

CHAPTER ONE

CONSERVATION OVERVIEW

A striking feature of the western Mojave Desert is the presence of large tracts of publicly-owned land, close to urban areas, which already receive high levels of resource protection. These lands include sixteen wilderness areas, twelve areas of critical environmental concern (ACEC), seven ecological reserves, the Joshua Tree National Park, and several state and county parks. Supplementing this network of protected properties are additional lands with the potential to provide some level of wildlife and plant protection, such as BLM "Class L" (limited use) lands.

It is important to realize how unique this situation is. Because an extensive network of wilderness, ACECs, reserves and parks already exists, we must devise strategies for more effective land management rather than more extensive land acquisitions. This contrasts with plans developed for areas having little public land (for example, California's Orange and San Diego Counties) where the public's focus has been on the mechanics of obtaining private lands for a reserve system without local precedent, rather than on the crafting of more useful management techniques. The western Mojave is also unlike regions with ample public land ownership but which lack complex urbanization issues. Selective land acquisitions are recommended by this report, but only where it is necessary to link and/or protect important habitat, centers of endemism, "hot spots," movement corridors, and lands critical to selected ecosystem processes.

Definitions

Ecosystem Processes: A combination of geological or topographic features that maintains habitat for a specialized species. An example is the blow-sand ecosystem which consists of drainages which transport sand to deposition areas, wind corridors which sort the sand into fine particles when moving it downwind, and dune habitat, which is where sand specialists like the Mojave fringe-toed lizard and many species of insects are found.

Endemism: Entire range of a species confined to a relatively small area, defined as 50,000 km² or less. This is about the size of the range of the Mojave ground squirrel. Many endemics in the West Mojave occupy much smaller ranges, consisting of only a few thousand acres. These are often termed narrow endemics.

Because species are interdependent, they are difficult to protect in isolation. Although the West Mojave Plan seeks permits on a species-by-species basis, the inherent interdependence of species and the ecosystems they depend upon makes it difficult to protect any given plant or animal without taking into account factors that may apply to many species. A conservation strategy which meets ecosystem needs will enhance the

effectiveness of measures adopted to mitigate and minimize the impacts of authorized take on any particular plant or animal. The following discussion describes how this could occur.

Table 1. Existing Protected Lands in the West Mojave

Protected land category	Acres
Wilderness Areas	498,476
Areas of Critical Environmental Concern	375,922
State Parks	25,396
Significant Ecological Areas (L. A. Co.)	131,658
Department of Fish and Game lands	14,554
County/city regional parks	911
Joshua Tree National Park	303,384
Other mitigation lands	3,885
Total	1,354,186

DESERT WILDLIFE MANAGEMENT AREAS

The primary conservation lands recommended by this report are four Desert Wildlife Management Areas (DWMAs), which are proposed for permanent protection of the desert tortoise. These are large, unfragmented regions containing the dominant plant communities of the West Mojave, creosote bush scrub and saltbush scrub. They total 2,455 square miles (1,577,260 acres) and span the central part of the planning area. Most of this land is already in public (BLM) ownership. DWMA lands administered by BLM would be designated as BLM Areas of Critical Environmental Concern.

The tortoise conservation strategy which this report recommends be applied within the DWMAs would benefit four endemics: the Barstow woolly sunflower, desert cymopterus, Lane Mountain milk vetch, and Mojave monkeyflower. DWMAs could prevent habitat fragmentation and would serve as the primary conservation area for the long-term perpetuation of these plants.

DWMA management could also favor the Parish's phacelia, sand linanthus, Clokey's cryptantha, Mohave ground squirrel, Mojave fringe-toed lizard, Bendire's thrasher, and burrowing owl. Important disjunct populations of the alkali mariposa lily (at Paradise Springs), small-flowered androstephium, and crucifixion thorn would be conserved. Sizable portions of the habitat of such widely distributed species as loggerhead shrike and

LeConte's thrasher are located within the DWMA's. These are substantial enough to support viable populations in the long term.

In the mountainous portions of the DWMA's are found bighorn sheep, golden eagles, prairie falcon, and several species of bats. Significant numbers of each of these species could be conserved within the DWMA's, along with foraging areas in the flatter desert regions.

Because much of the diversity of the West Mojave lies along the edges of the planning area and on landforms (e.g. sand dunes and playas) that do not support desert tortoises, the DWMA's do not provide a solution for conserving the entire suite of target species in the West Mojave Plan. These other species are recommended for protection within the existing network of wilderness areas, ACECs, ecological reserves and parks and in additional conservation areas to be proposed by the Plan.

SIGNIFICANT ECOLOGICAL AREAS

Linkages to the San Gabriel Mountains are proposed through Los Angeles County's Significant Ecological Areas. Two State Parks could be linked to the mountains through the SEAs: Saddleback Butte State Park and the Antelope Valley California Poppy Preserve. Establishment of these linkages could prevent these parks from becoming isolated from their surroundings and losing diversity.

Los Angeles County is revising its general plan, and intends to review and update its SEAs. This report recommends SEA boundary changes which could be adopted through

Definitions

Significant Environmental Area (SEA): Los Angeles County zoning overlay, establishing areas where developments are reviewed for compatibility with the goals and purposes of the SEA.

Trophic Level: An organism's position on the food pyramid. The lowest trophic levels are termed primary producers and consist of plants that convert soil minerals, water, and air to biomass. Primary producers are eaten by primary consumers, which in turn are eaten by secondary consumers. At the highest trophic level are the larger predators.

Center of Endemism: Area where several endemic species occur together. These species presumably evolved in this location due to unique geologic, climatic, or biological features of the area, whether now or in the past.

Hotspot: Area containing ten or more of the target species.

Linkage: Region connecting two or more conservation areas. Linkages may act as dispersal corridors for wide-ranging species, provide habitat for pollinators, or serve to maintain genetic continuity between major populations of a species. Some linkages, particularly large drainages, serve to connect several different habitats over an elevational gradient.

the general plan revision. These changes to Big Rock Wash, Piute Butte, Alpine Butte, and Saddleback Butte SEAs would maintain the sand transport process of the blowsand ecosystem which is needed for the Mojave fringe-toed lizard as well as provide protected lands for several other species. A linkage between the Liebre Ridge SEA and Fairmont Butte could conserve the rare Valley needlegrass grassland and wildflower fields communities in addition to maintaining a habitat linkage with the San Gabriel Mountains. Retention of the Desert-Montane transect (Mescal Creek) SEA would provide an additional wildlife movement corridor between the mountains and the desert; opportunities for corridors are very limited on the west edge of the planning area because of the presence of private lands.

LINKAGES

Linkages serve to connect large patches of similar habitat, or to provide a connection among different habitats within the ecosystem. They function as genetic corridors, wildlife movement corridors for wide-ranging species, and can have important recreational value. Linkages are often created along riparian drainages or ridgelines.

The planning area contains both external and internal linkages. External linkages are public land connections between public lands within and just outside the planning area. The boundaries of the planning area provide external connectivity to protected habitat on nearly all sides. The Sequoia National Forest on the northwest, Owens Valley on the north, Death Valley National Park and East Mojave National Preserve on the east, Joshua Tree National Park on the south, and the San Bernardino National Forest on the west provide public land habitat that allow movement of wildlife across plan boundaries and insures landscape level protection for the planning area. Only on the west between the Cajon Pass and the Antelope Valley does the private ownership impede conservation linkages to the Angeles National Forest and the large ranches of the Tehachapi Mountains. For these areas, this report suggests that linkages be established through Los Angeles County Significant Ecological Areas and through acquisition of lands surrounding Big Rock Creek.

Internal linkages are also important in order to provide connectivity and maintenance of the ecosystem within the planning area. Internal linkages are proposed through three open space corridors, through the conservation areas for the Mohave ground squirrel, and through a link between Saddleback Butte State Park and Edwards Air Force Base. One additional link is suggested between Liebre Ridge SEA and the Antelope Valley California Poppy Reserve. With the creation and management of these internal open space linkages, a network of connected habitat is created in the West Mojave, allowing for the conservation of biodiversity at all trophic levels.

Three open space corridors are proposed by this report. The open space corridors could allow the movement of bighorn sheep through habitat used by bighorn when they travel between mountain ranges. These linkages also serve to protect other target species and

locations of high biological importance. The suggested linkages are described below.

San Bernardino Mountains to Granite Mountains

An open space corridor extending from this report's proposed carbonate endemic plants management area to the Granite Mountains north of Lucerne Valley would conserve a currently occupied linkage for bighorn sheep. It would include Rabbit Springs, which is the only extant occurrence of the Salt Spring checkerbloom and Parish's alkali grass within the West Mojave. Rabbit Springs is the type locality (location where the species was first described) for the Mohave ground squirrel, Parish's phacelia, and Salt Spring checkerbloom. This area contains one of only a few examples of the rare alkali seep plant community.

Within the potential open space corridor is a high-density area for LeConte's thrasher and one of the disjunct habitats for the Bendire's thrasher. Good coverage of the pygmy poppy distribution could be accomplished, along with a creosote bush scrub plant community containing many cactus and Joshua trees.

A color map illustrating the area of a potential open space corridor is provided in the color map volume.

East of Twentynine Palms

Rural development east of Twentynine Palms threatens to block a bighorn movement corridor between the Pinto Mountains and the Bullion Mountains. Fencing of the rural properties restricts bighorn travel through the area. Land ownership is split between private and BLM parcels, which are unconsolidated and difficult to manage. Species that could be conserved within a Twentynine Palms linkage include the Mojave fringe-toed lizard and sand linanthus. This linkage would provide habitat connectivity between Joshua Tree National Park and the Twentynine Palms Marine Corps Air Ground Combat Center. The map depicting Mojave fringe-toed lizard habitat in the Dale Lake area illustrates the land ownership pattern in this area and can be used to create potential open space corridors in conjunction with the bighorn sheep habitat map.

Joshua Tree - Yucca Valley

The third suggested linkage would connect the Joshua Tree National Park and the San Bernardino Mountains. It could be located in one of two locations, passing between either the communities of Morongo Valley and Yucca Valley, or Yucca Valley and Joshua Tree. This corridor would enhance dispersal of bighorn sheep. It could also provide conserved lands for the endemic Little San Bernardino Mountains gilia and the disjunct population of the Bendire's thrasher. The BLM has already taken steps towards the establishment of a linkage between the national park and the mountains with the expansion of the Big Morongo ACEC, though several parcels of private land are included in the potential

corridor. In addition, a substantial amount of land has already been acquired by the Wildlands Conservancy in this area. The map of Bendire's thrasher habitat in the Yucca Valley area (see Color Map Volume) illustrates potential open space corridors in this region.

MULTISPECIES HOTSPOTS

Overlays of species distributions reveal select locations where several target species occur together. Areas containing ten or more species are termed "hotspots" and represent locations of exceptionally high biodiversity. Conservation of "hotspots" presents an opportunity to protect many of the target species within a relatively small region, increasing the efficiency of management and promoting the wise use of limited funds.

Most of the hotspots are riparian communities, which is to be expected in an arid region where water often limits the range of wildlife distributions. Some, however, are areas of topographic and geological heterogeneity that have resulted in an expression of botanical diversity. The three most diverse hotspots within the West Mojave are listed below and are illustrated by maps that can be found in the Color Map Volume.

Mojave River - Mojave Narrows Park to I-15 14 species

Bell's vireo, yellow-breasted chat, vermilion flycatcher, brown-crested flycatcher, southwestern willow flycatcher, yellow warbler, summer tanager, Cooper's hawk, bald eagle, Western yellow-billed cuckoo, ferruginous hawk, long-eared owl, southwestern pond turtle, Mojave River vole.

Southern Sierra Nevada Mountains 16 species

Golden eagle, prairie falcon, Cooper's hawk, yellow-eared pocket mouse, Errter's milkvetch, Hall's daisy, Owens Peak lomatium, Charlotte's phacelia, Kern buckwheat, Dedecker's clover, Muir's raillardella, sweet-smelling monardella, Kelso Valley monkeyflower, The Needles buckwheat, Gilman's goldenbush.

Big Morongo Preserve 12 species

Bell's vireo, yellow-breasted chat, vermilion flycatcher, brown-crested flycatcher, southwestern willow flycatcher, yellow warbler, summer tanager, Cooper's hawk, long-eared owl, desert tortoise, bighorn sheep, triple-ribbed milkvetch.

CENTERS OF ENDEMISM

Twenty three species of plants and animals are endemic to the West Mojave; that is, their entire range is contained (or nearly so) within the planning area. These species are a high priority for protection in the West Mojave Plan, since this is the only regional planning

effort that will address these organisms throughout their entire distribution.

At least five regions contain endemic species that appear to have evolved in place. The reasons for this specialization and adaptation of certain species is sometimes clear, as in the case of the carbonate substrates in the San Bernardino Mountains, and is sometimes completely unknown, as within the Lane Mountain area. Centers of endemism and hotspots overlap in some cases.

This report suggests that conservation lands be established in each of these areas if conservation management is not already in effect. Most of the restricted endemics are plants, but it is anticipated that a variety of invertebrates would also be included in these areas if their biology and distribution were better known. Centers of endemism in the West Mojave include:

- Lane Mountain
Lane Mountain milk vetch, Clokey's cryptantha.
- Southern Sierra Nevada Mountains
Yellow-eared pocket mouse, Errter's milkvetch, Hall's daisy, Owens Peak lomatium, Charlotte's phacelia, Kern buckwheat, Dedecker's clover, Muir's raillardella, sweet-smelling monardella, Kelso Valley monkeyflower, The Needles buckwheat, Gilman's goldenbush.
- North slope of San Bernardino Mountains
Cushenbury buckwheat, Cushenbury milk vetch, Cushenbury oxytheca, Parish's daisy, Shockley's rock cress.
- Joshua Tree - Morongo Valley area
Triple-ribbed milk vetch, Little San Bernardino Mountains gilia.
- El Paso Mountains
Red Rock tarplant, Twisselman's (Red Rock) poppy.
- Mojave River
Mojave tui chub, Mojave River vole.

OTHER NEW PROPOSALS FOR CONSERVED LANDS

Interim Mohave Ground Squirrel Conservation Areas

Interim management areas have been delineated to protect this relatively little known species. These will remain in effect until studies are completed to determine with greater precision those habitat elements needed to sustain viable populations, particularly the location of areas of particular importance to the ground squirrel during drought

conditions. The interim boundaries are based on known occupied habitat and the location of capture and sighting records. Representative portions of the north, central, and southern portion of the range are included in the interim protection zone, while existing and future urbanized lands near cities have been excluded. The interim boundaries would be refined to incorporate the results of the proposed studies upon their completion.

Pisgah Crater

A new BLM ACEC is recommended for a portion of the Pisgah Crater area. This crater and lava flow, an uncommon landform in the Mojave Desert, and is currently designated as a National Natural Landmark. It contains lava tubes of several types, some of which are used as bat roosts. The mix of dark lava and white sand has resulted in interesting color adaptations in the reptile and small mammal fauna. The ACEC should be located in those areas where populations of crucifixion thorn, white-margined beardtongue, sand linanthus, and Mojave fringe-toed lizard occur. Special care should be taken to exclude mineral extraction and other activities, or to allow compatible operations to continue. Potential boundaries of a new ACEC are illustrated on the attached color map.

Big Rock Creek

Upper Big Rock Creek, located at the base of the San Gabriel Mountains, contains a significant riparian woodland bordered by diverse desert chaparral and Mojave mixed woody scrub communities. Within the riparian zone are the yellow warbler and summer tanager, and a high potential exists for occurrence of the endangered arroyo toad. In the surrounding uplands are found the short-joint beavertail cactus, gray vireo, and San Diego horned lizard.

The drainages coalescing at Big Rock Creek form the sand source for the Mojave fringe-toed lizard, located downstream at Saddleback Butte State Park. Fluvial action carries the sand down to the wind corridor, which then sorts the sand, carrying the fine-grained particles to dunes, hummocks, and sand sheets occupied by the fringe-toed lizard. Conservation of the ecosystem process is essential to the protection of the Mojave fringe-toed lizard.

Big Rock Creek is a proven wildlife corridor for larger predators traveling from the San Gabriel Mountains to the desert. This area is one of the few places on the west edge of the planning area where a surface break is found in the California Aqueduct.

Land ownership at Big Rock Creek is private. Portions of the conservation area are designated as a Significant Ecological Area by Los Angeles County, and are connected to other SEAs downstream. Scattered residences and a golf course are found within the conservation area, and future management is intended to be compatible with existing land uses. The area delineated on the attached map is suggested for acquisition.

Middle Knob

An unusual coalition of ecosystems is found at the edge of the West Mojave planning area in Kern County north of Highway 58 and west of Highway 14 between Walker Pass and Jawbone Canyon. In this area, called Middle Knob after one of the highest peaks, the Mojave Desert vegetation forms a transition zone with Great Basin vegetation to the northeast and with oak woodlands, blue pine, and pinyon pine forests of the southern Sierra Nevada Mountains on the north. The elevational gradient of this area, combined with the merging of these biotic provinces, creates an exceptional species diversity and variety of habitats.

Many of the target species of the West Mojave Plan occur within the Middle Knob area. Nests of golden eagle and prairie falcons are present, and a very narrow endemic, the Kern buckwheat, occurs within this region on unusual claypan depressions resembling vernal pools. The state-listed Tehachapi salamander has been recorded, and desert tortoises are found at the desert edge. Rare plants present include Charlotte's phacelia and Piute Mountains jewelflower.

Even without the protection that could be offered for declining species, Middle Knob deserves additional protection due to its biodiversity and its biological integrity. Important habitat for black bears and mountain lions is present, and the connectivity to adjacent large areas of open space (outside the West Mojave planning area) establishes a region large enough to support healthy populations of the larger predators. The habitats and natural communities are unfragmented and threats to the biodiversity are few.

New discoveries are made frequently in this area, such as the occurrence of the yellow-bellied salamander, Peirson's spring beauty, Palmer's mariposa lily, and cream layia. A number of springs and seeps support the wildlife habitat, and small patches of unusual plant communities, including freshwater marsh and native grassland add to the overall diversity.

The land ownership is almost entirely public (BLM) and access is provided by a single primary dirt road. The Ridgecrest Field Office of the BLM supports designation of the Middle Knob area as a new Area of Critical Environmental Concern.