or thousands of miles).

Measurements were made on the 1974 Barstow-Las Vegas Motorcycle Race (BLM, 1975). Suspended particulates were measured at four locations near the race course. California standards are 100 Mg/m^3, while Nevada and Federal standards are 150 Mg/m^3, (BLM, 1975). Two California locations had suspended particulate values of 176 Mg/m^3 and 158 Mg/m^3 the day of the race and values at the same two stations were, respectively, 180 and 94 Mg/m^3 the day after the race. The two locations in Nevada had average values of around 30 Mg/m^3 the two days before the race. The day of the race values at the two stations in Nevada were 97 and 161 Mg/m^3 and the day after the race values at the same two stations were, respectively, 57 and 16 Mg/m^3. Thus the California standards were exceeded at both California locations on the day of the race, and at one location on the day following the race. Nevada standards were exceeded at one of the two locations on the day of the race. The data does not permit separation of contributions from the race and from normal background levels. The overall increase in dustfall at nine sampling stations along the route was reported to be about 30 percent for the month following the race. Within three or four hours after the race, the dustfall contributed by the 3000 motorcycles and probably 2000 other vehicles was reported to be 6 to 90 times higher than the norm for the area. The peak concentration of dust was reported to be much higher during the first 15 minutes of the race when the maximum concentrations were reached. However, measurements were not obtained to characterize dust fall a short time after the start of the race.

While the number of vehicles involved in the Barstow-Vegas race was larger than will be in races at Cadiz, the race was run under very favorable meteorological conditions. During the race, the wind did not exceed 3 miles per hour. A similar race run with stronger wind would have caused a much greater dust problem.

Effects on air quality were also monitored for the "Mint 400" race in Clark County, Nevada. Measurements were made before, during, and after the race in the immediate vicinity of the track and about 8 km (5 miles) away. The values are shown in Table 3.0.

Table 3.0

Effects on air quality from "Mint 400" races

Date	Suspended particulate densities (Mg/m^3)	
	Vicinity of track	5 miles from track
3/18-19/71	59	75
3/19-20/71	-	-
3/20-21/71	-	-
3/21-22/71(race held on 22nd)	-	-
3/22-23/71	2158	170
3/23-24/71	859	47
3/24-25/71	117	-
3/25-25/71	206	-

Winds at the site 8 km (5 miles) from the track were 11.2 km (7 miles) per hour the day of the race, and from 3.2 to 6.4 km (2 to 4 miles) per hour at North Las Vegas Airport. As in the case of the Barstow/Las Vegas Race, stronger winds could have greatly increased the dust problem. Also, soil loosened by such a race will be susceptible to wind erosion during windstorms after the race. The susceptibility may extend over a period of months, especially until a significant rainfall. The report on the "Mint 400" race concluded that the "levels measured near the race course are alarmingly high and constitute unacceptable levels of air quality" (Clark County District Health Department Air Pollution Control Division, 1971).

A study of highway dust hazards (Arizona State University, 1976) reported that land use and surface studies reveal a strong locational association between sparsely vegetated, abandoned farmland and dust-related accidents on I-10. Some 68 percent of the accidents occurred in three small clustered areas on highway sites adjacent to abandoned farmland. The effectiveness of abandoned farmland as a dust source is enhanced by activities which disrupt the soil crust and make sediments available to the wind, ORVs and livestock were reported to be major factors in this regard. While the Cadiz area is not abandoned farmland, disturbance of stabilized soils may also produce sufficient dust to increase the odds for accidents on nearby highways.

Leathers (1977) reported plant components of desert dust in Arizona. Among these are biological agents which may cause human diseases ranging from allergies to zygomycosis. Analysis of dust has been done at numerous sites in Arizona since 1965. The analysis of dust from Arizona deserts may give some indication of dust components which could be in the California deserts. Pollen from more than 55 species of higher plants were recognized, many of which are known to be important causes of human allergy. Spores of 74 different genera were found, representing more than a hundred species. Several of the fungal spores are known to cause allergies and 15 different species of fungi were found which produce various diseases in man and animals. These include ringworm, athlete's foot, and various respiratory infections including aspergillosis and valley fever (coccidioidomycosis). Valley fever caused more than 20 deaths in Arizona in 1975 and several hundred other people were hospitalized for various periods. Of 329 dust samples collected at or near the soil surface in Arizona desert areas from 1973-1976, 28 were found to have valley fever spores. The disease causing organism has also been found in California deserts. Dust-raising activities were found to be an important method of causing disease to nearby residents. If valley fever exists in the Cadiz-Danby area, not only racers and spectators, but possibly inhabitants and travelers in adjacent areas, will be exposed to infection.

In summary, there are several areas which are very susceptible to wind erosion after ORV disturbance. ORV disturbance has been reported to cause dust plumes (Nakata et al, 1976). Air quality measurements were made before, during and after the Barstow-Las Vegas Motorcycle Race and the Mint 400 race, and both showed suspended particulates in excess of California, Nevada, and Federal standards during the race. This windblown dust from disturbed soils may continue to be a problem for considerable time. Finally, windblown dust presents hazards to humans. An Arizona study showed a correlation between disturbed land and dust-related automobile accidents. Increased dust levels in the Cadiz Valley/ Danby Lake area could cause an increase in dust-related auto accidents on Highway 62. Increased dust levels could also cause another health hazard if disease causing fungal spores (notably those which cause valley fever) are present in the soils of the area.

3.1.7 Noise

Noise is a very prominent feature of a competitive ORV event. Noise levels were measured for the AC-DELCO Parker 400 Race (2/75). The overall average vehicle noise level was 91.3 dBA. The overall average for motorcycles was 89.9 dBA and for pickup trucks 90.4 dBA. These noise levels were recorded 15 m (50 feet) from the track. For comparison noise, readings taken near a freeway can reach 85 dBA during periods of heavy usage (Shonerd, 1975). However, the readings for the motorcycles are for individual machines. The noise levels are higher when more than one vehicle is involved. If a vehicle emits 93.2 dBA at 15 m (50 feet), four such vehicles at 15 m (50 feet) will produce 99.2 dBA and these four vehicles were recorded at 87.2 dBA at a range of 60 m (200 feet)(Shonerd, 1975). This is still noisier than a busy freeway at close range. It must be noted that an estimated 550 motorcycles are expected to start at an average event on the proposed race courses. The noise generated by a wave of 275 motorcycles (half the field starts at a time) would be substantially higher than that listed above and high noise levels will affect larger areas.

The noise expected from competitive racing, should the proposed action be approved, could have impacts upon human as well as wildlife health. Noise intensity will probably not be great enough to cause any hearing damage to spectators, but vehicle operators may sustain hearing loss as a result of ORV noise. Mean at-ear noise levels for motorcycles range from 92-96 dBA. Sustained exposure to this intensity of noise (as in a race) may cause permanent hearing damage to the rider (Harrison, 1974). Nonauditory human health hazards, such as distress, would probably be negligible since those who dislike racing and its attendant noise will simply not be there.

However, this in itself is an impact. The noise of a competitive event will negatively impact the wilderness value of the Cadiz Valley/Danby Lake area. This noise pollution will effect humans within the immediate area of the race. However, in wilderness conditions the mere detection of ORV noise is sufficient to degrade the environment significantly for many users (Harrison, 1974).

In addition to hearing damage and degradation of the wilderness experience, the noise caused by competitive racing would have negative impacts upon wildlife.

The effects of noise and disturbance on animals are difficult to measure and to quantify. Disturbance will cause many species to leave the race course and associated use areas. When an animal leaves its home range and territory, it has two choices. It can move into unsuitable habitat or it can enter the territory of another member of the same species. Both choices cause stress to the animal because of competition for food, space, and cover. Stress may be significant for some species because race and race-related activities will last several hours (BLM 1974). Noise disturbance may cause nest desertion if racing is allowed in desert dry washes during the spring months. Even if nests are not deserted per se, a competitive event would produce enough noise and other disturbances to keep birds off their nests. If there are eggs in the nest at the time, they may succumb to temperature stress. If there are young in the nest at the time, reduction in feeding due to birds staying away from the nest and having to fly farther to gather food, may reduce survival rates of the young.

Studies using laboratory animals have shown loss of hearing after exposure to sound pressure levels of 90 dBA or less. The response depends on the type of animals and the type of noise. Most sutdies were done with high intensity narrow or broad band noise (EPA, 1972). Hearing loss of animals in the wild is not known. However, the noise itself may mask animals' distress signals, mating calls, detection of predators, and moteers may not hear the sounds of young.

Nonauditory effects of noise have been demonstrated in the laboratory on guinea pigs, mice, rats, and rabbits. There is evidence that noise below the level which would cause hearing damage influences stress responses producing neural and hormonal changes affecting the urinary, adrenal, and reproductive functions (EPA, 1972). Changes in any of these functions would affect the survival rate. Changes in reproductive function would be especially serious. If disturbance occurs during the breeding season breeding success of small mammals may be affected.

Bandello (1976) demonstrated hearing loss in Dipsosaurus dorsalis exposed to high intensity motorcycle sounds (114 dBA). These lizards suffered immediate hearing loss in their range of optimum acoustical sensitivity. Losses were similar for lizards exposed for 1 or 10 hours, indicating that the critical dose is less than 1 hour. Animals exposed for 1 hour had recovered more of their hearing after 7 days than those exposed for 10 hours, but neither had completely recovered. It was also shown that burrows do not reduce sound intensities very much. These data would indicate that recovery time is greater than one week and it would seem that survival potential would be significantly reduced during this time. Similar effects may also occur in other desert vertebrates.

3.1.8 Ordnance contamination

The people who use the Cadiz Valley/Danby Lake open area will be exposed to possible injury or death by unexploded military ordnance.

3.1.9 Other hazards

There are no environmental impacts associated with the other hazards as listed in Chapter II.

3.2 LIVING COMPONENTS

3.2.1 Sensitive and unique species

General

The effects of motorcycle races and of ORV use on desert vegetation have been examined in several recent studies (Davidson, 1973; Gibson, 1973; Keefe and Berry, 1973; and Davidson and Fox, 1974). These studies not only discuss general effects, but quantify impact and damage (i.e., number and kinds of shrubs and annuals damaged or destroyed in pits, camping and start areas, and along race-courses).

In general, these field studies show that ORV use:

1. Reduces shrub density.

2. Reduces the canopy cover of individual shrubs.

3. Reduces the diversity of shrub species by selectively impacting the smaller, more fragile species.

4. Reduces the diversity of both annual and perennial herbaceous species.

5. Reduces the numbers of annual wildflowers that will germinate and flower in following years.

6. Increases the density of weedy species.

Additional direct and indirect impacts on vegetation from ORV activity include:

1. Impairment of plant growth from increased dust.

2. Impairment of plant growth due to soil compaction.

3. Possible defoliation, flower and leaf injury, and abnormal growth as a result of exhaust pollutants from large concentrations of ORVs.

4. Degradation of soil biota.

5. Depletion of scarce organic matter, essential to the nutrient cycling of the ecosystem, through use of wood in campfires as a result of increased camping in washes and other areas.

The extent of reduction in numbers and diversity of shrubs and annuals is directly related to the number of motorcycles in the race and on whether the impacted site is part of the course, or is in a pit area (camping and gas stop site). Davidson (1973) found that the pit areas received the most intense use and showed the greatest degree of disturbance. The intensity of the disturbance depended upon the number and density of vehicles parked, the duration of the stay, and the number of times participants return during the year, and from year to year. Thus, in the pit and start areas as well as along the race course:

1. The impacts will increase as numbers of motorcycles and other vehicles increase.

2. The damage will be intensified with repeated use.

3. Repeated use will lengthen the period of recovery.

Impacts on vegetation noted above will be permanent or temporary. Long-lived and permanent impacts are impacts with expected recovery time of more than 50 years or not at all. These include decrease in vegetative biomass, soil compaction and resulting impairment of plant growth, depletion of scarce organic matter and distruption of vegetative types with slow recovery potential such as the creosote bush scrub community.

Temporary impacts are impacts from which essentially complete recovery is expected in less than 25 years. These include impairment of plant growth from increased dust, weed invasion (which could also be long-lived or even permanent) and disruption of vegetative types with relatively rapid recovery potential such as desert dry washes.

Recovery of vegetation. Recovery to predisturbance conditions, when or if ORV activity in the proposed open area is stopped, depends upon the degree of soil compaction, the time of the year the damage occurs and the severity of damage to the vegetation. Vollmer et al (1976) found that in randomly driven areas most shrubs were not severely damaged and were able to resprout. However, most shrubs in the regular track were so damaged that sprouting was prevented. He also found that regrowth was retarded following spring growth when root carbohydrate reserves were low. Thus, shrubs damaged in the spring responded less vigorously than those damaged in the fall or winter prior to breaking dormancy.

The most serious, widespread, and long-lasting effect of ORVs on vegetation is the secondary effect of damage to the soil through soil compaction. Compaction of the soil: (a) increases soil density to depths of up to 1 m (3 feet) (Berry, 1973); (b) decreases air spaces between soil particles which in turn reduces the ability of soil to hold water and reduces the ability of water to move through the soil; and (c) increases the amplitude and rate of fluctuation of soil temperature.

The destruction of seedbeds in areas disturbed by ORV activity noted by Davidson (1973) and Luckenbach (1975) is a result of soil compaction. Seeds that lie in the compacted zone do not receive normal thermal incubation due to changes in soil temperature. Because percolation of water into the soil is prevented, germination inhibitors are not leached away and the seeds are not nourished by the flow of water into the soil.

Davidson (1973) noted that in a disturbed race area herbaceous vegetation did not return to normal densities even after a season's rest. Wilshire and Nakata (1976) examined the 1974 Barstow-Vegas racecourse during the following spring and noted the elimination of annuals in the tracked areas. The immediate result of disturbance to the soil through compaction and resulting seedbed destruction is the relatively long-term loss of herbaceous vegetation.

Compaction also inhibits seed germination of shrub species, thereby greatly reducing or eliminating regeneration of perennial plant cover in disturbed areas. Many desert shrubs, dependent upon scant and erratic rainfall, grow slowly. In compacted areas, their growth is further slowed or even prevented because water and root penetration is greatly impeded (Stebbins, 1974). Thus, the chances of recovery of the perennials in a compacted area are poor.

In summary, soil compaction has long-lasting effects on vegetation. When soils are compacted, there is much less chance of vegetation becoming reestablished. The greater the degree of compaction, the longer the period required for habitat recovery. In heavy use areas (pits, camps, start areas and race courses) soil compaction and the resulting impairment of plant growth will be severe. In such areas, these impacts are long-lived to permanent with recovery time expected to require many decades, if it occurs at all.

Sensitive species were grouped according to their presences on a Federal, state or other list. Each species was rated as to types of expected impacts, and relative degree of impact (high, moderate, low, or unknown). Impact categories for sensitive and unique species are defined as follows (BLM, 1977): (a) a high impact is a severe threat to the viability of a species or population, with high probability that said species would be nearly or completely extirpated from the impacted area; (b) a moderate impact is a substantial and essentially permanent reduction in the abundance of a species, but not posing a serious threat to the survival of the population or species; and (c) a low impact is a minor alteration of the sturcture of a species population, but without substantial impairment of viability.

Sensitive plant species. As mentioned in Chapter 2, three species on the CNPS Inventory of Rare and Endangered Vascular Plants of California were found in the open area. Two of these species have been categorized as highly sensitive Astragalus lentiginosus var. borreganus and Pholisma arenarium, and the other species Antirrhinum filipes is limited distribution. These species are subject to the general impacts discussed earlier in Chapter 3, Section 3.21. Direct impacts are primarily physical destruction as a result of being crushed or uprooted, which will eventually reduce species density. Indirect impacts include (a) impairment of plant growth due to soil compaction, (b) impairment of plant growth from increastd dust, (c) possible injury as a result of high concentrations of exhaust pollutants, and (d) competition for habitat as a result of increased density of weedy species.

The following specific impacts may be expected for the rare species in the Cadiz open area.

1. Borrego locoweed, Astragalus lentiginosus var. borreganus. This species is widely distributed throughout the desert dunes and sandhills habitat of the open area. This habitat is expected to receive heavy use from both competitive and noncompetitive ORV activity. A substantial reduction in the abundance of this species is anticipated, resulting in at least a moderate impact to this population. It is unknown at the present time whether the continued existence of this population would be severely jeopardized by the proposed action. However, the potential is present for a high impact.

2. Scaly-stemmed sand plant, Pholisma arenarium. This species is rather limited in its distribution to the sandhills south of Danby Lake. One loop of the proposed racecourse will run directly through the location of the Pholisma population. The impact of the proposed action will be at least moderate. It is unknown at the present whether the continual existence of this population would be severely jeopardized by the proposed action, but the potential for a high impact is present.

3. Twining snapdragon, Antirrhinum filipes. One loop of the propsed racecourse will run directly through the small population of A. filipes on the southeastern shore of Danby Lake. It is anticipated that this small annual species will be completely extirpated from its present location. Thus, the impact of the proposed action on this species is extremely high.

In summary, it is anticipated that the Rare plants of the Cadiz open area will be moderately to highly impacted by ORV activity wihtin the area, thereby resulting in a significant loss of the environment.

Unique Vegetation

As mentioned in Section 2.2.1, several small potential creosote rings were found in Cadiz Valley. ORV activity would have a direct adverse effect on those clones by breaking branches and sections, resulting in a loss of the ring appearance. If damage were severe, the death of the individual creosote ring would occur. A damaged creosote clone would require at least decades, and possibly centuries, to recover its original ring appearance, if it is indeed possible for a damaged ring to ever recover.

Creosote bushes, as well as other perennials, accumulate windblown soil particles and vegetable matter beneath them so that the bush or clone appears to be growing on a mound. The soil in these mounds frequently has a higher concentration of nutrients than in surrounding areas. And, as with other desert soils, there is frequently a thin crust on these mounds. This crust is sometimes water repellent, so that rain water tends to run to the edge of the mound where it accumulates, and sinks into the ground. Because of this accumulation of water, roots of creosote bushes are more concentrated at the edges of these mounds, exhibiting a phenomenon similar to the roadside effect. In the case of creosote rings, this mound may have taken centuries to develop. ORVs driving over or through the creosote rings would break the crust of the mound, exposing the finer particles and nutrients to wind erosion (thus depleting the mound of its store of nutrients) and destroying the water accumulating effect.

Indirect impacts to the creosote rings are also anticipated and appear to be more probable than direct impacts. Destruction of smaller vegetation and soil compaction in adjacent areas leads to increased runoff. The increased erosive power of the runoff will then lead to serious root undercutting and ultimately to destruction of the rings.

Because the impact on creosote rings is expected to be high, there is a potential for a significant environmental loss of these unique vegetation features of great antiquity.

Wildlife

Off-road vehicle use, in most cases, causes such loss to animal populations as a decrease in both the numbers and diversity of species. The effects of ORVs on animals are direct and indirect. Indirect effects that cause population losses are loss of habitat (loss of food, cover, nests, burrows, etc.). Loss of habitat, in turn, reduces the carrying capacity of the community for the animals. In this case, mortality does not necessarily occur immediately. Mortality, however does increase in the long term and there is also a decrease in natality due to the smae long-term factors. In summary, there is a long term reduction in the populations of animals because:

1. Animals are eaten by predators when they cannot find burrows or cover.

2. Animals die of exposure because burrows and homesites are no longer available.

3. Food sources have been destroyed.

4. There are no nest sites, or fewer nest sites are available (BLM, 1974).

A reduction in both numbers and wildlife species is expected at the camp/start area, pit areas and along the race course (Stebbins, 1974; Busack and Bury, 1974; Byrne, 1973; BLM, 1976). Direct mortality to some animals will occur at the time of the race. Many desert reptiles and mammals spend some, if not all the daylight hours, underground in burrows. Many of these animals also hibernate or estivate in the colder months. Some, especially the reptiles lie a few inches beneath the soil surface. Others are in burrows from 5.08 cm to 1 m (2 inches to 3 feet) below the surface. These burrows are easily caved in, even when they are a foot or more underground, by the weight of a man on a motorcycle. During our survey, we found that just the weight of a man walking over a burrow was enough to cave it in due to the loose, unconsolidated nature of the soil. Susceptible reptiles are: banded gecko, desert iguana, zebra tailed lizard, Mojave fringe-toed lizard, leopard lizard, side blotched lizard, desert horned lizard, western whiptail, desert tortoise, Mojave patch-nosed snake, glossy snake, western shovel-nosed snake, and sidewinder.

The mammals that will be affected include antelope ground squirrel, little pocket mouse, long tailed pocket mouse, Merriam's kangaroo rat, desert kangaroo rat, canyon mouse, grasshopper mouse, and desert woodrat.

Significant species

As far as impacts on significant species are concerned, we must consider them in the context of the habitats they occupy. The brown pelican, a Federally Endangered species, occurs only on the MWD Pump Plant holding pond which should not be impacted by the proposed action. Running a competitive event in the area would directly impact the habitat used by the black tailed jackrabbit, and mourning dove (State partially protected species) and the yellow warbler and loggerhead shrike (Blue Listed). Reptile and rodent declines, due to habitat destruction, would have a further negative effect on populations of those predatory animals which rely on these groups for food. The significant species involved here include the partially protected bobcat and red tailed hawk, the fully protected kit fox and ring tailed cat, and the Blue Listed Swainson's hawk, sparrow hawk, marsh hawk, prairie falcon and short eared owl. Certainly, there would be population reductions of the fully protected desert tortoise and the partially protected chuckwalla, desert iguana, Mojave fringe toed lizard, collared lizard, leopard lizard, and desert horned lizard because of their diurnal habits. These reptiles, which are more active during the day, could easily fall victim to being run over by vehicles along with the destruction of their habitat. The above reptiles, along with the partially protected banded gecko, are also very likely to be picked up and taken home as pets by race participants and spectators. Further population impacts can occur for these more obvious species because they are often the target for BB guns, slingshots, rocks and other mortality factors that will go along with increased use of the area by large groups of people.

3.2.2 Specific habitats

Impacts on habitats have been summarized in Table 3.1. Each habitat type was assigned a high, moderate or low impact rating based on several key criteria:

1. Presence of Rare, Endangered or Threatened species.
2. Uniqueness or rarity of the habitat or associated plant communities.
3. Unusually high diversity or density of species.
4. Intensity and timing of ORV activity.
5. Unusual susceptibility to disruption (includes recovery potential).

Table 3.1 Impacts on habitats

HABITAT TYPE	Criteria					Impact Rating
	1	2	3	4	5	
Dry lake bed		X		X	X	High
Lake edge	X	X		X		Moderate
Creosote rockland		X	X			Low
Creosote flats			X	X	X	High
Desert dunes and sandhills	X	X		X		High
Desert dry wash		X	X	X		Moderate
Iron Mountain pumping plant						Low

The following definitions were used in assigning an impact rating to each habitat type (BLM, 1977):

1. High impact: a severe disruption of the integrity of an ecological community, degrading it to a lower successional stage. The stability, efficiency and functions of the community are severely impaired. Recovery to predisturbance condition is slow (several decades to centuries) or may never occur.
2. Moderate impact: a substantial disruption of the integrity of a community with slow recovery potential, or a severe disruption of a community having high potential for rapid recovery (a few years to a few decades).
3. Low impact: minor alteration of the structure of a community, but without substantial impairment of viability.

For the purpose of evaluating impacts of the proposed action, statistics were calculated for the areas of each specific habitat type which will be impacted by competitive use only. These figures were calculated assuming an average course width of 60 m (200 ft). Statistics are compiled in Table 3.2 and will be referred to late in Chapter 3.

It should be emphasized here that the total impacts due to the establishment of competitive events will be much greater than the per mile impact assessments given below. This is due to the large increase of random use by both spectators and participants at major competitions. Impacts from associated spectator play may far outweigh those of the organized event.

Table 3.2

Areas in specific habitat types to be impacted by competitive ORV use

HABITAT TYPE	Length of race course		Area		Habitat[a]
	kilometers	miles	ha	acres	Impacted
Dry lake bed	14.4	9	88	220	1.25
Lake edge	9.6	6	60	150	.7
Creosote rockland	4.4	2.8	18	70	.3
Creosote flats	78.8	49.3	960	2400	3.5
Desert dunes & sand hills	74.0	46.3	508	1270	2.4
Desert dry wash	6.0	3.8	36	90	10

[a]This is the percentage of habitat which will be directly impacted by competitive use only.

Dry lake bed

Vegetation. The dry lake beds are expected to receive heavy noncompetitive and competitive ORV use. Approximately 14.4 km (9 miles) of the proposed race course will be routed through southern Danby Lake, thus negatively impacting 88 ha (220 acres) of dry lake bed habitat type and about 0.1 percent of the open area.

As noted in Chapter 2, the soil of the lake beds are so highly alkaline that they are devoid of vascular plants. Therefore, ORV activity will have no direct impact on vegetation.

The major impacts to this habitat type will be indirect as a result of damage to the lake bed soils. The thin salt crust of the lake beds is very fragile and highly susceptible to disruption. Soil compaction and disruption of the soil crust could seriously degrade the possible microflora populations of Cadiz and Danby Lakes. Disruption of the soil crust also exposes large amounts of subsurface soil fines to wind erosion. Increased levels of dust in the air will impair plant growth in surrounding areas, thus negatively impacting the habitats surrounding the lake beds.

Although the surface of the lake beds can be expected to crust over again with the first rain, rainfall in the desert is scarce and erratic and these surfaces could possibly be exposed to wind erosion for many months before recrusting occurs.

Due to the relative rarity of this habitat, the high susceptibility of the lake bed soils to disruption and erosion, and the high intensity of use expected, this habitat was given a moderate impact rating.

Wildlife. The dry lake beds are expected to receive heavy ORV impact. The dry lake beds are not recognized as being significant habitat for wildlife species. The impact of ORVs on invertebrates is unknown. However, as an example, fairy shrimp eggs lie dormant near the surface of lake beds when the lake is dry. It is probable that ORVs running over the lake beds would negatively impact these invertebrate eggs.

During years wet enough to fill Cadiz and Danby Lakes, migrating waterbirds would probably be attracted to stop over at them. There would be no direct impact of the proposed action in such a situation, since the lake beds would be covered with water and thus unsuitable for ORV use. However, if the proposed action impacts invertebrate populations when the lakes are dry, this could cause an indirect impact upon birds that feed upon these animals when the lake contains water.

Lake edge

Vegetation. The Danby Lake loop of the proposed race course will be routed through approximately 9.6 km (6 miles) of the lake edge habitat. The actual area that will be negatively impacted is 60 ha (150 acres), representing less than 1 percent of the lake edge habitat type and less than 0.1 percent of the open area.

In most areas of the alkali sink scrub association, the vegetation occurs only on widely spaced hummocks over 1 m (4 ft.) high. In such areas, direct destruction of plants by ORVs is expected to be low, because the individual hummocks and their vegetative cover could easily be avoided. In other areas where the plants occur on much lower hummocks or on relatively flat ground, they will be much more susceptible to destruction. The plants will be exposed to the direct impact of crushing and the indirect impacts of soil compaction and increased dust. In addition, surface disruption of the hummocks would expose the finer subsurface soil particles to wind erosion, thereby removing the supporting soil and nutrient store of the vegetation.

Impacts to the saltbush scrub association are expected to be high on the proposed race course. Impacts will be both direct, as a result of crushing, and indirect, as a result of soil compaction and increased dust.

The longevity and recovery potential of the halophytes in the lake edge habitat are unknown in most cases. Vasek et al (1975) considered wingscale, Atriplex canescens, one of the dominants of the saltbush scrub association, to be a long-lived species. Such species are thought to live over many decades or perhaps even centuries, and it was noted that they generally respond negatively to disturbance. It was also noted that allscale, Atriplex polycarpa, a co-dominant of the saltbush scrub association, appeared to have a stong pioneering role in a disturbed saltbush scrub association. We might therefore expect the species composition of this association to change over time in areas not subject to intense use. However, as pointed out earlier in the discussion of general impacts, the potential for recovery and revegetation is greatly reduced in heavily tracked areas such as race courses. In such areas where destruction of vegetation and secondary impacts are severe, the vegetation may never recover.

Because of these factors, the relative rarity of this habitat and the presence of a rare species, this habitat type has been given a moderate impact rating.

Wildlife. The lake edge habitat is expected to be impacted by the Danby Lake loop of the proposed courses. Soil compaction is anticipated. This would indirectly impact wildlife by collapsing burrows, making the soil more dense and harder to burrow in and altering microclimate (see Ecological Interrelationships Section 3.3). Species most vulnerable to this type of impact are desert tortoise, Mojave fringe-toed lizard, horned lizard, Merriam's kangaroo rat, desert kangaroo rat, white-tailed antelope squirrel and round tailed-ground squirrel. Recovery time is not known, but as long as the area is used for racing, recovery is not expected (Stebbins, 1974).

Indirect impacts to wildlife as a result of perennial and annual plant destruction include:

1. Loss of forage. This would affect herbivorous insects and the desert tortoise the most. Jackrabbits would be less affected because of their higher mobility.

2. Loss of shelter. This would mainly affect diurnal species which use perennials for shade and shelter from the wind: lizards, snakes, birds, and small mammals would be most affected.

Direct impacts to wildlife are obvious. Diurnal terrestrial species will be run over by ORVs. Nocturnal and estivating species may be smashed when their burrows are collapsed. Mojave fringe toed lizards and horned lizards are very vulnerable because they lie immediately beneath the surface of the sand. Desert tortoises move slowly and thus are very vulnerable to being run over.

Migrating flocks of horned larks and some migrant sage thrashers were observed in the lake edge habitat. Degradation of this habitat by ORV use would also reduce forage and shelter for migrant birds and thus reduce use by migrant populations. This would not reduce actual number of birds because of the very small numbers involved, but would reduce the value of the area for wildlife enthusiasts and scientific research. In addition, though the actual area

involved is small, the cumulative effects of the destruction of many small areas throughout the desert would be to actually reduce bird populations due to lack of migration stopovers. The actual acreage expected to be impacted is not great. It represents less than 0.1 percent of the open area and less than 1 percent of the lake edge habitat type in the open area. About 9.6 km (6 miles) of race course is expected to negatively impact 60 ha (150 hacres) of lake edge habitat. This would degrade habitat use by an estimated 176 birds and an unknown number of small mammals and reptiles (see density data, Section 2.22).

Creosote rockland

Vegetation. Due to its rugged topography, the creosote rockland habitat is expected to receive very minimal noncompetitive ORV use. Only about 28 ha (70 acres) or 0.3 percent of this habitat and less than 0.05 percent of the open area would be adversely impacted by the 4.4 km (2.7 miles) rockpile loop of the proposed race course. Because the amount of area expected to be disrupted is relatively low, the impacts of competitive ORV use on the creosote rockland habitat are also anticipated to be minimal.

The creosote rockland is a unusual habitat with a relatively high species diversity. However, due to the absence of rare species along the proposed race course, the relatively low susceptibility to disruption, and the anticipated low intensity of use, this habitat was given a low impact rating.

Wildlife. The creosote rockland is expected to be impacted by the rock pile loop of the proposed courses. Soil compaction and burrows collapsing will probably be minimal in the rocklands due to the rocky nature of the substrate. However, loss of suitable burrowing substrate due to gully erosion caused by ORV use should be a more significant impact. Destruction of vegetation should also be a fairly limited impact simply because vegetation is sparse. This loss will reduce forage and cover in an already barren habitat although long range impacts are not known.

Direct physical impacts, such as running over animals, are probably the most significant to terrestrail species. Collared lizards, chuckwallas, and speckled rattlesnakes will probably be the most vulnerable due to their diurnal habits.

Birds would be most affected by noise. Noise during the breeding season could cause nest desertion (See noise, Section 3.1.7).

The area of creosote rockland which will be impacted represents less than 0.05 percent of the open area and about 0.3 percent of the creosote rockland habitat. Approximately 4.4 km (1.75 miles) of race course would adversely impact 18 ha (70 acres). This would degrade the habitat used by an estimated 4 birds and 200 pocket mice.

Creosote flats

Vegetation. Approximately 79 km (49 miles) of the proposed race course will adversely impact 960 ha (2400 acres) of the creosote flats habitat. This area represents 3.5 percent of the total creosote flats habitat and 1.3 percent of the open area.

All camping and pit areas for the proposed racecourse are located in the creosote flats habitat. Camping and pit areas will be impacted by many more vehicles and people (spectators and participants and their transportation) than other areas. This excessive number of vehicles and high intensity of use will have extremely high impacts on soil and vegetation, including crushing, uprooting, and soil compaction already discussed (see Section 3.2.1). These areas are expected to be completely denuded of all vegetation. In addition, repeated use will intensify the damage to these areas, as well as the damage along the racecourse, and will lengthen the period of recovery.

The probable existence of microscopic algae and fungi in the crusty soils of the creosote flats and their important functions in desert soils have been discussed previously (see Section 2.2.2). ORV activity severely compacts the soil and disrupts the fragile rain crust of desert soils. Rainfall, essential to the restoration of this crust, is scarce and often unpredictable in the desert. Algae and fungi may require two or more rains before growth begins again to restabilize the soil crust. In addition, although the effect of compaction and disruption of the soil crust on the microbes of desert soils has not fully been investigated, soils in northern Minnesota compacted by snowmobiles revealed a marked reduction in bacteria and fungi (Wanek, cited in Stebbins, 1974). ORV activity could also severely degrade the biota of desert soils, thus interfering with their essential activities.

As noted in Chapter 2, the creosote flats have a high diversity of annual species. A relatively long-term loss of this component of the vegetation over much of this habitat can be anticipated due to soil compaction and resulting seedbed destruction, especially in heavy use areas (pits, camps, start areas, and race courses).

The dominant perennial shrubs of the creosote flats (creosote bush and burro bush) are long-lived species, generally responding negatively to disturbance (Vasek et al, 1975). Recovery potential for creosote bush, Larrea tridentata, is very slow, requiring many decades to centuries (see Section 2.2.1). Burro bush, Ambrosia dumosa, also has a slow recovery potential, measured in many decades. Individuals less than 1 m high and of a known age of over 40 years can be found in Patton's camp, south of the Iron Mountain Pumping Plant.

Due to its much smaller size, burro bush is less likely to be avoided by ORVs and is thus much more susceptible to direct destruction than creosote. Burro bush also appears much less resitant to crushing than creosote (Keefe and Berry, 1973). Because direct impacts on burro bush are expected to be much greater than on creosote bush, it is anticipated that there will be a reduction in the frequency of burro bush even in moderately disturbed areas. It is also expected to take many decades for recovery of burro bush, if and when ORV use is stopped.

In summary, the high intensity of ORV activity in much of the cresote flats will result in a severe disruption of this habitat. The impact of severe soil compaction in heavy use areas (pits, camps, start areas and race courses) will greatly impair the growth of remaining perennial species and retard regeneration. Recovery to predisturbance condition will be very slow, requiring many decades to centuries, if it occurs at all. For these reasons, this habitat has been given a high impact rating.

Wildlife. The creosote flats are expected to receive heavy use. Start-finish areas, pit areas and camp areas are all located in this habitat type. Expected impacts include soil disturbance such as subsequent wind erosion, burrow destruction, destruction of vegetation, and physical destruction of animals.

Soil disturbances will have the most serious impacts on burrowing species. These include many invertebrate species, reptiles (especially the desert tortoise, banded gecko, spotted leaf-nosed snake, patch-nosed snake and others), Merriam's kangaroo rats and desert kangaroo rats.

Destruction of vegetation will impact those species which directly or indirectly depend upon it for food (see food relationships, Section 3.3) and those species which depend upon it for cover and protection, notably the leopard lizards, zebra tailed lizards, black tailed jackrabbits and black-throated sparrows.

Destruction of vegetation would also affect migrating birds. Flocks of Brewer's sparrows as well as Wilson's warblers, Say's phoebes, sage thrashers and others were observed in the cresote flats. Habitat destruction by racing and general ORV use would reduce forage and shelter used by migrating birds and thus reduce use of the area by migrants. This would reduce the value of the area to wildlife enthusiasts and scientific research.

The area of creosote flats which will be impacted represents 1.3 percent of the open area and 3.5 percent of the creosote flat habitat. Approximately 78.4 km (49 miles) of race course will adversely impact 960 ha (2400 acres). This would degrade the habitat used by an estimated 177 birds and 6000 Merriam's kangaroo rats (see density data Section 2.2.2).

Desert dunes and sandhills

Vegetation. Approximately 74 km (46 miles) of the proposed race course will adversely impact about 508 ha (1,270 acres) of the desert dunes and sandhills habitat. This area represents 2.4 percent of the total dunes habitat and about 0.7 percent of the open area.

This habitat is expected to receive heavy competitive as well as noncompetitive use. Because wind rapidly covers vehicle tracks, unorganized vehicles will not follow existing roads and trails, thus widely spreading the impacts throughout most of the dunes and sandhills. During competitive events, vehicles will fan out rather than follow a single track, thus also spreading the impacts over a wide area.

Desert dunes and sandhills are an extremely productive habitat following wet winters, often displaying both a high density and a diversity of annual species. It is during this growing season (when the heaviest use is expected) that this habitat is most vulnerable to ORV impacts. As ORVs will not avoid annuals and small perennials, direct destruction by crushing and uprooting will be high, thereby resulting in a significant loss of vegetative cover. Some annuals will be eliminated before they have set seed, resulting in a smaller seed crop for the following year. The loss in seed crop due to continued, regular racing

over several years would eventually result in a decreased seed reservoir in the soil. This reduction in the seed bed would result in a long-term reduction in annual vegetation.

Dunes, by their very nature, are somewhat unstable. Through the action of wind, dunes become streamlined and the sand grains are sorted so that the larger grains are on the surface, forming a seal of sorts. By churning and mixing the sand, ORV activity breaks the seal of course grains and destablizes the dunes. Crushing and uprooting of plants has a further destabilizing effect. Heavy use of the dunes and sandhills habitat can, therefore, be expected to cause a long-term reduction and loss of the stabilizing vegetation.

As the dunes are destabilized, they become more susceptible to wind erosion. The sand put into motion spreads as a sheet downwind where it buries and kills vegetation of the surrounding habitats not directly damaged by the motorcycles. In time, this will enlarge the zone of unanchored sand, thereby enlarging the area subject to wind erosion (Wilshire and Nakata, 1976).

The desert dunes and sandhills habitat is highly susceptible to disruption. The recovery potential is not known, but would appear to be dependent upon the degree of surface disturbance. Annual vegetation may recover relatively rapidly (a few years) if the soil disturbance has not been too great. However, there may be a considerable change in the composition of the annual vegetation due to invasion of exotic weeds such as Russian thistle and/or short-lived native or naturalized annuals and perennials. Recovery of perennial species such as creosote bush and burro bush will take several decades to centuries. Therefore, recovery to predisturbance conditions is apt to be very slow, if it occurs at all.

The heavy use expected in the desert dunes and sandhills habitat will have a high impact on all components of the vegetation, including two rare species, Astragalus lentiginosus var. borreganus and Pholisma arenarium, found in this habitat. For this reason, this habitat has been given a high impact rating.

Wildlife. The desert dunes and sandhills are expected to receive very heavy ORV use. The damage sustained is expected to be burrow destruction, vegetation loss and increased susceptibility to wind erosion. The flat areas now kept stable by vegetation would become unstable with tendencies toward dune formation. Such dunes would be expected to be less productive of wildlife because of loss of vegetation and lack of a stable burrowing substrate. A recent study on the Barstow-Las Vegas Race, 1974, supports this contention that ORV use will lower this habitat type's wildlife productivity (BLM, 1976). This lack of stability due to destruction of vegetation is a documented phenomenon (Wilshire & Nakata, 1976). A recent on-site reconnaissance of the open area on April 26, 1977 by Wilshire, of the U. S. Geological Survey, further supports our contention that ORV use in this habitat type will destabilize this habitat type and make it susceptible to wind erosions.

Animals particularly susceptible to impact are herbivorous invertebrates and vertebrates, including desert kangaroo rats, Merriam's kangaroo rats, and other small mammals, black-throated sparrows, Brewer's sparrows, mourning doves and otehr seed eating birds. Mojave fringe-toed lizards and horned lizards are especially susceptible to being run over because of their habit of burying themselves in the sand. Other diurnal and nocturnal burrowing species are expected to be killed by being run over because burrows in the sand are so easily

collapsed. Soil compaction will probably not occur (J. Adams, pers. comm.).

Destruction of vegetation will also have a negative impact on migrating birds. Many types of migrating birds were observed in this habitat. Some examples are tree swallows, water pipits, Brewers sparrows, and short-eared owl. Habitat destruction by racing and general ORV use would reduce plant and insect food sources and shelter used by migrants and thus reduce use of the area by migrating birds. This would reduce the value of the area as a resource for wildlife enthusiasts and scientific research.

The area of desert dunes and sandhills habitat which will be impacted represents about 0.7 percent of the open area and 2.4 percent of the desert dunes and sandhills habitat. Approximately 73.6 km (46 miles) of race course will impact about 508 ha (1270 acres) of this habitat type. This would degrade the habitat used by an estimated 1123 birds and 3000 desert kangaroo rats at the time of the inventory (see density data Section 2.2.2).

Desert dry wash

Vegetation. Because they are frequently favored as travel routes in the desert, dry washes are expected to receive some of the heaviest impacts in the open area as a result of both competitive and noncompetitive ORV use. In the 6 km (4 miles) of the race course proposed in the dry washes, an estimated 36 ha (90 acres) or 10 percent of the dry wash habitat would be negatively impacted. Approximately 80 percent of the major washes of Cadiz and Ward Valleys are expected to be used as major routes of travel by noncompetitive vehicles and thereby receive heavy ORV impacts.

Although most of the trees and larger shrubs may be avoided, cumulative negative impacts to the smaller herbaceous perennials and annuals are expected. In addition to direct destruction of plant cover, churned surfaces in even light to moderate use zones will make large volumes of material more susceptible to wind erosion (Wilshire and Nakata, 1976). The resulting increase in dust would impair plant growth in surrounding habitats.

Indirect impacts to the trees and larger shrubs are anticipated from vehicle use in areas immediately adjacent to them. Vegetation too large to be directly impacted by vehicles is generally adjusted to runoff levels that are balanced by the smaller vegetation and normal infiltration rates. Direct destruction of smaller vegetation and soil compaction will both lead to increased runoff. The increased erosive power of the runoff in turn leads to serious root undercutting and ultimately to destruction of the vegetation.

Impacts to the small dry washes in the wash complex at the base of the inselbergs in southwestern Cadiz Valley are expected to be very high. A major camping area is proposed in the wash complex along the northern side of the inselbergs. Due to the intensity of use and the severity of impacts anticipated, complete denuding of this area is expected.

The granite wash complex at the base of the Iron Mountains is expected to receive minimal competitive and noncompetitive use. The rugged topography of the area limits its accessibility and the washes themselves are extremely narrow and, therefore, undesirable as travel routes. There are on the granite flats, however, visible tank tracks in the desert pavement made during Patton's World War II maneuvers. Therefore, although the impacts to this area are

expected to be low, they will be extremely long lasting.

Desert washes are known to be subject to periodic disruption as a result of occasional flash floods. Consequently, many shrub species of washes may be somewhat adapted to this periodic disturbance and act as pioneers. Vasek et al (1975a) noted that such pioneer shrubs (i.e., Hymenoclea salsola, Bebbia juncea) are relatively short lived (probably not exceeding 1 or 2 decades) and respond positively to disturbance by invasion and rapid increase in population size. These pioneer species may thereby provide the dry wash habitat with a potential for relatively rapid recovery (a few years to a few decades) from disturbance as compared with other associations of the open area. It may, however, not be entirely correct to equate ORV disturbance with a natural disturbance such as a flood. A flood acts as a primer for germination by scarifying seeds and increasing the soil moisture content. ORV activity, on the other hand, may result in some seed scarification, but the accompanying soil disturbance due to compaction and disruption of the soil mantle is detrimental to germination (see soil impacts discussions, pp 3.12 and 3.39). Therefore, the assumption that the desert dry wash habitat type will rapidly recover from ORV activity may not be entirely correct.

ORV activity in the dry washes will result in a substantial disruption of this habitat type. However, due to its apparent potential for relatively rapid recovery, the impact to this habitat is rated as moderate.

Wildlife. Because desert washes are used as major travel routes in the desert, they are expected to receive some of the heaviest impacts in the open area. Burrow destruction along the edges of washes is expected, but damage to vegetation is viewed to be more significant. Noise and vehicle harassment of wildlife using desert washes is expected to be high because many species are concentrated within this habitat. Avoidance of the trees and larger shrubs is anticipated, but cumulative negative impacts to the smaller plants is anticipated.

The dry washes occurring outside of the creosote rocklands will be very vulnerable to ORV damage because topographically they are more desireable for ORV use. The proposed course is shown to run along 6.4 km (4 miles) of desert drywash, but we must consider this a conservative estimate because we are not able to measure all the small stretches of dry wash crossed by the courses as the ORVs circle the Iron Mountains.

The configuration of the open area boundary in relation to the Iron Mountains is such that virtually all of the proposed main course and many of the auxillary loops must cross the inherent drainage pattern of the open area.

The desert dry wash is by far the most important segment of the bird habitat in the open area to be impacted by the proposed action. The presence of smoke trees, desert willow, desert lavender, catclaw, tamarisk, and some palo verde provides excellent resting and nesting habitat for the bird species in the open area. While the estimated impact of the course was calculated figuring a course width of 60 m (300 feet) on the average, it is important to note that effects of the course could be much more far reaching for the birds of the area. For birds nesting in a wash crossed by a race, the noise caused by the race could cause a lower reproductive rate due to nest desertion. In addition to being important habitat for resident and breeding birds, the dry washes are

by far the most important habitat for migrant birds (except the pump plant complex). Many bird species, including unusual visitors, use the dry washes as feeding and resting places (see species-habitat Tables C.1 to C.11). The most important wash for migrant birds is the palo verde wash at the southern end of the open area which has a course running very nearby. There may be sufficient noise and casual disturbance to significantly affect migrating birds. If casual ORV use and/or noise and other disturbances of racing cause a reduction in use by migrating birds, this would be a significant negative impact on the non-consumptive resource value of the area for wildlife enthusiasts and scientific research.

Destruction of small vegetation is expected in washes affected by the proposed action. This will in turn affect wildlife by reducing forage for invertebrates and herbivores such as the desert tortoise, and seed eating small mammals and birds. It will reduce cover and shelter which are used by long tailed brush lizards, desert spiny lizards, leopard lizards, jackrabbits, and white tailed antelope squirrels. It will reduce nesting habitat for black-tailed gnatcatchers, verdins, Costa's hummingbirds, and mourning doves. Finally, physical destruction of diurnal animals is expected.

In the quantifiable 6.4 km (4 miles) of race course proposed in the dry washes, an estimated 36 ha (90 acres) of habitat would be negatively impacted. This would be expected to degrade the drywash habitat used by an estimated 86 birds of 13 common species and 300 Merriam's kangaroo rats (see density data Section 2.2.2).

Iron Mountain Pumping Plant

Vegetation. Impacts to the vegetation of this complex are expected to be low. No part of the proposed race course runs through this privately owned area. Therefore, no direct impacts on the vegetation of this man-made oasis are expected. However, increased dust from impacts to the surrounding habitats would result in deterioration of local air quality, thereby impairing plant growth and possibly degrading this oasis for wildlife.

Wildlife. Technically, impacts on lands owned by the MWD are out of the Bureau's control, but realistically, the secondary negative environmental impacts that would occur would be the result of the proposed action. Bird life associated with the aqueduct would be disturbed by events crossing it or coming near it and by the spectator use of the aqueduct roads. Birds or other wildlife using the residential landscaping are not expected to be disturbed by ORV events on national resource lands. Some species may use the habitat of the open area only because there is open water available at the pump plant or along the aqueduct. Still, there will be negligible impact on the area used by these birds. The uniqueness of the pump plant as bird habitat is best illustrated by some examples of the species found only on the pump plant grounds. These include brown pelican, common loon, eared grebe, western grebe, ground dove, shoveller, pintail, gadwall, buffle head, red head, lesser scaup, red breasted merganser, blue winged teal, green winged teal, cinnamon teal, snowy egret, cattle egret, sora, avocet, black necked stilt, Wilson's phalarope, black and white warbler, hooded warbler, indigo bunting, American redstart, belted kingfisher, and great tailed grackle (see species-habitat tables, Appendix C.).

Insects. Insects are adversely affected by ORVs in the following ways: (1) by destroying specific plants needed by these insects; (2) by destroying vegetative material in surrounding areas, thus reducing the amount of wind-blown vegetable matter; (3) by breaking up the surface crusts and accumulations of vegetable matter, thus destroying and exposing immature staqes to destructive environmental conditions; and (4) by disrupting reproductive behavioral patterns of highly adapted species (Andrews and Hardy, 1976).

3.3 ECOLOGICAL INTERRELATIONSHIPS

3.3.1 Interaction of plant and animal communities with the nonliving environment

Climate

Rainfall is the critical limiting environmental factor in arid areas. The extreme variability of annual rainfall in deserts has serious consequences for plant and animal populations attempting to recover from the impacts of ORV activity.

As stated earlier (see Ecological Interrelationships, Chapter 2), annuals grow only after sufficient rain has fallen to ensure survival to maturity and perennials grow little or not at all in dry years. All animal species are dependent upon the food supply, they do not reproduce in dry years. Therefore, populations of plants and animals that have declined as a result of ORV impacts, may further decline as a result of unfavorable climatic conditions.

In addition, these biotic communities may be further stressed by possible regional climatic alternations due to the increased levels of dust in the atmosphere as a result of ORV activity. Extra dust in the upper atmosphere may "over seed" the air with hygroscopic nuclei, thereby producing smaller cloud droplets that will stay suspended and float on by the disturbed area. In addition, layers of dust over a disturbed area, raised by winds from the denuded surface, can affect radiative transfer thereby increasing aridity. Such is the theory proposed by Bryson and Baerris (1967) for the development of the Rajasthan desert in India.

It appears critical that changes in atmospheric dust levels, resulting from ORV activity, be monitored to determine their possible detrimental effects on the regional climates, and on teh biotic components of desert ecosystems.

Soil

Off-road vehicles damage soil in several ways:

1. Direct displacement of soil particles by wheels on tracks.

2. Destabilization of the soil surface by stripping away protective desert crusts and pavements, and disrupting soil structure.

3. Destruction of stabilizing vegetation which holds the soil, reduces

the force of winds, and impedes the movement of air borne soil particles (Stebbins, 1974).

4. Degradation of soil biota.

5. Soil compaction.

6. Changing the soil thermal regime,and

7. Acceleration of wind and water erosion through the loss of protective vegetative cover, and through rupture of soil structure and surface crusts and the disruption of protective pavements that require from 30 years to a century or more to be reestablished after they have been disrupted by ORVs (BOR 1976).

The potential for fine particles to be transported long distances shows that nutrient and water capacity may be permanently lost by a soil (Gillette, 1974). Compaction can reduce or eliminate plant growth due to destruction of seedbeds and prevention of water and root penetration into the soil and reduction of shoot emergence from soil. Compaction will also prevent or inhibit burrowing of wildlife species. These negative impacts are expected to occur on and about the areas of the race courses, pit areas and camp areas described in the proposed action.

Substantial microclimate alteration may occur in heavily used areas because compaction produces an increase in soil bulk density and loss of soil pore space (Snyder et al, 1976). These alternations of soil characteristics can alter soil moisture and temperature regimes because they impede water penetration and reduce the insulating influences of the soil pore space (Snyder et al, 1976; Stebbins, 1974). The reduction of insulation characteristics increases the amplitudes and rate of fluctuation of soil temperatures (Stebbins, 1974). Such changes in environmental stability of the soil thermal regime are deleterious to both plant and animal life.

3.3.2 Interaction of plant and animal communities

General

As discussed in Chapter 2, plants provide protection from predators, shelter nest and burrow sites for desert animals. Lizards, birds, snakes, jackrabbits and ground squirrels hide in vegetation to avoid predators as well as to avoid man. Long tailed brush lizards and desert spiny lizards live in shrubs, and many reptiles, birds, mammals and insects utilize vegetation as shelter from extremes of insolation and wind. Small mammals, lizards, snakes, and desert tortoises burrow beneath shrubs. These shrubs protect, camouflage and shade the burrows. Birds nest in and under shrubs and trees. Clearly, destruction of the annual and perennial plants of an area will have negative effects on the wildlife species which use these plants as an integral part of their environment.

General effects of damage to shrubs on animal populations were outlined in BLM (1974) as follows:

1. Reduction of cover used for protection from extremes of weather. Resident bird populations and diurnal reptiles would be most severely effected.

2. Reduction of cover used as protection from predators. Small mammals, lizards and snakes would be most severely effected.

3. Reduction of sites for placement of burrows and nests. Small mammals, lizards, snakes and desert tortoise would be affected by loss of burrow sites. Birds which nest in or under low shrubs would be the most heavily impacted. Large trees are not as vulnerable to direct damage.

Luckenbach (1975) points out that many types of plant and animal species which utilize the area below shrubs would be adversely affected by destruction of those shrubs. These species include soil microbes and microfauna, desert iguanas, leopard lizards and various birds and terrestrial mammals. In addition there are a number of annual plant species which are largely restricted to the shade of perennial shrubs.

Busack and Bury (1974) showed in a study of ORV effects on lizard populations that species density as well as species composition were different in three separate areas, each of which had sustained different amounts of ORV damage. They go on to conclude that ORV use has a "negative effect on some lizards, probably because of a loss of cover, reduction in invertebrate food sources, disturbance of social structure, and casualties".

Byrne (1973) conducted a study of areas disturbed and undisturbed by ORV in Dove Springs Canyon and Randsburg and found both a reduction in plant diversity and structure and a reduction in small mammal diversity in disturbed areas.

Food relationships

General food relationships were discussed in Section 2.3. In this section, impacts to various specific parts of the ecosystem will be examined. These impacts on specific plants and animals have far reaching effects because of the interrelated nature of an ecosystem. General effects were outlined as follows by BLM (1974).

Damage to and loss of vegetation has a particularly important effect on animal-plant food chains and webs and the transfer and flow of energy in a community. Reduction of vegetation sets off a series of related events which are complex but predictable, because plants form the basis of all food chains and webs. There is:

1. Reduction in plants and plant nutrients available for transfer to consumer species.

2. Reduction in herbivores (includes herbivorous insects, reptiles, birds, and mammals).

3. Reduction in insectivores (includes insectivorous insects, reptiles, birds, and mammals).

4. Reduction in carnivores dependent upon insectivores, herbivores, and other carnivores.

5. Decrease in stability of communities through loss of populations and loss of species.

Vegetation in an ecosystem has three major roles, all of which indirectly determine the kinds and numbers of animals that community can support. First, vegetation converts solar energy to chemical energy producing an energy form usable to animals. Second, vegetation provides a mineral and nutrient source necessary for animal survival and cycles gases from the atmosphere and third, the vegetation modifies the environment by reducing insolation and temperature extremes, increasing humidity and soil productivity and altering many other environmental factors which affect animal habitat.

Significant changes in plant biomass, composition and abundance can drastically alter animal habitat and have long range effects on whole ecosystems.

The loss of vegetation in an ecosystem can have severe ecological repercussions depending on the rate, amount, and season the loss occurs. Reduction in vegetative biomass reduces energy levels and the carrying capacity of the area. Further, loss of vegetation reduces potential soil productivity and increases soil erosion by wind and water. These conditions all have the effect of reducing animal habitat and creating a less efficient and productive ecosystem.

Most small rodents, many insects and a few reptiles and birds are herbivorous. These animals would certainly be affected by a reduction in vegetation. As noted above reduction of annual and perennial plants would be expected in an area impacted by a race course. Among the animals adversely affected are desert tortoise, chuckwallas, most small rodents, black throated sparrows, lazuli buntings and other birds, and herbivorous insects.

Reduction in herbivorous insects will have negative effects on insectivores such as most lizards, (e.g., zebra tailed lizards, and horned lizards), all flycatchers, (e.g., the kingbirds, flycatchers, and warblers), certain snakes, and insectivorous insects. Reduction in insect populations is very important in the food web because they represent a huge biomass and are preyed upon by many of the animals in the open area.

Reduction in higher carnivores will also occur but to a lower extent since the proposed action will not impact a very large percentage of the open area. Higher carnivores will probably be impacted to a greater extent by noise, presence of large numbers of people and physical disturbance than by loss of food resources.

Decrease in stability of communities through loss of populations and loss of species will be treated in Section 3.3.3.

In addition to simple loss of food through damage to the food web, breeding success of some animals in the open area may be affected. As was noted in Section 2.3, many species of birds, mammals, and reptiles are dependent either directly or indirectly upon annual plant blooms to breed. Luckenbach (1975) notes that lizards which feed mainly on insects associated with annual plants show a correlation between the amount of winter rain, the spring bloom, and breeding. Kenagy (1973) observed a correlation between the peak body weight and reproductive peak of heteromyid rodent in relation to the occurrence of the spring bloom. The female tortoise must store enough energy in the spring

to lay eggs and then survive until the next spring. Desert tortoises feed predominantly on annual plants. If the female tortoise does not store enough energy, she will die. Destruction to annual plants by the proposed action could result in an adverse effect on the breeding success of these animals. Figure 3.1 (Luckenbach, 1975) is a graphic representation of some of the ecological ramifications of ORV impacts.

Subsequent to the first year of competitive use, a reduction in animal numbers may not be evident in wildlife monitoring data (Vollmer et al, 1976). Work done by Vollmer, et al (1976) suggests that damage to vegetation during the first year of use may induce basal sprouting of some perennials, thus increasing wildlife forage. However, since ORV use would be expected to continue year after year in the open area the root reserves of the crushed perennials would become exhausted, their vigor would decline and death would be anticipated. Therefore, the net impact of continued ORV use would be a loss of both wildlife habitat and the associated wildlife.

3.3.3 Importance of biological diversity

The concept of biological diversity and its importance were described in Section 2.3. ORV impacts have been shown to reduce both density and diversity of plant and animal species (Busack and Bury, 1974; Byrne, 1973, and Kuhn, 1974). The proposed action could impact biological diversity by:

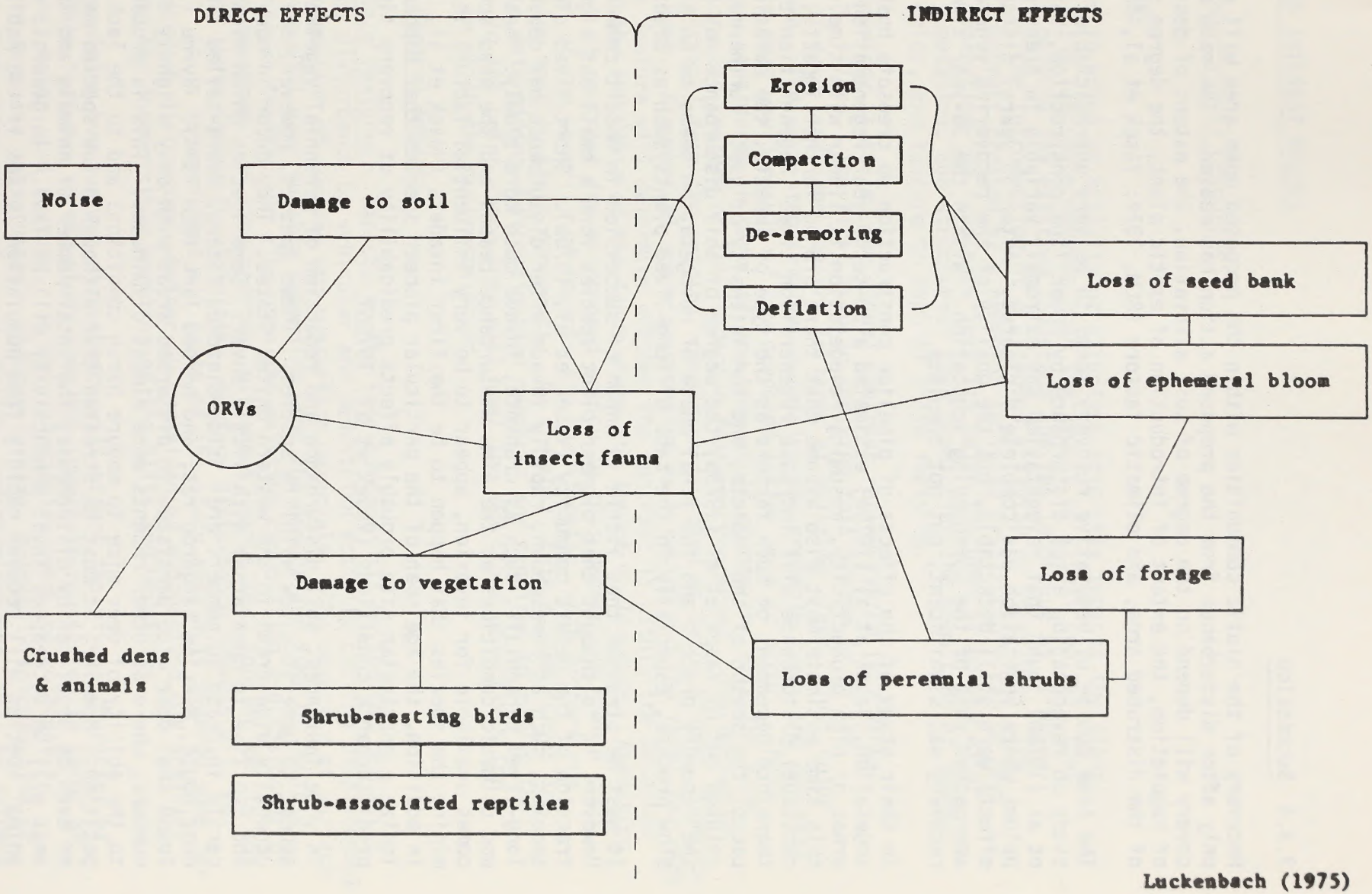
1. Altering soil structure so that plants and animals which are restricted to certain soil types cannot survive.

2. Reducing plant diversity. The loss of plant species from a certain area also means the loss of any invertebrate species which is exclusively associated with the plant species.

3. Allowing the introduction of invader species. Following the destruction of native plant cover by ORV use, weedy plants can invade because of changes in the soil and accidental introduction of seeds (Stebbins, 1974).

The changes in biological diversity outlined above would affect both the stability and productivity of a community. The reduction of the numbers of species and their replacement by invader species constitute a reduction in diversity. As was noted previously (see the biological diversity section in Section 2.2) any reduction in diversity reduces the ability of an ecosystem to adapt to changing conditions. Reduced diversity also results in a lowered total productivity, because a less diverse community utilizes radiant energy less efficiently. Therefore, although it is very difficult to predict long-term impacts in any specific way, it is possible to say that the survival potential of a community is decreased by reduction in diversity.

ORV IMPACT ON THE DESERT BIOTA



Luckenbach (1975)

Figure 3.1

3.3.4 Succession

Recovery of the biotic communities within the proposed open area will occur only after disturbance from the proposed action has ceased. The rate of recovery will depend on the degree of soil alteration, the extent of destruction of vegetation, the extent of introduction of exotic plant, the degree of aridity of the distrubed area, and climatic factors (BLM, 1974: Vasek et al, 1975a).

The time course of vegetative recovery seems to be very unpredictable. In a study on revegetation after disturbance by power line construction, Vasek et al (1975b) found that revegetation was extremely variable in areas under pylons where vegetation was completely cleared. After 33 years, disturbance effects were still detectable, but the quality of the recovering vegetation approached that of the surrounding vegetation. Within the 33-year time frame, recovery was significant, but not complete.

In their study of the effects of pipeline construction on creosote bush scrub vegetation, Vasek at al (1975a) estimated a 30-to 40-year regeneration time in areas of high productivity, assuming revegetation is linear with time. However, this time estimate must also assume that there are no further impacts, because continual disturbance will increase regeneration time. Regeneration time is therefore dependent on such factors as the type of impacts, the duration of impacts, the season of the impacts, and the intensity of use. Furthermore, as pointed out by Vasek et al (1975a) the degree of soil disturbance may slow the recovery process and the final phase of revegetation seems to be a very slow process, especially in the case of long-lived plants such as creosote.

It must be stressed that little is known of succession in desert communities. However, it is thought that pioneer plant species form a small but significant fraction of the desert community (Vasek et al, 1975a). Short-lived pioneer species, such as cheesebush, rapidly invade after disturbance has ceased, while long-lived perennials, such as creosote, invade much more slowly. Seasonal and climatic conditions at the time disturbance ceases and the seed source becomes available for invasion, appear to be very influential factors in determining the species that happen to be the first invaders (Vasek et al, 1975b). In addition, the age span of the particular pioneer species that happen to colonize a particular site probably affects predicability of recovery time to predisturbance conditions (Vasek et al, 1975b).

In some instances, soil disturbance and reduction of perennial vegetation can appear to benefit a few wildlife species. These species, however, are generally widespread in the western United States. They occur in many habitats and can live in open areas with little cover. Some species which might temporarily increase in numbers are: side-blotched lizard, zebra-tailed lizard, deer mouse, Merriam kangaroo rat, and horned lark (BLM 1974). Byrne (1973) found that deer mice persisted in disturbed areas with only slightly diminished numbers, where as other rodents were almost eliminated. This is probably due to the ability of deer mice to endure harsh conditions and to the lack of competition. However, it must be stressed that although a few species may survive or even be benefited by disturbance, the total number of animals and totol biomass will be decreased. Thus, productivity will be less. In general, most animal species will recover rapidly from population losses if the habitat is intact. However, if habitat is lost or damaged, recovery will occur only when the habitat is restored (BLM 1974).

3.4 HUMAN INTEREST VALUES

3.4.1 Scenic/visual resources

Methodology

The degree to which an activity or structure adversely impacts the visual quality of the landscape depends upon the amount of visual contrast that is created between the existing landscape and the landscape as it would appear after the introduction of a proposed activity or structure. The amount of contrast created by a proposed activity or structure can be measured by separating the landscape into its major features (land and water surface, vegetation, and structures) then predicting the magnitude of change in form, color, and texture to each of these features.

This methodology is called the visual contrast rating system (BLM Manual 6320) (BLM, 1975e). The first step in applying this system is in the analysis of each landscape feature in terms of existing form, line, color and texture. The next step involves examining the probable types and severity of impacts that would result if the proposed action were to occur. These impacts are considered in terms of how they would change the existing form, line, color, and texture of the landscape features concerned. The degree of change (contrast) from the original condition is rated as being Strong, Moderate, Weak, or None. A numerical score accompanies each rating and the total for each landscape feature will determine whether the contrast is within the accepted limits of the VRM Class of the lands where the impact would occur. Assessing the amount of contrast for a proposed action in this manner can give a good indication of the severity of impacts and specifically, what factors are contributing most to these contrasts. As a result, this system serves as a guide to determining what mitigation measures are required to reduce the contrasts to the point where they will meet the VRM Class objectives for the area in which the contrasts occur.

Expected General Impacts

Land surface features. Impacts to the land surface will be limited primarily to surface disturbance by vehicular and pedestrian activity causing displacement and/or compaction of surface and subsurface materials. The severity of surface disturbance will vary greatly depending upon the amount and type of vehicle and pedestrian traffic and also upon the existing composition and character of the areas impacted. In race courses, pit areas, campsites, popular trails and roads, and their immediate vicinities, surface disturbance impacts will be greatest. It is assumed that all parts of the study area will undergo some degree of surface disturbance whether by organized or unorganized ORV activity except for the inaccessible portions of the hills and mountains.

When determining how surface disturbance will affect the visual character of land surface features in the study area the impact is considered in terms of form, line, color, and texture. In this particular case, no noticeable changes in form are anticipated. Changes in line, primarily introduction of new lines through creation of roads, trails, and race courses, will be evident in varying degrees due to changes in surface color and/or texture. Color changes will be noticeable in areas of subsurface soil color contrast where surface materials are displaced. Texture changes will be evident in areas having

crusted surfaces that break when impacted by vehicles and/or feet.

An additional impact directly related to surface disturbance is the generation of dust which occurs not only at the time of vehicle or foot impact, but also during subsequent periods of wind in areas where crusted surfaces are broken. This impact will be evident throughout the study area and surrounding landscapes.

Vegetation features. Impacts to the vegetation features will consist of the damage to numerous plants by various means. Vehicles will be the primary cause of these impacts by striking and crushing plants and also by compacting and/or displacing soil which affects root systems, water absorbtion and germination. (see Vegetation impacts). Other causes include campsite clearing and use of the plants as firewood. Race courses, pit areas, campsites, popular trails and roads and their immediate vicinities will suffer the greatest impacts. Here, total denudation is expected in the heaviest use areas, e.g., courses, pit areas and campsites. It is assumed that all parts of the study area will undergo some degree of impact to the vegetation except those now unvegetated and areas inaccessible to vehicular entry.

The visual character of the vegetation features in the study area will undergo the following changes in the existing form, line, color, and texture.

Color changes will be most noticeable in areas where the majority of the existing vegetation is killed, such as in and around campgrounds and other heavy use areas. Less marked color changes, such as would occur from random density reduction, will be less obvious except where visibly different densities of the same communities border one another as might occur along strictly maintained area boundaries.

Texture changes will be noticeable, primarily only in those areas where great change occurs, such as the denuding of a previously evenly vegetated area.

Changes in line will primarily be from the addition of lines created by the loss of vegetation in either a linear pattern, such as with the creation of roads and trails, or where two areas of different colors or textures meet. Existing lines may be altered or destroyed through removal of vegetation. Form changes will occur wherever adjoining areas of visibly contrasting line, color, and texture are created.

Structure features. Impacts due to the introduction of structures will be a variable, non-cumulative impact that will consist of the presence of campers, pickups, tents, and jeeps throughout the area in varying locations and densities. Naturally, the heaviest impacts will be in campsite, race course, pit, popular road and trail areas.

In general, there will be an increase in the form, line, color and texture contrast from the current condition where few if any are every present.

Other impacts to the existing scenic visual resources include nightlighting from vehicles and general camping activities, smoke from fires and smokebombs, and the general presence of man and his vehicles in a presently natural setting.

Results

Upon determining the probable amount of contrast that will occur within the study area, if the proposed action takes place, and then matching these contrast ratings to the management class objectives, the following specific results are anticipated:

Within Class IV management objectives areas, all anticipated impacts to land surface, vegetation, and structure features fall within acceptable contrast limits except for land surface features on Danby Lake.

The existing coloration of Danby Lake is a blend of white, brown and intermediate shades of tan. Brown is the base color of the lake bed which is covered by shades of tan and white caused by varying degrees of white salt crust accumulation. Color contrasts between white and brown occur naturally along drainage patterns, high water lines from previous inundations, and at randomly scattered gypsum hummocks. Unnatural color contrasts are caused by breaking the existing crust by other than natural causes.

The propsed activities would produce high surface feature line contrast on Danby Lake through the creation of numerous linear impacts from vehicle activities.

Danby Lake, along with the Cadiz Lake, Class IV management objective area, their fringes, and numerous desert pavement areas throughout the study area are subject to high levels of dust generation when disturbed (see Soils and Air Quality). If the proposed action were to occur, anticipated surface disturbances to these areas would result in temporary but high dust generation at the time of each separate vehicle pass, and additionally,whenever sufficient winds disturbed these previously impacted areas. The dust clouds produced could potentially diminish the quality of the scenic/visual resources of not only the study area, but also in surrounding areas of high quality Class I and II lands.

Within Class III management objective areas, all anticipated impacts from the proposed action fall within acceptable contrast limits except for vegetation feature contrasts in Ward Valley and South Cadiz Valley. In these areas the general character of the vegetation is quite similar, being predominantly an evenly distributed creosote scrub community. Vegetative form is minimal with what little there is reflecting changes in soil conditions. These changes in form are noticeable due to minor color changes that are gradual and form a line only when preceived from a low angle of observation. The proposed activities would potentially create many new vegetative forms through changes in both color and texture brought about by loss of vegetation. This would be especially noticeable in heavy use areas where the potential exists to denude large areas of land. A similar effect would occur where area boundaries are arbitrarily drawn through areas of vegetative continuity, thereby creating a potential line between areas of high impact and low impact.

The lines which delineate these forms are most noticeable when viewed along their lengths, especially if the line and/or the viewer are in an elevated position.

Secondary impacts. If the proposed action is approved, two major secondary impacts are anticipated, both of them dealing with those lands surrounding the study area. Dust and inadvertent vehicle overflow from activities within the study area may extend into the highly sensitive Class I and II lands that lie near the study area. Impacts to land surface, vegetation, and structure

features from vehicle impact could seriously degrade the scenic/visual resources of these generally unimpacted Class I and II lands as well as the inselberg area which is partially attractive for camping. Similarly, dust generated from ORV activities within the study area would temporarily, though significantly, degrade both the air quality and visibility in the nearby Class I and II lands.

Conclusions. In the Class IV management objective lands in Danby Lake, surface feature impacts resulting from the proposed action would result in high contrast levels for the elements of line, color and texture, while resulting in low contrast levels for the element of form. These cumulative contrasts will not meet class objectives for the land surface features in Danby Lake.

Activities resulting in dust generation on Danby and Cadiz Lakes, their fringes, and numerous desert pavement areas scattered throughout the area would at times exceed management class limits both within and outside the study area.

In the Class III management objective lands in South Cadiz Valley and Ward Valley impacts to vegetation features resulting from the proposed action would result in at least moderate contrast levels for each of the elements of form, line, color, and texture. The cumulative contrasts to the vegetation features exceed management class objective limits for this area.

Impacts to Class I and II lands in the vicinity of the study area from secondary impacts would exceed visual resource management class objectives due to the proximity and high sensitivity of these lands.

3.4.2 Recreation

Recreation impacts will be analyzed as they effect values, uses, and opportunities.

Values

National Recreation Lands. Potential impacts on the Old Woman Mountains NRL are moderate to low. Access to the lands is made difficult by the Santa Fe Railroad tracks, and the distance from the camp-pit-start areas.

Cadiz Dunes. The far southeastern extension of the CNACC identified area is within the Cadiz Open Area. A moderate potential for direct impacts from competitive events on the Kilbeck Hills loop exists. A high potential for impacts to geologic formations found in the dunes will result from unorganized ORV play outside the open area.

Uses

A high potential exists for conflicts between ORV users and other outdoor recreationists. These conflicts can be physical and/or attitudinal. Physical conflicts include those that are spatial and temporal and those that involve lost options. Spatial conflicts involve competition for space and the problems that ensue when different recreationists attempt to carry out their activities in the same space. Temporal conflicts arise out of competition for space as a result of conflicting timing. Lost options are those opportunities for recreation which are preempted by another recreation activity. Generally speaking, the more aggressive, consumptive, and uncomtemplative recreation activities preempt or drive out those that are more unconsumptive, and contemplative.

Attitudinal or value conflicts result when the experiences sought by different recreationists in the same area are incompatible. Clawson and Knetsch (1966) analyzed a recreation experience as having five major phases. These are: (1) anticipation, which may take place over a long period of time in the case of a long trip or vacation or be very short in the case of a visit to a local park after work or school; (2) travel to the site; (3) the on-site experience; (4) travel back; and (5) recollections of the total experience. Thus, any recreation experience extends through time both prior to and following the on-site activities. The experience is a complex continuum made up of values, motivations, and expectations which can be viewed as attitudinal investments. The greater the investments made by competing recreationists, the greater will be the conflicts which arise.

The impact of the proposed action will vary greatly depending on the type of recreation experience being sought. The vehicle-oriented recreationist would receive a great deal of benefit from the proposed action. Being able to compete in an organized ORV event is a tremendously rewarding experience to many city residents who feel a need to excape. Others enjoy watching a competitive event or enjoy serving as a pit crewman or flagman.

On the other hand, competitive events tend to exclude many other recreationists from the area. A competitive event can be a great distraction to anyone seeking to enjoy the desert in a nonvehicle oriented way. Hikers, campers, photo enthusiasts, artists, and "nature lovers" in general are denied the chance to experience the desert in its natural state. See possible recreation experience conflicts Table 3.3.

Opportunities

Opportunities for competitive ORV activities will be provided through the proposed action. Opportunities for unorganized ORV activity may or may not be enhanced, but to what degree is uncertain. Unorganized use is not a compatible activity prior to or during a competitive event. The impact on unorganized ORV activity will depend then on the number of competitive ORV events run, or the ability of the Cadiz open area to sustain this competitive ORV opportunity. While the proposed action will increase ORV use, whether or not this increase is sustained depends on how well recreationists like the area and to what extent crowding in other open areas forces use into this area.

Unorganized ORV activity may be expected to increase at times where there are no competitive events. Those who are introduced to the area through participation in a competitive event and find it attractive for ORV activity may return for unorganized ORV recreation. This use may impact the competitive event system, however, if unorganized users use race routes for general ORV play. Trails could be widened, unsafe hazards developed, and parallel trails developed which might lead to confusion during a race, causing hazardous situations.

Opportunities for a wilderness experience will be completely lost by instituting the proposed action. The effects and activities of man will come to dominate the area, reducing the quality of natural and wildland values now found there. The ability to find solitude will be lost to the extent that competitive and unorganized ORV activity increases in the area.

Table 3.3

Possible recreation experience conflicts of the proposed action

ACTIVITIES	Attitudinal Conflicts	Physical Conflicts	Attitudinal Conflicts	Physical Conflicts
Wilderness experience	H	H	H	L
Backpacking & hiking	H	H	H	L
Natural study	H	H	H	L
Landscape, Photography and Painting	H	H	M	L
Camping and picnicking	H	H	M	L
Hunting	H	H	L	L
Rock hounding	M-H	H	M	L
Driving for pleasure	M	L	L	L
Shooting	L	H	L	L
Recreation vehicle use	L	H	L	L

Degree of conflict: H-High
M-Medium
L-low

3.4.3 Sociocultural interests

Educational-scientific resources

A study proposed by the California State Department of Food and Agriculture and to be conducted by the team of Andrews and Hardy during the fall, 1977, will be directed at the adverse effects on insects before, during, and after the proposed action in the Cadiz Dunes area (see Section 3.2.2).

Cultural resources

The following discussion includes an evaluation of direct and indirect impacts expected to occur as a result of the different actions included in the proposed action. In addition, the proposed action is evaluated in terms of the potential impact the proposed action may have on the sites considered to be potential National Register properties.

A systematic coverage of 2.4 percent of the total area, and a familiarity with the study area, does allow for general statements about potential impacts on cultural resources. A second survey would be necessary in order to make definitive statements about potential impacts should the proposed action be implemented. Recommendations regarding further survey in the area will be presented under mitigation measures.

The proposed action

It is suggested that the following actions be taken or continued:

1. Continue the use of the Cadiz Valley/Danby Lake area as an open area for all unorganized off-road-vehicle activity.

   It is impossible to determine what specific impacts will occur if the Cadiz Valley/Danby Lake area remains open to all ORV use. It is expected that the on-going vandalism, which is particularly evident at the Iron Mountain Divisional Camp and Saltmarsh, will continue. As people become aware of the open area activity will probably increase; thus increasing the possibility of direct impact. All known and unknown cultural resources may eventually be destroyed.

   Of the known cultural resources, Saltmarsh, Iron Mountain Divisional Camp, the salt mine (4-25-A), the old cars (F3-B, 3-24-A and 4-14-A) and the foxholes (4-4-A, 4-12-A, 4-22-A and 5-9-A) are the most vunerable to disturbance because they are visible from a distance.

2. Provide for competitive ORV use 188.8 km (118 miles) of Bureau of Land Management designated courses.

   None of the known cultural resources will be directly impacted as a result of competitive off-road-vehicle use on the proposed 118 mile course. It must be noted that the full 60 m (200 feet) width of the course was not surveyed. However, the probability of locating significant cultural resources along the course are minimal. Only a small segment of the primary course and Loop 4 cut through areas suggested to be sensitive in terms of cultural resources. Both segments were walked by the archaeologist and no cultural resources were located.

One known site (4-25-A-The Salt Mine) is located within the 60 m (200 ft) width of the proposed course. The course is flagged along the road that runs to the east of the site. By the nature of the site (large steep-sided evaporation basins), it is unlikely that during a race vehicles would run through the site.

Within what has tentatively been identified as the camping area are Sites 4-4-A and 4-12-A. They are located on the side of the inselberg and are unlikely to be disturbed by activities associated with pit and camping areas. However, the proximity of a large number of people to the sites does increase the chance of direct disturbance. Although Site 4-14-A is not on the proposed course, it is visible from the course and is in the general vicinity of the finish area.

Indirect impact from competitive use of the BLM designated course will result from the increase in accessibility to and public awareness of the cultural resources. Long after the races are completed, the established racecourse will be visible, and access into presently undisturbed areas will be improved. A large number of people will become aware of the cultural resources thus increasing the possibility of vandalism and illegal collection following the races.

3. Provide for consideration of enduro and organized noncompetitive ORV vehicle event application.

   Prior to an approval of sponsor-designed courses for enduro or organized noncompetitive ORV events in the future, it will be necessary to conduct a cultural resource survey of the areas that may be affected by the action. An evaluation of the potential impacts to known and unknown cultural resources in the area can only be made following the presentation of the application delineating the proposed course(s).

4. Continue to monitor baseline study plots.

   The continued monitoring of the vegetation and wildlife baseline plots will cause little additional impact. The plots and access routes have been established. Members of both teams demonstrated the ability to recognize cultural resources in the field. The sites that were located were reported to the archaeologist. None were located in the baseline plots.

Potential National Register Properties. The Bureau of Land Management has erected a fence around a major portion of the Iron Mountain Divisional Camp, including the relief map. Since the fence has been built, segments have been illegally removed. The removed sections have been replaced. A portion of the camp, however, is not fenced and is accessible to vehicles. It is not possible to determine what impact will occur if the Cadiz Valley/Danby Lake area remains open for all unorganized vehicle activity. The unprotected portion will probably receive an increasing amount of impact resulting from vehicular disturbance. Relic collection or vandalism will probably occur in fenced and unfenced areas of the camp unless public access is monitored.

The proposed 188.8 km (118-mile) course runs to the south of the Divisional Camp. No direct impact is expected as a result of the races themselves. The races, however, will generate an increase in vehicular and human activity in the area. Unless the area is monitored, the increase in activity will increase the possibility of destruction or disturbance of the historic remains.

The only expected indirect impact resulting from competitive use of the 188.8-km (188-mile) course, is an increase in vehicular disturbance and illegal collection due to an increased awareness of the location of the site by a large number of people. Presently, access is good.

Saltmarsh is located outside the boundaries of the Cadiz Valley/Danby Lake Open Area. The southern portion of the site is on private property. Access to the site is good. This site presently attracts campers and visitors. This is evidenced by the litter and vehicle tracks. If the open area, which is adjacent to the site, continues to be used for all unorganized ORV activity, disturbance of the site will continue over and above what would be expected if the open area were closed.

The proposed 188.8-km (118-mile) course runs well to the west of Saltmarsh. The expected impact, resulting from use of the BLM designated course for competitive events, is an increase in the destruction and disturbance of historic remains due to the increase in vehicular and human activity. A large number of people would probably become aware of Saltmarsh. This awareness could lead to an increase in vehicular disturbance and illegal collection following the event.

Paleontological resources

The proposed action will have no direct or indirect impact on known paleontological resources because the remains are well below the surface of Cadiz and Danby Lakes. Further investigation will be necessary in order to determine whether or not Pleistocene lake sediments are exposed on the southwestern side of Danby Lake. If so, the sediments will have to be evaluated to determine if they are fossiliferous and whether or not the fossils are considered to be significant.

If fossiliferous sediments are located, continued use of the area as an open area and competitive use of the course may contribute to the disturbance or destruction of the sediments and fossils. The primary course on the 188.8-km (188-mile) Bureau of Land Management designated course does cut across the southwestern edge of Danby Lake.

3.4.4 Wilderness resource

The proposed actions will adversely impact wildland values in the Cadiz open area, and will greatly increase the possibility of impacting wildland values in areas adjacent to the open area.

Impacts on wildland values will result from intrusions associated with organized and unorganized ORV use, e.g., noise, loss of solitude, and effects on natural values, e.g., loss of plants, creation of vehicle use trails and unimproved roads. The potential of the area as wilderness will be lost by

managing for vehicle use which by definition is inconsistent with wilderness designation. The potential for these effects to impact adjacent wildland areas will become high as more vehicle oriented recreationists become familiar with the Cadiz Valley and vicinity. This potential is highest for areas west and southwest of the open area as they are close to the camp-pit-start area. This includes the Calumet Mountains in the Cadiz Valley wildland polygon, the Sheephole Valley and Mountains, and the Coxcomb Mountains.

3.5 OTHER USES

3.5.1 Mining

Recreational vehicle activity will not directly impact the mining operations since recreational vehicle use is excluded from the mining area. However, since human activity will increase as a result of the proposed action(s), indirect impacts (such as vandalism, theft, interference with mining equipment on the access roads, degradation of the access roads due to increased use, et cetera) should be expected.

3.5.2 Colorado River Aqueduct

The MWD facilities and property appear to be adequately protected from impacts of ORV users. Chain-link fence surrounds the aqueduct and facilities at the pumping plant.

Under existing conditions each organized event to be authorized by the Bureau will have to obtain individual authorization by MWD in order to run their event around the southern end of the Iron Mountain. As long as this situation exists, sponsors of events, BLM and MWD will be burdened with an administrative work load because separate authorizations for each event will be needed for it to cross MWD's lands.

3.5.3 Rights-of-way

ORV use of existing or proposed power line roads would increase the need of road maintenance where heavy use occurs. In the past, where BLM has permitted or required routing of ORV courses on existing roads, damage has been severe enough to require event sponsors to repair damaged sections. Damage to these roads by unorganized ORV use would become the burden of the agency maintaining them, or BLM.

3.5.4 Grazing

There is an adverse impact on grazing. Grazing is not allowed in the open area due to its incompatibility with ORV use and public safety.

3.5.5 Roads and trails

The impacts on Highway 62 would consist of added wear due to typical on-road vehicles bringing visitors to the open area and added congestion on Sunday and holiday afternoons. Such congestion is already significant on peak days and consists primarily of recreationists traveling to and from the Colorado River. Cadiz Road, being dirt, is expected to show noticeable disturbance due to recreationists' vehicles on peak days. e.g., during ORV events. The MWD roads, aqueduct and powerlines will receive a significant increase in use. The road to the Cadiz Lake salt works will receive high use because it provides good access to the dune areas and lends itself to pit racing. Vehicle damage to this road will be high. The existing trails within the open area will be engraved more deeply into the soil and, where healing is now occurring, it will be frustrated by new disturbances.

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4. ENVIRONMENTAL IMPACTS OF ALTERNATIVES

The alternatives to the proposed action, as presented in Chapter 1, are the following:

1. Close the Cadiz Valley/Danby Lake Area to all ORV use.

2. Leave the subject area open under the ICMP until the Desert Plan is adopted in 1980, but prohibit competitive events.

3. Close the Cadiz Valley/Danby Lake Area to all ORV use except for competitive events on courses designated by BLM.

4.1 NONLIVING

4.1.1 Soils

Alternative #1

The soils would receive positive benefits from closure to all ORV use. The existing ORV activity would stop. This would allow the soil crusts, and other natural stabilizers to redevelop, thereby, reducing soil erosion.

Alternative #2

The impacts to the soil under this alternative would be less than that under the proposed action. This is because the present levels of use are low, and the proposed action would increase the level of use and the impact on soils. However, even the present low level of use will produce increased erosion and compaction.

Alternative #3

This alternative would probably increase use above present levels (Alternative #2).

4.2 LIVING COMPONENTS

4.2.1 Vegetation and wildlife

Alternative #1

There would be no negative impacts to the vegetation and wildlife of the area as a result of this alternative action. There would however be some positive effects. Closing the area to all ORV activity would allow the vegetation and wildlife to attempt to recover from damage resulting from past use. In addition, all threats from ORVs to the viability of the rare plant populations occurring in the open area would be removed.

Alternative #2

Although the actual use of the area in the future is unknown and difficult to predict, the potential degree of impact of leaving the area open to only unorganized ORV use would be directly related to the intensity of use. If the area becomes popular, the impacts of heavy use on vegetation and wildlife

would be high and might even exceed the impacts discussed in Sections 3.2 and 3.3. If, on the other hand, the use is of low intensity and long in duration, the long-range environmental impact would be a slow but progressive degradation of the ecosystem. In addition, the viability of all three populations of rare plants would be severely threatened.

Alternative #3

Although this alternative appears to close the area to unorganized ORV activity, major random use from spectators and participants at competitive events would undoubtedly occur. Therefore, there would be no low-intensity use, and no low impacts are expected as a result of this alternative action. A single competitive event and its associated spectator play may be short in duration, but are of very high intensity. The negative impacts to both plant and wildlife species and habitats from such intense use would be high and have been discussed in Sections 3.2 and 3.3. Cumulative impacts of such high-intensity, long-duration use would be extremely severe, and it is expected that these impacts (see Section 3.2) would be permanent. Consequently, this alternative is anticipated to result in significant environmental loss.

4.3 HUMAN INTEREST VALUES

4.3.1 Scenic/Visual resources

Alternative #1

Total closure to all ORV activity would meet and exceed all management class objectives. This would in effect remove all current recreation use from the area, and over a period of time, would allow healing of existing scars, thereby creating a more natural appearing landscape.

Alternative #2

With the exception of Danby Lake, the landscape is able visually to absorb impacts resulting from the present level of unorganized ORV use. The continuance of unorganized ORV activity at present levels would be compatible with existing scenic/visual management objectives. If future use increases to a level comparable with that anticipated under the proposed action, impacts to the scenic/visual resource would also be comparable to those outlined in Sections 3.4.1.1 and 3.4.1.2. At some unknown level of use between these two extremes, scenic/visual management class objectives would be exceeded. If this alternative is chosen, the environmental sampling plots (ESP) monitoring points should be established so that ongoing monitoring could be made of existing scenic/visual conditions, and notification given to the District Manager if impacts began to exceed management objective standards.

Alternative #3

Closure to all ORV use except competitive events on BLM designated courses would not meet management class objectives without mitigation. High impacts to vegetation in Cadiz and Ward Valleys, and high visual impacts to Danby Lake, would result from the proposed action. Dust generated within the study area would, at times, result in temporary high visual impacts to

adjacent Class I and II lands. The presence of highly scenic and diverse Class I and II lands directly adjacent to the proposed use area, as well as the inselberg area, would present an attraction that might generate unorganized ORV use during nonevent periods. The extent of such use cannot be anticipated, and impacts to these lands could range from low to high.

If this alternative is chosen, the ESP monitoring plots should be established both within the study area and at key observer points (not yet identified) in adjacent areas to monitor the condition of the scenic/visual resource. Should mitigation measures prove ineffective, the District Manager would be notified when scenic/visual management objectives are exceeded.

4.3.2 Cultural resources

Alternative #1

Closure of the Cadiz Valley/Danby Lake area to all ORV use would cause no known adverse impact on the cultural resources. Closure would, most likely, slow down the present rate of vehicular disturbance, vandalism and illegal collecting because fewer people would be attracted to the area.

Alternative #2

Opening the area only to noncompetitive ORV use would contribute to the continuation of the impact presently taking place in the open area. As more people become aware of the open area, impact on known and unknown cultural resources is likely to increase due to the increase in vehicular activity. In addition, vandalism and illegal collection is likely to increase as more people become aware of the cultural resources in the area. Direct impact would be extremely difficult, if not impossible, to assess, monitor and control.

Alternative #3

Opening the area to only competitive events on Bureau of Land Management designated courses would probably have a minimal direct impact on known cultural resources because it would be possible to monitor and control activities or actions that would result in direct impact. The likelihood of unknown cultural resources being disturbed or destroyed would be low.

Competitive events, however, attract a large number of people. This might lead to an increase, over the present rate, in vehicular disturbance, vandalism and illegal collection of cultural resources following the competitive events.

4.3.3 Paleontological resources

Alternative #1

Closure of the Cadiz Valley/Danby Lake area of all ORV use would have no known adverse impact on the palentological resources.

Alternative #2

Continuing the open status of the area would have no impact on known paleontological resources. If fossil-bearing sediments were located along the edge of Danby Lake, ORV use in the area might contribute to the disturbance of the context of the fossil locations, and possibly to the destruction of the remains.

Alternative #3

Opening the area to only competitive events on Bureau of Land Management designated courses would have no impact on known paleontological resources. A portion of the 188.8-km (118-mile) course does cross the area which may contain fossil-bearing sediments. If fossiliferous sediments were located, competitive use of this portion of the designated course would contribute to the disturbance or destruction of the context of the paleontological remains and the remains themselves.

5. MITIGATION MEASURES INCLUDED IN THE PROPOSED ACTION

5.1 NONLIVING

5.1.1 Soils

A site-specific soils analysis sufficient to demonstrate that the impacts outlined in Chapter 3 will not take place or can be mitigated is needed. For wind erosion potential, this must include adequate breakdown of particle sizes less than 50 microns, analysis of the size, abundance, and distribution of organic and nutrient components of the soil, and components potentially harmful to health. The likely final depositional areas of wind-eroded slats from the dry lake areas should be analyzed in terms of the adverse effects on plants, animals, and water quality (Wilshire 4/29/77).

5.1.2 Ordnance contamination

The Cadiz Valley/Danby Lake area must be cleared of dangerous military ordnance and certified safe for all uses by the proper agency.

5.2 LIVING COMPONENTS

5.2.1 Vegetation

Attempts will be made to minimize the impacts to the vegetational components by using the following measures:

1. Racing will be prohibited when the soil is wet in order to minimize the impacts due to soil compaction.

2. Racing will be prohibited during peak annual and perennial growth periods, to ensure that a seed crop is set for the following year.

3. The race course will be kept a maximum of 60m (200 ft.) wide to minimize destruction of all habitat types.

4. The collection or use of any tree, shrub, perennial herb, or annual material (dead or alive) for any use, including fire wood, will be prohibited to prevent depletion of scarce organic matter.

5. In the event that succeeding races were to take place, the same camping and pit areas will be used to prevent the total destruction of new areas.

6. No camping will be permitted by either competitive or noncompetitive users in the dunes.

7. The race course on the southeastern corner of Danby Lake will be moved at least 1 mile to the north to protect the population of *Antinhinum filipes*.

8. The dunes south of Danby Dry Lake will be closed to ORV use, to protect the rare plant populations, Pholisma arenarium.

9. Creosote rings located on the race course or in the start, finish, pit and camp areas will be fenced to protect them from ORV damage. Personnel will be stationed at these sites during any competitive event to prevent loss or disturbance of the creosote rings.

5.2.2 Wildlife

1. Minimize the amount of wildlife habitat receiving intensive or competitive ORV use by (1) establishing a fixed number of ORV courses and rejecting applications for courses other than the ones covered in this environmental assessment report; (2) confining the camp, start, finish, and pit areas to areas proposed by this environmental assessment report; and (3) requiring surface restoration of approved courses where necessary to preclude the need for moving the courses to new locations when they become unusable for ORV's.

2. Minimize the destruction and harassment of breeding and migrating wildlife by prohibiting competitive events from mid-February to mid-May.

3. Minimize the destruction and harassment of resident wildlife by prohibiting all night use, both competitive and noncompetitive.

4. Minimize destruction of well established palo verde washes by prohibiting a course in the wash from starting in SW¼, Section 22, T. 1 S., R. 17 E and ending in SE¼, Section 23, T 1 S., R. 17 E., Iron Mountain Quad, San Bernardino Co., CA. Also, determine significant catchments for this drainage, and prohibit their use to prevent indirect effects of increased runoff.

5.3 HUMAN-INTEREST VALUES

5.3.1 Cultural resources

All of the following mitigation measures should be adopted if the proposed action is approved. They are presented in three groups. Those included in the group entitled "General" pertain to both the open area and the BLM-designated courses. Those listed under "Open Area" relate to keeping the Cadiz Valley/Danby Lake area open to all unorganized ORV use. Under "BLM-Designated Courses" are the mitigation measures that pertain to competitive ORV vehicle use on the 188.8 km (118 miles) of BLM-designated coruses.

General

1. Post permanent but replaceable signs at the Iron Mountain Divisional Camp which indicate that the camp is deemed to possess historical value, that research is going on in the area, and that all cultural remains are protected by the Antiquities Act of 1906.

2. Post permanent but replaceable signs at Saltmarsh which indicate that the site is deemed to possess historical value, that research is going on in the area, and that all cultural remains are protected by the Antiquities Act of 1906.

3. Post permanent but replaceable signs at Site 4-25-A (the salt mine which indicate that the site is an abandoned salt mine and all cultural remains are protected by the Antiquities Act of 1906.

4. Post signs at Iron Mountain Division Camp prohibiting camping.

5. Post signs at Saltmarsh prohibiting camping.

Open area

1. Conduct an intensive cultural resource survey, using at least two archaeologists, around the base of the Iron Montain and Kilbeck Hills.

2. Conduct an intensive cultural resource survey, using at least two archaeologists, around the lakeshore of Danby Lake and Cadiz Lake.

3. Conduct additional intensive cultural resource survey in the Cadiz Valley/Danby Lake Open Area to bring the total surveyed area up to at least 25 percent.

4. Assess whether any of the cultural resources, which were located during these additional surveys, appear to meet the National Register Criteria of Eligibility. If so, follow procedures prescribed by the Advisory Council on Historic Preservation (36 CFR 800).

5. Establish and carry out recommended mitigation measures determined as a result of the additional surveys.

6. Determine the boundaries of Site A, and collect remains of Site A and Site LS-1.

7. Collect remains at Site AM1 and place test holes in the possible shelter to determine if any subsurface material exists.

8. Obtain a carbon sample from Site F3-D, if possible, for dating purposes.

9. Make a determination as to whether any agency, institution, or museum can use the old cars and car parts (Sites F3-13, 3-24-A, 4-14-A) for interpretive, educational or scientific purposes. If so, the car bodies and parts should be removed.

10. Evaluate and remove any historic objects from Site F3-C that may be used for interpretive, educational or scientific purposes.

BLM-Designated courses

1. Complete the survey of the proposed course, using at least two archaeologists. Survey a width of at least 60m (200 feet) since this has not been done.

2. Evaluate and mitigate any cultural remains located along the BLM-designated course.

3. Evaluate all alterations in the proposed BLM-designated course and the camping and pit areas in terms of known and potential presence of cultural resources, and survey those areas not previously surveyed.

4. Evluate and mitigate any cultural remains located as a result of alterations in the proposed BLM-designated course and the proposed camping and pit areas.

5. During any competitive event, advise participants and spectators of their responsibility to protect the cultural resources.

6. During any competitive event, constantly patrol Iron Mountain Divisional Camp to prevent any inadvertant loss or disturbance of cultural remains.

7. During any competitive event, constantly patrol Saltmarsh to prevent any inadvertant loss or disturbance of cultural remains.

8. During any competitive event, constantly patrol the area included in Site A (if not previously mitigated) in an unobtrusive manner in order to prevent loss or disturbance of cultural remains and yet not attract attention to the location of the site.

9. During any competitive event, restrict the designated course along the edge of Site 4-25-A (the Salt Mine) to the width of the exisiting road and patrol the area during an event to assure compliance.

10. During any competitive event, periodically patrol any known cultural resources, not previously mitigated, within the vicinity of a camping, pit or spectator area.

5.3.2 Scenic/visual resources

Mitigation measures necessary to meet Class III management class objectives in South Cadiz and Ward Valleys and the inselberg area consist of the following:

1. Highway 62 access and egress will be allowed only at Cadiz Valley Road. This will reduce the amount of form, line, color and texture alteration directly adjacent to State Highway 62 (Eligible State Scenic Route and primary viewer location in this area).

2. No camping, start areas, finish areas, or pit areas will be allowed in these Class III lands, thereby reducing potential areas of form, color and texture contrast produced by vegetation loss in and around concentrated use areas.

3. Wherever possible, race courses will be routed so as to avoid these Class III lands. Where routing through these lands is unavoidable, the following guidelines will be followed. The courses will be routed no closer than 1.6 km (1 mile) from area boundaries in order to reduce visibility of the potential form, line, color and texture impacts along unnatural boundaries and also to reduce potential spillover activities in boundary areas. Courses will cross previously disturbed areas wherever possible; curves that follow existing landforms are more in harmony with the natural landscape. Within 4.8 km (3 miles) of Highway 62, routes will run in a manner which roughly parallels Highway 62 wherever possible. This will reduce the amount of contrast readily evident from Highway 62, the primary viewer location in the area. Course routes will not lie within 60m (200 feet) of well developed washes. Assumed 60-m (200-foot) average course width converts to 90-m (300-foot) minimum from wash centerline to race course centerline. Where it is necessary for race courses to cross well developed washes, the crossings shall be at a 90^{o} angle to the washes, and no more than 9m (30 feet wide). These mitigations will greatly reduce potential race-related impacts to the vegetative line, form, color, and texture of the limited number of well developed washes in these Class III lands.

4. BLM personnel will be present to observe all pre-event, event, and post-event activities, and to enforce mitigation measures, race course boundaries and I.C.M.P. designations on adjacent lands.

5. A signing system will be utilized to mark area boundaries as per existing BLM signing procedures.

6. A scenic-visual resource monitoring program will be established to monitor these resources both on and adjoining the proposed open area. This monitoring program will follow the established BLM methodology for establishing and monitoring environmental study plots (see BLM Manual 1791 - Riverside District Manual Supplement).

7. To mitigate high impacts in Class IV lands, race course loop number 5 (Danby Lake loop) will be modified to cross the lake along established vehicle routes, thereby reducing additional visual contrast to the lake surface. As an additional measure, the District Manager will be notified if use begins to degrade the scenic quality below management objective class guidelines as evidenced through the monitoring program (Appendix E). Such notification will result in a reduction of permits or modification of courses until impact levels are reduced to within class guidelines.

5.3.3 Paleontological resources

1. Determine whether Pleistocene lakebed sediments are exposed along the southwestern side of Danby Lake. If so, evaluate the sediments in terms of potential significant fossils being present.

2. Make alterations in the proposed BLM-designated course to avoid sensitive paleontological resources if they are determined to be present.

5.4 OTHER MITIGATION MEASURES

5.4.1 Open Area Management Plan

As a result of this environmental analysis, an area management plan is needed to implement the necessary mitigation measures included in the proposed action. The following objectives will be accomplished by the management plan:

1. Field inspections of the established course by an interdisciplinary team will be required. Prior to each event, it will be the Bureau's responsibility to select which course would be the least detrimental to the area's resources for the season in which an event is proposed.

2. Establish the number of events per year and the number of entrants each event can support as dictated by the Base Line Study data.

3. Establish where rangers will be needed to monitor each kind of event on each course and provide for the monitoring.

4. Identify the locations where environmental sampling plots (ESPs) will be needed on the course and how often they will be read and evaluated.

5. Provide for the means of using ESP's to make routine management changes within the scope of the area management plan. This requires the establishment of criteria of permissable impact that can occur before a course must be changed.

6. Clarify coordination channels with the MWD. It may be necessary for this to take the form of a cooperative agreement between the Bureau and the District.

7. Provide recognition of the unprotected historical values associated with General Patton's World War II training maneuvers (SW¼, Sec. 14 T., 1 S., R. 17E.) and provide means of incorporating them into an expansion of the original 0.8- by 2.8-m (0.5- by 1.8-mile) fenced enclosure.

8. Specifically identify areas with cultural value not of enough significance to fence, but of enough significance to require rerouting of ORVs that would potentially impact them.

9. Establish a signing plan to reduce spillover impacts on areas outside the open area.

10. The Bureau is to conduct compliance inspections prior to, during, and after each event to insure that all regulations and stipulations required by SRUP have been met.

11. The Bureau is to require the event sponsor to restrict the unorganized ORV play at organized events to the open area. This would require the event sponsor to police his own ranks, and failure to do so would be considered noncompliance with the SRUP stipulations.

12. Event sponsors will be required to restore any roads used or crossed during an event to a condition at least as good as before the event.

13. SRUP stipulations must require that race sponsors notify race participants of potential ordnance hazard.

14. The number of participants in any event will be limited to 500.

15. All races are to be subject to immediate BLM cancellation or postponement in the event of a rain or wind storm, or for any other reason the BLM feels is sufficient to cancel or postpone a race.

6. ADVERSE IMPACTS THAT CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

Observations of motorcycle and 4-wheel-drive vehicle competition events, and of frequently used competition areas, show that certain adverse impacts are unavoidable despite mitigations. Some of these impacts are tangible and some are intangible. The tangible factors, i.e., soil, plants, wildlife, are readily measured and quantified. The intangible factors or values, e.g., those relating to aesthetics and recreation though less easily quantified, are no less important. A discussion of these tangible and intangible elements follows.

6.1 WATER

Although there would be no direct impact on water resources, an indirect impact in the form of added turbidity to the occasional overland flows of water in areas where vehicle tracks are concentrated, and the runoff on the fine-textured soils, can be expected. Compacted soils may also retard recharge of groundwater supplies.

6.2 SOILS

Vehicle destabilization of the surface will greatly accelerate erosion. Because the drainage is into closed basins, the likely cause of off-site effects will be wind erosion. As the various natural barriers to erosion are broken down by vehicle use, the soils not only become directly exposed to wind erosion, but enormously larger volumes of fines are exposed to water erosion. Water erosion then winnows out the fines and distributes them in the main drainage channels in flat sheets with large surface exposure where they are vulnerable to wind erosion. The use envisioned will accelerate these combined forms of erosion for a very long time.

6.3 AIR

Competitive events in the area can be expected to temporarily increase oxidant and carbon monoxide levels as well as dust levels. Increases in blowing dust will persist after events until the infrequent rains reseal protective crusts broken by ORV tires. Wind erosion of disturbed soils (blowing dust and sand) can also adversely affect air quality, and is expected to persist after a given event until the next significant rain. This may aggravate driving safety problems on Highway 62 during windstorms.

6.4 NOISE

The noise levels created by competitive ORV events are intense but generally of short duration. At any given point, the noise would increase from almost total silence to loud noise levels and back again to almost total silence. This loud noise level would last from 30 minutes to 5 hours, depending on the type of event and the number of participants. Noise from casual ORV use would persist as long as such users are in the area.

6.5 LIVING COMPONENTS

6.5.1 Vegetation

The proposed mitigation will not significantly reduce the impacts of this action on the vegetation components of the environment. Those impacts, discussed in Chapter 3, are summarized here. Table 3.3 summarizes acreages impacted for each habitat type. The following impacts will occur: reduction in the total number of perennial shrubs; reduction in the canopy cover of individual perennial shrubs; reduction in the diversity of perennial shrub species; reduction in the diversity of both annual and perennial herbaceous species; reduction in the numbers of annual wildflowers that will germinate and flower in the years following the race; increased growth of weedy species; impairment of plant growth from soil compaction, increased dust, and exhaust pollutants; and degradation of soil biota.

Severe soil compaction reduces permeability and porosity of the soil, thereby essentially eliminating plant growth of any kind. Such compaction can greatly reduce or block emergence of shoots from germinating seeds. This reduced potential for seed germination and plant growth reduces the chances of vegetation becoming reestablished and prolongs the period required for habitat recovery.

Although adverse impacts to creosote rings from competitive ORV use can be mitigated on the racecourse, it is not feasible in terms of economics or personnel to mitigate for adverse impacts from noncompetitive use throughout the entire open area. Therefore, adverse impacts to creosote rings can be anticipated as discussed in Section 3.2. Recovery of the rings from such impacts will require decades or centuries, if recovery occurs at all.

The viability of the population of borrego locoweed, Astragalus lentiginosus var. borreganus, a highly sensitive species, is threatened by the proposed action. Due to its widespread occurrence throughout the desert dunes and sandhills habitat of the Cadiz Valley/Danby Lake areas, it is impossible to mitigate the expected impacts to this rare species without totally closing the area to ORV use.

The overall effect of ORVs on desert vegetation is to reduce the variety of native species and the size of their populations. In areas of heavy use, they completely denude the landscape. In disturbed desert areas, natural revegetation occurs at a slow rate. Estimates for recovery of vegetation range from decades to centuries depending upon climatic factors, degree of soil compaction, extent of introduction of exotic plant species, and extent of damage to the vegetation. In heavy use areas, impacts will be long-lived to permanent and recovery will take many decades, if it occurs at all.

6.5.2 Wildlife

The proposed action, if approved, would cause unavoidable impacts to wildlife. Assuming complete compliance with the mitigating measures, there will still be heavy impacts to the 1680 ha (4200 acres) of wildlife habitat which lies on the proposed courses, pit areas, and camp areas. Adverse impact of ORV racing on wildlife are thoroughly discussed in Chapter 3. Briefly, unavoidable impacts to wildlife inhabiting the proposed race courses, pit and camp areas will be:

1. Animals will be run over and killed.

2. Burrows will be destroyed and animals will be crushed within.

3. Soil compaction will make new burrowing more difficult or impossible.

4. Intense noise may affect reproductive biology of small mammals, reptiles, and especially birds.

5. Loss of vegetation will mean a loss of cover, food, and burrows and nest sites.

In addition to the severe impacts to wildlife directly affected by competitive racing, the remainder of the open area will receive more diffuse damage due to pit racing by spectators and an anticipated increase in noncompetitive use as more ORV recreationists become aware of the area. Impacts of this diffuse use are difficult to predict but severity of impacts would correspond to intensity and length of use. It has been pointed out in Chapter 3 that wildlife populations generally recover quickly when habitat (i.e., soils and vegetation has recovered. However, recovery of vegetation is very slow in desert areas and vegetation may never recover to preimpact conditions. As a result, wildlife may never recover to preimpact conditions.

In summary, damage is incurred by any race or event on undisturbed land. Vegetation is damaged and lost, soils disturbed and compacted, and wildlife populations disturbed with losses to some animals. If the disturbed site is not reused, recovery will take place gradually. Crushed shrubs may resprout from root crowns and weedy annuals fill in as ground cover. Animal populations will return to prerace levels as the habitat recovers. However, if the site is used again, damage increases. Shrubs resprouting from root crowns may be destroyed; there is additional compaction, erosion, and deflation of soils. Wildlife populations are again disturbed. Trails along the motorcycle course are widened and pit areas enlarged. The amount of acreage disturbed increases. Increased use, even on an intermittent basis, results in increased damage and disturbance. Potential for total recovery decreases and the time span for restoration increases. With repeated use, the soils and vegetation may be so severely damaged that recovery may never occur (BLM, 1974).

6.6 HUMAN INTEREST

6.6.1 General

Large concentrations of participants, spectators and events support personnel would congregate at the staging areas.

Traffic and human congestion would occur despite efforts to minimize these problems.

Despite normal precautionary measures as well as the mitigations in this

proposed action, a threat to the safety of the racers would exist. Serious lacerations, contusions, and bone fractures are common injuries in ORV competitive events. The possibility of death must also be reckoned with. This danger is generally understood and is regarded as an inherent element of the competition.

6.6.2 Scenic/visual resources

Unavoidable adverse impacts to scenic/visual resources, such as the presence of man, his ORVs, campers, tents, etc., and the associated dust, noise, smoke, and night lighting would be evident in varying degrees throughout the year for the duration of the proposed activity.

The cumulative impact of repeated impacts to surface and vegetation features will have some effect, but the degree cannot be accurately anticipated. At the least, one can expect that the entire area will receive random surface disturbance and vegetation alteration with areas of increasing impacts of up to 100 percent surface disturbance. Similarly, great vegetation loss in heavy-use areas with unknown recovery potential after extended use is anticipated. Heavy unorganized ORV activity is anticipated on Danby Lake as a result of this proposal which will result in highly noticeable color and line contrasts. With the exception of Danby Lake, these unavoidable adverse impacts would be within Class III and IV visual resource management objective class lands if the mitigation measures listed in Chapter 5 are complied with.

In the Class I and II lands in the vicinity of the study area, mitigation measures would not be sufficient to reduce impacts to within management class objective limits. Dust generation will periodically and temporarily reduce visibility and scenic values significantly in these surrounding lands. Direct impacts from ORVs attracted to these surrounding lands is expected, but the level of intensity cannot be accurately determined.

6.6.3 Recreation

Adverse impacts upon natural and wildland values, and nonvehicular oriented recreation opportunities and uses are unavoidable. Physical impacts of competitive and noncompetitive ORV use upon resource values will result from damage and destruction of geological and biological features. Wildland values of solitude and freedom from mechanical intrusions will be lost during competitive event periods. Nonvehicle-oriented recreationists such as hikers, campers, photo enthusiasts, artists and hunters will be displaced if it develops. These same recreationists will also be impacted indirectly through ORV use and its subsequent vegetative and aesthetic disturbance through tracks, camping areas, etc. The net effect is to lower this area's desirability for some forms of recreation use, and the people affected undoubtedly will go elsewhere to pursue their interests in areas not impacted by this intensity of ORV use (Badarracco, 1976).

6.6.4 Sociocultural interests

In spite of mitigation measures, some cultural resources will probably be disturbed or destroyed as a result of direct and indirect impact from the proposed action. Those sites mitigated through collection or excavation will be adversely impacted since collection or excavation involves destruction of the site as an entity.

6.6.5 Educational and scientific resources

Educational and scientific values and uses of the Cadiz Dunes as a unique geological feature recognized by the California Natural Areas Coordinating Council are not compatible with the type of use anticipated in the open area.

6.7 STATE AND PATENTED LANDS

About 4608 ha (11,520 acres) of the open area is in private ownership. The location of most of these lands is not readily discernible in the field. It is anticipated, therefore, that they will be vulnerable to ORV trespass. The location of these lands is such that, where possible, routing courses around them will intensify ORV damage to National Resource Lands.

7. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

There are multiple long-term effects that reduce the productivity of the living components of the environment. Reduction in productivity occurs through loss of, and disturbance to, soils and from damage and destruction of annual and perennial vegetation. Losses of vegetation and soils constitute losses to wildlife habitat. With loss of habitat, major changes in abundance and composition of animal species in the biotic communities are expected to occur. When numbers of animals, diversity of species, and biomass are reduced, plant and animal communities are simplified and stability is reduced. Productivity is lowered.

Recovery of wildlife populations is dependent upon restoration of habitat. Recovery to the soil and vegetation is dependent upon the extent of damage and varies considerably. Annual vegetation is likely to require up to 10 years or more to return to its natural state. Perennial vegetation is likely to require many decades and, in some cases, centuries to return to predisturbance conditions. In some areas where soil compaction has been severe or where invasion of exotic weedy species has occurred, recovery may never take place. Therefore, recovery of wildlife populations and productivity is also variable and is likely to require anywhere from 1 to over 100 years, or, perhaps never. Certain species with low population numbers and limited available habitat may never recover if habitat losses are severe.

If use of the area is continued, productivity will continue to decline, the acreage affected will increase, and the time for recovery lengthen. If use of the course and race-related areas is discontinued, time for return of productivity to former levels (soils, vegetation, and wildlife populations) will require over 100 years. It must be stressed, however, that even if recovery should occur, there is no guarantee that the wildlife and its habitat that would develop in the Cadiz Valley/Danby Lake area would either be desirable or resemble the present one.

The effects of the proposed action on the existing scenic/visual resources range from short-term degradation due to the presence of man and his vehicles and their associated noise, dust, nightlighting, etc., to longer-term degradation resulting from modification of surface and vegetation features such as the creation of roads, trails, and denuded areas, plus decreased visibility from more frequent dust episodes. This scenario is contrasted with the proposition of retaining these relatively unintruded, moderate scenic quality, large scale landforms in their current condition to be used primarily as low volume, non-consumptive use areas.

The loss of satisfaction of those who enjoy the desert for its natural values and state will be lost for both those who wish to visit the site of the open area and for those whose benefits stem from the "existence factor". Those who do visit the area will find their recreational experience impaired. This impairment would suppress and eventually displace recreation not ORV-oriented (Badaracco, 1976).

Information gained during the assessment of the cultural resources will contribute to an understanding of the history and prehistory of the Cadiz Valley/ Danby Lake Open Area. However, cultural resources are nonrenewable, and once they are disturbed, whether from vehicular disturbance, vandalism, or mitigation procedures, their cultural value (scientific, educational and interpretive) is diminished permanently or lost completely.

If significant fossiliferous sediments are located in the area, this will contribute to an understanding of the geology and past environments in the study area. Knowledge that the sediments are not present will also contribute to future scientific investigations in the area.

Paleontological resource are nonrenewable resources. If fossils or their context are disturbed or destroyed, their scientific value is diminished or lost completely.

The long-term productivity of the recreation/aesthetic environment must be considered against the benefits of short-term social gains. The immediate short-term economic gains and psychosocial satisfaction of those associated with the proposed action are obvious. Less obvious are the potential and perhaps likely long-term consequences:

1. The proposed action will result in loss or deterioration of natural, cultural, recreation, and aesthetic values which would otherwise be passed on to future generations.

2. The proposed action will further marshal that trend which extends to the nation's wild lands from the habits, activities, commotion, and pollution of the urban world. Thus, the integrity of the desert itself will be further impaired. To the extent that the inherent qualities of the California desert are reduced or lost, the American people lose long-term resource diversity, options, and opportunities.

The significance of the overall changes the proposed action would produce in the area are not readily apparent because we have no satisfactory scale with which to measure them. Until the Bureau establishes a baseline, we will not be in a position to develop criteria with which to say whether significant long-term productivity or long-term resource values have been lost, maintained or enhanced.

8. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The proposed action will result in permanent loss of soil by wind and water erosion along the trail, and the start, check, refueling, and finish points. Soil disturbance throughout the study area will be a long-lived to permanent impact with a recovery time of over 50 years, if it occurs at all. Such severe soil disturbance in heavy-use areas will prevent natural revegetation. Thus, cumulative impacts resulting from repeated use of popular areas will cause irreversible damage to vegetation.

Creosote rings, as unique vegetation features of great antiquity, will also be a significant environmental loss. Because most desert species, including creosote, require many decades to centuries to recover, they are not renewable in the short term. Thus, commitment of these resources is essentially permanent.

If the proposal is adopted, nine motorcycle races will be held in the Cadiz Valley Open Area instead of the Johnson Valley Open Area. As the fuel consumption in Cadiz Valley will be roughly the same as that in Johnson Valley, the energy to be considered is that required to drive the additional distance from Johnson Valley to Cadiz Valley. Cadiz Valley is approximately 50 miles further from most urban centers (San Diego, Los Angeles, Orange County, etc.) than Johnson Valley. Using EPA 1977 gas mileage figures for the average car sold in the United States (29.7 km or 18.6 mi/gal.), the average 1977 vehicle will require an additional 5 gallons to go to and from Cadiz Valley. Using data collected from previously held events, an average of 800 vehicles will be used for transportation to get to Cadiz for each race. Thus, for each race, 4300 additional gallons of gas will be used for transportation to Cadiz. For nine events, this figure becomes 39,000 gallons. This assumes that all the vehicles are average 1977 cars. Since many of the vehicles will be older recreational vehicles, the increased fuel consumption will be higher than 39,000 gallons.

Irretrievable losses to wildlife would occur in areas of irretrievable habitat (soil and vegetation resources) loss. Severe habitat disturbance would occur at least throughout the 4200 acres of racecource. This loss of habitat would not be permanent in the strict sense, but would require decades or centuries to regenerate. Wildlife will return to preimpact levels as the habitat recovers (BLM, 1974), but in the meantime, wildlife resources would be committed. In areas heavily impacted by racing and associated activities, species numbers and diversity of mammals, reptiles and resident birds will be greatly reduced (BLM, 1976; Byre, 1973; Busak and Bury, 1974). Fewer species and numbers of migrating birds, which are a significant nonconsumptive wildlife resource, will be attracted to the area because of reduction of vegetation used for cover and feeding.

Long term degradation of 2.3 percent of the total open area by the racecourses, plus an unknown additional amount due to increased ORV use, represents a reduction in feeding grounds used by prairie falcons, sparrow hawks (Blue Listed) as well as other high-level predators. Reduction in feeding ground may cause further population decline of these already declining species.

Finally, destabilization of the ecosystem may cause further irreversible impacts to wildlife which are not yet understood.

Scenic/visual resources rank among those resources that may be significantly altered during and beyond the life of the proposed action. This is especially true in terms of the effects of vegetation alteration and loss, and surface disturbances to the visual integrity of the study area.

Estimates of the time required for these areas to return to their natural condition range beyond hundreds of years.

The context of cultural resources yields most of the scientific information that contributes to an understanding of man's past. Therefore, given the proposed action, loss of cultural resource information will occur as a result of direct and indirect impact. Mitigation of cultural resources involves an irreversible and irretrievable commitment of the resources.

9. CONSULTATION AND COORDINATION WITH OTHERS

American Motorcycle Association

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Dimmitt, Mark - Ecologist, Riverside District, BLM

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Olsen, William - Archaeologist, California State Office, BLM

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Riverside County Planning Department

San Bernardino County Environmental Improvement Agency

San Bernardino County Museum

Smith, George - U. S. Geological Survey

Southern California Air Pollution Control District

State of California Department of Food and Agriculture

Weaver, Don - Caltrans

Wilshire, H. G. - U. S. Geological Survey

10. INTENSITY OF PUBLIC INTEREST

The public interest in the proposed action falls into two major categories: ORV-oriented users and conservation-oriented users. General public interest in use of the California desert is high. Especially high interest results from BLM actions regarding ORV events, either with large number of participants or in areas not previously used for such events. Since distribution of the first draft of this environmental assessment last fall, several letters expressing opinions of the proposed action have been received. These letters are included in Appendix H.

In 1975, the Bureau contracted a statewide survey of California residents to obtain preliminary data regarding use, recreational demand, and attitudes regarding the California desert (BLM 1975b). The results of this survey do provide some indication of the general public's interest in desert wildlife species. They show (1) a substantial use of the desert by the public, (2) and expressed demand for a variety of recreational activities, and (3) a general public concern in protecting and maintaining the desert's ecology, wildlife, naturalness, and historic features.

The most important issues recognized by respondents to the statewide survey ranked as follows: more protection of desert wildlife and ecology, first; more protection of areas of historical importance, second; less development of all kinds, third; and more places for ORV use, nineteenth.

Respondents to the Bureau's contracted survey ranks as least important: more motels and eating places, first; more places for use of ORVs, second; and more places for organized recreation, third.

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Bell, Alice C. - Production

Bell, Daniel - Recreation Technician

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APPENDIX A

BIOLOGICAL RESOURCES, PLANT SPECIES

Table A.1. Plant species by habitats

COMMON NAME AND SCIENTIFIC NAME	Habitat types							Comments
	Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	
Trees:								
Acacia *Acacia* sp.							X	Introduced
Carob *Ceratonia siliqua*							X	Non-native, Introduced
Palo verde *Cercidium floridum*						X	X	
Desert willow *Chilopsis linearis*						X	X	
Smoke tree *Dalea spinosa*						X	X	
Eucalyptus *Eucalyptus* sp.							X	Non-native, Introduced
Mulberry *Morus* sp.							X	Non-native, Introduced
Olive *Olea* sp.							X	Non-native, Introduced
Date palm *Phoenix* sp.							X	Non-native, Introduced
Pine *Pinus* sp.							X	Non-native Introduced
Cottonwood *Populus fremontii*							X	Native, Introduced
Screw-bean mesquite *Prosopis pubescens*		X					X	Native, Introduced

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Trees (continued):								
Tamarisk *Tamarix aphylla*		X					X	Non-native, Introduced
Tamarisk *Tamarix ramosissima*		X					X	Non-native, Introduced
Elm *Ulmus* sp.							X	Non-native, Introduced
Fan palm *Washingtonia filifera*							X	Native, Introduced
Shrubs:								
Cat's claw *Acacia greggii*				X		X		
Burro-weed *Ambrosia dumosa*		X	X	X	X	X	X	
Wingscale *Atriplex canescens* ssp. *canescens*		X						
Desert holly *Atriplex hymenelytra*			X					
Allscale *Atriplex polycarpa*		X				X		
Sweet bush *Bebbia juncea*						X		
Bougainvillea *Bougainvillea* sp.							X	Non-native, Introduced
Bottle brush *Callistemon* sp.							X	Non-native, Introduced
Desert senna *Cassia armata*				X				

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Shrubs (continued):								
Dyeweed Dalea emoryi					X			
Brittle bush Encelia farinosa var. farinosa			X	X		X		
Brittle bush Encelia farinosa var. phenicodonta						X		
Rayless encelia Encelia frutescens			X	X		X		
Mormon tea Ephedra californica		X		X	X	X		
Mormon tea Ephedra sp.			X					
Smooth-stemmed fagonia Fagonia laevis			X	X				
Barrel cactus Ferocactus acanthodes			X					
Cheese bush Hymenoclea salsola				X	X	X		
Desert lavender Hyptis emoryi						X		
Bladder-pod Isomeris arborea				X				
Juniper Juniperus sp.							X	Non-native, Introduced
White ratony Krameria grayi			X	X		X		

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Shrubs (continued):								
Creosote bush Larrea tridentata		X	X	X	X	X		
Anderson thornbush Lycium andersonii		X	X			X		
Desert aster Machaeranthera torlifolia			X					
Oleander Nerium oleander							X	Non-native, Introduced
Buckhorn cholla Opuntia acanthocarpa			X	X				
Beavertail cactus Opuntia basilaris var. basilaris				X				
Pencil cholla Opuntia ramosissimo			X	X				
Cactus Opuntia sp.							X	Introduced
Sandpaper plant Petalonyx thurberi						X		
Pigmy-cedar Pencephyllum schottii			X			X		
Rose Rosa sp.							X	Non-native, Introduced
Trixis Trixis californica			X	X		X		
Mojave yucca Yucca schidigera							X	Native, Introduced

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Perennial herbs:								
Inland pickleweed *Allenrolfea occidentalis*		X						
White-stemmed milkweed *Asclepias albicano*			X			X		
Desert milkweed *Asclepias erosa*				X				
Ajamete *Asclepias subulata*						X		
Borrego locoweed *Astragalus lentiginosus* var. *borreganus*				X	X			
Locoweed *Astragalus lentiginosus* var. *variabilis*					X			
Brandegea *Brandegea bigelovii*						X		
Plicate coldenia *Coldenia plicata*					X	X		
Desert croton *Croton californicus* var. *mohavensis*		X			X			
Coyote melon *Cucurbita palmata*							X	
Burmuda grass *Cynedon dactylon*							X	Non-native, Introduced
Western jimson *Datura meteloides*				X				
Saw-toothed ditaxis *Ditaxis serrata*			X			X		

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Perennial herbs (continued):								
Desert trumpet *Eriogonum inflatum*				X				
Desert bedstraw *Galium stellatum* ssp. *eremicum*			X			X		
Desert lily *Hesperocaulis undulata*					X			
Galleta grass *Hilaria rigida*				X	X	X		
Desert alyssum *Lepidium fremontii*				X				
Wishbone bush *Mirabilis bigelovii*			X			X		
Desert tobacco *Nicotiana trigonophylla*			X	X				
Burro-weed strangler *Orobanche cooperi*					X	X		
Scaly-stemmed sandplant *Pholisma arenarium*					X			
Desert mistletoe *Phoradendron californica*						X		
Thick-leaved ground cherry *Physalis crassifolia*			X			X		
Arrow-leaf *Pleurocoronis pluriseta*			X					
Odora *Porophyllum gracile*						X		

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Perennial herbs (continued):								
Velvet rosette *Psathyrotes ramosissima*				X				
Purple climbing milkweed *Sarcostemma cynancoides*			X			X		
Sea-purslane *Sesuvium verrucosum*		X						
Desert mallow *Sphaeralcea ambigua*			X			X		
Stillingia *Stillingia linearifolia*						X		
Inkweed *Suaeda torreyana* var. *ramossima*		X						
Honey sweet *Tidestromia oblongifolia*						X		
Annuals:								
Sand-verbena *Abronia villosa*					X	X		
Frost-mat *Achyronychia cooperi*			X	X	X	X		
Fiddle-neck *Amsinkia tesselata*						X		Probable
Twining snapdragon *Antirrhinum filipes*		X						
Woolly marigold *Baileya pleniradiata*					X	X		
Mustard *Brassica tournefortii*						X		

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Annuals (continued):								
Woody bottlewasher *Camissonia boothii* ssp. *decorticans*				X	X	X		
Yellow cups *Camissonia brevipes*				X	X			
Brown-eyed primrose *Camissonia claviformis*				X	X	X		
Pebble pincushion *Chaenactis carphoclinia*				X				
Fremont pincushion *Chaenactis fremontii*				X		X		
Esteve pincushion *Chaenactis stevioides*								
Brittle spine-flower *Chorizanthe brevicorau*						X		
Rigid spiny-herb *Chorizanthe rigida*			X	X	X	X		
Narrow-leaved forget-me-not *Cryptantha angustifolia*				X	X	X		
White-haired forget-me-not *Cryptantha maritima*						X		
Purple-rooted forget-me-not *Cryptantha micrantha*				X	X	X		
Silk dalia *Dalea mollis*				X	X	X		
Desert dicoria *Dicoria canescens*					X			
Spectacle-pod *Dithyrea californica*				X	X	X		

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Annuals (continued):								
Desert fivespot *Eremalche rotundifolia*				X	X	X		
Eriastrum *Eriastrum eremicum*				X	X	X		
Fleabane *Erigeron divergens*					X			
Skeleton weed *Eriogonum deflexum* var. *deflexum*				X		X		
Kidney-leaved buckwheat *Eriogonum reniforme*				X		X		
Little trumpet *Eriogonum trichopes*			X					
Wallace eriophyllum *Eriophyllum wallacei*				X		X		
Desert heron's bill *Erodium texanum*					X			
Poppy *Eschscholtzia caespitosa*				X		X		
Little gold-poppy *Eschscholtzia minutiflora*				X	X			
Sand mat *Euphorbia polycarpa*				X	X	X		
Dwarf filago *Filago depressa*				X		X		
Desert sunflower *Geraea canescens*				X	X	X	X	

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Annuals (continued):								
Chinese pusley *Heliotropium curassavicum* var. *oculatum*							X	
Desert calico *Langloisia matthewsii*				X	X			
Schott langloisia *Langloisia schottii*				X		X		
Bristly langloisia *Langloisia setosissima*		X		X				
Pepper grass *Lepidium lasiocarpum*				X	X	X		
Hairy lotus *Lotus tomentellus*				X	X	X		
Arizona lupine *Lupinus arizonicus*				X	X	X		
Desert dandelion *Malacothrix californica*				X		X		
Small-flowered blazing star *Mentzelia albicoulis*								
Sand blazing star *Mentzelia involucrata*				X				
Panamint blazing star *Mentzelia longiloba*						X		
Bigelow monkey flower *Mimulus bigelovii*						X		Probable
Ghost flower *Mohavea confertiflora*			X	X		X		

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Annuals (continued):								
Mojave desert star *Monoptilon bellioides*				X		X		
Purple mat *Nama demissum*				X		X		
Hispid nama *Nama hispidulum* var. *spathulatum*					X			
Dune primrose *Oenothera deltoides*		X			X	X		
Linear-leaved cambess *Oligomeris linifolia*		X				X		
Spanish needle *Palafoxia linearis*				X	X	X		
Broad-nutted comb-bur *Pectocarya platycarpa*		X						
Emory rock daisy *Perityle emoryi*			X	X		X		
Notch-leaved phacelia *Phacelia crenulata*				X		X		
Wooly plantain *Plantago insularis*				X	X	X		
California chicory *Rafinesquia neomexicana*				X		X		
Russian thistle *Salsola iberica*					X	X		
Chia *Salvia columbariae*				X		X		
Schismus *Schismus arabicus*				X	X	X		

Table A.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Annuals (continued):								
Mojave grounsel *Senecio mohavensis*			X					
Mustard *Sisymbrium orientale*						X		
Sow-thistle *Sonchus oleraceus*		X						
Broad-leaved stillingia *Stillingia spinulosa*						X		
Long-beaked twist-flower *Streptanthus longirostris*		X						
Yellow-head *Trichoptilium incisum*			X			X		

APPENDIX B

BIOLOGICAL RESOURCES, SIGNIFICANT WILDLIFE SPECIES

Table B.1. Criteria for significant wildlife species

COMMON NAME AND SCIENTIFIC NAME	Calif. Dept. of Fish & Game fully protected	Partially protected species	Blue List of diminishing birds	Numbers limited due to restricted habitat	Numbers limited due to position in food chain	Special values for education	Special values for science	Recreation consumptive uses	Recreation nonconsumptive uses	Commercial uses
Reptilian species:										
Desert Tortoise *Gopherus agassizi*	X					X	X		X	
Banded Gecko *Coleonyx variegatus*		X				X		X	X	X
Desert Iguana *Dipsosaurus dorsalis*		X				X		X	X	X
Chuckwalla *Sauromalus obesus*		X		X		X		X	X	X
Mojave Fringe-Toed Lizard *Uma scoparia*		X		X		X		X	X	X
Collared Lizard *Crotaphytus collaris*		X		X		X		X	X	X
Leopard Lizard *Crotaphytus wislizenii*		X				X		X	X	X
Desert Horned Lizard *Phrynosoma platyrhinos*		X				X		X	X	X
Speckled Rattlesnake *Crotalus mitchelli*				X	X	X		X		X

Table B.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Calif. Dept. of Fish & Game fully protected	Partially protected species	Blue List of diminishing birds	Numbers limited due to restricted habitat	Numbers limited due to position in food chain	Special values for education	Special values for science	Recreation consumptive uses	Recreation nonconsumptive uses	Commercial uses
Mammal species:										
Black-Tailed Jackrabbit *Lepus californicus*		X						X		
Bobcat *Lynx rufus*		X			X			X		X
Raccoon *Procyon lotor*				X	X			X		
Kit Fox *Vulpes macrotis*	X				X					
Coyote *Canis latrans*					X			X		X
Avian species:										
Western Grebe *Aechmophorus occidentalis*	X		X						X	
Brown Pelican[a] *Pelecanus occidentalis*	X						X		X	
Marsh Hawk *Circus cyaneus*	X		X		X				X	
Red-Tailed Hawk *Buteo jamaicensis*		X			X			X	X	
Swainson's Hawk *Buteo swainsoni*	X		X		X		X		X	

[a]The Brown Pelican is listed on both the Secretary of the Interior's Endangered list and the California Dept. of Fish and Game Endangered list.

Table B.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Calif. Dept. of Fish & Game fully protected	Partially protected species	Blue List of diminishing birds	Numbers limited due to restricted habitat	Numbers limited due to position in food chain	Special values for education	Special values for science	Recreation consumptive uses	Recreation nonconsumptive uses	Commercial uses
Avian species (continued):										
Prairie Falcon *Falco mexicanus*	X		X	X	X		X		X	
Sparrow Hawk *Falco sparverius*	X		X		X				X	
Mourning Dove *Zenaida macroura*		X						X	X	
Ground Dove *Columbigallina passerina*	X								X	
Long-Eared Owl *Asio otus*	X		X	X					X	
Short-Eared Owl *Asio flammeus*	X		X	X	X		X		X	
Loggerhead Shrike *Lanius ludovicianus*	X		X	X	X				X	
Vesper Sparrow *Pooecetes gramineus*	X		X						X	
Yellow Warbler *Dendroica petechia*	X		X						X	

APPENDIX C

BIOLOGICAL RESOURCES, WILDLIFE SPECIES

Table C.1. Wildlife species by habitats

COMMON NAME AND SCIENTIFIC NAME	Habitat types							Comments
	Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	
Reptilian species:								
Banded Gecko *Coleonyx variegatus*			P[a]	V[b]	V			
Desert Iguana *Dipsosaurus dorsalis*			V	V	P	V		
Chuckwalla *Sauromalus obesus*			V					
Zebra-Tailed Lizard *Callisaurus draconoides*		V	V	V	V	V		
Mojave Fringe-Toed Lizard *Uma scoparia*		V		V	V	V		Sand Specialist
Collared Lizard *Crotaphytus collaris*			V			V		
Leopard Lizard *Crotaphytus wislizenii*				V				
Desert Spiny Lizard *Sceloporus magister*			P			V		
Side Blotched Lizard *Uta stansburiana*		V	V	V		V	V	
Long-Tailed Brush Lizard *Urosaurus graciosus*						V		
Desert Horned Lizard *Phrynosoma platyrhinos*		V		V	V	V		

[a]Species which have been verified in a certain habitat type are marked with a "V".

[b]Species whose presence was not verified, but expected in a habitat type are marked with a "P".

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Reptilian species (continued):								
Western Whiptail *Cnemidophorus tigris*			V	V		V	V	
Red Spotted Toad *Bufo punctatus*							V	
Desert Tortoise *Gopherus agassizi*		V		V		V		
Western Blind Snake *Leptotyphlops humilis*			P					In patches of loose soil
Rosy Boa *Lichanura trivirgata*			P					
Spotted Leaf-Nosed Snake *Phyllorhynchus decuratus*				P	P	V		
Coachwhip *Masticophis flagellum*				P				
Western Patch-Nosed Snake *Salvadora hexalepis*			P	V		V		
Glossy Snake *Arizona elegans*				P	V			
Gopher Snake *Pituophis melanoleucus*				P				
Common Kingsnake *Lampropeltis getulus*				P		P		
Long-Nosed Snake *Rhinocheilus lecontei*				P				
Western Ground Snake *Sonora semiannulata*					P	P		
Western Shovel-Nosed Snake *Chionactis occipitalis*				V	V	P		

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Reptilian species (continued):								
Sonora Lyre Snake *Trimorphodon lambda*			P					
Night Snake *Hypsiglena torquata*			P	P		P		
Western Diamondback Rattlesnake *Crotalus atrox*			P	P		P		
Speckled Rattlesnake *Crotalus mitchelli*			V					
Sidewinder *Crotalus cerastes*		V		V	V	V	V	
Mojave Rattlesnake *Crotalus scutulatus*				P				
Mammal species:								
Coyote *Canis latrans*		P	P	V	V	P		
Kit Fox *Vulpes macrotis*		P	P	V	V	V	V	
Gray Fox *Urocyon cinereoargenteus*		P	P	P	P	P		
Badger *Taxidea taxus*				P		P		
Bobcat *Lynx rufus*		P	P	V	P	P		
Raccoon *Procyon lotor*							V	Seen on canal bank
Ringtail *Bassariscus astutus*			P					

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Mammal species (continued):								
Jackrabbit Lepus californicus		V		V	V	V		
Round-Tailed Ground Squirrel Spermophilus tereticaudus		V		V	V	V		
White-Tailed Antelope Squirrel Ammospermophilus leucurus		V	V	V	V	V		
Botta Pocket Gopher Thomomys bottae						V		
Desert Kangaroo Rat Dipodomys deserti		V		V	V	V		
Merriam Kangaroo Rat Dipodomys merriami		V		V	V	V		
Canyon Mouse Peromyscus crinitus			V		V			
Cactus Mouse Peromyscus eremicus			V					
Deer Mouse Peromyscus maniculatus		P	P	P	P	P		Uncommon but ubiquitous
Southern Grasshopper Mouse Onychomys torridus					V			
White-Throated Wood Rat Neotoma albigula						V		
Desert Wood Rat Neotoma lepida			V		V			
Little Pocket Mouse Perognathus longimembris					V	V		
Long-Tailed Pocket Mouse Perognathus formosus			V		V			

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types							Comments
	Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	
Mammal species (continued):								
Desert Pocket Mouse *Perognathus penicillatus*		V		V	V	V		
California Leaf-Nosed Bat *Macrotus californicus*				P	P	P	P	
California Myotis *Myotis californicus*				P	P	P	P	
Big Brown Bat *Epesicus fuscus*				P	P	P	P	
Western Pipistrelle *Pipistrellus hesperus*				P	P	P	P	
Pallid Bat *Antrozous pallidus*				P	P	P	P	
Brazilian Free-Tailed Bat *Tadarida brasiliensis*				P	P	P	P	
Big Free-Tailed Bat *Iadarida molossa*				P	P	P	P	
Avian species:								
Common Loon *Gavia immer*							V	
Western Grebe *Aechmophorus occidentalis*							V	Blue List
Eared Grebe *Podiceps caspicus*							V	
Pied-Billed Grebe *Podilymbus podiceps*							V	
Brown Pelican *Pelecanus occidentalis*							V	Endangered

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Avian species (continued):								
Pintail Anas acuta							V	
Gadwall Anas strepera							V	
Shoveler Spatula clypeata							V	
Blue-Winged Teal Anas discors							V	
Cinnamon Teal Anas cyanoptera							V	
Green-Winged Teal Anas carolinensis							V	
Redhead Aythya americana							V	
Lesser Scaup Aythya affinis							V	
Buffelhead Bucephala albeola							V	
Ruddy Duck Oxyura jamaicensis							V	
Common Merganser Mergus merganser							V	
Red-Breasted Merganser Mergus serrator							V	
Turkey Vulture Cathartes aura		V	V	V	V	V	V	
Marsh Hawk Circus cyaneus				V	V			Blue List
Red-Tailed Hawk Buteo jamaicensis		V	V	V	V	V		

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Avian species (continued):								
Swainson's Hawk *Buteo swainsoni*				V				Blue List
Prairie Falcon *Falco mexicanus*			V	V	V			Blue List
Sparrow Hawk *Falco sparverius*				V	V	V	V	Blue List
Snowy Egret *Leucophoyx thula*							V	
Cattle Egret *Bubulcus ibis*							V	
Great Blue Heron *Ardea herodias*							V	
Sora *Porzana carolina*							V	
American Coot *Fulica americana*	V						V	
American Avocet *Recurvirostra americana*							V	
Black-Necked Stilt *Himantopus mexicanus*							V	
Killdeer *Charadrius vociferus*							V	
Spotted Sandpiper *Actitus macularia*							V	
Willet *Catoptrophorus semipalmatus*							V	
Western Sandpiper *Ereunetes mauri*							V	

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Avian species (continued):								
Wilson's Phalarope *Steganopus tricolor*							V	
Common Snipe *Capella gallinago*							V	
Ring-Billed Gull *Larus delauarensis*							V	
Forester's Tern *Sterna forsteri*							V	
Rock Dove *Columba livia*				V				
Mourning Dove *Zenaida macroura*				V	V	V	V	Breeds in open area
Ground Dove *Columbigallina passerina*							V	
Long-Eared Owl *Asio otus*						V		
Short-Eared Owl *Asio flammeus*				V	V			Blue List
Poor Will *Phalaenoptilus nuttallii*		V	V			V		
Lesser Nighthawk *Chordeiles acutipennis*			V			V		
White-Throated Swift *Aeronautes saxatalis*			V	V			V	
Costa's Hummingbird *Calypte costae*			V	V	V	V	V	Breeds in open area
Belted Kingfisher *Megaceryle alcyon*							V	

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Avian species (continued):								
Common Flicker *Colaptes auratus*							V	
Vermillion Flycatcher *Pyrocephalus rubinus*						V		
Western Kingbird *Tyrannus verticalis*					V	V	V	
Cassin's Kingbird *Tyrannus vociferans*							V	
Ash-Throated Flycatcher *Myiarchus cinerascens*				V	V	V	V	
Say's Phoebe *Sayornis saya*		V	V	V	V	V	V	
Gray Flycatcher *Empidonax wrightii*				V		V		
Olive-Sided Flycatcher *Nuttallornis borealis*							V	
Horned Lark *Eremophila alpestris*		V	V	V	V	V		Breeds in open area
Barn Swallow *Hirundo rustica*						V		
Violet-Green Swallow *Tachycineta thalassina*				V	V	V	V	
Tree Swallow *Iridoprocne bicolor*		V		V	V	V	V	
Common Raven *Corvus corax*				V	V		V	
Verdin *Auriparus flaviceps*						V	V	

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Avian species (continued):								
Rock Wren *Salpinctes obsoletus*			V					
Mockingbird *Mimus polyglottos*			V	V	V	V		
Sage Thrasher *Oreoscoptes montanus*		V		V	V	V		
Le Conte's Thrasher *Toxostoma lecontei*					V	V		
Robin *Turdus migratorius*							V	
Swainson's Thrush *Hylocichla ustulata*							V	
Black-Tailed Gnatcatcher *Polioptia melanura*				V		V		Breeds in open area
Ruby-Crowned Kinglet *Regulus calendula*						V	V	
Water Pipit *Anthus spinoletta*					V		V	
Phainopepla *Phainopepla nitens*						V		
Loggerhead Shrike *Lanius ludovicianus*		V		V	V	V		Blue List
Starling *Sturnus vulgaris*							V	
Hutton's Vireo *Vireo huttoni*							V	
Warbling Vireo *Vireo gilvus*						V	V	

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Avian species (continued):								
Black and White Warbler *Mniotilta varia*							V	Accidental migrant
Orange-Crowned Warbler *Vermivora celata*						V		
Yellow Warbler *Dendroica petechia*						V		Blue List
Yellow-Rumped Warbler *Dendroica coronata*			V	V	V	V	V	
Townsend's Warbler *Dendroica townsendi*						V	V	
Hermit Warbler *Dendroica occidentalis*						V		
Black-Throated Gray Warbler *Dendroica nigrescens*						V		
Yellowthroat *Geothlypis trichas*						V	V	
MacGillivray's Warbler *Oporornis tolmiei*						V	V	
Hooded Warbler *Wilsonia citrina*							V	Accidental migrant
Wilson's Warbler *Wilsonia pusilla*				V		V	V	
American Redstart *Setophaga ruticilla*							V	Accidental migrant
House Sparrow *Passer domesticus*							V	
Western Meadowlark *Sturnella neglecta*							V	

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Avian species (continued):								
Yellow-Headed Blackbird *Xanthocephalus xanthocephalus*						V	V	
Red-Winged Blackbird *Agelaius phoeniceus*							V	
Brewer's Blackbird *Euphagus cyanocephalus*							V	
Great-Tailed Grackle *Cassidix mexicanus*							V	
Brown-Headed Cowbird *Molothrus ater*							V	
Northern Oriole *Icterus galbula*						V	V	
Western Tanager *Piranga ludoviciana*						V	V	
Black-Headed Grosbeak *Pheucticus melanocephalus*							V	
Indigo Bunting *Passerina cyanea*							V	Accidental migrant
Lazuli Bunting *Passerina amoena*						V	V	
House Finch *Carpodacus mexicanus*				V	V	V	V	
Lesser Goldfinch *Spinus psaltria*							V	
Savannah Sparrow *Passerculus sandwichensis*							V	
Vesper Sparrow *Pooecetes gramineus*							V	Blue List

Table C.1 (continued)

COMMON NAME AND SCIENTIFIC NAME	Habitat types: Dry lakebeds	Lake edge	Creosote rockland	Creosote flats	Desert dunes and sandhills	Desert drywash	Iron Mtn. Pumping Plant complex	Comments
Avian species (continued):								
Lark Sparrow *Chondestes grammacus*							V	
Black-Throated Sparrow *Amphispiza bilineata*		V	V	V	V	V		
Chipping Sparrow *Spizella passerina*					V	V	V	
Brewer's Sparrow *Spizella breweri*		V		V	V	V	V	
White-Crowned Sparrow *Zonotrichia leucophrys*			V	V	V	V	V	
Song Sparrow *Melospiza melodia*		V					V	
Roadrunner *Geococcyx californianus*				V	V			

APPENDIX D

SCENIC/VISUAL DESCRIPTIONS OF SPECIFIC LANDSCAPE FEATURES

Figure D.2 Typical Calumet Mountains Vista
(#1 on Figure D.1)

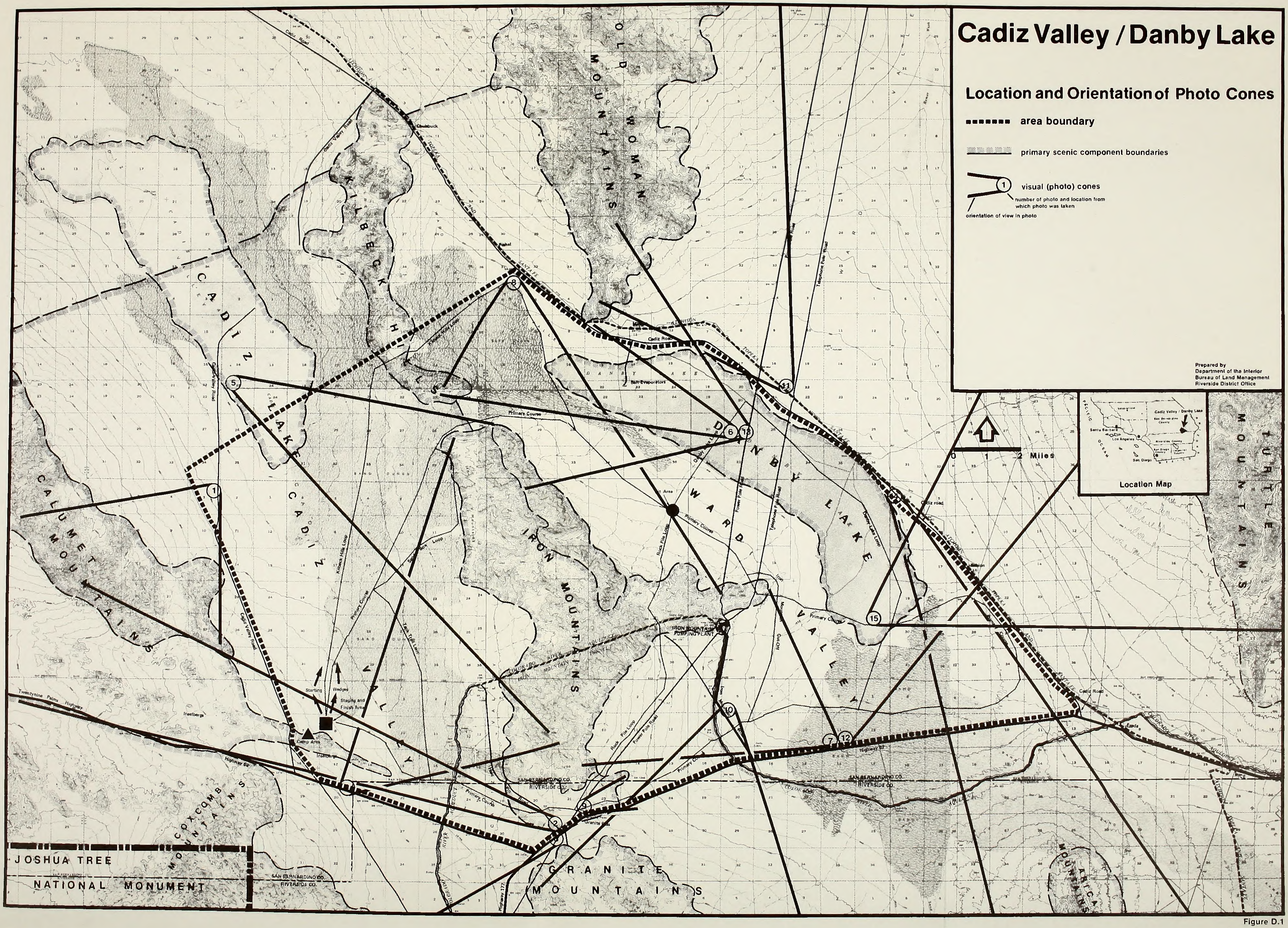
Calumet Mountains

Location: The Calumet Mountains form part of the western boundary of Cadiz Valley.

Landform: These mountains are of a steep, rugged nature with some near-vertical elements and ragged ridgelines.

Intrusions: There are no intrusions visible from the study area.

Distinctive features and remarks: The Calumet Mountains are representative of this area with their dark grey-brown coloration, rugged steepness, lack of vegetation, and lack of intrusions. Even though they are not in the study area itself, the Calumet's are still an important feature within the immediate viewshed of the study area.



Cadiz Valley / Danby Lake
Location and Orientation of Photo Cones
area boundary
primary scenic component boundaries
visual (photo) cones
number of photo and location from which photo was taken
orientation of view in photo
Prepared by
Department of the Interior
Bureau of Land Management
Riverside District Office
Location Map
0 1 2 Miles
OLD WOMAN MOUNTAINS
KILBECK HILLS
CADIZ LAKE
CADIZ VALLEY
DANBY LAKE
IRON MOUNTAINS
WARD VALLEY
CALUMET MOUNTAINS
COXCOMB MOUNTAINS
GRANITE MOUNTAINS
TURTLE MOUNTAINS
AFRICA MOUNTAINS
JOSHUA TREE
NATIONAL MONUMENT
IRON MOUNTAIN PUMPING PLANT
SAN BERNARDINO CO.
RIVERSIDE CO.
Highway 62
Cadiz Road
Salt Evaporators
Primary Course
Starting Wedges
Staging and Finish Area
Camp Area
Granite Pass

Figure D.1

Figure D.3 View of the inselburgs
(#2 on Figure D.1)

Inselburgs

Location: The inselburgs are found between the Calumet and Coxcomb Mountains, with their general southern boundary being Highway 62.

Landform: This area is composed of a long, flat, continuous slope broken by several steep rugged peaks, some of which are connected into east-west trending ridges. These peaks average from 90 to 120 m (300 to 400 feet) in elevation.

Intrusions: The only intrusions visible are Highway 62 along the southern edge of the area, Patton's Road (a graded dirt road) which cuts across the eastern extremity of this area, and ORV tracks which are not visible unless one is within a few hundred feet of them, due to restricted angle of observation, low vegetation density, and a lack of soil color contrast.

Distinctive features and remarks: This group of inselburgs is unique within the study area and relatively uncommon in the entire region. The majority of the inselburgs lie outside of the visual perimeter of the study area, but to lend visual variety to a landscape otherwise dominated by valleys and mountains.

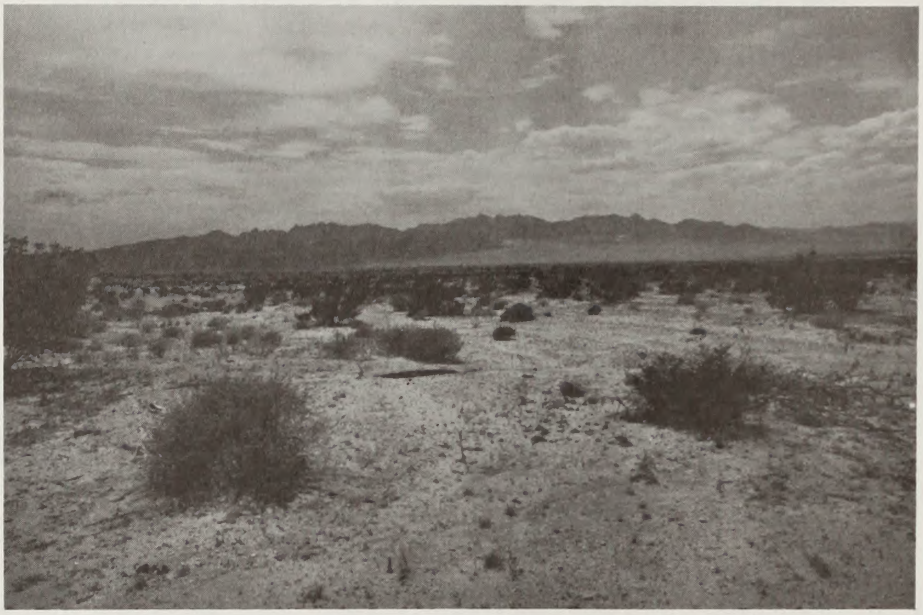


Figure D.4 Coxcomb Mountains view
(#3 on Figure D.1)

Coxcomb Mountains

Location: The Coxcomb Mountains form part of the western boundary of Cadiz Valley, and are found south of Highway 62.

Landform: These mountains are of a very steep and rugged nature, rising as much as 600 m (2000 feet) above their bases into rugged ridges adorned with spires and peaks.

Intrusions: There are no intrusions visible from the study area.

Distinctive features and remarks: The Coxcomb Mountains are the most rugged, and among the tallest, mountains in this area. They are also a fairly deep range in contrast to the other primarily single ridge formations found in this area. A large portion of the Coxcomb Mountains lie within Joshua Tree National Monument which is primarily composed of National Wilderness Preservation System lands. Even though they are not in the study area itself, the Coxcombs are still an important feature within the immediate viewshed of the study area.

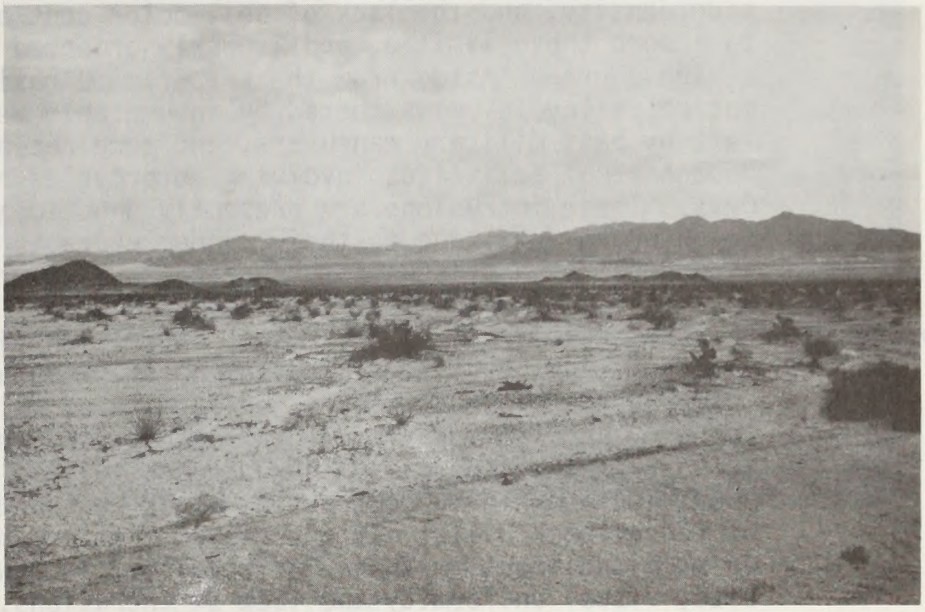


Figure D.5 View of Cadiz Valley
(#4 on Figure D.1)

Cadiz Valley

Location: Those portions of Cadiz Valley in and near the study area are bounded on the west by the Calumet and Coxcomb Mountains, and on the east by the Kilbeck Hills and the Iron and Granite Mountains.

Landform: Cadiz Valley is a very long, wide, gentle, north-south trending valley. In the study area the valley floor is almost trough-like with long gentle slopes dropping from the bases of the bordering hills and mountains, either to the wash that runs down the center of the valley or to the surface of Cadiz Dry Lake itself, some 210 m (700 feet) below the upper reaches of the valley. Some surface variation is caused by a few wide, shallow washes, and the presence of sand dune areas along the eastern slopes, especially in the vicinity of the dry lake and the Kilbeck Hills. The only major surface variations present within the study area are the presence of a few inselburgs just to the north of Highway 62. The entire area is covered by a sparse but even textured and colored creosote scrub community.

Intrusions: Intrusions in Cadiz Valley are primarily limited to the California Aqueduct, Highway 62, and Patton Road. The large scale of this landscape, the limited angle of observation available due to gradual elevation changes, the low vegetation density, and the lack of soil color contrast all combine to absorb these limited, and linearly oriented intrusions to a high degree. Aside from the specific intrusions, the entire valley is crisscrossed by innumerable vehicle tracks left by past military maneuvers, and more recently, by recreational activities involving motorcycles and other ORVs. These intrusions are presently unnoticeable beyond a few hundred feet, due to their random character, low vegetation density, and lack of subsurface soil color contrast.

Distinctive features and remarks: The initial visual impression given by Cadiz Valley is one of distance and sameness. In southern Cadiz Valley the consistent slopes, uniformity of coloration and texture, and lack of visible intrusions serve only to accentuate the steepness and ruggedness of the bordering mountains and highly contrasting black and sand coloration of the Kilbeck Hills. If any visual distinction is to be pointed out about northern Cadiz Valley, it would be its size, visual uniformity and lack of intrusions.

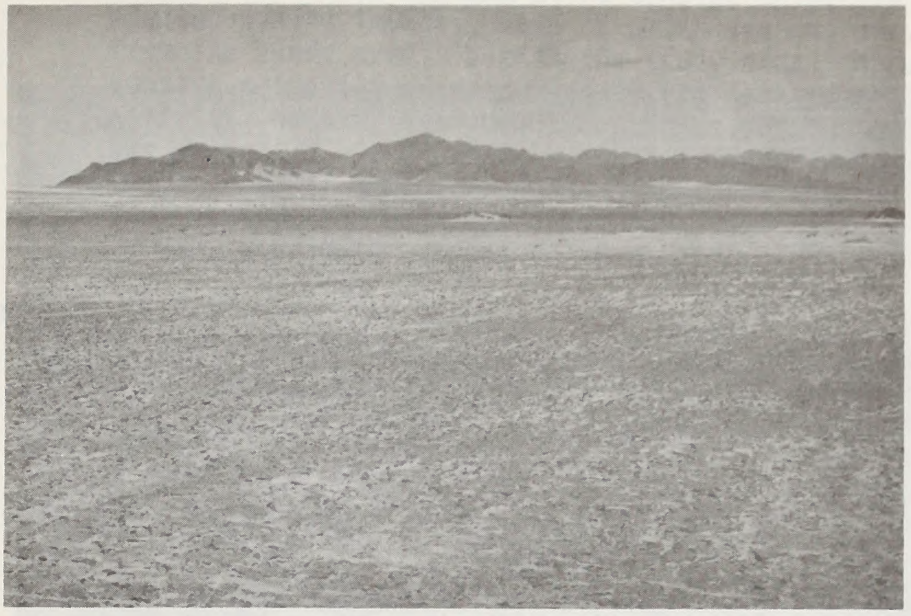


Figure D.6 Portion of Cadiz Lake
(#5 on Figure D.1)

Cadiz Lake

Location: Cadiz Lake is located in the center of Cadiz Valley.

Landform: The lakebed is essentially flat, with a thin crust that becomes evident at close range.

Intrusions: Intrusions on Cadiz Lake consist of three active and one abandoned salt works with the associated wells, dikes, buildings, and roads. Only the abandoned site is within the study area itself.

Distinctive features and remarks: Cadiz Lake itself is a distinctive feature within Cadiz Valley, but is not an unusual occurance in this region. The additional scenic interest created by Cadiz Lake is only slightly diminished by the existing visual intrusions. From the lakebed itself, surface visibility is often diminished by shimmering heat waves and mirages during much of the year. From surrounding vistas, the intrusions are of such a comparatively small scale that they do little to detract from the overall scenic quality of the area. An additional factor affecting the scenic quality of the area is the occurrance of dust clouds generated by high winds. Cadiz Lake is especially prone to wind erosion in areas where the surface crust has been broken, exposing subsurface soil fines. Only the southern tip of the lake is within the study area.

Figure D.7 View of Kilbeck Hills
(#6 on Figure D.1)

Kilbeck Hills

Location: The Kilbeck Hills are located directly east of Cadiz Dry Lake.

Landform: The Kilbeck Hills are essentially a northerly extension of the main ridge of the Iron Mountains, only on a much smaller scale. From base to peaks, the hills average between 90 to 120 m (300 to 400 feet) in elevation. They are composed primarily of the same dark mottled grey-brown rock as the Iron Mountains. Many of the southern hills are partially covered by windblown sand. In some instances, only the upper slopes remain uncovered, and sand saddles stretch between the peaks. The northern hills are generally not composed of windblown sand, and therefore appear steeper and more rugged. It should be noted that the northern hills have a much greater color variation, with some reds and lighter tans offsetting the genrally dark mottled grey-brown character of the hills. Vegetation is extremely sparse within the rock formations of the Kilbeck Hills, but is plentiful on the surrounding talus slopes with the exception of the windblown sand areas which are primarily unvegetated. Where there is vegetation, it is generally found to be even textured creosote scrub.

Intrusions: Intrusions in the Kilbeck Hills consist primarily of limited mining impacts, none of which are in, or visible from the study area. Within the study area, intrusions consist primarily of roads and trails created by ORV activity, both military and recreational. These intrusions are generally not visible except at close range, due to the large scale of the surrounding landscape, limited angle of observation, low vegetation density, and the lack of sub-surface soil color contrast.

Distinctive features and remarks: The Kilbeck Hills are very distinctive within this area due to the combination of steep, rugged, dark colored rock masses partically covered and linked by smooth textured light-colored windblown sand. These combined color and textural contrasts draw attention immediately in this landscape of large, low-contrast features. Only the southern-most peaks and saddles are within the actual study area, but the majority of the Kilbeck Hills are within the immediate viewshed of the study area.

Figure D.8 Portion of Iron Mountains (#7 on Figure D.1)

Iron Mountains

Location: The Iron Mountains are the focal point of the study area, occupying its center and serving to separate Cadiz and Ward Valleys, the two other primary landforms within the study area.

Landform: The Iron Mountains are of a steep, rugged nature, consisting of a primary north-south trending ridge with a secondary easterly trending ridge extending from the central portion of the mountains. The general composition is that of primarily unvegetated, dark mottled grey-brown rock masses forming multiple ridges and peaks, some of which exhibit horizontal and diagonally tilted plats and some color variation, primarily into the reddish earth tones. The footslopes vary from deeply furrowed pavement areas to broad, evenly textured bajadas.

Intrusions: Intrusions in the Iron Mountains are limited primarily to the easterly trending secondary ridge and the southern tip. These intrusions consist of dirt roads, woodpole power lines, a steel-lattice power line, a repeater site, and tailings from construction activities. These intrusions are limited primarily to the base and the lower slopes of the mountains, and are closely backdropped, which modifies their visibility. Overall, the scenic qualities of the Iron Mountains are not depreciated by visual intrusions.

Distinctive features and remarks: The Iron Mountains are generally representative of this area with their steep, rugged slopes, lack of vegetation, dark mottled grey-brown coloration, and lack of intrusions. Even though the Iron Mountains are no taller than other ranges in the area, they appear to be larger, due primarily to their being bordered on the east and west by broad, gentle valleys, which in contrast, accentuate their steepness and scale.

Figure D.9 Northeast face of Iron Mountains (#8 on Figure D.1)

Iron Mountains, northeast face

Location: The steep northeast face east of the northerly trending mountains overlooks Ward Valley and Danby Dry Lake.

Landform: This portion of the Iron Mountains fits the general description of the Iron Mountains given previously.

Intrusions: There are no intrusions visible in this portion of the Iron Mountains.

Distinctive features and remarks: The Northeast Face of the Iron Mountains has been rated as a separate landscape feature due to the presence of several characteristics which produce a distinctive landscape. The slopes fall away at an unusually steep angle, forming a broad, rugged face that stretches almost continuously along this side of the mountains. Along this face one finds areas with varying surface conditions, such as horizontally layered plates, sheer rock faces, rockslides and talus slopes. The apparent scale of this feature is magnified by the contrast of its dark, rugged, shadowed mass rising almost vertically from the smooth, horizontal, sand-tan reaches of Ward Valley. This effect is even greater when contrasted against the flat whiteness of salt-crusted Danby Lake.

Figure D.10 Section of Granite Pass desert pavement (# 9 on Figure D.1)

Granite Pass desert pavement

Location: The Granite Pass desert pavement area is located between the southern end of the Iron Mountains and Highway 62.

Landform: The overall landform of this area is that of a gently sloping saddle, covered by grey desert pavement and cut by washes that are deep and narrow adjacent to the Iron Mountains. These proceed to widen out and become more shallow as they extend away from the mountains toward Cadiz and Ward Valleys. A number of rock outcroppings are found adjacent to the Iron Mountains. Vegetation is very sparse with the exception of minor concentration in the washes and a smoke tree community in the primary wash leading into Ward Valley.

Intrusions: There are numerous intrusions in this area, including Highway 62, a steel-lattice power line, a wood-pole line, numerous dirt roads, and much surface disturbance from both past military activity and ORV activity more recently.

Distinctive features and remarks: The desert pavement in this area is not well developed, yet it is highly visible due to the lack of vegetation outside of the washes and the light grey coloration. The overall scenic quality of this area has been adversely affected by the existing intrusions to a considerable degree.

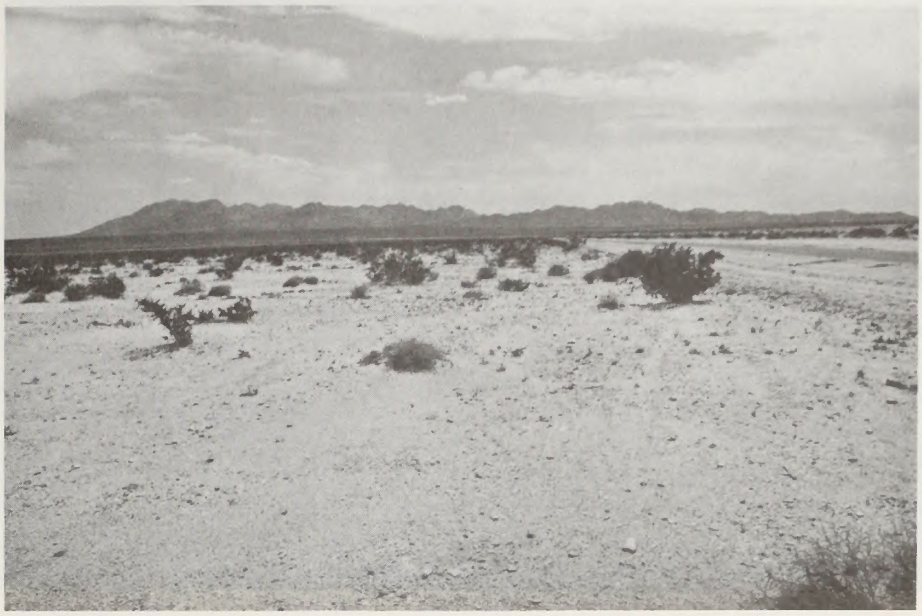


Figure D.11 View of Granite Mountains (#10 on Figure D.1)

Granite Mountains

Location: The Granite Mountains are found to the south of the Iron Mountains.

Landform: These mountains are of a steep and rugged nature, comprised of numerous ridges, peaks, and drainages, with many near-vertical elements and ragged ridgelines.

Intrusions: There are no intrusions visible from the study area.

Distinctive features and remarks: The Granite Mountains are representative of mountains in this area with their dark mottled grey-brown coloration, rugged steepness, and lack of both vegetation and visible intrusions. These mountains contain some of the most rugged and dramatic landforms found in the region. As viewed from the study area (looking south), their ruggedness is often accentuated by shade and shadow high-lighting, which adds greatly to the scenic quality of this landscape element. Even though they are not in the study area itself, the Granite Mountains are still an important feature within the immediate viewshed of the study area.

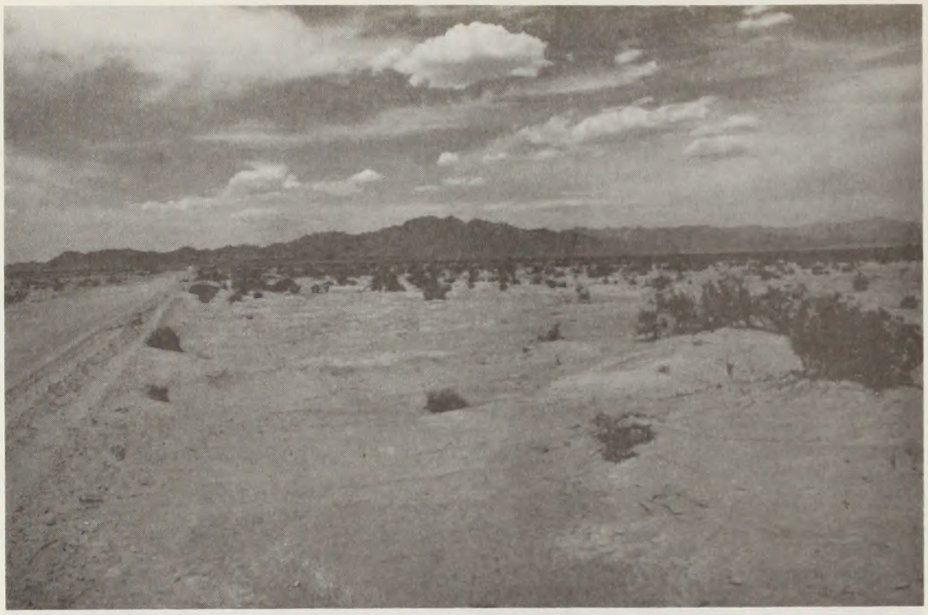


Figure D.12 Section of Old Woman Mountains (#11 on Figure D.1)

Old Woman Mountains

Location: The Old Woman Mountains are located to the north of the Iron Mountains and are separated from the latter by that part of Ward Valley containing the northwestern tip of Danby Lake.

Landform: These mountains are composed of a primary north-south trending ridgeline with numerous major drainages and canyons cutting the range into its existing rough and rugged condition. The Old Woman Mountains are among the larger mountain ranges in the region.

Intrusions: There are no intrusions visible from the study area.

Distinctive features and remarks: The Old Woman Mountains have the distinction of having been designated as National Recreation Lands by the Secretary of the Interior in 1972. Within this designation, they are classified as a natural environment area. This designation is born out by the steep, rugged, diverse landforms and lack of visible intrusions found here. Again, even though they are not within the study area itself, the Old Woman Mountains are still an integral part of the immediate viewshed of the study area.

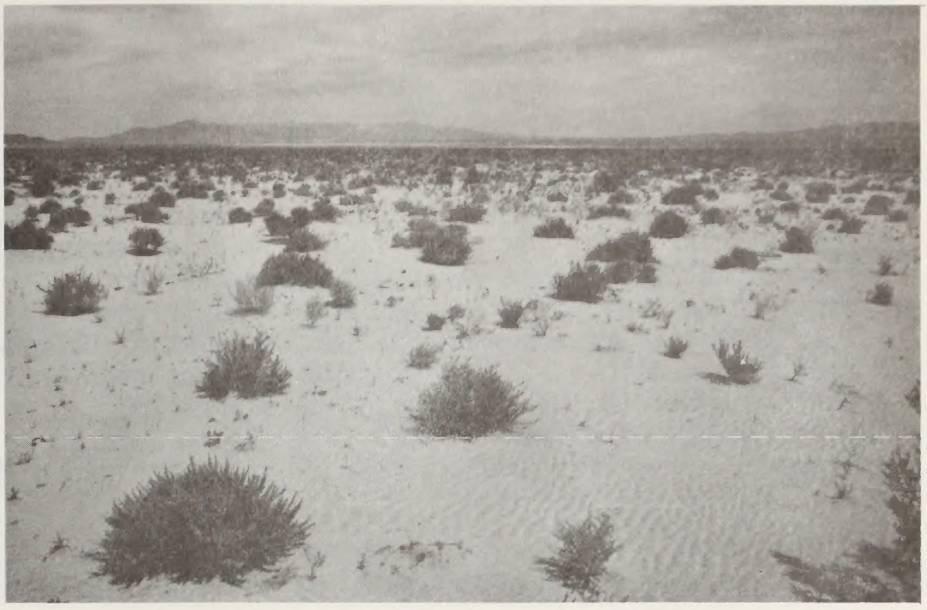


Figure D.13 View of Ward Valley (#12 on Figure D.1)

Ward Valley

Location: Ward Valley is bounded on the west by the Piute, Old Woman, Iron, and Granite Mountains, and on the east by the Sacramento, Stepladder, and Turtle Mountains. It has a branch that extends in a northwesterly direction between the Old Woman and Iron Mountains and is bounded on its western extremeity by the Kilbeck Hills.

Landform: Ward Valley is an extremely large valley of about 80 km (50 miles) in length and up to 24 km(15 miles) wide in some areas. As in the case of Cadiz Valley, it is a north-south trending valley with a trough-like character with no extreme surface variations. What surface variation there is consists of wide, shallow washes, sand dunes (primarily south of Danby Lake), Danby Lake, and those caused by intrusions. Aside from Danby Lake and the sand dunes, the entire valley is covered by a sparse creosote scrub community of even texture and color.

Intrusions: There are many intrusions in Ward Valley. Most of them are within the study area. These include Highway 62, a railroad, the California Aqueduct, flood dikes, the Iron Mountain Pumping Station with the associated community, salt operations, the remains of Patton's Camp, a steel-lattice power line, wood-pole lines, Iron Mountain Road, numerous dirt roads, and general surface disturbance from military maneuvers and ORV activity.

Distinctive features and remarks: Ward Valley is similar to Cadiz Valley in that they are both large-scale landforms with the characteristics of low subsurface soil color contrast, limited angles of observation, low vegetation density and distance, all of which enable landscapes to absorb intrusions. Even though there are numerous large-scale intrusions in the area, the scenic qualities present have not been entirely nullified due to the capacity of this area to absorb visual intrusions. Of primary visual interest in Ward Valley is Danby Lake with its unusual salt crust giving added color and contrast to the landscape.

Figure D.14 View of Danby Lake (#13 on Figure D.1)

Danby Lake

Location: Danby Lake is found in southwestern Ward Valley, to the northeast of the Iron Mountains.

Landform: Danby Lake is a dry lake with an essentially flat surface cut by very shallow, meandering washes. Surface variation from these washes and other natural phenomena is relatively minor. The surface of the lakebed itself consists of a thin crust except where the surface is either wet or broken by intrusions. The entire lake is very sparsely vegetated.

Intrusions: There are several intrusions on Danby Lake. Among them are saltworks with the associated evaporation ponds, roads, and structures, a steel-lattice power line, wood-pole lines, dirt roads, and random vehicle tracks over much of the lake's surface.

Distinctive features and remarks: Danby Lake is somewhat unique in the southern California desert in that it has a large surface salt deposit of intense whiteness that greatly enhances the color, contrast and interest of the surrounding landscape. This thin salt crust is as fragile as it is unique. Minor disturbances, such as walking on its surface, are enough to break the crust and expose the highly contrasting brown colored fines of the subsurface. These surface color contrasts are highly visible for great distances. Another unusual feature on Danby Lake are scattered hummocks created by surface deposits of gypsum which add a type of surface variation not commonly seen. Even though Danby Lake does have visual intrusions that do adversely affect the scenic qualities of the area, enough of it still remains in its natural state to provide a unique visual experience and enhance the surrounding landscape.

Figure D.15 Section of Arica Mountains (#14 on Figure D.1)

Arica Mountains

Location: The Arica Mountains are found in Ward Valley south of Highway 62 and east of the Granite Mountains.

Landform: The Arica Mountains are a very small range consisting of a single north-south ridge approximately 3.2 km (2 miles) in length. The eastern face is quite steep and rugged in contrast to the more gradual, less rough, western slopes. The ridge is broken by a saddle that splits the mountains into two parts, adding interest to the skyline.

Intrusions: There are numerous mines and roads in these mountains, especially on the eastern face.

Distinctive features and remarks: This unusually small mountain range has a geologically diverse composition that gives the landform more diverse coloration than many of the surrounding landforms. The geological diversity is also responsible for the large number of visual intrusions caused by mining activity.

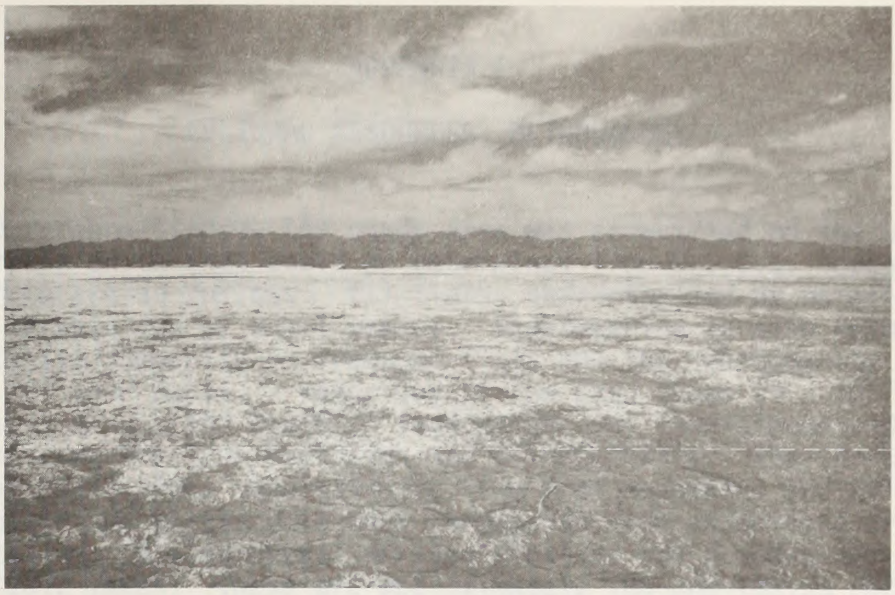


Figure D.16 View of Turtle Mountains (#15 on Figure D.1)

Turtle Mountains

Location: The Turtle Mountains are found along the eastern edge of the southern half of Ward Valley.

Landform: They are a large, deep, complex range composed of multiple ridges, numerous drainages, internal valleys, and uplifted rolling areas. These mountains are lower and less steep than most of the other ranges in the area.

Intrusions: There are no intrusions visible from the study area.

Distinctive features and remarks: As viewed from the study area, the Turtle Mountains are a long, low, moderately sloping range that have the same dark mottled grey-brown coloration, lack of vegetation and lack of visible intrusions that characterize the other mountain ranges in the area. Even though they are not in the study area itself, the Turtle Mountains are still an important component within the immediate viewshed of the study area.

APPENDIX E

CULTURAL RESOURCES, METHODOLOGY

Prior to field reconnaissance, the study area was stratified on the basis of general geomorphic units that could be determined from U.S.G.S. topographic maps. The strata are as follows: (1) flats, characterized by relatively flat alluvial terrain cut by small washes. Sheetwashing is also common. The dominant vegetative community is creosote flats and the subcommunity creosote wash complex; (2) sand dunes, - comprised of low sand dunes (3 - 10 feet), associated desert dunes, and sandhill vegetation; (3) mountainous and hilly slopes, encompassing the Iron Mountains and Kilbeck Hills. The terrain is extremely steep and rugged. Geologically, the Iron Mountains and Kilbeck Hills are granitic and metamorphic rock formations with associated creosote rockland vegetation; (4) lakeshore, or specifically, the present-day lakeshores of Danby and Cadiz lakes. These are approximately 186 and 163.5m (620 and 545 feet), respectively. Desert dunes, and sand hills, and salt bush scrub, and alkali sink scrub vegetation communities are located around the lakeshores; (5) lakebeds, such as those of Cadiz and Danby lakes, are flat and, for the most part, devoid of vegetation.

Following the determination of strata, the study area was subdivided into 0.2 by 1.6m (0.125 by 1 mile) north/south transects, totaling 2224 transects. Transects were then evaluated to determine the stratum which they occurred. If, for example, 50 percent or more of a transect was located in sand dunes, the transect was so classified. All transects that crossed the lakeshore elevations were classified as lakeshore. The total number of transects for each category is as follows: 963 in flats, 619 in sand dunes, 285 in mountainous and hilly slopes, 188 in lakeshore, and 160 in Lakebed.

Given the number of field days and personnel, and in order to be consistent with the cultural resource inventory being conducted by the Desert Planning Staff, a 1 percent sample of each stratum was considered to be a minimum for the systematic survey. Within each stratum, 1 percent of the transects were randomly selected using a table of random numbers, in addition to alternative transects selected for each stratum is as follows: 10 transects in flats, 6 transects in sand dunes, 3 transects in mountainous and hilly slopes, 2 transects in lakeshore, and 2 transects in lakebed. See Figure 2.20 for location of the randomly selected transects.

It was established, for the purposes of this study, that all cultural resources considered to be older than 25 years should be recorded. The criteria used to establish the type of site are consistent with those currently being applied by the Cultural Resource Section of the Desert Planning Staff.

In the field, all of the selected transects in flats, sand dunes, lakeshore and lakebeds were located on the ground and surveyed. The survey procedure involved one archaeologist walking four zig-zag sweeps, running north to south for each sample transect selected. All cultural resources were recorded and photographed.

APPENDIX F

CULTURAL RESOURCES, SITE DESCRIPTIONS

F.1 Archaeological Resources

The following archaeological sites were located and recorded:

Site A - Temporary camp

Within this site are eight recorded loci. The site includes numerous flakes (utilized and nonutilized) of chert, chalcedony, quartz, jasper, quartzite and basalt; complete and fragmented manos; and fragments of portable metates. Historic Site 4-12-B and scattered ration cans are located in the site. The recorded portion of the site area is over 5,000 m^2 (53,775 sq. ft.). Most of the site area is not located within the boundaries of the Cadiz Valley/Danby Lake Area. The western and northern boundaries of the site have not been completely determined. The loci are located in the deflation areas between low sand dunes near Danby Lake.

Locus 4-12-C. The cultural remains include numerous flakes of chert, chalcedony and jasper; cobble choppers, chert cores, one possible chert knife; one granite mano; one quartz mano with evidence of battering; two portable metate fragments. Artifacts, reportedly from this locus, were given to the archaeologist.

Locus 1. The locus consists of one possible felsitic core or chopper and quartz ball, approximately 5 cm. (1.95 inch) in diameter, which may be natural. The area is less than 10 m^2 (107.5 sq. feet).

Locus 2. Two quartz flakes were recorded in an area less than 10 m^2 (107.5 sq. feet).

Locus 3. The locus includes two vesicular basalt manos, a granitic mano, one portable metate fragment, and lithic flakes in an area of between 11 and 50m^2. One oil can (SAE 20 wt.) and one piece of thick, black rubber are located in the area.

Locus 4. This lithic scatter consists of flaked jasper and chert within an area between 11 and 50 m^2.

Locus 5. One flake each of chalcedony, porphoritic basalt and quartz is located in an area of less than 10 m^2 (107.5 sq. feet).

Locus 6. The locus consists of one flaked piece of jasper, one utilized chert flake, one basalt core and three quartz flakes within an area of 51 to 250 m^2.

Locus 7. Numerous flakes and cores of felsitic rock, chert and jasper are located in an area of 11 to 50 m^2. In addition, one possible polishing stone was recorded.

Site AM1 - Lithic scatter

This site consists of numerous flakes of chalcedony and chert in an area up to 10 m^2 (107.5 sq. feet). Many of the flakes appear to be from the same rock. The site is located at the base of the Iron Mountains. The lithic scatter

is located in a sandy area near Danby Lake. A Desert Strike camp is located near the site.

Site F3-D - Roasting pit or hearth

The site consists of blackened earth and ash approximately 1 meter in diameter and at least 10 cm. (3.9 inches) in depth. A few fire affected rocks are in association. The site is located on a low terrace just above the bottom of a wash. The location of the site would suggest that it is not very old. However, the ash is very deep and there are no associated remains that suggest it is recent.

Site F8-A - Isolated find

The isolated find consists of one granite rock, 16 by 8 cm., that shows evidence of grinding on three and possibly four surfaces. It is located on packed sandy flats west of some low sand dunes and a wide shallow wash.

Site 4-20-A - Isolated find

One chert flake was located along the western edge of Danby Lake. Extensive sheet wash is evident in the area. This suggests that the flake was washed to its present location.

Site SD5-A - Isolated find (possible)

One possible flake was located in a wash that cuts through low sand dunes. It has been polished by water and/or sand blasting.

F.2 Historical resources

The following sites were recorded:

Site Saltmarsh/Ward - Settlement

Saltmarsh or Ward is a small mining ghost town site near the Atchison, Topeka and Santa Fe Railroad (Dept. of Parks and Rec. 1976; 107). Thompson (1929: 707-708) noted that the well at Ward was the only reliable water source in Ward Valley. Foundations of structures are located above and below the surfaces. The well and the foundation of a water tank are still evident. Historic artifacts along with modern debris, are scattered in the area. Chunks of salt are located in one area of the site. The site dates from the late 1800s. The site was named Saltmarsh in honor of S.M. Saltmarsh, car accountant for the Santa Fe (Cox, 1977:333).

Site 4-25-A - Salt mine

The site is located on Danby Lake. Wooden planks and an occasional 4 by 4 board are located around the edges of the large evaporation basins. Metal piping and a well are located at the site. The site probably dates to the early 1900s.

Site 4-12-B - Camp

This site is located within the boundaries of Site A. The remains include burned railroad ties, badly deteriorated tin cans, and a forged metal tool whose function has not been determined. The location of the camp and the metal tool suggest that the camp was associated with the operation of the railroad. The condition of the cans and the tool indicate that the camp most likely predates the 1930s.

Site F3-B - Car and dump

The site consists of one car body and a small dump. The car body is made of thin metal nailed and bolted to metal and wood. A small dump is located just west of the car body. Old parts of cars and paint cans were noted there. The car body predates the 1930s.

Site 3-24-A - Car

This site consists of pieces of body parts for what has tentatively been identified as a Model "T" car. It predates the 1930s.

Site 4-14-A - Car

The car is located in an ordnance area used during the 1940s. The car has been identified as a 1932 chevrolet.

Site Iron Mountain Divisional Camp

The divisional camp is located on the southwest side of the Iron Mountains. Records indicate the camp, which was establshed in the early 1940s, was occupied by the 3d armored Division, the 183 Field Artillery Group and, most likely, units from the X Corps Artillery.

The roads and walkways of the camp are lined with rocks and often with plants that are not common in the area, such as barrel cactus and ocotillo. Most of the perenials in and around the center of the camp are surrounded by rocks. Rock alignments that form a variety of designs are common. Rocks were also used to form company symbols. The Presidential Seal, which is made of small white quartz, and the Military Medical Seal are still evident.

Two altars are located at the site. They were constructed from rock which was probably found in the area. An early photography indicates that one of the altars was from the chapel and altar area of the 183rd Field Artillery Groups (anon. 1973:6).

The historic remains also include a topographic relief map built on the desert floor that portrays the area where World War II army troops manuevered. "It takes in an area that extends as far east as the mountains near Kingman, Arizona and as far north as Hoover Dam (Lyneis 1973: C1). A photograph taken in 1946 shows a wooden bridge spanning the relief map. Another photograph

shows that the mountains and towns were labeled with signs, and roads were marked by string or wire (anon. 1973:6).

Today the relief map is surrounded by a fence built by the Bureau of Land Management. The signs that remain are no longer readable and the wire is scattered. Most of the topographic relief is still intact, although motorcyclists, vandals and erosion have taken their toll. The southwest portion of the map is in danger of being eroded away by water.

Although much of historic and interpretive interest remains at the camp, vandalism is apparent throughout the site. Holes have been dug in many areas of the site. Modern litter is also scattered in many areas.

General George Patton, Jr. selected the location for the Iron Mountain Division Camp in March 1942 and the camp was officially out of operation on May 1, 1944.

This site is included in the California Inventory of Historic Resources (Dept. of Parks and Rec. 1976:186).

Site F3-C - Trashdump

The site is a small dump on the side of a wash. Large and small tin cans and some pieces of sheet metal are located at the bottom of the slope. Broken glass, most of which appears to be from beer bottles, is at the top of the slope. Mixed in with the broken glass is broken china. Most of the china is thick, white, and has a green flora design on the inside and outside of the rim. Burned bone is also present. The distribution of the remains within the dump suggests that the metal was initially dumped followed by the dumping of the glass and ceramics. The dump is not a result of cumulative deposition over a long period of time.

The following sites are a result of military activity in the study area. Given the nature of the sites, it is impossible at this time to definitely state whether these sites are a result of the manuevers during World War II or the 1964 Operation Desert Strike.

Site 4-4-A - Military foxhole

The foxhole is about 2.5 m by 3m and 0.5 by 1m deep. The site is located on a small knoll just south of a large inselberg in Cadiz Valley. A piece of rubber is located down hill from the fox hole. Ordnance is common in the flats to the south.

Site 4-12-A - Military foxholes

This site includes 10 recorded foxholes or gun emplacements. Seven of the rock structures range from 3 to 4m wide, 1 to 2.5m deep and 1.5 to 2m deep and are filled with rocks. The remaining three range from 3 to 5m across, 1 to 2m deep, and 1.5 to 2.5m deep and are cleared of rocks behind the

structure. Pieces of wood, some ordnance and communication wire are located in the area. The amount of ordnance and communication wire are located in the area. The amount of ordnance increases as one moves away from the inselberg on which they are located.

Site 4-22-A - Military foxholes

Seventy rock alignments of a variety of shapes and sizes are recorded at this site. The alignments are located on the slopes of an inselberg in Cadiz Valley. Most of the alignments are circular, less than 2m in diameter and less than 85 cm deep. The second most common form of alignment is a horseshoe. The horseshoe alignments are less than 2m across and 80 cm deep. The remaining alignments are a variety of shapes, but the dimensions are consistent with the circular and horseshoe alignments. On the average, the alignments are much smaller than those at Site 4-12-A. Often the alignments are only 1m in diameter and less than 30 cm deep. Wooden stakes are located around the base of the inselberg. Communication wire, mortar fragements, and small slugs were noted, along with two recent beer cans.

Site 5-9-A - Military foxholes

This site includes 10 rock alignments. Most of the alignments are roughly horseshoe shaped. They range from 2 to 4 m across and from 0.5 to 1.5 meter deep. Eight of the alignments are located on a small knoll east of the inselberg. Shrapnel is scattered in the area.

Site B - Land mine

This site was located by a member of the scenic/visual team. The land mine was located in the general area designated for camping and was in good condition. For safety reasons, the mine was exploded by experts from the Army.

Site C - Land mines

Twelve land mines were located in the pass between the Iron Mountains and Kilbeck Hills. Several were located within the 60m (200- foot) width of the proposed course. For safety reasons, the known mines were exploded by experts from the army.

the transect was also recorded. With the exception of a few historic artifacts (which were collected for identification and dating purposes), cultural remains were not collected.

Of the three transects selected in mountainous and hilly slopes, one-half of one transect was surveyed by two archaeologists. Because of the precipitous terrain in the Iron Mountains, and for safety reasons, the second half and the two remaining slope transects were not surveyed.

In addition to systematically surveying the transects, specific areas were nonrandomly selected to be surveyed. From one to three archaeologists surveyed these areas. The archaeologist participated in flagging the proposed motorcycle courses. All portions of the proposed course and loops were either walked or driven at a very slow speed.

APPENDIX G

QUALITY EVALUATION OF RECREATION USE OPPORTUNITIES

14-18 = Excellent = A
9-13 = Good = B
6-8 = Fair = C

Quality Evaluation Chart

WILDLAND VALUES*

RATING CRITERIA AND SCORES

KEY FACTORS	A	B	C
INTRUSIONS PRESENT (includes maintained roads) ①	Pristine or nearly so. Evidence of man's activities are minimal. 4/3	Some intrusions but could be restored within 50 years with a minimum of rehabilitation work. 2	Some intrusions which could be restored but would take in excess of 50 years and/or considerable rehabilitation work. 1
FREEDOM FROM OUTSIDE INTRUSIONS ②	High 4/3	Moderate 2	Low 1
SIZE ③	Greatern than 50,000 acres. 6	Between 5,000-50,000 acres. 4	Area less than 5,000 acres. 2
ROADS ④	75% of area roadless remaining 25% averages less than 1 mile of unimproved road per section. 4/3	50% of area roadless, remaining 50% averages less than 1 mile of unimproved road per section. 2	Average less than 1 mile of unimproved road per section. 1

* Wildland value is the relative degree of the absence of man and his impact as well as opportunity for solitude.

EXPLANATION OF RATING CRITERIA

① Present Intrusions. A measure of the internal "pureness" of the area or the degree of impact man has had on the area.....and the potential for restoration to natural conditions.

② Freedom from Outside Intrusions. A measure of the degree of exposure to outside influences (i.e., visual, noise, smell, etc.) which could adversely effect isolation or solitude within the area. The highest rating would usually be given to an area which is roundish in shape with topographic or other features on the perimeter which screen outside influences. However, an elongated or irregular shaped area such as a deep canyon could provide an excellent buffer from outside influences and consequently rate high. Usually an elongated area such as a single chain mountain range with most of the slopes exposed to outside influences would rate low; however, if the outside influences are minimal, the rating should be upgraded accordingly. A moderate rating is assigned to those areas which fall in between these extremes.

③ Size. A measure of the degree of solitude and isolation within the area (i.e. the larger the area the greater the possibility for isolation and solitude).

④ Roads. Unimproved roads are those roads not maintained by a city, county, state or any other person or entity.

INSTRUCTIONS

Purpose. To rate the quality of an area for primitive values.

How to Identify Primitive Value. Consider the following characteristics in identifying primitive areas:

1. Contains natural, wild, and undeveloped lands in a setting essentially removed from the effects of civilization.
2. Has outstanding opportunities for solitude or a primitive and confined type of recreation.
3. Is of sufficient size as to make practicable its preservation and use in an unimpaired condition.
4. May also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

How to Determine Minimum Suitability for Evaluation:

A. Evaluate all roadless areas over 5,000 acres in size.

B. Evaluate roadless areas smaller than 5,000 acres if they are bounded by natural barriers that provide a substantial buffer from outside influences.

C. Large areas which have some impacts from roads and other intrusions should be evaluated providing the intrusions could realistically be restored to near the natural condition.

How to Delineate Rating Areas:

1. Use physiographic features such as large drainage basins, mountain ranges, etc. wherever possible. Select boundaries that form logical management units.
2. Maximize size consistent with other variables.
3. Exclude significant internal intrusions consistent with need to maximize size.
4. Exclude all improved roads (i.e. those that are graded and maintained regularly). Where possible, exclude networks of unimproved roads which reduce primitive values. Ignore occasional unimproved roads which have little or no effect on wildland values.
5. Exclude areas of human use, substantial impact, or low potential manageability.

(714) 540-4075
(714) 831-2171

Lee Chemical Co.
Post Office Box 1873
Costa Mesa, California 92626

April 25, 1977

Bureau of Land Management
1695 Spruce Street
Riverside, CA

Attention: Mr. Jeff Steele

Subject: Cadiz Lake as an off-road vehicle recreation area

It is our understanding that Cadiz Lake is being considered by the Bureau of Land Management for use as a recreation area for off-road vehicles.

We respectfully request that the subject area not be designated for this type of activity for the following reasons:

1. Safety: There is a lack of medical facilities, fresh water, and utilities. Currently there are four independent companies in operation producing liquid calcium chloride. These operations involve the use of heavy equipment and the daily use of a privately maintained road by the employees and commercial tank truck carriers.
2. Ecology: the potential destruction of native plants and the disruption of animal life.
3. Economics: an increase in operational liability and theft insurance would follow. There would be an increase in the cost of road maintenance unless the government or recreation groups intend to pay for the added maintenance.

We do not understand why, with the thousands of square miles of open desert, this parcel of approximately fifty square miles is being considered for recreational use amidst commercial operations.

Sincerely,
Lee Chemical Inc.

L.L. Bardsley
President

llb/rlb

SIERRA CLUB
SAN GORGONIO CHAPTER
Founded 1892
P. O. Box 1023
Riverside, California 92502
Mojave Group
PO Box 1367
Barstow, CA 92311

Gerald Hillier
District Manager
Bureau of Land Management

July 15, 1977

Dear Mr Hillier;

Thank you for letting us review the EAR for Interim Critical Management, Program Area #37, Cadiz Valley/Danby Lake. We are concerned about ORV use in this area, especially before adqquate inve ntory is made.

We support alternative 1. "Close the Cadiz Valley/Danby Lake Area to all off-road vehicle use." We feel this is the only alternative pursuant to section 603 of PL 94-579. As theEAR points out, there are several possible potential wildderness areas within Area #37 and these wilderness values need to be studied.

I have visited the area twice, and am amazed by the solitude and vastness one gains from this remote area.

Off-Road-Vehicles should not be allowed to destroy an area before its been inventoried and studied for wilderness potential. Off-Road-Vechicles should be enccuraged to use already existing destroyed areas such as Johnson Valley. Opening up new areas for ORV destruction is a significant loss for the majority of the American public. The Sierra Club is working with the state parks department to have state ORV parks closer to the Los Angeles metropolitan area, so that vast amounts of energy aren't wasted for ORV use. The Hungry Valley and Ocotillo Wells state ORV parks are examples of ORV areas close to the metropolis for ORV use.

Please keep us informed.

sincerely,

Peter Burk

Peter Burk
Mojave Group Chairman

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

7/16/77

Mr. Gerald E. Hillier
District Manager
Bureau of Land Management
1695 Spruce St.
Riverside, CA 92506

Dear Mr. Hillier,

Thank you very much for the opportunity to review the draft EAR for the Interim Critical Management Program Area #37, Cadiz Valley/Danby Lake. I have read the document carefully and my comments are attached. I should say that this EAR is head-and-shoulders above the one issued last year for the same area. While it is still notably lacking in site-specific data on the critical subjects of soil and hydrology, the discussions and assessments of impacts are in general outstanding.

In fact, the nature of the assessments of impacts under the proposed alternative and the assessment of Irreversible and Irretrievable Commitments of Resources, strike me as clearly inconsistent with adoption of the proposed alternative. Because this action would constitute a significant commitment of resources of the public lands, as can be reasonably inferred from the EAR, I strongly recommend that an Environmental Impact Analysis be prepared. In this way, substantive facts can be gathered to fill the present large (and critical) gaps in site-specific data that are needed for judicious weighing of the real environmental trade-offs involved.

Sincerely yours,

Howard G. Wilshire

cc Lewis J. Walker
San Bernardino Co. Environmental Improvement Agency

INTRODUCTION

p. I-4, item 2. The "possible maximum of 3,000 motorcycles in one event" and average of "550 motorcycles per event" do not fit the statement on p. V-11, item 6, that "The number of participants should be limited to 500."

If as many as 3,000 are allowed to participate in one event, then the areas of impact should be adjusted by a formula derived from the 1974 Barstow to Las Vegas experience in which it was not possible to control the use to preplanned courses.

p. I-7, item B.5. Surely it was an oversight to exclude base line studies of soils; is the level of erosion not to be monitored, or to determine the number of races to be held? Also, the ESP approach is likely to be inadquate for erosion monitoring. Since you have available mechanical disturbances in the immediate area of known age (Patton's and those of Desert Strike) which are undergoing accelerated erosion, some idea of erosion rates to be expected from disturbing the area with ORVs can be obtained relatively easily. These disturbances also should afford good opportunity to obtain data on natural recovery rates, and yet the EAR contains no such information.

p. II-77, item D.4. Instructions of Sect. 603(c), PL 94-579 to manage wilderness study areas so as not to impair the suitability of such areas for preservation as wilderness, is not consistent with proposed action in terms of the rankings illustrated on map II-8, p. II-58. Clearly, the creation of long-lasting disruptions of the soil mantle of the scale

permitted by the proposed action will cause significant deterioration of scenic, habitat, and air and water quality values.

p. III-1, Section III. The summary dismissal of significant impact in items 1-4 is unwarranted by the scope of the proposed action:

A. (1), Topography. The opportunity exists to determine the effects of Patton's and Desert Strike's trails and roadways in modifying drainage patterns. The only areas of no slope are the dry lake basins, so the vehicle effects on all other surfaces must be felt. Moreover, the potential for rapid geomorphic change occurs in all sand-mantled areas that are presently stabilized by plant growth (most of them). This also clears the way for rapid change in the dimensions of the dry lake through encroachment of wind-blown material from destabilized surfaces upwind from it.

A. (2) Climate. This statement is inconsistent with the analysis on p. III-38, with which I agree. The combined effects of altering surface albedo, moisture content, transpiration rates, and, probably most important, long-term increased dust yield cannot be summarily dismissed as they are all additive, and are parameters of climatic importance. The potential direct and indirect dust yields to the troposphere have not been analyzed so the dismissal of significant impact cannot be made.

A. (3). The type of deposit described by Smith (p. II-76) is easily "mined" and destroyed by ORVs. As no inventory of

geologic features vulnerable to vehicle destruction has been made, the assessment made here has no foundation.

A. (4) Water. ORV use in most instances reduces infiltration and increases overland flow. Use of the scope envisioned in the proposed alternative must have a substantial adverse effect on soil moisture and groundwater. This has not been assessed.

A. (5) Soils. While I concur with the general assessments made here, there are no quantitative data given that will allow accurate predictions of the environmental impacts of the proposed action. The impacts of destabilizing these soils will affect visual, wilderness, air, water, habitat, scientific, and cultural values as well as modifying the capacity of the land to restore itself, and therefore require detailed quantitative analysis.

A. (6) Air. There are no soil grain size data for the ORV event examples cited, and none for Cadiz/Danby to allow prediction of direct vehicle-induced dust yields, duration of excesses over standards, or of indirect yields resulting from wind erosion of the vehicle-destabilized surfaces. Surely such information should be obtained from existing organized ORV event areas, and thorough analysis of soils at Cadiz/Danby made before the irrevocable commitment is made? The same applies to dust-borne disease problems, and effects of salt deposition from erosion of disturbed dry-lake areas.

Section III, general. Per mile impact assessments do not correctly assess total impacts due to establishment of competitive events because there must be a very large increase

of random use by spectators and participants at major competitions that would not occur without the competition. This is characteristic of all competitive events that I have witnessed, and I estimate that the impacts from associated spectator play frequently far outweigh those of the organized event.

p. III-30 to 31. The impacts on the life-support functions of sand deposits can be evaluated by proper study of dune systems now in use by ORVs. It would seem mandatory to perform these studies before commitment of the little-used Cadiz/Danby area whose sand dune and sand sheet areas have probably been stabilized for several thousand years.

p. III-32, last paragraph. Assessment of sand hills impact represents only direct impact; indirect impact through erosion will be much greater (in addition, of course, to random play impacts).

p. III-33 to 36, Sect. f, 1. This is an important assessment. I would like to add a point of emphasis that we have observed in desert and nondesert ORV areas. ORV impacts of course destroy smaller vegetation directly and cause soil compaction. The result of both is increased runoff. As the vegetation too large to be directly impacted by vehicles is generally adjusted to runoff levels that are balanced by the smaller vegetation and normal infiltration rates, even they are impacted by indirect effects of the changed system. This has led, through increased erosive power of the runoff, to serious root undercutting and ultimately to destruction (Figs. 1,2). Precisely

the same effects have been observed where vehicle use adjacent to large trees, of a size to discourage voluntary direct impacts, have resulted in wind erosion-root exposure and toppling (Fig. 3). Wind and water erosion further cause root exposure of smaller plants where they have been accelerated by ORV use of nearby areas (Figs. 4-5).

p. III-38, C, last paragraph. This statement seems quite adequate grounds for choice of alternative C-1 (p. I-7). If you don't know what the effects are, then they should be determined from areas already in use rather than to commit a little-used area to irreversible experiments.

p. III-39, C., 1, b. An additional item is needed: ORV-induced soil and plant cover modifications cause significant change in the soil thermal regime that is deleterious to plant and animal life.

P. III-38 through 48. An excellent resume of most of the reasons why the management alternative chosen is the least reasonable one available.

p. III-66, D,4,a. If so, how can the increased use proposed by [illegible] justified in terms of PL 94-579?

p. IV-1, A, 1. I do not believe that the impact to soils under alternative #2 is the same as under the proposed alternative. It is already conceded that present (since open designation in 1973) levels of use are low. The proposed action will greatly increase the level of use and therefore the impact on soils. Moreover, the type of use is very important, and the proposed alternative will increase all types substantially above present (Alternative 2) levels. The same applies to

alternative 3, unless competition only, with no random spectator play, is enforced--hardly likely!

The low use level soil impacts are not properly assessed. Erosion rates for most mechanical disturbances of the soil are highest at and soon after the inception of disturbance and reduce with time. The random use that is coincidental with competitive events will greatly enlarge the area of high erosion rates. This is, after all, what causes the comparatively rapid erasure of visual scars from vehicles on some surface types. The fact of the erosion that caused the erasure, however, is very real even if we have failed to set up the experiments that will measure its environmental impacts.

p. IV-1, B, 1, alternative #2. Same comments as above. The proposed alternative will definitely bring a major increase in use; no competitive events may not, and, considering use levels since 1973, probably will not.

Alternative # 3. There is always major random use from spectators and entrants at competitive events. It is not likely that they will come all the way to Cadiz/Danby merely to watch a race.

p. V-1, A, 1. How can the proposed alternative be seriously considered without the site-specific data?

p. V-2,3, B, 2, c. Need to prohibit all night use, competitive or otherwise to achieve this end.

p. V-3, B, 2, d. Need to prohibit use of significant catchments for this drainage to prevent indirect effects of increased runoff.

Section V, General. I recommend an addition: bonding of event promoters adequate to restore all damages to natural or cultural features, or to undertake reclamation actions, including surface restorations to reduce erosion, replacement of destroyed and damaged plants, and the like for all areas of unauthorized enlargement of specific course allotments, and those brought about by spectator and participant enlargement of authorized camp and pit areas, and spillover into areas outside the open-area. The costs of adequate damage assessment should also be borne by the promoter. Such requirements would appear to be in keeping with the Memorandum of the Secretary of the Interior that accompanies the Interior lands EIS implementing EO 11644.

p. V-6, C, b, 6 to 10. How does monitoring mitigate anything? Substantive penalty for noncompliance should prove more effective.

p. V-9, D, 1, e. I cannot do other than emphatically endorse the urgent need to specify permissible levels of impact. These must, of course, be predicated on a firm understanding of the role of each monitored factor in the viability of the whole system. The rate at which permissible levels are exceeded would be useful information in evaluating continuation of such use; otherwise such an approach will result only in a rapid reduction of the whole area to the permissible damage level.

p. VII-3, last paragraph. How, then, can the selected alternative be considered?

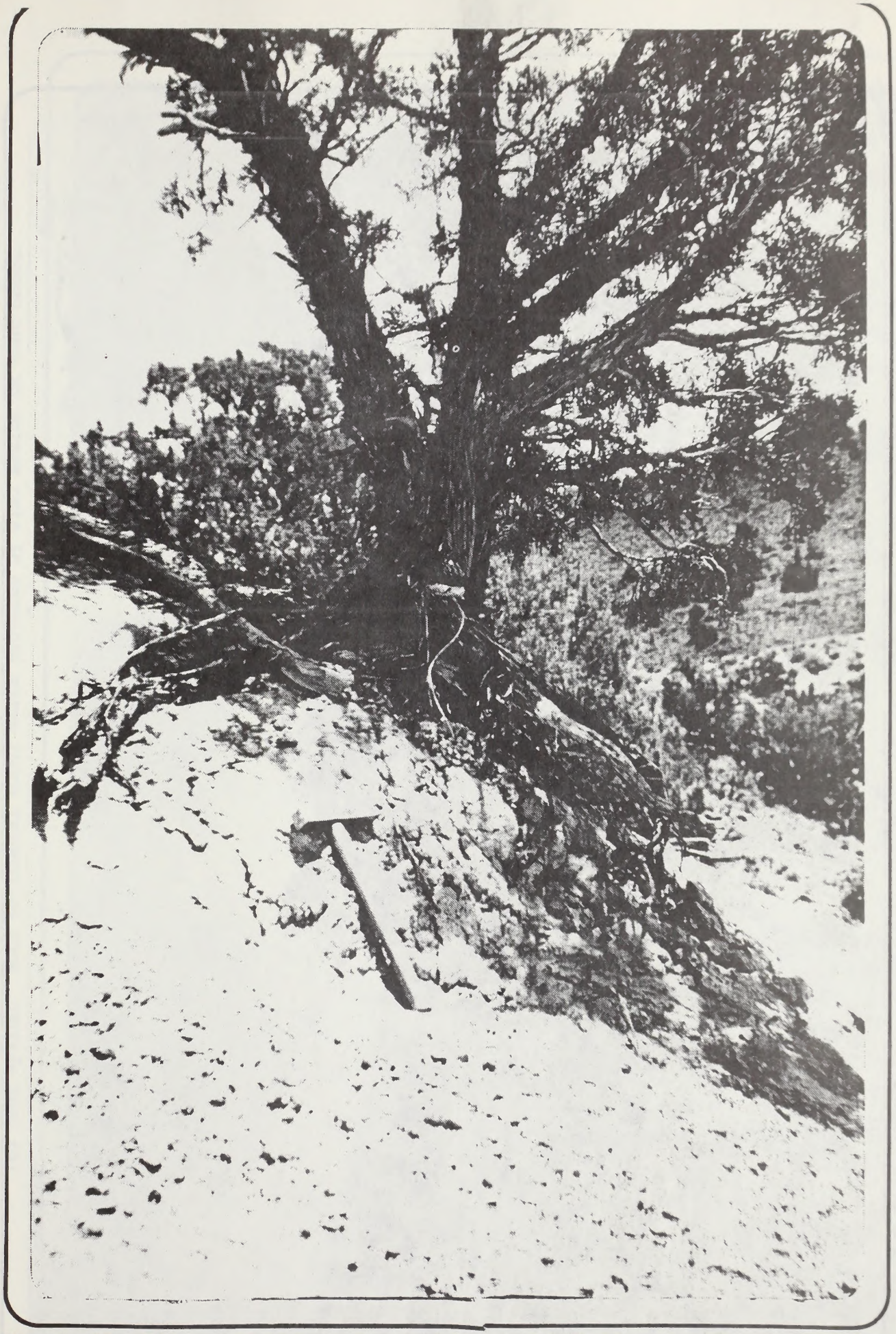


Fig. 1. 32 inch root exposure of juniper caused by water erosion of ORV-bared adjacent areas. 1 year after this photo was taken, the tree had toppled.

Fig. 2. 15 foot juniper toppled by wind after wind and water erosion of adjacent ORV trail had undercut its root system.

Fig. 3. 8 foot joshua tree toppled after wind erosion of motorcycle hillclimb at left had undercut its root system. Note horizontal scour marks produced by wind action on root mound.

Fig. 4. 14 inch root exposure of creosote shrub caused by wind deflation of adjacent ORV trails.

Fig. 5. Severe root exposure of creosote shrubs caused by headward erosion of gullies formed in ORV trails.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
3619A Canyon Crest Drive
Riverside, CA 92507
(714) 686-8750

August 4, 1977

Mr. Gerald E. Hillier
District Manager
Bureau of Land Management
1695 Spruce Street
Riverside, CA 92507

Dear Mr. Hillier:

We have reviewed the Preliminary Draft of the Environmental Assessment Record for Cadiz Valley/Danby Lake.

While heavy use of this area by ORV will increase wind and water erosion, the project area is remote to the extent that the impacts will be of less consequence than many other sites.

Thank you for giving us the opportunity to make this review.

Sincerely,

Donald F. Miller

DONALD F. MILLER
Area Conservationist

cc: Harlan D. McIntire, SCS, Apple Valley

5 Aug '77

Mr Gerald E. Hillier
District Manager
Bureau of Land Management
1695 Spruce Street
Riverside, CA 92506

Dear Mr Hillier,

Reference the Cadiz Valley/Danby Lake ORV Activities.

I for one would much rather see people enjoy the Public lands in the area, rather than leave it stay to the little wild life that is in the area. Just can't see where would ecology would be upset if that type wild life is lost to that specific area.

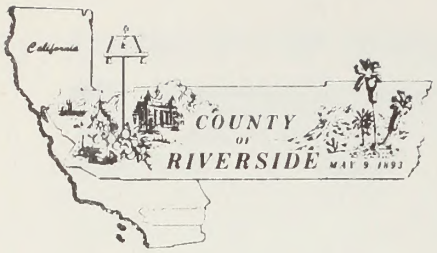
However, trust your proposals will protect the private property in the area. As owner of 160 acres in Cadiz Valley plan one day to build and settle in the area. As soon as it builds up to much in the area where I now live Cadiz Valley is to be my retreat and retirement home.

Thank you kindly and please advise.

Yours truly,

George C. Hanschild

George C. Hanschild
2423 Road Runner Drive
Star Route 2, Box 735
Twentynine Palms, CA 92277



RIVERSIDE COUNTY PLANNING DEPARTMENT

JAR: 72379

July 15, 1977

A. E. NEWCOMB - PLANNING DIRECTOR

4080 LEMON STREET, 9th FLOOR, RIVERSIDE, CALIFORNIA 92501
TELEPHONE (714) 787-6181

Mr. Gerald E. Hillier, District Manager
United States Department of the Interior
Bureau of Land Management
1695 Spruce Street
Riverside, California 92506

Re: 1791 (C-068)

Dear Mr. Hillier:

Thank you for the opportunity to review the preliminary Environmental Assessment Record for Interim Critical Management Program Area #37 Cadiz Valley/Danby Lake.

We found the report to be complete and informative and we have no comments at this time.

We are returning, under separate cover, our copies of the report for your future use.

Very truly yours,

RIVERSIDE COUNTY PLANNING DEPARTMENT

A. E. Newcomb, Planning Director

AEN/ew

5922 Cahuilla St.
Twentynine Palms California
August 7 1977

Gerald E Hillier,
Bureau of Land Management
Riverside District Mgr.

Dear Mr. Hillier:

As a resident of Twentynine Palms, I am very opposed to Cadiz Valley Danby Dry Lake being open for the use of ORV in any way. Any use of it as proposed in the report of BLM will destroy all vegetation, forever making a dust bowl from which will come more and worse dust storms from the east then this area is getting more often, and destroy all historical landmarks, beauty and wildlife.

Please preserve Danby Dry Lake for history and future generations to look at, NOT DESTROY.

There was not enough time given for input after the news medie recieved the BLM announcement of the hearing which is ubfair to we desert people but favorable for the ORV forces.

Thank you,

Sincerely,

Beulah B. Smith

Beulah B. Smith

Mrs. Susan L. Moore
P. O. Box 262
Twentynine Palms, Ca. 92277
August 8, 1977

Mr. Stewart Branson
Bureau of Land Management
1695 Spruce Street
Riverside, Calif. 92507

Dear Mr. Branson:

As a resident of Twentynine Palms, and a worker for the protection of desert lands, I am OPPOSED to the opening of Cadiz Valley for off-road vehicle activity. I think that the ORV's have enough open areas already, and that more lands should not be "sacrificed."

On those lands not already officially "open" on the permanent plan, I think that ORV traffic should be confined to existing roads and trails; there are plenty of these all over the desert.

I would also advocate a stiff penalty for anyone caught "burning" new trails as I heard one motorcycle man brag about doing, at an Advisory Committee hearing.

All of the regular events listed to be scheduled for the Cadiz Valley proposed "open" area would encourage a tremendous waste of gasoline by those who would travel long distances to participate. This would probably also mean a great increase of noisy traffic through the Morongo Basin towns along Highway 62, with the likelihood of more side trips over private property along the way, adding to the local residents' problems in this regard.

While I have heard the virtues of organized ORV clubs extolled at BLM hearings, I am concerned that so much activity at Cadiz might result in a greater influx of the lawless "fringe" of motorcycle riders that could cause additional vandalism and lawlessness in our towns. We already have a big problem with that.

I would appreciate your careful consideration of these concerns.

Sincerely yours,

Susan L. Moore

Susan L. Moore

cc: Congresswoman
Shirley Pettis
Mr. Theodore Bickmore
Pres. of MBCA

STATE OF CALIFORNIA—RESOURCES AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF FISH AND GAME
350 Golden Shore
Long Beach, CA 90802
(213) 590-5113

August 9, 1977

Mr. Gerald E. Hillier, District Manager
U.S. Department of the Interior
Bureau of Land Management
Riverside District Office
1695 Spruce Street
Riverside, CA 92506

Dear Mr. Hillier:

We have reviewed the Draft Environmental Assessment Record for "Interim Critical Management Programs Area No. 37 Cadiz Valley/Danby Lake," and find it adequate in its discussion of the probable adverse impacts to desert flora and fauna that may result from unorganized off-road vehicle use. However, we find that the document does not present adequate measures to offset these impacts. We feel that severe habitat and wildlife losses will occur which cannot be adequately compensated for due to the projected long term adverse effects that may occur on desert biosystems.

Based upon the irreparable damage that may occur, we strongly recommend that the subject area be closed to off-road vehicle use and be managed for passive recreational uses.

If you have any questions, please contact Mr. Jack L. Spruill or Mr. Richard Nitsos of our Environmental Services staff at the California Department of Fish and Game, 350 Golden Shore, Long Beach, California 90802. The telephone number is (213) 590-5137.

Thank you for the opportunity to review and comment on this document.

Sincerely,

George C. Shanda

Robert D. Montgomery
Regional Manager
Region 5

Sierra Club
Southern California Regional Conservation Committee
Desert Committee

AUG 12 4 PM '77

August 11, 1977

To: Disrtict Manager
Riverside District Office
Bureau of Land Management

Fm: Lyle K. Gaston, Chairman
Desert Committee, Sierra Club
1844 Seventh Street
Riverside, CA 92507

Re: Cadiz Valley/Danby Lake EAR

The following are our comments, questions, and recommendation for the Cadiz Valley/Danby Lake EAR.

This document is certainly the most comprehensively researched, and documented assessment of ORV impacts on an area that the Bureau has prepared to date. The problems and the trade-offs have been clearly outlined. We commend BLM for its efforts.

Proposed Action

The resource inventory and lack of ORV use indicates that the original land use allocations in the ICMP were based on federal ownership of large contiguous parcels of land (II-62) and not on resource or need. Therefore, the provision in the ICMP, that it is an interim plan and is subject to review and change as new information is acquired, should be initiated and area No. 37, Cadiz Valley/Danby Lake, be closed to use of vehicles off designated highways.

The entire inventory is developed around the 118 miles of competitive race course but one of the actions considered is to establish the area as totally open to off-road vehicle activity. The EAR does not evaluate the impacts of proposed action I.B.1. - continue the use of the Cadiz Valley/Danby Lake area as an open area for all unorganized off-road vehicle activity - thus, this option must be withdrawn.

Wilderness Inventory

Public Law 94-579, section 603, mandates that all

roadless areas of 5000 acres or more shall be managed so as to not impair their suitability for wilderness. In 43 CFR 19.2 (e) a road is defined as one which is suitable for public travel by means of four-wheeled, motorized vehicles intended primarily for highway use. (Note that the Forest Service definition of a road specifies that the road must be "maintained" rather than "suitable".) The EAR identifies 6 areas that meet wilderness criteria, one of which is in the proposed open area. These areas must be managed to preserve their wilderness character until they have been reviewed; opening them tc ORV use in inconsistent with this mandate. Further, since these areas have been identified as having wilderness character, we ask that they be reviewed with existing primitive areas. What is the timetable for review of these areas?

Ordnance

Ordnance contamination of the area is a serious hazard. Before the area is opened to unrestricted ORV use, the Department of Defense must certify that all ordnance has been removed and that the federal government will assume all liability for any future ordnance accident claims. If BLM opens the area to ORV use, tacitly inviting people to use the area, than the solicitor must render an opinion on the liability of BLM for ordnance accident claims if the area is not certified as above. What is the solicitor's ruling on this matter? The ordnance issue alone is enough to preclude opening the area.

Enforcement of Boundries

The EAR acknowledges that there will be adverse impacts on surrounding lands due to unorganized ORVs being drawn to the open area. From past experience in the Algodones Dunes, a few signs will not restrict ORV travel to the open portion of the Cadiz Dunes. The mitigation measures are totally inadequate and, and if the area is opened, an adequate and enforeeable solution must be found to protect the dunes.

The EAR acknowledges the historic values of Saltmarsh and the present low level use of the area. As demonstrated at the Tortise Preserve, a few signs and a fence offer no protection for an area near an intense use area. If BLM officially directs more ORV use to the area, then it will be sanctioning the destruction of Saltmarsh in violation of the Historin Sites Preservation Act. What measures does BLM propose that will in fact protect the adjacent areas?

Within the area, there are 11,520 acres of private property. The boundries are not readily discernible in the field. Thus land uses permitted on BLM lands will carry over to non-federal lands. What provisions has BLM made to ensure that the provisions of CEQA are complied with on private property? What steps have been taken

to secure permission from the affected private property owners to zone the surrounding area for ORV use?

Air Quality

The EAR documents well the adverse effect on air quality that will follow disturbance of the soil by ORV activity. Presently ARB has designated the area as Class B; however, with the potential for wilderness classification, this area should be redesignated as emergency Class A. The federal government has delegated air quality to the states. How does BLM propose to meet state air quality standards if the the area is opened for competitive ORV events?

In addition, BLM must propose a solution to the health hazard caused by Coccidioidomycosis spores accompanying the displaced soil particles.

Scenic Visual Resources

We question the validity of this entire evaluation because the criteria used were developed for mountainous (vertical) topography, see maps II-5, 6, 7. In spite of these criteria, Cadiz Valley was still identified as having excellent wildland values. When is BLM going to develop criteria for evaluating visual resources in a relatively flat, open desert situation?

Historical

We commend BLM for nominating both the Iron Mountain Divisional Camp and Saltmarsh to the National Register of Historic Places. For Saltmarsh comments see Enformement of Boundries above. The Iron Mountain Divisional Camp is subject to water erosion from Iron Mountain run-off. No mitigation measures were proposed to control the diversion of present water courses due to rutting along the Rock Pile Loop, No. 4 on Map I-3. What flood control measures are proposed and what are the impacts of the flood control project?

Natural Resources

For the most part, the living resources have been well documented. The major deficiency is in the invertebrate inventory. The Cadiz area is in the interface of the Mojave and Colorado Deserts and thus maybe one of the key links in following invertebrate speciation among the sand dunes. Clearly finding 27 sensitive animal species and 3 sensitive plant species that will be adversely affected if the area is opened to ORV use is justification for not opening the area. With recovery times measured in multi-decades or centuries, ORV destruction of this area will prevent many generations of humans from seeing and/or using this area in its present state. How does BLM justify the loss of these opportunities to future generations?

The EAR documents very well the rosources of the area, and the impacts of the proposed action. The only course of action consistent with the EAR is to follow I. C. 1. - close the Cadiz Valley/Danby Lake Area to all off-road vehicle use. We recomment this alternative.

We further question the propriety of BLM using their time and money to develop information to satisify a single-purpose, minor use of their lands. How much money did BLM spend on this EAR and how much was recovered from the proponents of this project?

The Atchison, Topeka and Santa Fe Railway Company

A Santa Fe Industries Company

121 East Sixth Street, Los Angeles, California 90014, Telephone 213/628-0111 ext. 2457

Los Angeles, August 11, 1977

File: BK-38009

Gerald E. Hillier, District Manager
United States Department of Interior
Bureau of Land Management
Riverside District Office
1695 Spruce Street
Riverside, CA 92506

Attention: Albert S. Branson

Gentlemen:

The Atchison, Topeka and Santa Fe Railway Company is pleased to have been furnished a copy of the Draft Environmental Assessment Record for Interim Critical Management Program Area #37 Cadiz Valley/ Danby Lake for our review and comments. As noted in the Report, the eastern boundary of Open Area No. 7 parallels the Santa Fe Railroad. For your information and use, following are our comments on the concerns of Santa Fe with regard to what is proposed:

1. Proposed competitive events will increase the vehicular use of the area (by the public), which will increase the wind erosion and dust in the area along Santa Fe's right of way. Due to high speed and velocities of the wind, the natural earth crust will be disturbed and sand will become a more prevelant problem to the railroad. This erosion from blow sand will increase the maintenance problems of the railroad (sand will cover up the tracks) and will increase the hazard of possible derailments of trains and injury to train personnel.

2. Increasing the number of both competitive and non-competitive vehicles in the area will also increase incidents of encroachments on Santa Fe's right of way. It is quite possible that both four-wheel off-road vehicles and motorcycles will encroach not only on railway property but also will attempt to use the track as a "roadway". This would increase the possibility of vehicle-train collision. It is also possible that four-wheel vehicles will attempt to cross the railroad track at any location which leads to track damage and possible train derailments.

3. Increased use of the area by the public will surely increase vandalism to railroad property. Periodically, Santa Fe personnel and maintenance gangs are stationed in the area to insert ties, surface

track, and repair bridges, which requires the use of sophisticated, expensive machinery. Since it is not economically feasible to house these machines, it is necessary that they be left at the site during the maintenance program. It is quite possible that very expensive machines will be damaged by vandals if the area is opened to the public, with the increased exposure as is proposed by the Report.

Santa Fe requests that, of the three alternatives to the proposed action by Bureau of Land Management, Alternative No. 1, "Close the Cadiz Valley/Danby Lake area to all off-road vehicle use", be adopted.

Very truly yours,

J. G. Fry, Jr.
Assistant General Manager
Engineering

P.O. Box 141, Westerville, Ohio 43081 Telephone (614) 891-2425
Telex: 245392

August 12, 1977

RIVERSIDE, CA

Bureau of Land Management
Riverside District Office
1695 Spruce Street
Riverside, California 92506

Gentlemen:

The American Motorcyclist Association appreciates the opportunity to offer the following comments on the Environmental Assessment Record for the Interim Critical Management Program Area, No. 37, Cadiz Valley/ Danby Lake. The association is not in complete agreement with all that is described within the EAR but generally excepts the value and the extensive planning that has gone into providing use areas for both competition and non-competition of off-road vehicles. The underlying theme of the Cadiz Valley/Danby Lake EAR seems to reflect a search for reasons why off-road vehicle recreation should not be tolerated rather than how management approaches might accommodate this type of recreation satisfactorily.

The Cadiz Valley/Danby Lake area represents 178,000 acres of the total 25 million acres included in the California Desert Conservation Area. Within this area only 4,420 acres is effected by the proposed routes designated for competitive off-road vehicle events. As the draft EAR indicates this is only 2.5 percent of the total area included within the EAR. However, the draft fails to consider the potential consequences of delegating competition events to small areas. Continued concentration of off-road vehicle events in small areas can only serve to increase the environmental impact. The utilization of larger areas could permit further rotation of the competition sites, therefore, allowing more time to rehabilitate individual sites utilized for competition.

The designation of larger areas would also permit accommodation of larger numbers of participants in this form of recreation. By including larger numbers of users, management of such areas would be enhanced because of the increased control of the particular recreational event being accommodated. Nowhere in the EAR are these positive measures addressed.

Most disturbing among the topics excluded from the EAR is the failure to consider the positive human interest value of providing a recreational outlet for off-road vehicle enthusiasts. While the EAR addresses the environmental impact of alleged air pollution and noise

generated by off-road events on non-motorized recreation users, nowhere does the EAR address the positive effects on the participant in the off-road vehicle event.

Also of interest are the economic impacts generated by participants in the off-road vehicle event. This economic impact extends beyond the area addressed within the draft into the metropolitan areas where participatns often are domiciled. The purchase of vehicles, maintenance, equipment and accommodations all contribute to the economy of the area.

We recognize the importance of addressing a specific management problem and the environmental impact of off-road vehicle events and unorganized off-road vehicle use on a specific area. However, little attention seems to have been given to the users of the off-road vehicle and the value of that use as a recreation outlet. There is a continued theme throughout the EAR which seems to weigh the human value against the land values encompassed within the area being studied. The only human values addressed are those representing the non-motorized recreational user who may be impacted by the presence of ORV's.

The association feels that closer attention should be paid to development of more courses to assist in distributing the use over a larger portion of the area. Such a step would assist in mimimizing environmental impacts as well as further controlling use by off-road vehicle competitors. We would also like to see the socio-economic value of the off-road vehicle use discussed in greater detail. Investigations required for such discussion could serve to answer many of the questions that arise concerning the value of man's recreational experiences versus the value of prohibiting that use by restricting areas available to him. Such investigations would also add greater depth to the short term, versus long term utilization of our national resource lands.

The American Motorcyclist Association has always advocated a position that recognized the importance of proper environmental management in considering off-road vehicle use. However, we feel the area in southern California Desert, because of the demands made on those lands, must include valid consideration for their recreational value as well as consideration on environmental issues. The socio-economic impact of the off-road vehicle use in southern California is too important to take a back seat to subjective environmental assessments.

As always we wish to continue working with the Bureau of Land Management to enhance the quality of a recreational experience in the California Desert.

Sincerely yours,

Robert Rasor
Associate Director
Legislative Department

THE CALIFORNIA NATIVE PLANT SOCIETY

DEDICATED TO THE PRESERVATION OF CALIFORNIA NATIVE FLORA

Southern California Conservation Representative
320 Maravilla Drive
Riverside, California 92507
(714) 686-9156
12 August 1977

Mr. Gerald Hillier, District Manager
Bureau of Land Management
Riverside District Office
1695 Spruce Street
Riverside, CA 92506

Re: Preliminary Draft Environmental Assessment Record for Interim Critical Management Program Area #37, Cadiz Valley/Danby Lake, June 1977

Dear Mr. Hillier:

Thank you for sending me a copy of the above EAR and notice of public meeting in San Bernardino on 8 August 1977 when the following proposed action was presented to the public:

1) Continue the use of the Cadiz Valley/Danby Lake Area as an open area for all unorganized off-road vehicle activity;
2) provide for competitive off-road vehicle use on 118 miles of BLM designated courses;
3) provide for continued consideration of enduro event applications for sponsor designed courses;
4) provide for consideration of applications for organized non-competitive off-road vehicle events on sponsor designed courses;
5) conduct base line studies of vegetation, wildlife and scenic-visual resources to obtain quantitative values for each resource and to quantify any changes in those resources as a result of the proposed action or alternatives. The baseline data will determine the actual number of races to be held and evaluate their impact.

Attached hereto is copy of my statement made at that meeting in which I complimented the Bureau for the quality of this EAR and also stated that Alternative No. 1 to close the Cadiz Valley/Danby Lake Area to all off-road vehicle use is the only logical choice of action for this area on the basis of the facts and assessments presented in the EAR.

Last year, the first EAR prepared for Cadiz Valley/Danby Lake ICMP #37 proposed to "establish five 90-mile courses to be used at least once a year by an average of 400 motorcycles per event. The maximum total area that would be impacted by this proposal would be about 15,808 acres (25 square miles) or about 14% of the lands in Federal ownership." (See attached copy of our letter of 27 October 1976).

The current EAR states, as a part of proposed action paragraph 2) above, that "The Bureau has established, with input from District 37 of the American Motorcycle Association, 118 miles of off-road vehicle course. These courses would be used by

an average of 500 motorcycles per event, plus an undetermined amount of 4-wheel drive, dune buggies, and other competitive off-road vehicles. The maximum total area that would be impacted by these courses will be about 4,420 acres (7 square miles) or 2.5% of the Federal lands in the area."

However, Figure I-1 "Land Committed to the Proposed Action" (page I-6) of the current EAR, indicates that total Federal land area committed to competitive use is 4,220 acres, PLUS Federal land area committed to non-competitive use of 166,500 acres, PLUS private land impacted by proposed action of 11,520 acres, for a grand total of lands within the boundary of the proposed action of the astronomical sum of 178,000 acres or approximately 278 square miles committed to off-road vehicle use.

In the current EAR section on vegetation and wildlife (II-B pages 10-46) seven major habitats are identified. Two highly sensitive plants (listed by the California Native PlantSociety Inventory of Rare and Endangered Vascular Plants of California as "rare and endangered") were found in the area - the Borrego locoweed (Astragalus lentiginosus var. borreganus) and the scaly-stemmed sandplant (Pholisma arenarium); also found was the twining snapdragon (Antirrhinum filipes) a plant of limited distribution.

Section II-B and C discusses in detail the vegetation, wildlife and habitats, revealing a diverse flora and fauna including the above rare plants and a large number of birds and animals listed by the California Department of Fish and Wildlife as fully protected (desert tortoise, kit fox, ringtailed cat), or partially protected (blacktailed jackrabbit, bobcat, redtailed hawk, mourning dove, banded gecko, desert iguana, chuckwalla, Mojave fringetoed lizard, collared lizard, leopard lizard, desert horned lizard); on the Audubon Blue List (western grebe, Swainson's hawk, marsh hawk, prairie falcon, sparrow hawk, shorteared owl, loggerhead shrike, yellow warbler, vesper sparrow); and the brown pelican, a State and Federal endangered species, which was found at the Iron Mountain Pumping Plant. Invertebrates were not inventoried, nor were soil fungi and algae, although their occurrence and importance were discussed.

The section on environmental impacts of the proposed action on vegetation and wildlife (III-B and C, pages 10-47) identifies probable impacts and predicts that impairment of plant growth and loss of wildlife will be severe and directly related to the numbers of motorcycles and repeated use. The three sensitive plants are expected to be moderately to highly impacted, dependent on intensity and location of use. As a loop of the proposed course runs directly through each population, the scaly-stemmed sandplant and the very small stand of twining snapdragon could be completely eradicated. Mitigating measures (page V-2) recommend that the course be moved at least one mile to protect the twining snapdragon population and the the dunes south of Danby Dry Lake be closed to protect the scaly-stemmed sandplant population. No mitigating measures are proposed for protection of the rare and endangered Borrego locoweed which is scattered throughout the open area in dunes and sandy valleys in the direct path of the proposed course and in areas most likely to be used for non-competitive off-road vehicle activity. These plants would also be eradicated along the race course and elsewhere if the proposed action is accepted. Several potential creosote rings (of potentially great scientific value) occur in Cadiz Valley and would be directly subjected to destruction by ORV activity. No mitigating measures are proposed for the creosote rings by the EAR.

Impact mitigation for wildlife is proposed only to minimize impact on habitats along the race course. Predicted impacts on habitat range from severe to substantial

disruption except in the creosote rockland and Iron Mountain Pumping Plant where alteration is rated as minor. In other words, impact on all other habitats, five out of seven, is predicted to be moderate to high, with destruction either directly or indirectly of many mammals and reptiles.

One mitigating measure (page V-2) recommends that the collection or use of any plant material for any use will be prohibited to prevent depletion of any organic matter. It is ironic that this recommendation is included when, if the proposed action or alternative 3 is permitted and use is intensive, a swath of National Resource land 118 miles long and 200 feet wide could be denuded entirely of all organic matter by off-road vehicle activity.

Proposed impact mitigating measures for vegetation and wildlife address only the habitats along the proposed competitive event course. They do not consider the destruction to vegetation and wildlife that will accompany non-competitive off-road vehicle use, which, under either the proposed action or alternative 2, would occur throughout the entire 178,000 acres. However, Chapter III-B and C, pages 10-48, addresses the effects of motorcycle races and of off-road vehicle use on desert vegetation and wildlife, their ecological interrelationships and diversity. Chapter VI on adverse impacts that cannot be avoided, Chapter VII on relationship between local short-term use of the environment and maintenance and enhancement of long-term productivity, and Chapter VIII on irreversible and irretrievable commitments of resources are devoted to off-road vehicle use and its effects, both short-term and long-term, upon the ecosystem and the integrity of the desert. In the light of these thorough and sobering discussions and the facts and assessments presented in the remainder of the EAR, it is inconceivable that any other alternative than closure of the area to off-road activity would be considered.

At a time when many of us are more aware than ever before of the urgency of land conservation, it is apparent that wise and judicious land use decisions must be made. In an area where the average annual precipitation for the last 40 years has been only 3.06 inches, where wind velocities often reach over 40 miles per hour, surely the delicate crust of the soils in this area is a protective mantle which alone ensures the continued existence of the living plants and animals which it supports.

We can only repeat the statement in our letter of 27 October 1976 that we find this proposed action totally unacceptable and again urge the acceptance of Alternative 1 which will "close the Cadiz Valley/Danby Lake Area to all off-road vehicle use". If Alternative 1 is not accepted, then we request that an environmental impact statement be prepared before either the proposed action, Alternative 2 or Alternative 3 is accepted.

Sincerely yours,

June Latting

June Latting, Ph.D.
Southern California Conservation Representative

cc: Congresswoman Shirley Pettis
Dr. James P. Smith, President, CNPS

Statement made August 8, 1977, at public meeting on EAR for ICMP Area #37, Cadiz Valley/Danby Lake, July 1977. Meeting held at San Bernardino State College, San Bernardino, CA.

My name is June Latting, I represent the California Native Plant Society. I will submit a letter in more detail than is given here, but I would like here to compliment the Bureau on their preparation of this EAR. The Environmental Assessment Record is well-organized, readable and thorough in its attention to the living and non-living components of the area and to the impact of the proposed action. I commend the Bureau and the people responsible for this report.

The area is one of scenic beauty, historical value, rich in natural resources and in plant and animal diversity, including numerous rare species. If the facts and assessments are carefully considered, the only logical conclusion is that instead of the proposed action, Alternative 1 be accepted.

June Latting

LEGAL DEFENSE TASK FORCE 10238 Chaney Avenue • Downey, California 90241

SPORTS COMMITTEE DISTRICT 37

AMA, INC.

CHAIRMAN
Jim Wells
(213) 861-3642

COMMITTEEMEN
Bob Tartter
(714) 998-5859
John Townsend
(714) 557-0754

(1)

ALBERT S. BRANDON
E/R TEAM LEADER
DCM RIVERSIDE DISTRICT.

AUG 16 4 00 PM '77
DISTRICT OFFICE
RIVERSIDE, CA.

RECEIVED

DEAR STEVE:

JUST A FEW COMMENTS TO EXPRESS THE POSITION OF THE DISTRICT 37 LEGAL TASK FORCE.

FIRST I WOULD LIKE TO POINT OUT THAT OFF ROAD MOTORCYCLE SALES HAVE BEEN AT THE HIGHEST LEVELS IN THE LAST TEN YEARS AS THEY HAVE BEEN IN THE HISTORY OF THE MOTORCYCLE. THE INTEREST IN MOTORCYCLING HAS TAKEN A TREMENDOUS UP SWING, IN THE AREA OF INTEREST IN DESERT RACING AND ENDURO'S WE HAVE BEEN RELATIVELY STATIC FOR THE PAST TWO YEARS, WITH THE EXCEPTION OF AN UPSWING OF INTEREST IN THE EARLY SEVENTY'S, TO A SORT OF LEVELING OUT IN THE MIDDLE SEVENTY'S. THIS LEADS TO CERTAIN CONCLUSIONS, ONE IS THAT THERE HAS BEEN A LOSING OF INTEREST IN ORGANISED ACTIVITIES, ALTHOUGH WE STILL HAVE THE SAME AMOUNT OF SALES ACTIVITY IN THE DIRT BIKE FIELD, THIS CAN ONLY LEAD TO THE CONCLUSION THAT THESE PEOPLE ARE NOW RIDING IN AN UN ORGANISED FASION, WHICH OF COURSE CAN NOT BE CONTROLLED BY THE ORGANISED GROUPS.

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SPORTS COMMITTEE DISTRICT 37

AMA, INC.

CHAIRMAN
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(2)

ONE SOLUTION TO THIS PROBLEM IS TO GIVE THE PARTICIPANTS OF ORGANISED EVENTS A MORE ATTRACTIVE PROGRAM TO PARTICIPATE IN, WITH MORE AREAS OPEN THAN THE ONES NOW AVAILABLE. THIS WOULD SERVE TO ENTICE SOME OF THE UNORGANISED RIDERS INTO ORGANISED PROGRAMS. IT IS OUR OPINION THAT THE DESERT ENVIRONMENT WOULD SUFFER LESS WITH SOME OF THE UNORGANISED RIDERS RIDING ORGANISED EVENTS.

THIS SHOULD NOT BE CONSTRUED AS SAYING THAT UNORGANISED RIDING SHOULD BE CURTAILED OR FORBIDDEN, IT IS SAYING THAT IF MORE RIDERS ARE PARTICIPATING IN ORGANISED PROGRAMS, LESS RIDERS WOULD BE IN UNORGANISED RIDING THEREBY REDUCING THE CHANCE OF INADVERTANT ENVIRONMENTAL DAMAGE. (WHEN THEY STOPPED BARSTOW TO VEGAS, THEY THREW A LOT OF RIDERS INTO UNORGANISED RIDING THEREBY CREATING MUCH MORE ENVIRONMENTAL DAMAGE AND TRESPASS OR PRIVATE PROPERTY THAN THERE EVER WAS BEFORE).

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(3)

SECOND ANOTHER POINT BROUGHT OUT BY THE RECREATIONAL STAFF IS THE RECREATIONAL VALUE OF THE "EXISTANCE FACTOR" I THINK THIS IS A BIG IN THE MANAGER TYPE OF APPROACH TO RECREATIONAL VALUES

THIRD: THE CONTENTION THAT THE REMOTENESS OF THE AREA WOULD BE LOST CAN NOT BE ACCEPTED THE IMPACT OF PEOPLE BEING THERE FOR NINE OR SO RACES A YEAR WILL NOT TURN IT INTO A METROPOLIS PARK. I DON'T THINK THE AUTHORS OF THE EAR TOOK INTO CONSIDERATION THAT THE AREA IS 20 MILES FARTHER FROM THE METROPOLITAN AREA THAN THE OTHER OPEN AREAS).

FOURTH ANOTHER POINT IS THAT THE PROPOSED COURSE LAY OUT MAKES IT ALMOST IMPOSSIBLE TO LAY OUT A 2 LOOP RACE WITH A CENTRAL PIT AREA. I DO NOT THINK THAT THE COURSE LAY OUT SHOULD BE LOCKED IN UNTILL CONSIDERATION FOR A RACE WITH TWO SEPERATE LOOPS AND A CENTRALISED PIT AREA BE INCORPORATED IN THE PLANNING FOR THIS AREA. APPARENTLY IT WAS NOT TAKEN INTO CONSIDERATION THAT BIKES HAVE AN AVERAGE 40 MILE RANGE, AND

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(4)

IF YOU DESIRED TO HAVE A RACE WITH THE PITS AT THE START AREA THE BIKES WOULD HAVE TO HAVE CONSIDERABLY MORE RANGE.

IF I CAN BE OF ASSISTANCE TO YOU IN ANY WAY, PLEASE FEEL FREE TO CALL.

WITH BEST REGARDS

Jim Wells

The following self-addressed sheet is provided for your convenience for any further statements you would like to have considered by the Bureau of Land Management concerning the Cadiz Valley/Danby Lake open area. If additional sheets are needed, please do not hesitate to add them. Also, please give your name and address in the space provided if you use this sheet.

I would like to commend the Bureau of Land Management on the Environmental Assessment Record for Interim Critical Management Program #37 Cadiz Valley/Danby Lake area as a very easy to read and follow report.

As one who strongly believes that the California Desert is one of our most magnificent and not to mention irreplaceable natural resources in the United States, I sincerely hope the BLM, caretaker of these lands, will do everything possible to insure wise use of it. Although I hope and believe that much of the desert should be preserved and protected in its pristine state, as it has remained for thousands of years, thus affording future generations the chance for enjoyment and inspiration that the irreplaceable natural wonders of the desert have to offer in an undeveloped manner, in the form of wilderness making such experiences as sightseeing, camping, photography, hiking, backpacking, and other nonconsumptive forms of recreation possible; I do strongly feel that BLM should include as part of the desert planning consideration for areas designated for off-road vehicles.

I have reviewed this document (the AR) with much interest and urge BLM to take positive action to prevent reality being made of the staff's comments that opportunities for a wilderness experience will be completely lost by instituting the proposed action and the effects and activities of man will come to dominate the area reducing the quality and wildland values found there, in favor of complete closure of the Cadiz Valley/Danby Lake area to the purpose of alternative no. 1. As pointed out in the AR only a very small amount of ORV activity has been sustained in this region and that continued usage will cause substantial and mostly irreversible damage, and this only clarifies the necessity that the area be completely closed. Secondly, I question the continuation of current policy when damage by ORVs serve to cause unwarranted harm to the area's delicate ecosystem when alternative areas of equal or better quality exist for ORV recreation closer to major population centers. I believe it necessary to confine more consumptive uses - ORVs - to areas of more limited size and that the effects caused thereof but at the same time preserving the enjoyment this recreation offers, thus enabling both the public and Congress the opportunity to give adequate consideration to all desert resources.

My major concern is that continued widespread ORV use of the desert in a checkerboard fashion inhibits later decisions by Congress as to what land shall be designated to which purposes, whether recreational in the form of consumption of the desert's resources or not, or it be scientific or resource development, and that such practice of consuming vast areas of desert lands as to eliminate future wilderness designation under the comprehensive planning program for the desert to

be completed by 1980, and even for consideration under BLM's inventory of all roadless areas under its jurisdiction by 1991. It is my hope that BLM will not fail to follow through on Section 603(c) of PL 94-579 that states that the areas shall be managed "...so as not to impair the suitability of such for preservation as wilderness..." until Congress has determined otherwise. As pointed out six areas meet the minimum critera for wilderness consideration in the Wilderness Act of 1964, have been identified in the Cadiz area, and I urge that their natural qualities be vigorously protected. In addition I feel that these points as noted by the staff should be carefully weighed in consideration of policy selection for this area: 1) the proposed action will result in loss or deteriation of natural, cultural, recreation, and aesthetic values which would otherwise be passed onto future generations; 2) the proposed action will further marshal that trend which extends to the nations wildlands - the habits, activities, commotion and pollution of the urban world, and thus the integrity of the desert itself will be further impaired. To the extent that the inherent qualities of the California Desert are reduced or lost, the American people lose long-term resource diversity, options and opportunities.

In short, I believe it to be to the benefit of all concerned, whether ORV users or wilderness enthusiasts and others who enjoy and are otherwise inspired by the desert in its natural state, that checkerboard subdivision of the desert cease, for giving a bit here and there to each interest not only distroys the possibility of preserving whole ecosystems, but also distroys the freedom enjoyed by all recreationists, and as pointed out enjoyment of the desert by consumptive and nonconsumptive users is in direct contradiction to each other so I feel it best that the Cadiz Valley/ Danby Lake are be closed and that alternative no. 1 become policy.

I appreciate the BLM's interest,

Sincerely,

Mark A.R. Chalfant

Mark A.R. Chalfant

Motorcycle Owners Riders Enthusiasts

RUSS SANFORD, PRESIDENT
LEGISLATIVE ADVOCATE

of California, Inc.

13 August 1977

USDI, Bureau of Land Management
Riverside District Office
1695 Spruce Street
Riverside,CA 92506

This association has just reviewed your Preliminary Draft for the ICMP of the Cadiz Valley/Danby Lake Unit. The Preliminary Draft is entirely non-acceptable in that it fails to make a non-arbitrary assessment of the off-road vehicle use of the area. The entire membership of this statewide association is adamantly opposed to those portions of the Preliminary Draft that would in any way lessen the future use of the area by off-road vehicles from the present use.

Respectfully,

Russ Sanford

Russ Sanford

3525 So Port Drive, P.O. Box 26062, Sacramento, CA 95826 Telephone (916) 363-9609

ENVIRONMENTAL IMPROVEMENT AGENCY

County of San Bernardino

1111 East Mill Street · San Bernardino, CA 92415 · (714) 383-1718
ENVIRONMENTAL ANALYSIS DIVISION
BLDG. 1, 2ND FLOOR (714) 383-1532

ROBERT B. RIGNEY, Administrator
Environmental Improvement Agency

August 12, 1977

Albert S. Branson
Environmental Coordinator, Cadiz-Danby Open Area
Bureau of Land Management, Riverside District
1695 Spruce Street
Riverside, CA 92506

Dear Mr. Branson:

We sincerely appreciate the opportunity to comment on the proposed ORV Competitive Area in the Cadiz Valley-Danby Lake area, and are pleased with the ongoing productive relationship which we have with the BLM.

Attached are our comments on the July, 1977, Preliminary Draft EAR for ICMP Area #37 (Cadiz-Danby). The document is generally excellent, and our comments, by and large, relate to information not available to the staff when the report was prepared.

Please consider these comments as broadly representing our concerns with this project, whose various impacts include effects on private lands and economic activities under County jurisdiction.

Thank you for involving us in this review process.

ENVIRONMENTAL IMPROVEMENT AGENCY
Robert B. Rigney, Administrator

Lewis J. Walker

Lewis J. Walker
Environmental Review Officer

LJW:TV:cas

Attachment

COMMENTS ON PROPOSED COMPETITIVE AREA

for

CADIZ-DANBY OPEN AREA (ICMP #37)

August 12, 1977

1. General

The Environmental Analysis Record (EAR) is clear and well-researched. It is an excellent disclosure document, covering all the major aspects of the proposed action.

2. Ordnance and Public Safety

The unexploded ordnance in the area is a serious hazard to public use. The disagreement among the ordnance distributions mapped by the Department of Defense, BLM, and the resource team onsite, suggest that some positive action to remove this hazard is preferable to partial closure of the area or posting signs warning of the hazard.

Liability for injuries resulting from ordnance should be clearly established before any action is taken which could be construed as inviting the public to use the area. An opinion from the Solicitor General is the minimum level of legal review we feel is needed.

This request derives from a concern for public safety and a desire to know what liabilities exist for the various public agencies.

3. Air Quality

The preservation of air quality in the desert portion of San Bernardino County is the responsibility of the Board of Supervisors, which has contracted with the Southern California Air Quality Management District for technical services and enforcement. The state Air Resources Board is currently considering a Class B designation for the California desert.

The EAR indicates that fugitive dust from ORV use will probably exceed the present standards. The impact of dust (and possibly soil microorganisms such as Coccidioides immitis) on private lands and economic activities adjacent to the ORV area clearly involve the County's responsibility for maintaining air quality.

Dust poses a visibility hazard to the railroad, a visibility and work safety hazard to the salt mines, and a nuisance of potentially large magnitude for the MWD aquaduct and pumping station.

BLM should consider the likelihood that they will be held responsible for these air quality impacts.

4. Land Use

The proposed action is in conflict with existing BLM, State, and County land use policies.

The Federal Land Policy and Management Act of 1976, Section 603, requires a study of all roadless areas over 5000 acres. The Open Area qualifies for such a study area, but the dedication of this land to increased ORV use would seriously compromise any natural resource values which the "Organic Act" seeks to protect. This action may be administratively exempt from a "hold" pending the completion of the Desert-Wide Plan, but it would be a bad precedent, reflecting a lack of commitment on BLM's part to the principles of the FLPMA.

State school lands, under administration of the State Lands Commission, are included in the Open Area. ORV use of these lands, either in organized events or as part of general Open Area use, would likely be subject to review under CEQA. Posting, fencing, or other closure of these lands to recreational users is demonstrably a short-lived measure. True exclusion of state lands from use could be achieved by allowing organized events only, but this too is difficult to enforce.

Private lands, such as those of Leslie Salt Co., the Santa Fe Railroad, and the Metropolitan Water District, will be affected by the proposed action. The impact of fugitive dust is discussed above. Other impacts, such as trespass (both intentional and unintentional), vandalism, and the danger of personal injury to both workers and recreationists raise the issue of incompatible land uses.

The race courses proposed cross the aquaduct and the MWD roads. It is possible that these portions of the courses may need separate environmental review and County site approval since they are outside the discretionary jurisdiction of the BLM. At least, the BLM and MWD should develop a formal agreement regarding these crossings, covering uses, liability, and terms under which MWD can revoke permission to cross their lands.

General open use of the area would be the greatest source of land use conflicts. Organized events would be susceptible to regulation, and thus to mitigation of off-site and off-course impacts. Rights of present users should take precedence over new consumptive uses of public land.

5. Roads

Cadiz Road is presently County-maintained. It is likely that intensive recreational use of the area would lead to increased need for maintenance, possibly including upgrading the intersection with State Highway 62. These expenses would be borne by the County, and are a real cost associated with the proposed action.

6. Valley Fever

Although there is no evidence that valley fever organisms (Coccidioides immitis) are a major health problem in the Cadiz-Dandy area, the scale of soil disturbance likely to occur as a result of ORV use and subsequent wind erosion suggest that the soils should be sampled for this organism. If it is present in large numbers, the possibility of changing the proposed action should be considered.

As with the ordance problem discussed above, the exact extent of the disease vector problem should be ascertained before any action is taken.

The Metropolitan Water District of Southern California

AUG 17 1977

Mr. Gerald Hillier
District Manager
Bureau of Land Management
1695 Spruce Street
Riverside, California 92506

Dear Mr. Hillier:

Environmental Assessment Record for Cadiz Valley/Danby Lake

Thank you for the opportunity to comment on the Environmental Assessment Record for the Interim Critical Management Program Area No. 37, Cadiz Valley/Danby Lake transmitted by your letter of July 11, 1977. Metropolitan's comments are as follows.

The report appears to adequately address the impacts associated with the implementation of this program in the Cadiz Valley/Danby Lake area. Proposed mitigation measures appear to incorporate those features most desirable to provide the greatest use of these lands with the least possible environmental damage. It should be noted however, that Metropolitan is referred to variously throughout the report as the Los Angeles Municipal Water District, the Los Angeles Metropolitan Water District, and the Municipal Water District of southern California. The correct name is The Metropolitan Water District of Southern California.

On page II-80 it is stated that, "The Los Angeles (sic) Metropolitan Water District currently requires a permit for an organized vehicle event to cross its lands. That permit is only issued after receipt of both a processing charge, not to exceed $200, and an insurance policy covering MWD." Not to exceed $200 should be changed to read not less than $200.

On August 1, 1977, Mr. Phil Hitchcock of Metropolitan's Environmental Planning Branch spoke by telephone with Messrs. Kemp Conn and Steve Johnson of your office. The subject of compliance with the California Environmental Quality Act (CEQA) was discussed along with various other criteria Metropolitan feels are necessary to insure that its interests are fully represented and protected. Mr. Hitchcock pointed out that Metropolitan could not grant a permit to BLM for the use of its lands for off-road race courses without someone assuming the lead

1111 Sunset Boulevard, Los Angeles, Calif. Mailing address: Box 54153, Los Angeles, Calif. 90054 Telephone: (213) 626-4282

agency role relative to compliance with CEQA. It was understood that a verbal agreement had been reached between BLM and the County of San Bernardino for the County to assume the role of lead agency under CEQA and that the County will probably adopt BLM's environmental analysis record as its document under CEQA. If this is the case, then Metropolitan will be required to review and certify the County's environmental documents as a responsible agency under CEQA. Upon Metropolitan's certification of these documents, negotiations regarding the issuance of permits to cross District-owned lands could commence. If however, the County does not assume the role of lead agency Metropolitan could not assume the responsibility in its place. This would preclude Metropolitan's participation in any capacity.

Metropolitan is concerned over the question of liability insurance. It is understood that event sponsors will be required to procure coverage in an amount sufficient to satisfy Metropolitan before BLM will issue a permit. This appears adequate for scheduled events; however, the question of liability regarding the unsupervised public needs to be resolved. It is therefore essential that BLM provide some assurance that Metropolitan will not be held accountable for any liability arising from the use of these race courses by unsupervised individuals. If this cannot be arranged, then the use of Metropolitan's lands by such individuals will be prohibited.

The Colorado River Aqueduct is one of the major water importation facilities for delivery of water to the south coastal plain. As such, any activities on Metropolitan's lands not associated with the delivery or treatment of water must be subordinate to the District's responsibilities and would therefore be subject to immediate cancellation of any use permit for cause. Consequently, Metropolitan's Operations Division has requested that BLM be informed of the following special conditions and restrictions which must be incorporated into any permit granted by Metropolitan.

1. Race course #4, the Rock Pile Loop, located near Metropolitan's transmission line within Sections 1, 2, 10, 11, 15, 21, and 22 should be realigned in a westerly direction as far from the transmission line as possible.

2. Metropolitan's patrol roads may not be used by any vehicle at any time.

3. As noted in your report, the General Patton Desert Strike Force Monument, near the Iron Mountain Pumping Plant, must be protected from acts of vandalism or degradation.

4. Mr. Don Christianson, Metropolitan's Area Superintendent for the West Desert Section, shall be notified two weeks prior to any major race activities. The Area Superintendent must also be contacted in the event of an emergency or accident involving Metropolitan's property. The telephone number is (714) 392-4548.

5. Crowd control and traffic monitors must be posted at all siphon and road crossings and located near the aqueduct canal at all times during race activities. There shall be no bodily contact with the water in the aqueduct.

6. Race sponsors shall provide post race cleanup on Metropolitan's property. It is understood that BLM will require all permittees to perform cleanup of the courses after use.

7. If in the opinion of the Area Superintendent, erosion over Metropolitan's designated siphon crossings occurs due to the use of these sites by vehicles, the BLM shall be required to effectively repair such siphon crossings. In regard to this last point, it is Metropolitan's understanding that BLM is willing to have Metropolitan's siphon crossings maintained at those points where the race courses cross them or to reimburse the District for the cost of repair if this becomes necessary.

It is hoped that these comments will be helpful in your final decision relative to this proposal. If you have any questions, please contact Mr. E. F. Butler, Principal Engineer, Environmental Planning Branch at (213) 626-4282, extension 455.

Very truly yours,

John H. Lauten
General Manager

PEH/ro

THE DESERT PROTECTIVE COUNCIL, INC.

A NON-PROFIT ORGANIZATION

To safeguard for wise and reverent use by this and succeeding generations those desert areas of unique scenic, scientific, historical, spiritual and recreational value and to educate by all appropriate means children and adults to a better understanding of the desert.

BOX 4294 • PALM SPRINGS • CALIFORNIA 92262

Gerald Hillier, Dist. Mgr. 8/19/77
BLM
1695 Spruce St.
Riverside, Calif. 92506

Attn: Stew Branson

Re: EAR - Cadiz/Danby ICMP Area #37

Dear Mr. Hillier,

The Preliminary Draft EAR issued July 11, 1977 is one of the most thorough and informative environmental assessments ever assembled by Riverside District Staff. Its resource inventories and impact analyses are highly superior to those contained in the 1976 draft, offering the advantage of full project disclosure.

Although more site-specific soil, air quality, hydrology and other data would be important to a final EAR or EIS, DPC believes that more than enough information is now available to require closure of Area #37 to off road vehicles (Alternative #1). The expenditure of additional man-hours on document preparation is not justifiable in light of the definite constraints detailed in the EAR, therefore we will not critique the EAR per se.

Alternative #1 should be adopted due to the following reasons:

1. Military Ordnance

The existence of unexploded ordnance throughout most of the area is a definite constraint to an official "open" ORV-use designation. BLM will not be able to comprehend its exact legal obligations until a lawsuit is settled relative to an injury or death due to BLM's invitation to ride off-road under the hazardous conditions described in the EAR. For this reason alone an administrative decision to close the area could and should have been made months ago. It may not be government's function to protect people from the results of their own voluntary actions, but it doesn't make any sense to invite such a high probability of trouble. It is impractical and probably impossible to clear the area to a "safe" level. (See V-1).

2. Air Quality

The EAR's soil and air quality assessments are sufficiently quantitative to indicate that County, State and Federal particulate standards would be violated during and long after soil disturbance from competitive events and heavy-use weekends. The Air Resources Board's pending Class A designation for adjacent Joshua Tree National Monument and its pending Class B designation for Area 37 would definitely be jeopardized by an open ORV-use designation. To quote from III-3; "the potential for long-term regional air quality deterioration appears very great". Increased travel to, in and from the area will result in higher oxidant levels.

3. Soils

Soil erosion potential has been generally described in the EAR as being significant. However the following quote from V-1 indicates that further study would be needed to provide a more quantitative soil disturbance and soil loss analysis:

> A site-specific soils analysis sufficient to demonstrate that the impacts outlined in Chapter III will not take place or can be mitigated is needed. For wind erosion potential, this must include adequate breakdown of particle sizes less than 50 microns, analysis of the size, abundance, and distribution of organic and nutrient components of the soil, and components potentially harmful to health. The likely final depositional areas of wind-eroded salts from the dry lake areas should be analyzed in terms of the adverse effects on plants, animals, and water quality.

4. Biotic Resources

The EAR contains an excellent treatise on ecological relationships. The sensitive nature of the rare and endangered plant species, unique and scientifically important creosote rings, occasional use of Danby Lake by waterfowl, and the unknown status of the sand dunes' endemic species all require protection that can only be afforded by a closed ORV designation.

5. Wilderness Review

Although the EAR contains a good assessment of many of the area's natural resources, it does not contain a required wilderness study that would be deemed adequate under either Section 603 of the 1976 BLM Organic Act or under the 1964 Wilderness Act. An "open" ORV designation constitutes a high level of resource commitment. As a result it would be a premature decision that would "impair the suitability" of the area "for preservation as wilderness" and would result in "unnecessary or undue degradation of the lands and their resources" prior to completion of the California Desert wilderness review. (Sec. 603-c of Organic Act).

6. Land-Use

The ATSF Railroad and salt mine operators seem to be generally opposed to an open ORV designation due to obvious land-use conflicts. The State School Lands Commission (administrator of state-owned sections in Area #37) has not even begun its required actions relative to the "open" designation pursuant to the California Environmental Quality Act. The following quotes from the EAR substantiate the inherent conflicts with MWD land-uses resulting from an "open" status:

VI-8

About 11,520 acres of the open area is in private ownership. The location of most of these lands is not readily discernible in the field; therefore, we anticipate that they will be vulnerable to ORV trespass. The location of these lands is such that, where possible, routing courses around them will intensify ORV damage to National Resource Lands.

II-80

The MWD lands are so situated that without their authorization no organized event could be routed around the southern end of the Iron Mountains and still stay within the open area. At this time no satisfactory arrangement exists for routinely authorizing events to cross MWD lands within the open area.

Although not fully treated in the EAR, general "open" free-riding and general spectator use would spread the impacts beyond the course areas, well into the regions of concentrated private lands.

An "open" designation would definitely impair BLM's land-use options for the 1980 desert-wide plan. The Desert Advisory Committee and/or its Interim Management Subcommittee should review the Cadiz/Danby proposal in order to ascertain its effect on the Committee's mandated planning functions.

7. Environmental Health

The existence of Valley Fever-causing fungal agents in the soils of Cadiz and Danby dry lakes is probable. Allowing ORV damage to lake bed soils with a possible subsequent spread of fungi creates environmental health implications that cannot be ignored. Soil analyses are necessary to determine content of potentially harmful organic elements and their effects on human health.

8. Demand

Quote from II-59: The intensity of recreational use...in the Cadiz area has been very low. The distance and travel time required to reach the area, plus the availability of areas of equal or greater quality closer to the Los Angeles area, and the absence of readily accessible visitor services probably have combined to account for the low use of the area.

The demand factor for ORV use of this area is too low to commit BLM personnel to any additional and unnecessary permit processing, EAR writing and resource monitoring. BLM time and money will be better spent on projects that do not so completely consume natural resources belonging to the taxpaying American public.

9. Energy

The large, additional amount of gasoline consumed by recreationists during travel to, in and from this relatively remote region is not worth the small degree of benefit. High fuel cost may well be the primary reason for the low demand expressed for ORV use of the area.

10. Mitigation Measures

The proposed measures are good attempts toward impact mitigation, but as expressed in the EAR, many adverse impacts cannot be avoided if an "open" designation is implemented. The level and magnitude of impacts are too high to allow open ORV use of the area, especially before more regional resource inventories are made and the desert-wide plan is drafted.

The proposed mitigation measures should be implemented as conditions of CRUP approval for all ORV events in the Riverside District. Such application would be a solid indication that the level of understanding and sophistication of BLM administration has increased in the last few years.

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The following quote from VII-3 of the EAR is an excellent summation of the need to choose alternative 1 and close the area to "open" use of ORVs:

> The proposed action will further marshal that trend which extends to the nation's wild lands - the habits, activities, commotion, and pollution of the urban world. Thus, the integrity of the desert itself will be further impaired. To the extent that the inherent qualities of the California Desert are reduced or lost, the American people lose long-term resource diversity, options and opportunities.

Thank you for holding the public meeting on August 8, 1977. We commend BLM staff for an excellent environmental review.

Sincerely,

Charles H. Bell, V. P.

cc: Des. Ad. Committee
Ed Hastey, State Dir. BLM
Congresswoman Pettis
Senator Alan Cranston

STATE OF CALIFORNIA—BUSINESS AND TRANSPORTATION AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 8, P. O. BOX 231
SAN BERNARDINO, CALIFORNIA 92403

August 16, 1977

Project Review
08-SBd-62 - 83.4/102.3
Cadiz Valley/Danby Lake

Mr. Gerald E. Hillier
District Manager
Bureau of Land Management
1695 Spruce Street
Riverside, CA 92506

Dear Mr. Hillier:

Thank you for the opportunity to review a preliminary draft of the Environmental Assessment Record for Interim Critical Management - Program Area #37 - Cadiz Valley/Danby Lake.

This large area fronts on and is entirely dependent on State Highway Rte 62 for access. The report recognizes that Rte 62 is often congested with weekend recreational traffic and that increased recreational use of this area will at times increase this congestion.

We must note that we do not have any improvements proposed for this highway that would reduce this congestion within the foreseeable future.

This report indicates that dust created by the off road vehicle use of this area could increase the odds for accidents on nearby highways.

We suggest that use of the area be sufficiently removed from the highway or other mitigation measures imposed so that the accident hazard on the highway is not increased.

The dirt roads providing access into the area could also be expected to produce considerable amounts of dust during their use by spectators and participants alike. This dust could be a particular problem at the intersections with the highway.

Mitigation measures such as watering, use of dust palliatives or paving of portions of these roads should be considered to minimize this hazard.

If any work is necessary within the highway right of way, the developer must obtain an encorachment permit from the District 8 office of the State Department of Transportation prior to beginning the work.

If additional information is desired, please call Mr. George Boon at (714) 383-4671.

Very truly yours,

J. E. PEDDY
District Director

By
Project Development Services Engineer

STATE OF CALIFORNIA
EDMUND G. BROWN JR., Governor

AIR RESOURCES BOARD
1102 Q STREET
P.O. BOX 2815
SACRAMENTO, CA 95812

August 12, 1977

Mr. Gerald E. Hillier
Bureau of Land Management
Riverside District Office
1695 Spruce Street
Riverside, CA 92506

Dear Mr. Hillier:

We have reviewed the Preliminary Draft of the Environmental Assessment Record for Interim Critical Management Program Area No. 37, Cadiz Valley/Danby Lake. This draft is a Bureau of Land Management (BLM) presentation of a land management program and alternatives for off-road vehicle use in Cadiz Valley/Danby Lake area. We offer the following comments.

The Assessment reflects the BLM concern for air quality. Throughout the draft it is pointed out that the proposed action will adversely impact air quality in the area. Supporting evidence is presented that the proposed action will result in excessive suspended particulate levels during and after organized events. Under "Adverse Impacts that Cannot be Avoided" the draft concludes that:

> Competitive events in the area can be expected to temporarily increase oxidant and carbon monoxide levels as well as dust levels. Increases in blowing dust will persist after events until the infrequent rains reseal protective crusts broken by ORV tires. Wind erosion of disturbed soils (blowing dust and sand) can also adversely affect air quality, and is expected to persist after a given event until the next significant rain. This may aggravate driving safety problems on Highway 62 during windstorms.

This adverse impact on air quality of the proposed action is of concern to the Air Conservation Program (ACP), which is now under development by the Air Resources Board (ARB). The ACP is designed to respond to the Environmental Protection Agency's regulations (40 CFR 52) for the "prevention of significant deterioration" of air quality. As you probably know, the Clean Air Act Amendments of 1977 codify this process and insure air quality protection for the "public trust" lands. At this time the ACP is concentrating on an Early Action phase which includes proposals to classify state and national parks, national monuments, national wildernesses, and wilderness study areas as Class A (minimal deterioration). In addition to the possible adverse impact on the immediate area, fugitive dust generated by the proposed action could adversely impact Joshua Tree National Monument, a potential Class A area, approximately five miles southwest of the Cadiz Valley/Danby Lake area. While complex sources of emissions (e.g., ORV activity) are not proposed for review under ACP, the resultant impact on the air quality of the National Monument remains a concern.

Due to the proposed action's potential for adverse impact on air quality, alternatives which mitigate or eliminate the threat to air quality should be encouraged. Alternative II leaves the area open under the Interim Critical Management Program until the Desert Plan is adopted in 1980, but does not allow competitive events. This alternative would mitigate the potential additional adverse impact. Alternative I closes the Cadiz Valley/Danby Lake Area to all existing and proposed off-road vehicle use. This alternative would improve air quality. If it appears Alternative I is not appropriate, we suggest you consider amending it to read: "Close the Cadiz Valley/Danby Lake area to all off-road vehicle use until the Desert Plan is adopted in 1980".

We appreciate the opportunity to comment on the Preliminary Draft Assessment. If there are any questions relating to the ACP, please contact Gary Honcoop, ACP Manager, at (916) 322-2700.

Sincerely,

W. C. Lockett

William C. Lockett, Chief
Planning Division