

West Mojave Plan

Draft Evaluation Report

Suggested Conservation Strategies

Working Draft
September 22, 1999

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INTRODUCTION

This report suggests conservation strategies for the desert tortoise, Mohave ground squirrel and other special status plants and animals which could support the issuance of programmatic incidental take permits, “no surprises” assurances and biological opinions to the agencies and jurisdictions which are preparing the West Mojave Plan (Plan). These strategies are based on a review of current agency management which was conducted by the West Mojave Planning Team, the United States Fish and Wildlife Service (Service), and the California Department of Fish and Game (Department). Biologists evaluated the effectiveness of current management, identified management shortfalls, and suggested measures to address those shortfalls¹. Their findings and recommendations are presented herein.

The suggested strategies are intended to meet two planning needs. They allow state and federal land management agencies to implement their mandate to conserve and protect species of concern and habitats on public lands, a mandate which includes facilitating the recovery of these species. At the same time, the measures suggest a streamlined program to minimize and mitigate the impacts of projects on private lands. Thus the Plan will serve as both a “conservation” plan and a “mitigation” plan.

WHAT ROLE DOES THE EVALUATION REPORT PLAY IN THE WEST MOJAVE PLANNING PROCESS?

The Evaluation Report is not the “West Mojave Plan.” The formulation of the Plan is the responsibility of the Supergroup, including the 28 participating jurisdictions. The evaluation report is one of several resources which are being provided to the Supergroup for its use when it writes the Plan.

The West Mojave Plan is being prepared in four steps: (1) *Foundation* (assembling the best science reasonably available); (2) *Evaluation* (a review of the effectiveness of current agency management and suggestions for improvement); (3) *Supergroup writes the Plan*; and (4) *Environmental Impact Report and Statement (EIR/S)*. Step 1 was completed in 1998. Publication of this Evaluation Report marks the completion of Step 2.

Step 3 involves the writing of the Plan by the Supergroup. The Supergroup will accomplish this task using the suggestions presented by this report, together with the West Mojave scientific data base, map and literature library, the recently published *Current Management Situation of Special Status Species in the West Mojave Planning Area*

¹A summary of current management and identified shortfalls is presented for each species. A more detailed description of current management, biological opinions, incidental take permits and other matters concerning FESA and CESA may be found in the *Current Management Situation of Special Status Species in the West Mojave Planning Area (March 1999)*, which the reader is encouraged to consult.

(March 1999) (CMS), and the expertise brought to the process by the Supergorup.

The preparation of an EIR/S constitutes Step 4. It will identify the environmental impacts of the Supergroup's Plan. A Draft EIR/S and Plan will be released to the general public for a 90-day public review. Following this, a Final EIR/S will be published together with a Plan which incorporates, as appropriate, modifications suggested by the public.

A mandatory component of an application for incidental take permits issued pursuant to the federal and California endangered species acts (FESA and CESA) is a planning document known as a habitat conservation plan, or HCP. The West Mojave Plan will function as an HCP; as such, it must satisfy the incidental take permit issuance criteria of both FESA and CESA. Those criteria are presented in Tables I-1 and I-2. Table I-3 presents a brief summary of the content of a typical HCP, which could serve as a starting-point for the Supergroup when it writes the Plan.

The "issuance criteria" are critical. These standards **must be satisfied by the Plan** if it is to support the issuance of permits.

HOW IS THIS REPORT ORGANIZED?

Our intent is to enable the Supergroup to understand not only the conclusions reached by the evaluators, but also the process by which those findings and recommendations were developed. Accordingly, the discussion flows in a logical manner that mirrors the evaluation itself, beginning with a summary of current agency management and the biological needs of species, next suggesting strategies which could address management

Definitions

Take (FESA): Harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (Section 3 of FESA, as amended). "Harass" is further defined in federal regulations as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. "Harm" is further defined as an act, which may include significant habitat modification or degradation, where it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

Take (CESA): Hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill. (Cal. Fish & Game Code Section 86.)

Incidental Take: Take that is incidental to, but not the purpose of, the carrying out of an otherwise lawful activity, or take that is inadvertent. Construction of transmission lines and installation of pipelines in occupied desert tortoise habitat are examples of "otherwise lawful activities" which have resulted in the take of tortoises in the planning area.

Incidental Take Permit: A permit issued by the Service that exempts a permittee from the take prohibition of section 9 of FESA (issued pursuant to section 10(a)(1)(B) of FESA) (a "Section 10" permit). Also a permit issued by the Department that exempts a permittee from the take prohibition of section 2081 of CESA (a "Section 2081" permit).

Habitat Conservation Plan: A planning document that is a mandatory component of an incidental take permit application, also known as an HCP.

shortfalls, and finally explaining why those strategies should succeed.

Because each plant or animal was evaluated separately, findings and recommendations are presented on a species-by-species basis in Chapters 2 through 6. To complement this species-driven approach, Chapter 1 presents an overview of the suggested conservation strategies from an ecosystem perspective, explaining how these measures could function collectively as a bio-regional conservation plan.

Table I-1
FESA Section 10(a)(2)(B) Permit Issuance Criteria

- (i) The taking will be incidental;
- (ii) The applicant will, to the *maximum extent practicable*, minimize and mitigate the impacts of such taking;
- (iii) The applicant will ensure that *adequate funding* for the plan will be provided;
- (iv) The taking will *not appreciably reduce the likelihood of the survival and recovery of the species in the wild*; and,
- (v) The measures, if any, required under [1539(a)(2)(A), “such other measures that the Secretary may require as being necessary or appropriate”] will be met, and [the Secretary] has received such other assurances as he may require that the plan will be implemented.... [emphasis added]

Table I-2
CESA Section 2081(b) Permit Issuance Criteria

- (1) The take is incidental to an otherwise lawful activity.
- (2) The impacts of the authorized take shall be *minimized and fully mitigated*. The measures required to meet this obligation shall be *roughly proportional* in extent to the impact of the authorized taking on the species. Where various measures are available to meet this obligation, the measures required shall *maintain the applicant’s objectives to the greatest extent practicable*. All required measures shall be capable of successful implementation. For purposes of this section only, impacts of taking include all impacts on the species that result from any act that would cause the proposed taking.
- (3) The permit is consistent with any regulations adopted pursuant to Sections 2112 and 2114.
- (4) The applicant shall ensure *adequate funding* to implement the measures required by paragraph (2), and for monitoring compliance with, and effectiveness of, those measures. [emphasis added]

The discussion of each animal or plant is organized into five parts:

- **Evaluation Findings:** The methodology used to evaluate current management and formulate conservation strategies. Substantive conclusions of the evaluators are presented regarding the habitat and distribution of, and threats to, each species, current management, and identified management shortfalls.

- **Measurable Biological Goals and Objectives:** Broad guiding principles for the recommended conservation strategy. Goals and objectives are intended to (a) create benchmarks for developing conservation measures, (b) provide the rationale behind the Plan's terms and conditions, (c) promote an effective monitoring program, and (d) help determine the focus of an "adaptive management" strategy (that is, they ensure that the Plan can be modified to incorporate findings of the monitoring program). Biological goals may have associated biological objectives which represent specific, measurable targets for achieving the goal.
- **Anticipated Take:** Take is expressed in numbers of individual animals or acres of habitat. This section identifies a level of incidental take which could be authorized by incidental take permits and biological opinions, assuming a 30-year Plan term and the adoption of the suggested conservation strategy.
- **Conservation Strategy:** The program of management prescriptions and/or special management areas for a particular species which will, at a minimum, ensure that the taking will not jeopardize its continued existence in the wild.
- **Permit Compliance Summary:** The reasons why the conservation strategy would satisfy the requirements of the FESA and CESA permit issuance criteria, even assuming that all of the take authorized by permits occurs during the term of the Plan. The discussion explains how the recommended conservation strategy would allow measurable biological goals and objectives to be attained.

Separate chapters are devoted to the desert tortoise (Chapter 2) and the Mohave ground squirrel (Chapter 3) due to the complexity of the issues associated with those species. Conservation strategies for the remaining plants and animals are discussed in Chapter 4 (species which can be covered by an HCP) and Chapter 5 (species which are outside the scope of coverage that can be provided by an HCP, such as species found only on federal and/or state lands, but which could be addressed through measures adopted by agencies through their land use plans). Chapter 6 identifies plants and animals which the evaluators suggest be dropped from the list of species being addressed by the Plan. A map volume is also attached.

Table I-3 HCP OUTLINE

This table presents an HCP outline which could be utilized by the Supergroup when it writes the West Mojave Plan. Much of this information is drawn from a document prepared by the Service's Ventura Field Office titled *Habitat Conservation Plan and Implementation Agreement Templates for Section 10(a)(1)(B) Permits*.

Executive Abstract and Introduction

Chapter 1: Project Description

Planning Area: Describe the planning area. Descriptive elements should include the geographic location and acreage. The general environmental setting should be described with reference to primary habitats and any current factors affecting the environment in the project area, including growth trends and forecasts. Finally, current land uses and activities in and adjacent to the project area should be briefly presented, and land ownership discussed. A clear map is useful. The description need not be exhaustive, but should provide the reader with a realistic and accurate sense of the character and setting of the planning area. Only those elements relevant to the West Mojave Plan should be included.

Conservation Planning Process: The history of the development of the West Mojave Plan should be briefly discussed. Notable items include when the process began; participating parties such as landowners, local officials, environmental groups, public land users, and other government agencies; foundational meetings and consultations; and key decisions made during the development of the HCP. Legal and regulatory requirements should be addressed. Equitable Precepts should be discussed, indicating how and when they were developed and the purpose they serve.

Chapter 2: Biological Data and Species of Special Concern

Briefly describe all species being addressed by the West Mojave Plan, including those for which incidental take permit coverage or "no surprises" assurances are being sought. Species accounts can be incorporated by reference. Describe affected ecosystems and other pertinent biological information.

Chapter 3: Conservation Strategy

Address each species separately; in addition, describe the collective effect of all species programs, taken together (the "big picture"). Identify **measurable biological goals** for each species. Specific measures to be taken during implementation must be clearly defined, including **measures to minimize and mitigate impacts**, and proactive management programs. Success criteria should be clearly defined. Include a **monitoring** program which evaluates the effectiveness of the conservation strategy relative to defined success criteria; specify the data to be collected, the frequency of monitoring, who will conduct it and how the data will be analyzed, and how and when monitoring reports will be provided. The scope of monitoring should be commensurate with the scope of the conservation strategy. Monitoring should evaluate compliance, determine if biological goals are being met, and provide feedback to an adaptive management strategy. Describe **adaptive management** programs (especially for species for which information gaps exist) which utilize monitoring findings to modify the conservation strategy where necessary and, where appropriate, identify agreed-upon future changes that must be implemented as a result of monitoring findings. A time schedule of implementation that defines the order in which events will occur should also be included.

Table I-3 (Con't)

Chapter 4: Funding and Administration

Describe how the implementation of the Plan will be funded. Clearly state how much the Plan will cost including long-term maintenance and monitoring. Identify the source of the funding, who will manage the money, and how expenditures will be audited. Funding options could include collecting assessments or fees, appropriated agency funds, grants, or donations. If an endowment is to be established, its management should be described.

Chapter 5: Alternatives to the Proposed Plan

Both FESA and CESA require that alternatives to the taking of species be considered, and the reasons why such alternatives are not implemented be discussed. In addition, the EIR/S analysis will need to address alternatives. Any sort of reasonable alternative conservation strategy can be considered; these must include, however, a "no action" alternative and a "no take" alternative. The impacts of the alternatives should be briefly summarized, and the more detailed analysis of the EIR/S should be incorporated by reference.

Chapter 6: Changed and Unforeseen Circumstances

References and Literature Cited

HOW WAS THE EVALUATION CONDUCTED?

The recommendations presented in this report were developed during a series of meetings held between March 1998 and December 1998. Participants included biologists from the West Mojave planning team, the Service, the Department, and invited experts. The following information was made available to participants: (1) A "species account" for each plant or animal, prepared by a recognized expert, describing its distribution, natural history, habitat requirements, and population status, together with a threats analysis, recommended measures to address threats, and a bibliography; (2) hard copy maps and computer-generated and projected images; (3) a preliminary version of the CMS; and (4) applicable recovery plans. Findings and recommendations were recorded during each meeting by a West Mojave planning team biologist using a computer word processing program; agreed-upon text was projected on a meeting room wall, and was considered adopted only after all participants had reviewed, modified and accepted the text.

Evaluation meetings were structured around the following seven questions:

- How important is the planning area to the species as a whole?
- Does the planning area contain essential habitat for the species to complete its life history?
- Why was the species placed on the special status list? What is the concern?
- Is current management adequate to protect the species?
- Is the geographical size and location of conservation areas adequate to protect the

species? If not, what additional areas need to be committed to assure protection of the species?

- Is the management of proposed conservation areas adequate to protect the species? If not, what management improvements could be implemented to assure protection of the species within the target conservation areas.
- Is management of lands outside conservation areas adequate to protect the species? If not, what management improvements could be implemented to assure protection of the species outside conservation areas?

A FINAL NOTE: CESA “SECTION 2081 MANAGEMENT AUTHORIZATIONS”

Prior to May 1997, the Department authorized incidental take for state-listed species (such as the desert tortoise) by issuing “2081 Management Agreements” under its interpretation of the “management purposes” exception to CESA’s take prohibition. In April 1997, however, a California appellate court held this approach to be incompatible with CESA. (*Planning and Conservation League v. Department of Fish and Game* (1997) --- Cal.App.4th ---) As a result, the legislature amended CESA. A revised CESA section 2081 became effective in January 1998, which established a formal incidental take permit program comparable to the FESA section 10(a)(1)(B) permit (see above). This permit authorizes the incidental take of state-listed species. Throughout the remainder of this document, we refer to the Department’s authorization (historically and currently) where there is no state lead agency as a “2081 permit.”

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 blowsand 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.

CHAPTER TWO

DESERT TORTOISE

(Gopherus agassizii)

Status: Federal: Threatened California: Threatened

Date of Evaluation: March 12, 17-19, 1998; October 20-22, 1998

Attendees: Bransfield, Black, Hoover, Jones, Thompson, LaRue, LaPre, Haigh, Bell, Boarman, Avery (briefly), Lovich (briefly), Foreman, Egan, Woodman, Karl

Development of a successful conservation strategy for the desert tortoise is the West Mojave Plan's most important task. To this end, the evaluators met repeatedly to assess the effectiveness of current tortoise management, identify management shortfalls, and develop a conservation strategy that blends the most effective components of current management with new solutions to identified threats.

The approach developed by the evaluators, and recommended in this report, categorizes lands within the planning area into one of three desert tortoise management areas, and recommends measures to minimize and mitigate impacts of take in each of these areas. The chapter is organized as follows:

- Part A, *Methodology*, documents the meetings, studies, and discussions that led to the suggested conservation strategy.
- Part B identifies *biological goals and objectives*.
- Part C explains the *conservation strategy*.
- Part D presents ideas for the Supergroup's use when it determines the *take* to be authorized by incidental take permits and biological opinions.
- Part E examines the likely success of the recommended conservation strategy in meeting the biological goals and objectives.
- Part F presents a bibliography of literature cited in this chapter.

In addition, a Desert Tortoise Appendix Volume (available upon request) presents background information concerning management prescriptions and areas.

Part A Methodology

BACKGROUND INFORMATION

Evaluators kept three factors in mind throughout their deliberations: (1) known threats to the desert tortoise, (2) field survey results, and (3) current and historic tortoise management areas. Each is discussed below.

Threats to the Desert Tortoise

Boarman (1999) summarized the literature and documented 22 threats affecting the desert tortoise. His analysis provides a comprehensive discussion of the most important threats to tortoise recovery. While similar to the discussion given in the *Desert Tortoise (Mojave Population) Recovery Plan* (Recovery Plan) (U.S. Fish and Wildlife Service 1994b), Boarman's study updates it by providing the results of research completed since 1994.

Dr. Boarman assigned each of the threats a rank of high, medium, or low based on the following rationale: (a) percent of known mortalities attributable to a specific factor; (b) geographic extent of the threat factor (localized versus region-wide); (c) temporal pattern of threat (e.g., one-time, seasonal, long-term); (d) acreage affected by the factor; and (e) future expected trends in the threat factor. Using these criteria, threats to tortoise recovery were ranked as follows:

Table 2-1 Desert Tortoise Threats		
High	Medium	Low
Construction Disease Urbanization & development	Agriculture Fire Landfills Livestock grazing Military operations Off-road vehicles Predation Roads & highways Utility corridors	Collecting Drought Energy & mineral development Garbage & litter Handling & manipulation Invasive weeds Noise Non off-highway vehicle recreation Vandalism Wild horses & burros

Source: Boarman 1999. Threats within a given rank are listed alphabetically

Dr. Boarman added a word of caution:

The rating of relative importance of different threat factors is a difficult undertaking for several reasons. First, it is difficult to determine the cause of death of animals and it is even harder to determine how much decline is really attributable to the various indirect causes of mortality (e.g., habitat alteration)...Second, not enough is known about several potential threats to evaluate their absolute or relative impact...Third, which mortality factors are functioning is very site specific...Finally, as discussed above, factors that caused the declines (e.g., disease) may not be the same factors that are preventing recovery (e.g., genetic or demographic consequences of small populations, fragmentation, raven predation).

Dr. Boarman's analysis is only one interpretation of the relative importance of threats affecting tortoises; the Recovery Plan is another source. Regulatory agency personnel, the planning team, and the biologists participating in the evaluation (including Dr. Boarman) were very familiar with these and other threats, and applied this knowledge and experience when determining solutions to those threats.

Whereas Dr. Boarman considered fragmentation, degradation, and loss of habitat to constitute a 23rd threat (Boarman 1999), the evaluators viewed them as habitat impacts that *result* from a combination of other threats. For example, roads and utility corridors fragment tortoise habitat; sheep grazing, off-highway vehicles, and some military operations degrade habitat; and urbanization clearly results in habitat loss.

Some threats affect both habitat and tortoises (construction, urbanization, wildland fires), while others affect only tortoises (disease and predation). Appendix DT-6 presents a "threats matrix" that identifies, for each threat, whether it results in fragmentation, degradation, and/or loss of habitat, and whether tortoises would be directly affected.

In many ways the West Mojave tortoise population is more affected by human and non-human threats than any of the other tortoise populations listed as threatened (i.e., those occurring north and west of the Colorado River). In Table 2-2, we list the relative degree of threat for each recovery unit and the associated Desert Wildlife Management Areas.

Additional documentation regarding the relative effects of various threats are given below:

- Although population declines are occurring over large sections of the species' range, the tortoise appears to be faring least well in the Western Mojave desert of California, where, not coincidentally, habitat destruction due to human disturbance is widespread...Our most obvious conclusion is that populations of desert tortoise in the Western Mojave desert are in grave danger (Doak et al. 1994).

**Table 2-2
Degree of Threat
Recovery Plan DWMA's**

Recovery Unit	Proposed DWMA	Degree of Threat	Average Degree of Threat
Upper Virgin River	Upper Virgin River	5	5.0
<i>Western Mojave¹</i>	<i>Fremont-Kramer</i> <i>Ord-Rodman</i> <i>Superior-Cronese</i>	5 4 5	4.7
Eastern Colorado	Chuckwalla	4	4.0
Northeastern Mojave	Beaver Dam Slope Coyote Spring Gold Butte - Pakoon Mormon Mesa	5 2 2 3	3.0
Eastern Mojave	Fenner Ivanpah Piute El Dorado	3 3 2	2.7
Northern Colorado	Chemehuevi	1	1.0

Source: Recovery Plan, Table 6; Degree of Threat: 5=High, 1=Low.

- Studies conducted throughout the California deserts indicate that ravens were most abundant in the west Mojave Desert (Knowles and Berry 1990); ravens in the Mojave desert increased by over 1,500%...and this increase is likely much higher in the western Mojave desert...the largest number of [tortoise] shells [with evidence of raven predation] have been found in the western Mojave (Boarman 1992b); tortoise populations experiencing highest raven predation rates are within the western Mojave Desert (Rado 1989).
- On the BLM western Mojave Desert study plots, 14.6% to 28.9% of all desert tortoise carcasses bore evidence of gunshots, whereas carcasses from the less-visited eastern Mojave Desert yielded gunshot frequencies of 0% to 3.1% (Berry 1986); the highest rate of vandalism was recorded in the Fremont Valley, where 40.7% of desert tortoises found dead between 1981 and 1987 showed signs of gunshots and other vandalism (Berry 1990, as amended).
- Tortoise mortality, apparently from the upper respiratory tract disease, has been more severe at the Desert Tortoise Research Natural Area than at most other BLM study plots

¹ The Joshua Tree DWMA, which has a threat level of 1, is excluded from this analysis because it is already being managed by the National Park Service as a reserve and has implemented management prescriptions identified in the Recovery Plan. If Joshua Tree were included, the entire Western Mojave Recovery Unit would have an average threat level of 3.75.

(Berry 1990, Corn 1994).

- Corn (1994) indicates that there was an apparent decline in large tortoises and a marked decline in small tortoises since the latter-1980's and mid-1980's, respectively, in the western Mojave Desert
- Early fires may be particularly damaging in the western parts of the Mojave Desert where [tortoise] growth and breeding are focused on a relatively short time period during the late winter and early summer (Brooks 1998).

Tortoise Field Surveys

1975 to 1982 BLM Tortoise Surveys: Between 1975 and 1982, the BLM funded surveys throughout much of the Mojave Desert to determine relative tortoise densities. A total of 1,678 transects was surveyed throughout the California portion of the Mojave Desert, including 894 in the planning area (Matt Daniels, pers. comm., 12 February 1999). These data were used to develop tortoise density polygons (Berry 1984), and the resulting map (Desert Tortoise Map 2) has been used by regulatory agencies, land managers, and tortoise biologists ever since.

The map depicts areas of tortoise densities segregated into the following categories: 0 to 20, 21 to 50, 51 to 100, 101 to 250, and more than 250 tortoises per square mile. A central area roughly corresponding to current critical habitat contained most of the tortoises, surrounded by peripheral areas of 0 to 20 tortoises per square mile. The outermost portions of the planning area (foothills in the Sierra Nevada, San Gabriel, and San Bernardino mountains and the northern portions of China Lake and Fort Irwin), according to this map, did not support tortoises.

The highest tortoise densities occurred in four areas. The largest area (approximately 163 square miles) was found entirely within Kern County and roughly consisted of Fremont Valley, northeastern portions of California City (including the Desert Tortoise Research Natural Area), and areas southeast of California City. The next largest area (64 square miles) was found mostly in the Brisbane Valley (between Interstate 15 and National Trails Highway) and in the northwestern portion of the Stoddard Valley Open Area. Two relatively smaller areas (e.g., Water Valley near the Mud Hills and the eastern end of Daggett Ridge along Camp Rock Road) were also identified as having more than 250 tortoises per square mile. Although these areas were considered tortoise "hot spots" in the late 1970's, other extensive areas north, south, and east of Edwards Air Force Base were documented as supporting between 51 and 250 tortoises per square mile.

Local Government Tortoise Surveys: Since the tortoise was listed as threatened in 1990, county and city planning departments have required focused tortoise surveys on undeveloped lands as per Service protocol (U.S. Fish and Wildlife Service 1992). Such sites have been surveyed along transects spaced at 30-foot intervals, effecting a 100 percent presence-absence analysis of tortoise occurrence. During May 1998, the planning

team reviewed the records of approximately 250 focused desert tortoise surveys completed in San Bernardino County. Of these, 234 reported either presence or absence of tortoise sign. That information shows many areas, particularly to the south, where focused surveys failed to locate tortoise sign.

There have been five other, recent programmatic surveys of tortoise occurrence within urban areas, including: (a) 225 square miles of Lancaster (Tierra Madre Consultants, Inc. 1991); (b) 200 square miles encompassing portions of Adelanto, Apple Valley, Hesperia, and Victorville (Tierra Madre Consultants, Inc. 1992); (c) 100 square miles of Palmdale (Feldmuth and Clements 1990); (d) 38 square miles of Ridgecrest and Inyokern (Circle Mountain Biological Consultants 1997a); and (e) 38 square miles of Yucca Valley (Tierra Madre Consultants, Inc. 1993a).

1988 to 1997 Military Surveys: During the past decade, extensive tortoise survey work has been conducted on four of the military bases in the planning area. These surveys included the China Lake Naval Air Weapons Station (1990; 270 transects): Edwards Air Force Base (1992 and 1994; 987 transects): Fort Irwin, including proposed expansion areas (1988, 1989, 1990 and 1992; 1098 transects); and the Marine Corps Air Ground Combat Center at Twentynine Palms (1997; 875 transects).

These surveys revealed one area where tortoise populations were significantly underestimated by the 1984 map. This was an area south and southwest of Fort Irwin, where Woodman in 1988 and other surveyors in 1990 found areas apparently supporting as many as 250 tortoises per square mile (Chambers Group, Inc. 1990).

1998 West Mojave Regional Survey: The Supergroup's intent is to base the West Mojave Plan on the best available scientific data. Until 1998-1999, when much of the planning area was surveyed for tortoises, the 1984 map provided the latest available information regarding tortoise densities and distribution. However, this map is based on 20 year old data (from the late 1970's through early 1980's), and there have been documented declines in tortoise numbers in much of the West Mojave since the data were collected (Berry 1990, as amended; Corn 1994).

In addition, large areas of estimated tortoise densities on the 1984 map are associated with very few transect data points. For example, in the polygon located southeast of California City, encompassing between 60 and 70 square miles with tortoise densities estimated at 51 to 100 per square mile, only two transects were surveyed between 1975 and 1982.

The planning team concluded that a new survey effort was necessary for areas not recently (or ever) surveyed. The 1998 surveys were designed to (a) determine relative tortoise abundance throughout the proposed DWMA's and adjacent areas where tortoises likely occur; (b) quantify observable human impacts in those same areas; and (c) be sufficiently comprehensive to avoid excessive extrapolation onto unsurveyed lands.

The planning team was concerned about the methodology to be used: the prediction of tortoise density on the basis of tortoise “sign” counts (i.e., deriving an estimate of population per square mile from the number of tortoise burrows, scat and shells recorded on a given transect). Predicting tortoise density based on sign counts is problematic because of the wide range of tortoise sign found in areas of known (or suspected) tortoise density.

For example, on the Lucerne Valley permanent study plot where tortoise density was estimated at 82 animals in 1990, surveyors found as few as 6 and as many as 23 pieces of tortoise sign in 1998 (LaRue, pers. obs.). Since, during 15 out of 17 years tortoise densities have been estimated a single piece of sign has equated to 10 tortoises (Woodman, pers. comm.), one would estimate that as few as 60 and as many as 230 tortoises occur on the Lucerne Valley plot. To correct the effects of this variance, Dr. Michael Weinstein (pers. comm., 10 July 1998) indicated that three transects per square mile would be preferable to estimate tortoise densities.

Concerns with the methodology were tested by calculating tortoise densities in several different ways. Statistical techniques applied included the regression analysis traditionally used by Dr. Kristin Berry and the reduced major axis method (McArdle 1987). Variable results were obtained by (a) either “forcing” or “not forcing” the regression line through zero; (b) either considering all tortoise age classes, or adults only; and (c) applying either linear regression analysis or the reduced major axis method.

As a result of this analysis and discussion with several statisticians, it was decided to avoid the uncertainties inherent in these alternative treatments of the data. Instead, we have mapped “patterns of tortoise occurrence” based on normalized sign counts among the surveyors rather than on estimated tortoise densities.

This decision is supported by evidence that the regional sign count patterns more or less correspond to patterns of relative tortoise occurrence. Dr. Anthony Krzysik (1996) wrote that although “the use of surrogate measures to assess or monitor wildlife populations has universally been criticized on issues of relevancy, accuracy, or precision ... statistical modeling revealed that both burrow and scat counts were strongly positively correlated with the occurrence of tortoises on survey transects.”

Prior to beginning the surveys, field biologists (Steve Boland, Frank Hoover, Dr. Alice Karl, Ed LaRue, David Silverman, and Peter Woodman) met with Dr. Kristin Berry on 9 July 1998 to discuss the locations of the transects. The 1998 survey transects were positioned, in part, to avoid areas that had been surveyed since 1988. Transect locations were chosen to accomplish the following goals:

- Delineate boundaries of tortoise management areas, particularly: (1) south of Edwards Air Force Base, north of Adelanto, south of Shadow Mountain Road,

north of Silver Lakes, and east of Highway 395; (2) north of Kramer Junction and west of Highway 395 to the Kern-San Bernardino county line; and (3) east of Helendale Road in the Iron Mountain area.

- Confirm areas of expected high tortoise densities, including: Water Valley and Mud Hills; around Iron Mountain north of Silver Lakes; south of Interstate 40; portions of the Brisbane Valley; and the region east of Highway 395, south of Highway 58, west of Helendale Road, and north of Shadow Mountain Road.
- Confirm areas of expected low densities, such as: the Cady Mountain region south of Interstate 15, north of Interstate 40, and west of Broadwell Dry Lake; and the area around California City.
- Consider a potential connecting corridor between Twentynine Palms Marine Corps Base and Joshua Tree National Park.
- Determine general distributions in the Stoddard and Johnson Valley Open Areas.

Surveys were completed between July 13 and September 24, 1998 on approximately 875 square miles of the planning area. Methodologies were the same as those used throughout the desert over the past 20 years (Berry and Nicholson 1984), where one transect was surveyed along a 1.5-mile equilateral triangle on a given square mile. Tortoise “Total Sign” and “Total Corrected Sign” (and other data including observable human disturbances) were recorded and later entered into a geographical information system (GIS) data base. Observable human disturbances included vehicles (paved roads, dirt roads, trails, tracks), garbage, shooting (targets, areas), mining (test pits, markers), campsites, sheep sign, cattle sign, domestic dog sign, fencelines and posts, utility lines, denuded habitat, partially denuded habitat, old buildings, and ordnance.

There was concern that tortoise sign may have deteriorated during the middle and latter parts of August 1998 when uncharacteristic summer storms associated with the *El Niño* weather pattern occurred throughout the area. As a result, calibration transects were re-surveyed. Dr. Boarman confirmed that there was no significant difference in the surveyor’s finding abilities before or after the rains.

The survey confirmed tortoise declines through much of the planning area since the late 1970's. Like other post-1984 surveys, the 1998 effort found few new significant populations where fewer than 50 tortoises per square mile were reported in the 1970's. The 1998 surveys indicated that sizable populations remain in the Mud Hills, west of and including Iron Mountain and Kramer Hills, and lands north of Barstow, and documented major declines in tortoise numbers in the California City and Fremont Valley areas since 1990.

1999 West Mojave-Fort Irwin Regional Survey: With money provided by the Department of Army, and with coordination among the BLM, Service, Army, and West Mojave team, eight tortoise surveyors (Ed LaRue, Peter Woodman, Dr. Alice Karl, Steve Boland, Mercy Vaughn, Paul Frank, Denise LaBerteaux, and Gilbert Goodlett) were enlisted to survey for tortoises and human disturbances in various Fort Irwin expansion alternative areas and remaining portions of the planning area, particularly in proposed DWMA areas.

The goals of the survey effort were to (a) determine the approximate number of tortoises in various expansion area alternatives; (b) conduct tortoise surveys in areas not surveyed in 1998; (c) determine the relative disturbance levels inside and outside proposed expansion areas; and with this information, (d) determine the relative effect of a given expansion alternative on tortoises found in the planning area.

Between 19 July and 11 September 1999 the eight biologists surveyed approximately 1,500 transects on approximately 1,200 square miles. They surveyed two transects per square mile throughout the Army's 1999 expansion proposal alternative and one transect per square mile outside that area. These data provide a new look at tortoise occurrence within the various expansion area alternatives and around California City, on lands that were last surveyed between 1990 and 1992.

Summary of Recent Desert Tortoise Surveys: Studies conducted since 1988 (see Desert Tortoise Map 6) include the most recent, available tortoise survey information for approximately 4,775 square miles of the planning area. This is the first time this amount of tortoise distribution information for the West Mojave Desert has been assembled and is available in one place. These survey efforts are summarized in Table 2-3.

Table 2-3					
Regional Tortoise Surveys Completed Since 1988					
Geographic Area	Date	Transects	Square Miles	Surveyors	Literature Citation
Outside Fort Irwin (west, east, and south)	1988	90	90	P. Woodman	U.S. Fish and Wildlife Service 1988
Fort Irwin and Goldstone	1989	406	406	P. Woodman G. Goodlett A. Krzysik	Woodman and Goodlett 1990, Krzysik 1994
California City, Rand Mountains, Fremont Valley, Spangler Hills	1990	450	150	G. Goodlett G. Goodlett P. Woodman	Berry et al. 1994

Table 2-3
Regional Tortoise Surveys Completed Since 1988

China Lake Naval Air Weapons Station	1990	270	270	S. Boland T. Shields P. Woodman	Kiva Biological Consulting and McClenahan & Hopkins Associates, Inc. 1990
Fort Irwin (including expansion areas)	1990	468	468	S. Boland J. Kaufmann T. Shields P. Woodman	Chambers Group, Inc. 1990
Fort Irwin (including the North Alvord Slope proposed expansion area)	1992	134	134	S. Rowland R. Lewis P. Potenza T. Cholmondeley B. Leatherman K. Thorne	Chambers Group, Inc. 1994
Edwards Air Force Base	1992	672	224	M. Allaback R. Arnold D. Laabs	Mitchell et al. 1993
Edwards Air Force Base	1994	315	105	M. Allaback D. Laabs E. LaRue	Laabs et al. 1996
Twentynine Palms Marine Corps Base	1997	850	850	G. Goodlett P. Woodman	GIS database provided by Marine Corps, with no associated document
West Mojave Survey	1998	875	875	S. Boland F. Hoover A. Karl E. LaRue D. Silverman M. Vaughn P. Woodman	Reported herein
West Mojave - Fort Irwin Survey	1999	1,500	± 1,200	S. Boland G. Goodlett P. Frank A. Karl D. LaBerteaux E. LaRue M. Vaughn P. Woodman	Reported herein
Totals		6,030	± 4,775	23 Surveyors	

Not all of this information reflects *current* tortoise densities and distribution in the planning area. The 1999 survey effort included approximately 100 square miles in and around the Desert Tortoise Research Natural Area, which was last surveyed in 1990. The 1999 data will be compared with the 1990 data to document tortoise declines in that area, and will be useful in determining the conservation strategy for the planning area. The 1999 surveys, those from 1998, Twentynine Palms Marine Corps Base's 1997 effort, and two surveys at Edwards Air Force Base (1992 and 1994) provide the best, most recent tortoise information for the planning area. Other surveys around Fort Irwin in the late 1980's and early 1990's, between California City and Spangler Hills in 1990, and on China Lake Naval Air Weapons Station in 1990 are useful for comparison's sake, but should not be used to determine current distributions of tortoises in the planning area.

Tortoise Management Areas, Historic and Current

Repeated efforts have been made during the past two decades to identify the areas that are, and are not, important to desert tortoise management. This section discusses the most significant of those attempts, several of which have been adopted as components of land use plans, or formally designated pursuant to FESA. They are summarized in Table 2-4 and discussed in greater detail below.

Table 2-4 Current and Historic Tortoise Management Areas		
Name	Date Established	Notes
Crucial Habitat	1980	California Desert Conservation Area Plan Designation
Category I, II, and III	1993	California Desert Conservation Area Plan Designation
Critical Habitat	1994	Designation pursuant to FESA
Recovery Plan	1994	Suggests that DWMAs be established
Desert Tortoise Emphasis Zones	1998	Analytical tool developed to assist BLM route designation

Crucial Habitat: “Crucial habitat” for the desert tortoise was identified by the California Desert Conservation Area (CDCA) Plan (U.S. Bureau of Land Management 1980). The crucial habitat area (CDCA Plan, Map 4) was considered to be “...essential to the continued existence of the species....” In 1987, the BLM described crucial habitat:

‘Crucial habitat’ includes portions of the habitats of officially designated BLM sensitive species that if destroyed or adversely modified could result in their being listed as threatened or endangered pursuant to section 4 of the Endangered Species Act of 1973, as amended.

Within the planning area, the CDCA Plan recognized two areas of tortoise crucial habitat: the Desert Tortoise Research Natural Area (an ACEC) and “Western Mojave Desert Crucial Habitat 1.”

Category I, II, and III Habitat: In 1992, the BLM adopted a *California Statewide Desert Tortoise Management Policy*. This policy directed that desert tortoise habitat be categorized into one of three categories. Management goals were assigned to each category. For Category I, the goal is to maintain stable, viable populations and increase populations where possible; for Category II, the goal is to maintain stable, viable populations; for Category III, the goal is to limit declines to the extent possible using mitigation measures. In April 1993, the BLM amended the CDCA plan to delineate these three categories of desert tortoise habitat on public lands.

Critical Habitat: Critical habitat is defined as (a) the specific areas within the geographical area occupied by the species at the time it is listed on which are found those physical or biological features which are essential to the conservation of the species and which may require special management considerations or protection; and (b) specific areas outside the geographic area occupied by the species at the time it is listed upon a determination by the Secretary of the Interior that such areas are essential for the conservation of the species (FESA section 3(5)(A)). In 1994, the Service designated four critical habitat units in the planning area: Fremont-Kramer, Superior-Cronese, Ord-Rodman, and Pinto Mountain units (U.S. Fish and Wildlife Service 1994a).

Public lands designated as critical habitat were generally the same as those earlier delineated by the CDCA Plan as crucial habitat. Boundaries differed in the following respects: (a) the northern half of Brisbane Valley, most of the Stoddard Valley Open Area, and two \pm 50-square mile areas in Johnson Valley Open Area were considered crucial habitat but are not designated as critical habitat; and, (b) areas south of Fort Irwin and Edwards Air Force Base, and most of the area east of Highway 247, which are now critical habitat, were never identified as crucial habitat. Similarly, BLM properties designated as critical habitat generally correspond to Category I and II habitat lands.

Desert Tortoise Recovery Plan Recommendations: The Recovery Plan established recovery goals and objectives for six “recovery units.” These included the Western Mojave Recovery Unit, which corresponds to the planning area. The Recovery Plan stated that recovery units are “...essential to the long-term recovery, viability, and genetic diversity of the species.” The Recovery Plan also recommended that Desert Wildlife Management Areas (DWMAs) be established within each recovery unit. DWMAs were characterized as areas in which “...recovery actions will be implemented to provide for the long-term persistence of viable desert tortoise populations and the ecosystems upon which they depend.” The Recovery Plan recommended that DWMAs should include:

- “...somewhere between 200 and 5,000 square miles...” with “...at least 1,000

square miles...recommended as the target size” (page 33).

- “...boundaries ... drawn to include the best examples of desert tortoise habitat in specific vegetation regions...heterogenous terrain, soil types, and vegetation within DWMA will best provide protection for the entire ecosystem upon which healthy desert tortoise populations depend” (page 48).
- “...the largest possible blocks of good tortoise habitat in an area, containing the most dense desert tortoise populations, should be included within DWMA boundaries” (page 48).
- “...round or square patches of habitat are more likely to retain desert tortoise populations than elliptical or rectangular ones. Long, linear strips are least desirable” (page 49).

The Recovery Plan distinguished the differences between DWMA and critical habitat as follows:

Critical habitat does not accomplish the same goals or have as dramatic an effect upon tortoise conservation as does a recovery plan because critical habitat does not apply management prescription to designated areas. However, designation of critical habitat does provide protection of desert tortoise habitat until such time as the Desert Tortoise Recovery Plan is implemented and DWMA management is employed. [page 56]

The Recovery Plan suggested that four DWMA be established within the Western Mojave Recovery Unit. These included the Fremont-Kramer DWMA, located along both sides of Highway 395 between Adelanto to the south and Red Mountain to the north; the Superior-Cronese Lakes DWMA, located due east of the Fremont-Kramer DWMA, encompassing Superior Valley, areas north of Barstow, and areas south of Fort Irwin, east to Cronese Lakes near Baker; the Ord-Rodman DWMA, bounded by Highway 247 on the west, Interstate 40 on the north, the Twentynine Palms Marine Corps Base on the east, and the Lucerne and Johnson valleys on the south; and the Joshua Tree DWMA, which more or less corresponds to Joshua Tree National Park. These areas were recommended for the following reasons:

The Western Mojave recovery unit is the largest and most heterogenous of the recovery units in terms of climate, vegetation and topography. It includes three major vegetation types - the Western Mojave, Central Mojave, and Southern Mojave - each of which has significant and distinctive elements...Four DWMA within the Western Mojave recovery unit represent the diversity. The Fremont-Kramer DWMA represents the Western Mojave region; the Superior-Cronese DWMA represents the Central Mojave region; and the Ord-Rodman DWMA represents the Southern Mojave region. The Joshua Tree DWMA, the fourth within this recovery unit, contains Southern Mojave and Eastern Colorado elements. The tortoises have responded to this habitat heterogeneity with

different food habits and behavior in each of these areas. *Thus, three DWMA's are essential in this recovery unit to preserve the heterogeneity* [emphasis added]. Secure, large reserves are especially critical because of the severe population declines and heavy human use in these areas. [page F28]

It is important to note that the Recovery Plan's suggestions are advisory, not binding. The actual decision of whether to adopt DWMA's and, if so, where they should be located, is the function of the West Mojave Plan:

The recovery plan recommends the general areas where DWMA's should be located, but leaves the task of delineating the DWMA boundaries to the land management agencies, in coordination with FWS [U.S. Fish and Wildlife Service], State wildlife agencies, local stakeholders, and other interested parties. The principle agency mechanism for implementing recovery plan tasks is through amendments to existing resource management plans (BLM [Bureau of Land Management]) or general management plans (NPS [National Park Service]) or through the development of broader bioregional plans in conjunction with local government (e.g., the West Mojave Coordinated Management Plan) (Hastey 1996).

Desert Tortoise Emphasis Zones: The Desert Tortoise Emphasis Zone (DTEZ) concept was designed by the BLM to aid the designation of off highway vehicle routes as open or closed in the Ord Mountain area (U.S. Bureau of Land Management 1997). The BLM based DTEZ and Non-DTEZ categories on (a) desert tortoise density; (b) landform type and degree of slope; (c) elevation; and (d) a desert tortoise habitat quality index. Categories included: (a) High DTEZ, (b) Medium DTEZ, (c) Low DTEZ, and (d) Non-DTEZ. High DTEZs in the Ord Mountain area consisted of areas with slopes less than 30 degrees, less than 4,000 feet elevation, and relatively high tortoise densities (mostly greater than 20 animals/square mile). Non-DTEZ habitats were considered to be the least important tortoise habitat (based on slope, elevation, and historic records of tortoise occurrence). In early 1998, the BLM applied the DTEZ concept throughout the West Mojave planning area (See Desert Tortoise Map 1a.).

HOW WAS THE EVALUATION CONDUCTED?

In late February and early March 1998, the Recovery Plan and other documents were reviewed for potential solutions to the 22 discrete threats to the tortoise that were identified by Dr. Boarman. Between March 4 and 6, 1998, the team (Chuck Bell, Dr. Bill Boarman, Wes Chambers, Bill Haigh, and Ed LaRue) and several tortoise biologists (Dr. Hal Avery, Tom Egan, Dr. Larry Foreman, and Dr. Jeff Lovich) met to consider the approaches given in these documents and to identify any additional solutions to counteract threats.

The results of these analyses and meetings were presented by the team (Dr. Bill Boarman, Bill Haigh, Dr. Larry LaPré, and Ed LaRue) to the Service (Ray Bransfield) and Department (Glenn Black, Frank Hoover, Becky Jones, and Rocky Thompson) on March

12 and 17 to 19, 1998. On separate days, Dr. Alice Karl and Pete Woodman, long-time tortoise field biologists, attended the meetings; Larry Morgan, BLM range management specialist, was contacted on the telephone. During the four days, agency personnel considered the materials and adopted, modified, or recommended new solutions to the threats. In this manner, 145 suggested management prescriptions were identified.

The evaluators also recommended that three types of management areas be established. These included the following: (1) Desert Wildlife Management Areas, which would be most intensively managed for tortoise conservation²; (2) Managed Use Areas, where impacts to tortoises would be mitigated, but tortoise management would be less intensive and protective than in the DWMA's; and (3) Incidental Take Areas, where most lands are expected to be lost to or severely impacted by continued human development. Each area is discussed in greater detail below in Part D of this chapter, titled Conservation Strategy.

DTEZ category boundaries were used by the evaluators to draw lines that would capture the best current and historic habitat for the tortoise (Desert Tortoise Map 1b). These lines (a) encompassed most of the High DTEZ areas and some Medium and Low DTEZ areas to the east, particularly the southeast; and (b) were drawn with no regard to land ownership or current management. For example, privately-owned areas between Highway 395 and California City were included because they once supported significant densities of tortoises. The general idea was to identify all lands within the planning area with any potential for contributing to the recovery of the tortoise, as background information for the use of the evaluators when they began the work of identifying DWMA boundaries.

Between March and October 1998 the planning team recommended boundaries for four desert tortoise DWMA's, and consulted numerous tortoise biologists concerning all aspects of the recommended prescriptions and management areas (see Appendix DT-4). A highly annotated "long version" of each prescription was prepared. Then, from October 20 to 22, 1998, the planning team (Bill Haigh and Ed LaRue) met for three days in Ventura with Ray Bransfield, Frank Hoover, and Becky Jones to reconsider the "long version" of the management prescriptions in light of the newly proposed management areas. The applicability of each prescription to each management area was discussed.

During the course of the October meeting, the evaluators developed a final list of 120 management prescriptions, and comprise the recommendations of this report (see Section 1.0 of Appendix DT-1).

The *Desert Tortoise Appendix* to this report presents a more detailed and annotated

²In the earliest iterations, the DWMA's were divided into two subset management zones that were referred to as "Conserved Habitat Areas" and "Protected Habitat Areas." For reasons given in Appendix DT-1, these designations were dropped from further consideration, resulting in changes to six prescriptions (see Section 3.0 of Appendix DT-1).

discussion of each prescription. The appendix materials include the following:

- *Appendix DT-1*: A 12-page list including 120 final prescriptions, 10 prescriptions that were considered redundant and therefore dropped and 6 prescriptions that changed when the potential core area designations were dropped, and the reasons for not proposing core areas (as per footnote 2, this chapter).
- *Appendix DT-2* (“short version”): A 10-page list with the 120 final prescriptions segregated into six categories.
- *Appendix DT-3* (“tabulated version”): A tabulation of each threat, including rank (high, medium, or low); description of the threat; predominant occurrence and effects of each threat; goal statement by the agencies to address each threat; and the management prescriptions recommended to counteract each threat.
- *Appendix DT-4*: Persons involved in the formulation of the prescriptions.
- *Appendix DT-7* (“long version”): An 80-page document that lists each management prescription, including the associated threat; agency goal statement; rank; applicable management areas; applicable and non-applicable jurisdictions; team interpretations (usually a description of the information considered that resulted in a given prescription); and potential task group activities (listing some of the issues that the public may want to discuss with regards to a given prescription).

The “long version” of the prescriptions (Appendix DT-7) includes an expanded discussion (or interpretation) of the intent of a given prescription (titled “Team Interpretation”). For example, prescriptions 91 through 96 include recommended measures for fighting wildfires in tortoise habitat; the “team interpretations” follow:

The Bureau of Land Management currently fights wildland fires under prescriptions that were formulated, in part, to minimize impacts to biological resources. If not already, these guidelines should be made available to county and city jurisdictions to ensure consistency, where applicable, in fire suppression activities. Suppression activities in the [DWMA] and [Managed Use] Areas should be somewhat more restrictive and resource protective than those in Incidental Take Areas.

The Bureau of Land Management has already considered means to reduce resource damage during fire fighting activities. The current situation for private fire stations is unknown.

The “Long Version” also includes a discussion of “Potential task group activities” for each prescription. This is a brief, bulleted list of issues that the Supergroup may want to discuss. The information provided for prescriptions 91 through 96 follows:

(A) If necessary, fire management organizations could meet to discuss variable approaches to fighting fire in different management zones. A standard set of guidelines could be developed to minimize impacts to biological resources during and after fire suppression activities. These guidelines would be adopted by all applicable, private and federal fire departments.

(B) Experts on fire suppression (Todd Esque of USGS-BRD, Tim Duck of Arizona Strip District of Bureau of Land Management, Steve Johnson, California Desert District of Bureau of Land Management, etc.) could be asked to review any guidelines that may be developed by such a Task Group.

The 120 management prescriptions are considered “side boards” or indicators of the types of actions which would help recover the desert tortoise within the planning area.

Part B

Measurable Biological Goals and Objectives

Biological Goal 1

Protect sufficient habitat to ensure long-term tortoise population viability.

Objective 1 for Goal 1: Establish a minimum of three, preferably four, Desert Wildlife Management Areas that would be managed for the long-term survival and recovery of the desert tortoise, and which would also benefit other special-status plant and animal species.

Objective 2 for Goal 1: Ensure that at least one DWMA exceeds 1,000 square miles in size.

Objective 3 for Goal 1: Design DWMA's so that they are well distributed across the recovery unit, edge to area ratios are minimized, impediments to the movement of tortoises are avoided, and (where feasible) boundaries are contiguous.

Biological Goal 2

Establish an upward or stationary trend in the tortoise population of the West Mojave Recovery Unit for at least 25 years.

Objective 1 for Goal 2: Achieve population growth rates (λ) within DWMA's of at least 1.0.

Objective 2 for Goal 2: Attain a minimum average population density of 10 adult female tortoises per square mile within each DWMA.

Objective 3 for Goal 2: Establish a program for tortoise population monitoring that

would detect an increase, decrease, or stable trend in tortoise population densities, and include an information ‘feedback loop’ that ensures that necessary changes will be made in management.

Biological Goal 3

Ensure genetic connectivity among desert tortoise populations, both within the Western Mojave Recovery Unit, and between this and other recovery units.

Objective 1 for Goal 3: Delineate and maintain movement corridors between DWMAs, and with the Eastern Mojave Recovery Unit, the Eastern Colorado Recovery Unit, and the Northern Colorado Recovery Unit.

Objective 2 for Goal 3: Ensure a minimum width of two miles for movement corridors, and include provisions for major highway crossings.

Biological Goal 4

Reduce tortoise mortality resulting from interspecific (e.g., raven predation) and intraspecific (e.g., disease) conflicts that likely result from human-induced changes in ecosystem processes.

Objective 1 for Goal 4: Initiate proactive management programs addressing each conflict, to be implemented by each affected agency or jurisdiction.

Objective 2 for Goal 4: Establish an environmental education program to facilitate public understanding and support for proactive management programs necessary to reduce tortoise mortality.

Objective 3 for Goal 4: Continue research programs that assess the relative importance of human activities and natural processes that affect desert tortoise populations.

Part C

Conservation Strategy

The following is a suggested conservation strategy for the desert tortoise. The discussion is divided into five parts:

- First, three types of *management areas*. “Desert Wildlife Management Areas” could protect valuable tortoise habitat while “Managed Use Areas” and “Incidental Take Areas” could provide streamlined permitting and survey procedures.
- Second, *take-avoidance measures*. These measures are intended to minimize or

mitigate the impacts of specific projects that might incidentally take desert tortoises.

- Third, *survey and disposition protocols*, which suggest the type of tortoise surveys that should be conducted in each of the management areas, and recommend standards to guide the handling and disposition of tortoises found during surveys and project construction.
- Fourth, *proactive tortoise management programs*, which cities, counties and agencies are encouraged to undertake on their own initiative (in contrast to the take-avoidance measures, which are reactive in nature).
- Finally, guidance to aid the Supergroup's development of an *adaptive management* program, including ideas for monitoring programs (to measure the success of the Plan in achieving biological goals) and "feedback" procedures that would allow the conservation strategy to be modified by monitoring findings.

For the Supergroup's convenience, each prescription is accompanied by a parenthetical number. These numbers were assigned during the evaluation meetings, and correspond to more detailed discussions of that prescription that can be found in Appendices DT-1, 2, 3 and 7. Prescriptions developed after the evaluation meetings are denoted by "(200)".

MANAGEMENT AREAS

Overview

The evaluators recommended that three types of management areas be established. Management area summaries follow:

- *Desert Wildlife Management Area.* Establish four DWMA's: Fremont-Kramer, Superior-Cronese, Ord-Rodman, and Pinto Mountain (see Desert Tortoise Map 4). These areas consist of habitat that is considered essential to the conservation of tortoises. The evaluators used tortoise survey information, land ownership patterns, and discussion with scientists and agency personnel to determine the location of the boundaries. They concluded that the designation of smaller "core areas" within the DWMA's would not effectively provide for the conservation of tortoises; accordingly, no such "two-tiered" DWMA structure is recommended.

DWMA's would be managed for tortoise conservation; the most protective of the recommended management prescriptions would apply, as indicated below. Long-term survival and recovery of the tortoise would be the goal. (1)

The BLM should recognize DWMA's by designating as many as four Areas of Critical Environmental Concern (ACEC), each of which would encompass the

public lands within a given DWMA. (10) All public lands that are within the DWMA and outside of congressionally-designated wilderness areas should be designated as Class L (Limited Use) under the CDCA Plan. (9)

- *Incidental Take Area.* Identify *Incidental Take Areas* (ITA), which are lands likely to be developed in the foreseeable future. The ITAs should consist of cities and developed unincorporated county lands. (1, 2)

Recommended ITAs are comprised of all areas within the city limits of Adelanto, Barstow, California City, Hesperia, Lancaster, Palmdale, Ridgecrest, Twentynine Palms, and Victorville and the town limits of Apple Valley and Yucca Valley. Collectively, this area comprises approximately 512,700 acres (801 square miles), or 5.48 percent of the 9,354,670-acre (14,617-square mile) planning area.

It is recommended that the Supergroup identify private and public lands within the counties that appropriately could be designated as “County ITAs.” Like the “City ITAs,” the County ITAs would be areas where the incidental take of all resident tortoises would be anticipated. It is suggested that portions of Lucerne Valley, Lake Los Angeles, Rosamond, Mojave, Boron, Inyokern, and Helendale, for example, be considered for ITA designation. The areas not included in ITAs or DWMA would be designated as Managed Use Areas (see next point).

- *Managed Use Area.* Lands not designated as either a DWMA or an ITA would constitute the *Managed Use Areas* (1). Tortoise management would be less intensive and protective than in the DWMA. The management goal should be to regulate development through appropriate mitigation rather than tortoise recovery.

When identifying the final boundaries of DWMA, ITAs, and MUAs, the Supergroup should understand that (1) the exact number and distribution of tortoises in a given area is unknown, and (2) the habitat quality associated with different jurisdictions is unknown. Even where tortoises apparently have been extirpated (such as from large parts of some cities), it is possible that habitat of suitable quality to support tortoises could still occur in some areas, and may be worth protecting.

In addition, the evaluators suggested that military bases be characterized as *Military Management Areas*, wherein each base could, at its option, identify lands as ITAs, MUAs, and DWMA. Bases are under no obligation to make such designations. (55) The Plan could function, in part, to document conservation measures currently implemented on the bases, and indicate how those measures add to or detract from the overall conservation strategy of the planning area (particularly if “current missions” are altered such that the overall conservation value provided for the area is reduced).

The Supergroup should determine how the dichotomy between Discretionary Permits and Ministerial Permits will be handled. It must decide whether habitats lost under ministerial

permits will be counted towards the total loss of habitat. It must also be decided where the line between a ministerial and a discretionary action lies for purposes of FESA and CESA compliance. (200)

Proposed DWMA's Compared to Current and Historic Tortoise Management Areas

The proposed DWMA boundaries were drawn to capture habitat that has been identified in the past as essential to the conservation of the species, including critical habitat, BLM Category I and II habitats, BLM's desert tortoise emphasis zones, and the approximate boundaries of the Recovery Plan's proposed DWMA's. Table 2-6 compares the relative sizes of these areas. Joshua Tree National Park, which is already managed consistently with the Recovery Plan (National Park Service 1995), is not included in the table.

Table 2-6 Proposed DWMA's Compared to Current and Historic Tortoise Management Areas				
Land Status	Proposed DWMA	Critical Habitat	BLM Category I & II	Tortoise Emphasis Zones
Private	725	696	0	1,248
BLM	1,651	1,533	1,288	1,804
National Park Service	0 ³	27	0	0
Military				
Edwards	102 ⁴	102	0	102
China Lake	150	150	0	150
Fort Irwin	52	52	0	52
29 Palms	0	0	0	0
NEBO	1	1	0	1
State	40	51	0	55
Total	2,721	2,612	1,288	3,412

Note: All figures expressed in square miles.

Proposed DWMA's and Designated Critical Habitat: The proposed DWMA's roughly

³ Although the Tortoise Emphasis Zone acreage is given as "0" for the National Park Service, the Plan recognizes that all tortoise habitat within Joshua Tree National Park is being managed for tortoise protection and recovery.

⁴ The acreages for military bases given in the first column correspond to existing critical habitat, rather than newly proposed DWMA's on military bases. No DWMA's are proposed for military bases, which have their own management plans that, some more some less, benefit conservation efforts within the planning area.

correspond to critical habitat, which was identified as “...essential to the conservation of the species...” by the Service in 1994 (U.S. Fish and Wildlife Service 1994a). They diverged from critical habitat where necessary to reduce private land in-holdings and to capture high tortoise densities. Because the West Mojave tortoise population is more affected by human and non-human threats than most other tortoise populations listed as threatened (see Table 2-2), reducing the area proposed as critical habitat was considered counter-productive to the conservation of tortoises within the planning area.

The boundaries of the proposed DWMA differ from critical habitat designations in the following ways (see Desert Tortoise Map 5):

- In areas south of Edwards Air Force Base and north of Adelanto, the proposed DWMA does not include some areas of critical habitat that are largely on private lands. It is suggested that these lands be included in the Managed Use Area.
- The proposed DWMA in the vicinity of the Desert Tortoise Research Natural Area is approximately 70 square miles larger than critical habitat. These additional lands are included for the following reasons: (a) to provide for a connection between the northwestern portion of the DWMA and Red Rock Canyon State Park; (b) to include the Desert Tortoise Research Natural Area (not currently critical habitat) in the DWMA; and (c) to provide for better connection and manageability by acquiring approximately 21 square miles east of the Desert Tortoise Research Natural Area and north of the Mojave-Randsburg Road.
- In the Iron Mountain area north of Silver Lakes, the DWMA boundary is farther east than critical habitat to encompass significant numbers of tortoises that were detected during the 1998 regional survey.

There are no recommendations to alter critical habitat lines on Edwards Air Force Base, China Lake Naval Air Weapons Station, or on Fort Irwin. Nor are there any recommended modifications to the Pinto Mountain Critical Habitat Unit, which is mostly managed by the BLM. The current boundaries of that unit will suffice to protect tortoises occurring in the area, and provide essential connectivity between the West Mojave and Northern and Eastern Colorado Desert recovery units.

Boundary modifications of BLM-designated Open Areas (Johnson Valley, Stoddard Valley, El Mirage, Jawbone Canyon, and Razor open areas) were not recommended by the evaluators. These areas are well established and known to OHV users. Reducing their size may result in more intense use in adjacent areas where tortoise conservation is considered essential.

Conversely, the expansion of the Johnson Valley Open Area into the Cinnamon Hills was considered an unacceptable impact due to (i) the relatively small size and isolation of that portion of the DWMA from larger areas to the north, east, and west; (ii) the relatively

high incidence of tortoises in the area; and (iii) the status of tortoises found there as the southern-most relatively intact population in the West Mojave. Although other habitats occur farther south, particularly between Yucca Valley and Twentynine Palms, many of those lands have been severely impacted.

TAKE-AVOIDANCE MEASURES

Take-avoidance measures are those components of the conservation strategy that would minimize and mitigate the impacts of discrete projects (such as a shopping center or a water pipeline). They should apply to both the construction and operation of a given project. These measures should be included as requirements of permits issued to project proponents by cities, counties, and agencies.

In developing take-avoidance measures, the Supergroup should consider the dichotomy between permanent impacts (solar power plant, facilities development) and intrusive but temporary impacts (pipelines, fiber optic cables). (26)

Generally Applicable Measures

It is recommended that the take-avoidance measures described in this section apply to all lands within the West Mojave Planning Area, including DWMAs, Managed Use Areas and, to a limited extent, Incidental Take Areas. Take-avoidance measures that would be limited in application to a particular management area are described later (e.g., “Take-Avoidance Measures Unique to DWMAs”).

It is recommended that prescriptions identified for the DWMAs apply equally to BLM-administered public lands, State of California properties, and private lands; the same would apply for MUA and ITA prescriptions. For example, measure 86, which recommends that pipeline construction right-of-ways be revegetated, should apply to both public and private lands in DWMAs and MUAs, and to neither in ITAs.

Pre-Ground Disturbance Tortoise Surveys: Differing tortoise survey and disposition requirements could apply to each of the management zones. For suggestions as to how this could be done, see the discussion under “Survey and Disposition Protocols.”

Agriculture: The Supergroup is asked to consider if the Plan should address the loss of native habitat to new agriculture. For example, should we consider compensation by paying appropriate fees, or implementing other, appropriate measures? (80)

General Construction and Maintenance: It is recommended that the Supergroup develop standard mitigation measures for ground-disturbing construction projects, such as (a) pipelines, (b) parcel development, (c) mines, etc. (28, 56)

Rather than focus on what will and will not be allowed, general development criteria

should be defined: size of development covered by the West Mojave Plan (less than or greater than a certain acreage), permanent versus temporary impacts, single time impacts (e.g., pipeline booster station) versus ongoing impacts (e.g., solar plant employing 100 workers). The Supergroup should discuss the management prescriptions that could apply in each case. (27) The approach should be flexible enough to allow applicants to utilize innovative approaches. (200)

Utility Construction and Maintenance: Pipelines within DWMA's and the MUA should be revegetated where feasible; those in ITAs need not be revegetated. (26) Narrowing the construction right of way is suggested in all management areas. (89)

Recommend that the CDCA Plan's existing network of designated utility corridors and use restrictions be retained (88) (although it is recommended, below, that CDCA Plan *contingent* corridors not be activated within DWMA's (82)).

Routine, non-emergency maintenance of pipelines that requires ground disturbance should occur during the late fall and winter only. (200)

Avoid creating new nest substrates for common ravens in areas where few currently exist. New transmission lines that would provide significant new nesting opportunities should not be erected (112) unless the poles are designed to reduce the potential for raven nesting, as follows:

- Absence of two parallel cross-arms; a single cross-arm is preferred; inverted "V" shape. (83)
- Where possible, solid-bodied transmission towers should be used instead of lattice-bodied towers to minimize raven nesting opportunities. (84)
- It is not necessary to require anti-perch structures on transmission lines. (85)

Highway Construction and Maintenance: Maintenance operators should be aware of tortoises and avoid them. Seasonal restrictions may be appropriate (late fall and winter may be the best time for these activities). Any such measures should consider roads on a case-by-case basis and be dependent on tortoise densities in the area or adjacent management areas. These or other measures to avoid the need for a biological monitor are advisable. (72)

As far as possible, road beds should not be lowered and berms should not exceed 12 inches or a slope of 30°. Helendale Road, Fossil Bed Road, Camp Rock Road, and Copper City Road were identified as particular problems. Consider alternatives to grading, such as chain drag. (73)

Fire Management: Wildland fire management should be allowed in all management

areas. (91) Fire suppression could be a mix of aerial attack with fire retardant; crews using hand tools to create firebreaks; mobile attack engines limited to public roads and designated open routes. (92) The use of earth-moving equipment or vehicle travel off public roads and designated open routes should not be allowed except in critical situations where needed to protect life and property. (93)

Incoming fire crews unfamiliar with tortoise protection should receive a tortoise awareness program to minimize impacts. (94)

Post-suppression mitigation should include rehabilitation of firebreaks and other ground disturbances using methods compatible with management goals. (95)

Mineral Development: Restoration under SMARA or other applicable laws should strive to reclaim lands to constitute tortoise habitat as a goal. (116)

Site-specific withdrawals from mineral entry could be considered by the Supergroup to facilitate tortoise recovery. (118)

Recreation: Suggest that the Supergroup consider the use of speed regulators (speed bumps, signs) to further reduce speeds on some strategic roads lacking tortoise-proof fencing (e.g., Helendale Road north of Silver Lakes). (78)

Recommend that the portion of the Barstow-to-Vegas race course that lies within the West Mojave planning area be deleted from the CDCA Plan. (34) The Supergroup should also consider whether the Stoddard-to-Johnson Valley corridor should be retained. (35)

Dogs off-leash that are accompanied by owners could be allowed in all areas. (108)

Hunting should be allowed and regulated by current legislation. (122)

Research Protocols: At present, scientific manipulation of tortoises is authorized by permits issued under section 10(a)(1)(A) of FESA; take that is incidental to an otherwise lawful activity would be permitted under section 10(a)(1)(B); and projects that are funded, authorized or carried out by a federal agency would be authorized under FESA section 7 consultations. Comparable state permits are authorized by section 2081 of the California Endangered Species Act. (139) Translocation and other science-based studies implied or required by this Plan also require separate authorization under federal and state scientific collection permits. (140)

The timing of scientific studies may need to be modified when persisting drought conditions occur. (145)

Take-Avoidance Measures Unique to DWMA

Authorized Take and Compensation (DWMA): Recommend that within each DWMA, new ground disturbance not exceeding a cumulative total (over the term of the plan) of 1 percent of the total acreage of that DWMA could be authorized using the streamlined permitting procedures of the Plan (i.e. case-by-case consultations with the Service and Department would be necessary to approve ground disturbance in excess of the 1% threshold). (25) It is advisable that this percentage be tracked separately on BLM and private lands so that development of private lands would not impair the BLM's ability to continue to manage public lands (200). Once this threshold is reached in any given DWMA, all future ground disturbing activities within that DWMA would be considered outside the scope of the Plan. In such a case, a project-specific incidental take permit or biological opinion, as appropriate, would be required.

Recommend that the Supergroup identify a specific compensation ratio for DWMA. Suggest a compensation ratio of 5:1 within DWMA (one acre of land disturbed within a DWMA would be compensated for by protecting another five acres within the same DWMA). (25) Consider the ratios that might apply where lands lost from one management area (e.g., MUA) could be compensated by the acquisition of lands in another management area (e.g., DWMA).

Recommend that the Supergroup consider the best means to address the interplay between fees and compensation acreage. Should the proponent have an option to pay fees or buy land? If land values are less than fees, would this option undermine the income from compensation fees? Consider the effect this might have on the ability of the Plan to fully mitigate the impact of the authorized take.

Boundaries and Ranger Patrol (DWMA): DWMA boundaries could be signed or otherwise designated to identify boundaries and facilitate enforcement. (125)

BLM ranger patrols should be increased. (36) The Supergroup should determine the degree of increase that would be necessary to facilitate conservation goals, based on current ranger deployment and other factors. The BLM should determine whether this should be accomplished by diverting rangers from other duties or by increasing the ranger force.

General Construction and Maintenance (DWMA): Invasive weeds should not be used in landscaping within or adjacent to the DWMA (e.g., do not plant African daisies along Highway 395). (126)

Proponents wishing to construct new roads or railroads should be encouraged to locate them outside of DWMA. (200) Proponents should implement designs and maintenance procedures that are consistent with the terms identified for existing roads; locations of such roads should consider reserve design relative to the DWMA and other factors. (77)

Develop a maintenance schedule to maintain fence integrity and effectiveness. (71)

No new landfills should be allowed either inside or within five miles of any DWMA because ravens eat juvenile tortoises and research shows that ravens daily travel up to five miles (and farther on occasion) from landfills for food. (47)

Utility Construction and Maintenance (DWMA): Within existing corridors, use areas that are already disturbed rather than disturb new areas within the two to three mile corridor. (90) Suggest that no additional CDCA Plan contingent corridors be activated within the DWMA. This would apply to currently inactive portions of contingent corridors P, Q, and W. (82)

Maintenance of existing utilities should be allowed. However, impacts to tortoises and habitat should be minimized. Recommend that maintenance crews remain on existing access roads except for the point location of maintenance-related disturbance. (87)

It is not necessary to require anti-perch structures on transmission lines. After obtaining applicable salvage permits, however, a mechanism should be established for the proponent of a transmission line project to implement monitoring and removal of raven nests from the DWMA in areas where other nesting substrates are uncommon. (85)

Cattle Grazing (DWMA): Current BLM management of livestock grazing under the CDCA Plan and as regulated by various biological opinions could be modified, as necessary, with Supergroup input. The following recommendations resulted from evaluation meetings

- Supplemental feed (hay, alfalfa) and food supplements (nitrogen supplements like molasses) should not be allowed on public lands. (103)
- The rancher shall contact the BLM for range improvements requiring off-road use of equipment; routine maintenance using mechanized equipment should be restricted to existing roads; unreported off-road travel should be authorized to remove cattle carcasses. (104)
- Herding of cattle should be minimized, and cattle allowed to disperse throughout the area of use. (105)
- In the Ord Mountain Allotment, consider placement of water sources in areas that would draw cattle away from tortoise concentrations located to the east, west, and southwest. (200)

The BLM's California State Office range conservationist has suggested that the Supergroup consider and discuss a range of possible measures to govern livestock grazing within tortoise DWMA. None, one, or several of these measures could be adopted by the

Supergroup. It is recommended that the Supergroup discuss the merits of each when it writes the Plan:

- **Suggestion 1:** Maintain forage biomass of 350 pounds per acre (air dry weight) from March 15 to June 15. Grazing use should not occur, and cattle should be removed from the allotment or area, if above-ground ephemeral forage falls below this value during the March 15 to June 15 period.
- **Suggestion 2:** Rather than establish biomass thresholds, establish a no grazing period from March 15 to June 15.
- **Suggestion 3:** Initiate research into the relationship between winter weather and the amount and attributes of ephemeral forage production. If this research can adequately predict production of ephemeral forage and related attributes, the results of that data would be used to determine turnout of livestock between March 15 and June 15.
- **Suggestion 4:** Allow a lease to be canceled if the holder of base property voluntarily relinquishes the grazing lease and related authorizations. New allotments may be designated from those portions of allotments outside DWMA's.
- **Suggestion 5:** Terminate ephemeral allotments, and terminate ephemeral grazing authorization of an ephemeral/perennial allotment.
- **Suggestion 6:** Terminate grazing authorizations and the area of the allotment within the DWMA. New allotment boundaries would be developed, where feasible, from portions of terminated allotments outside DWMA's.

The Department's Becky Jones (September 1999, pers. comm.) indicated that it is the Department's preference that cattle grazing not be allowed within the DWMA's "to be consistent with the recovery plan." Jones said that if grazing is allowed, current BLM management of grazing under the CDCA Plan could continue provided that additional research is conducted on the effects of cattle in DWMA's, and that the results of this research should be used to modify the plan as needed.

Sheep Grazing (DWMA's): There should be no sheep grazing within DWMA's. (97) Ephemeral and perennial sheep grazing allotments within DWMA's should be eliminated. (200) Consider permanent closure of the Pilot Knob Allotment to future grazing by cattle or sheep. (200) Consider terminating sheep allotments with more than 50% of an allotment is in a DWMA. (200)

Mineral Development (DWMA): Mining operations resulting in ground disturbance exceeding a certain acreage (which should be set by the Supergroup; 80 to 100 acres has been suggested) should be evaluated by the "Implementing Team" (see Part D of this

chapter) to determine if additional compensation and mitigation may be required of the proponent. (117)

Recreation (DWMA): On public lands administered by the BLM, camping should be allowed within 100 feet of vehicle routes designated as “open.” (120) Otherwise, no vehicles should be allowed to travel off of designated routes. (38) Limited speed travel on designated, signed routes should be allowed. (41) Travel in washes should be allowed only in those washes that are signed as “open.” (45)

General shooting, other than hunting, should not be allowed in DWMAAs. (123)

Non-consumptive recreation (e.g., hiking, birdwatching, horseback riding, photography) should be allowed within DWMAAs. (124)

No off-highway vehicle speed events should be allowed in DWMAAs. (39) Dual Sport events, however, could be allowed seasonally. Consider summer Dual Sport events (although problems with rain in summer should be kept in mind). Agencies should continue to implement the existing biological opinion on dual sport events. (40)

Other Measures (DWMA): Upland game guzzlers in tortoise habitat should be modified to prevent or reduce future tortoise mortality. (121)

Commercial activities (such as filming) that result in ground disturbance or adverse effects should not be allowed in DWMAAs. (132) Cross-country vehicle travel should not be allowed for commercial activities. (131)

Take-Avoidance Measures Unique to the Fremont-Kramer DWMA: Suggest that tortoise-proof fencing be installed along Highway 395 from Shadow Mountain Road to Red Mountain. The Supergroup should consider the possibility of fencing Highway 395 north of Red Mountain, as well as parts of Highway 58 not currently fenced. (63) Suggest that tortoise-proof fencing be considered along the National Trails Highway from Helendale to just south of Lenwood. (65)

Recommend fencing west of Helendale to minimize impacts on areas to the west. (8)

Suggest that tortoise-proof fencing be installed on the following unpaved roads should average daily traffic (ADT) levels increase to the point that traffic becomes a problem: Helendale Road and Mojave-Randsburg Road. (69) The Supergroup should identify the ADT threshold that would trigger a need for fencing.

Take-Avoidance Measures Unique to the Superior-Cronese DWMA: Suggest that tortoise-proof fencing be installed along both sides of Irwin Road and Fort Irwin Road. (64)

Take-Avoidance Measures Unique to the Ord-Rodman DWMA: Suggest that tortoise-proof fencing be installed along the south side of Interstate 40 from Barstow to Camp Rock Road. (67) Suggest that Highway 247 from Lucerne to Barstow not be fenced to avoid fragmenting a relatively small population (in any event, ADT levels may not warrant fencing). (66)

The effects of an expanded Barstow Landfill on the adjacent DWMA need to be discussed. (48)

Take-Avoidance Measures Unique to the Pinto Mountain DWMA: No specific measures identified.

Take-Avoidance Measures Unique to the Managed Use Area

Authorized Take and Compensation: Recommend that within the MUA as a whole, new ground disturbance not exceeding 5 percent of the total acreage could be authorized. (25) Once this threshold is reached, subsequent ground disturbing activities within the MUA would be considered outside the scope of the coverage provided by the West Mojave Plan. In such a case, a project-specific incidental take permit or biological opinion, as appropriate, would be required.

The team suggested a compensation ratio of 1:1 within the MUA. (25) The Department (Becky Jones, September 1999, pers. comm.) recommended "...a compensation ratio of 1:1 in the areas currently considered Category III habitat and 3:1 for other habitat." (200) The Supergroup must identify a specific compensation ratio for the MUA and other management areas.

Utility Construction and Maintenance (MUA): Pipeline revegetation could be determined on a case-by-case basis with input from the Implementing Team. Suggest that pipeline revegetation should be required in MUAs unless the Implementing Team determines otherwise. (26) Suggest that narrowing the construction ROW is best. (89)

Sheep Grazing: Pursue a conservation easement with California City, Kern County, and other appropriate jurisdictions to eliminate all sheep grazing from areas east of California City Boulevard and Neuralia Road and southeast of Mojave-Randsburg Road; consider compensating landowners for lost income from sheep grazing fees (if any) and/or reimbursing wool growers for loss of this area to their industry; alternatively, require that wool growers consult independently with the Service under section 10(a)(1)(B) for impacts to tortoises. It is recognized that this would require significant discussions among all involved entities. (200)

Recreation (MUA): Travel in washes should only be allowed in those washes that are signed as "open." (45)

Dual Sport events could be allowed year-round. The BLM would continue to implement the existing biological opinion on dual sport events. (40)

On lands administered by the BLM, camping could be allowed within 300 feet of vehicle routes designated as open. (120)

Other (MUA): Upland game guzzlers in tortoise habitat should be modified to prevent or reduce future tortoise mortality. This should be done in the MUA only after completion of this task in the DWMA's. (121)

Take-Avoidance Measures Unique to Incidental Take Areas

Dual Sport events should be allowed year-round. BLM should continue to implement the existing biological opinion on dual sport events. (40)

On lands administered by the BLM, camping should be allowed within 300 feet of vehicle routes designated as open. (120)

Suggest a compensation ratio of 1:1 within the ITA. (25)

SURVEY AND DISPOSITION PROTOCOLS

DWMA Survey Protocols

Pre-disturbance, removal surveys should be required for tortoises in DWMA's. If tortoise sign is found or there is a reasonable likelihood that tortoises occur, construction activities should either be monitored by a tortoise biologist or a tortoise-proof fence erected to preclude tortoises from the area of impact. (79)

Managed Use Area Survey Protocols

Pre-disturbance, removal surveys should be required. If tortoise sign is found, construction activities should either be monitored by a tortoise biologist or a tortoise-proof fence erected to preclude tortoises from the area of impact. If no tortoise sign is found, monitoring by a tortoise biologist would not be required. Instead, a biologist could be on call should tortoises wander into non-monitored sites. (22)

Incidental Take Area Survey Protocols

Recommend that within the Incidental Take Area, the Supergroup identify tortoise *removal zones* and *exclusion zones*.

- *Removal Zones:* Areas where tortoises are occasionally found. Where tortoise sign is found or there is a reasonable likelihood that tortoises occur, construction

activities should either be monitored or a tortoise-proof fence erected to preclude tortoises from the area of impact. Alternatively, with input from the Implementing Team, a biologist could be on-call to rescue tortoises wandering into harms way.

- *Exclusion Zones:* Areas where tortoises are almost never found. Neither presence-absence surveys nor tortoise removal surveys should be required. (18) A biologist should be on call or another contingency established to rescue a tortoise incidentally found in exclusion zones during construction. (19)

Removal zones and exclusion zones should be identified by the Supergroup with input from the team. Suggest that these zones be determined based on housing density and other factors, such as previous focused tortoise survey information. (23) They should be identified for both County ITAs (for example, small communities such as Helendale and Lake Los Angeles) and City ITAs (that is, lands within incorporated city limits). (21)

Handling and Disposition of Tortoises

The Supergroup should identify scenarios where qualified biologists handle tortoises during removal surveys and environmental monitors fill in afterwards for operations at mines, bases, and other large-scale projects. (141) Biological monitors should handle tortoises as per *Guidelines for Handling Tortoises During Construction Projects* (Desert Tortoise Council 1994 (Revised 1999)). (138)

Tortoises found during drought conditions or summer should be excavated just before sunset and moved to an existing burrow (preferably their own) at night. (144)

The Supergroup, with input from the team, needs to discuss the disposition of tortoises removed from certain areas (for example, city versus county). (24) Alternatives for disposition of tortoises taken during removal surveys could include: (a) euthanasia versus translocation; (b) translocation into the nearest suitable area; (c) placement in a conservation camp (as in Clark County, Nevada) prior to final disposition; (d) use tortoises for coordinated translocation studies; (e) adopt them out. (137)

PROACTIVE TORTOISE MANAGEMENT PROGRAMS

The programs recommended in this section are intended to be undertaken by the participating agencies proactively, on their own initiative, in contrast to take avoidance measures identified above, which are designed to minimize and mitigate the impacts of discrete projects. It is suggested that programs should be specific (e.g., rather than recommend highway fencing, indicate the exact stretches to be fenced), and set implementation priorities (e.g., rather than recommend highway fencing along highways 395 and 58, recommend that Highway 395 be fenced first, followed by Highway 58, and Interstate 40).

Disease Control

Issues relative to desert tortoise diseases (e.g., upper respiratory tract disease, cutaneous dyskeratosis) should be considered at the level of the interagency desert tortoise Management Oversight Group (MOG). (14) Disease research is encouraged, and coordination between the Implementing Team and the appropriate MOG contact should be maintained. (15) Any breakthrough relative to disease management should be incorporated into the West Mojave Plan through adaptive management provisions. (200)

Authorized tortoise handlers should use sterile techniques to avoid spreading the disease (current management). (17)

Education programs should stress that captive tortoises are not to be released. (16)

Translocation studies should be designed to avoid potential transmission of disease. (200)

BLM Route Designation

The BLM should designate a network of open, closed, and limited off-highway vehicle routes within DWMAAs. (200) The closure of routes not designated as open or limited should be undertaken by the BLM. (42) The most effective means of implementing the network (e.g., Signs? Restoration?) should be discussed.

Recommend that route closure be concentrated throughout the DWMAAs with implementation in the following order: (a) Upper Lucerne Valley, eastern Stoddard Valley, Cinnamon Hills, and other level portions of the Ord-Rodman DWMA; (b) southern portions of the Fremont-Kramer DWMA, east of Highway 395, south of Highway 58, west of Helendale Road, and north of Shadow Mountain Road; (c) eastern portions of the Superior-Cronese DWMA, north of Hinkley, east of Black Mountain, south of the Mojave B Range (China Lake), and west of Irwin Road; (d) western portions of Superior-Cronese and eastern portions of Fremont-Kramer DWMA, east of Highway 395 and west of Black Mountain; and (e) the remaining portions of all DWMAAs as funds become available. (200)

Education

Recommend that a curriculum on environmental education be developed, or agencies identified to do this, for presentation to school districts. Counties and cities should ensure that this program is implemented. Education programs should be implemented at the school district level. (7)

Suggest that the Supergroup work with OHV groups (AMA, CORVA) to establish meaningful education brochures and mechanisms to discourage inappropriate off-highway vehicle travel. (44)

The public should be educated about not releasing captive tortoises (16) and about the risks associated with handling or relocating tortoises. (136) Public education should emphasize that tortoises are not to be handled or otherwise harmed. (135) Immigrant communities should be contacted concerning laws against tortoise collection. Suggest working directly with community representatives and groups. (200)

Contract with a proven group to formulate a desert-wide education program; potential groups may include Desert Tortoise Preserve Committee, San Bernardino County Museum, or California Department of Parks and Recreation. A call to (702) 383-TORT will provide a good example of a tortoise outreach effort already in place, as required by the Clark County Desert Conservation Plan (RECON 1995). (200)

Fencing and Culverts

It is recommended that tortoise-proof fencing be placed along the following roadways in the order presented: (a) along both sides of Highway 395 between Shadow Mountain Road and Kramer Junction and along the eastern side of Highway 395 between Kramer Junction and Red Mountain; (b) on unfenced portions of Highway 58 between Kramer Junction and Hinkley (consult Boarman); and (c) along the south side of Interstate 40 between Barstow and approximately Camp Rock Road. (200)

To counteract the effects of Helendale and Silver Lakes on the DWMA to the west, an exclusion fence should be placed along the western boundary of the community from Shadow Mountain Road, north to the westward extension of Smithson Road; at Smithson Road and other appropriate places, install kiosks or other signs to let the public know they are entering a DWMA. (200)

Encourage research concerning the following:

- The use of fencing (other than roads) as a management tool to minimize residential impacts on adjacent areas (e.g., impacts on adjacent areas, west of Silver Lakes).
- The feasibility (cost, use by tortoises, maintenance) of overpasses compared to underpasses. (75)
- The use of culverts, which are necessary where fencing would otherwise permanently fragment tortoise habitat. Studies are encouraged that would determine more about spacing, and design and monitoring should be implemented to see if there is a need to manually translocate tortoises. (74) Culverts should be maintained on a regular basis to facilitate tortoise use. (76)
- Criteria should be developed to determine future needs for fencing; e.g., 500 to 1,000 ADT, dependent on tortoise densities in adjacent areas; insofar as possible, do not fragment DWMA's by running fences through the center of them without

installing culverts. (70)

- Pursue the feasibility of transferring Interstate 15 fencing funds from Caltrans/ Federal Highway Administration to the Implementing Team to fence portions of Highway 395. (200)

Predators: Ravens

A raven control program should be considered. The program should target only those ravens that are preying on tortoises; wholesale eradication without evidence of predation may be possible in specific areas (raven removal zones) and may be seasonal (March to June and September and October). Consider investigating and implementing measures to restrict raven use of water at cattle troughs. (200) Another alternative may be “nest management” including the removal of nests from areas where other nesting substrates are uncommon (200) and replacing real eggs with fake eggs (109).

Investigate and eliminate miscellaneous anthropogenic sources of raven food and water (e.g., spilled grain from trains, sewage ponds). (110) Jurisdictions should enforce removal and proper disposal of dead farm animals (e.g., chickens, cattle) from rearing facilities. “Proper disposal” should not include dumping animals at landfills; animals should be buried, rendered. (111)

Landfill and transfer station management should conform to the standards currently implemented by San Bernardino County at landfills such as Victorville, Phelan, and Barstow, and transfer stations such as at Newberry Springs. (49) Activities at landfills and sewage ponds could be modified by providing more effective cover of materials. The need for installing coyote-proof fences should be discussed. (113)

Refuse containers in residential areas and dumpsters should have self-closing lids. (51, 114) “Do-it-yourself” dumpster centers should be eliminated unless they are well designed and maintained. (50) Ensure that there is regular refuse pickup. (114) Suggest improved maintenance and litter removal from various recreation sites and problem areas. (130)

Suggest creating and/or enforcing ordinances against illegal dumping. (128) Existing, illegal dumps on private and public lands in the DWMAAs should be cleaned up. (129) Ensure that landfill operations do not encourage illegal dumping. Consider the following (52): Is free dumping available to local residents? Are receptacles available at landfills to receive after-hours refuse? Can operating hours be extended into the evening to accommodate refuse?

Predators: Feral Dogs and Pets

Feral and free-roaming dogs, when found, should be eliminated by designated individuals (such as BLM rangers) from DWMAAs. (107)

Bolstering Tortoise Populations

Consider ways of supplementing existing, wild tortoise populations:

- With input from pertinent experts (Dr. Dave Morafka, Dr. Kristin Berry and Edwards' Environmental Management) consider implementing head-starting programs in areas where tortoises have apparently been extirpated or numbers significantly reduced; e.g., west and south of Fremont Peak, Fremont Valley, Desert Tortoise Research Natural Area, northern portions of Edwards Air Force Base. (200)
- Consider translocation alternatives that would (a) maintain wild tortoises in a given area and (b) not likely result in spread of upper respiratory tract disease; i.e., translocation of clinically healthy tortoises from Barstow and Brisbane Valley development sites to eastern portions of Stoddard Valley, north of West Ord Mountain. (200)

Land Acquisition

In order to consolidate land ownership to enhance tortoise conservation:

- Consider acquiring, or otherwise protect through conservation easements, approximately 11 square miles of private land south of Edwards Air Force Base; 21 square miles of private land north of the Mojave-Randsburg Road and adjacent to the Desert Tortoise Research Natural Area; and 8 square miles of private land north of Silver Lakes, west of Helendale Road. (200)
- BLM is currently implementing a Land Tenure Adjustment Project, through which private land in-holdings (including many within the proposed DWMAs) are being acquired through land trades for public ownership. Suggest conferring with BLM realty specialists to identify lands for priority acquisition. (200)
- Insofar as possible, encourage consolidation of public lands throughout all DWMAs to facilitate natural resource management.

Mining

Within the DWMAs, any entity proposing any mining activity on public lands that is not already approved must submit a mining plan of operation to the BLM, which will consider it for compatibility with the conservation recommendations given in this Plan; the BLM should ensure compatibility with this Plan when it approves, disapproves, or modifies the Plan of operation. (200)

Off-Highway Vehicles

Recommend implementing the following measures to encourage vehicle use consistent with tortoise conservation:

- Strategically place signs along the eastern side of the Stoddard Valley Open Area (i.e., along the eastern side of Highway 247) to reduce cross-country vehicle travel in the Ord-Rodman DWMA; increase ranger patrols to enforce compliance. (200)
- Place signs along the western boundary of the Johnson Valley Open Area (i.e., along the eastern side of Camp Rock Road) encouraging off-highway vehicle use of that area (this as opposed to more signs along the west side prohibiting use of that area). (200)
- Place a fence along pertinent portions of the western boundary of the Johnson Valley Open Area to prevent off-highway vehicle use in the Ord-Rodman DWMA to the west and to minimize use in the Cinnamon Hills; increase ranger patrols to enforce compliance. (200)

ADAPTIVE MANAGEMENT

Adaptive management is used to examine alternative strategies for meeting measurable biological goals and objectives through research and/or monitoring and then, if necessary, to adjust future conservation management actions according to what is learned (U.S. Fish and Wildlife Service 1999). A flexible conservation strategy may be necessary to attain long-term goals (or biological objectives) and to ensure the likelihood of the survival and recovery of the species in the wild (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1996).

Adaptive management concepts should be incorporated into HCPs to minimize the uncertainty associated with listed species where there are gaps in the scientific information or their biological requirements (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1996). For example, in the discussion presented above concerning fencing and culverts, there is a recommendation to conduct studies that would help determine the ideal design and spacing of culverts along fenced highways. Once determined, the results of such studies could be applied to actual construction of culverts at a later date.

A practical adaptive management strategy within the operating conservation program of a long-term incidental take permit will include milestones that are reviewed at scheduled intervals during the lifetime of the incidental take permit and permitted action. If there is a relatively high degree of risk, milestones and adjustments may need to occur early and often (U.S. Fish and Wildlife Service 1999).

The intent of the following sections is to suggest three monitoring programs which could be incorporated into the adaptive management provisions of the West Mojave Plan.

Tortoise Population Monitoring

One of the biological goals recommended for the desert tortoise is to “establish an upward or stationary trend in the population of the West Mojave Recovery Unit for at least 25 years.” To that end, this report identifies, as an objective, the establishment of “a program for tortoise population monitoring that would detect an increase, decrease, or stable trend in tortoise population densities, and include an information ‘feedback loop’ that ensures that necessary changes will be made in management.”

Background: Between the 1970's and the mid-1990's, first the BLM, then the USGS-Biological Resources Division monitored population densities, sex ratios, age structure, mortality rates and survivorship, and other demographics of tortoises on eight different permanent trend plots in the planning area. Most of the square-mile plots were surveyed during a 60-day period in the spring on a four-year rotational schedule. Other plots, usually a square kilometer in size, continue to be monitored at Fort Irwin, Goldstone Deep Space Communications Complex, Twentynine Palms Marine Corps Air Ground Combat Center, and Joshua Tree National Park.

Another form of monitoring has been to survey relative density transects over regional landscapes to provide distribution and density data to which future data may be compared. The 1998-1999 tortoise survey efforts were completed, in part, to compare current relative tortoise occurrence with data collected by the BLM between 1975 and 1982. Recent, base-wide survey efforts at Edwards Air Force Base (Mitchell et al. 1993) and Twentynine Palms Marine Corps Base (Sharon Jones, pers. comm.) were completed, in part, to establish such baseline information to facilitate population monitoring.

The Recovery Plan (Appendix A, U.S. Fish and Wildlife Service 1994b) proposed yet another methodology for estimating regional densities of tortoises, whereby square kilometer study plots would be sampled throughout a given DWMA. According to the Recovery Plan, the advantages of this method were reported to include: (1) it assesses population trends over large areas, not just in single plots; (2) sample areas are selected randomly, allowing comparisons with standard statistical techniques; and (3) it violates no known assumptions of the underlying model. Hastey (1996) stated that this method may be cost prohibitive, and Corn (1994) argued that the sampling methodology was problematic because tortoises could enter and leave the area during monitoring (i.e., it is not a “geographically closed system”) and precipitation could also bias capture probabilities.

Distance Sampling Transects: The Desert Tortoise Management Oversight Group (MOG) has officially adopted the “line transect sampling” or “distance sampling” methodology as the best way to estimate tortoise abundance throughout the range of the

Mojave tortoise population (Ed Lorentzen, pers. comm.). The Department has not officially endorsed this method, pending further analysis of on-going surveys (Becky Jones, September 1999, pers. comm.).

This methodology has already been implemented in parts of Nevada (Drs. Phil Medica and Ron Marlow, pers. comm.), in Washington County, Utah (Ann McLuckie, pers. comm.), in Joshua Tree National Park (Gillian Bowser, pers. comm.), and in 1999 was implemented in the Chocolate Mountains Gunnery Range in southeastern California (Peter Woodman, pers. comm.). Several workshops have been conducted by Drs. David Anderson and Kenneth Burnham, of the Colorado Cooperative Fish & Wildlife Research Unit.

Anderson and Burnham (1996) provided an overview of this methodology in a document entitled, *A Monitoring Program for the Desert Tortoise*, which is summarized below. The primary objectives of this sampling methodology are:

- intensive monitoring to detect possible, short-term, drastic declines in population density;
- less intensive, long-term monitoring to detect possible long-term increases in population density due to management alternatives on the reserved lands; and
- a comparison of trends across reserved and surrounding lands.

They recommend two independent teams, one using line transect sampling (Buckland et al. 1993) and the other using radio-telemetry. The first team would be responsible for focused tortoise surveys along transects that can be resurveyed in the future. They expected that a dozen-or-so crews surveying during April and May of a given year could complete sampling efforts in about 40 days. In fact, Woodman (pers. comm., March 1999) and others working on the Chuckwalla Bench, surveyed a total of 30, 4-km transects during a three to four-week period in March and April of 1999. Information would be recorded for each tortoise found, and each tortoise would receive a permanent mark. They indicated that about 100 tortoises need to be found to have an adequate sample size.

The second team would determine the proportion of tortoises above ground during certain environmental conditions (referred to as g_0 , or “g-sub-zero”). Team two would make this determination at the same time team one is performing its surveys. Determining tortoise activity above or below ground would be facilitated by affixing radio-telemetry equipment to a dozen-or-so tortoises. By the time this sampling methodology could be implemented in the West Mojave, it is hoped that “ g_0 ” can be predicted based on easily measurable environmental variables, such as temperature, cloud cover and wind velocity, so that only the sampling team would be needed.

Suggested Transect Locations: Anderson and Burnham have indicated that it would be necessary to stratify the sampling area to between 30 and 70 sub-strata. For example, there would be a number of transects in each of the four DWMAs and perhaps on the four military bases, and within each region there would be transects at certain elevations, in certain plant communities, on certain substrates (rocky, upper bajadas versus lower, sandy bajadas), or even within certain management zones (Open Areas versus DWMAs versus MUAs). Whereas the MOG has decided that this methodology should be employed to monitor the Mojave Population of tortoises, it is still necessary to develop a specific approach, including the number of transects and their locations.

This report recommends that the Supergroup consider implementing a “head-starting” program (where hatchling tortoises are reared and released in the wild) at the Desert Tortoise Research Natural Area and areas south and/or west of Fremont Peak. It is appropriate, therefore, that some of the permanent distance sampling transects be located in the vicinity of these areas where tortoise populations would ostensibly be bolstered. If over a period of 10 years, for example, there are no measurable increases in tortoise numbers in these areas, plan managers would want to consider if the head-starting programs should be continued, modified, or discontinued.

In addition, the translocation of clinically healthy tortoises from impact areas into adjacent management areas where tortoise densities may be very low or non-existent is also recommended. One such proposal may be to relocate tortoises out of southern Barstow impact areas into the eastern portions of Stoddard Valley. If this proposal is adopted, transects should be positioned in Stoddard Valley to see if the translocation program is successful, as may be determined if the numbers of disease-free tortoises increase in the area. Because these tortoises would be permanently marked, there would be opportunities in future sampling efforts to determine if the tortoises were persisting following translocation. At the same time, surveyors would be recording information on the incidence of URTD-symptomatic tortoises and carcasses. If monitoring determined that diseased animals were relatively more common in these translocation areas than before, it may be necessary to stop the program and provide better screening for diseased versus non-diseased animals before the program can be resumed.

Use of Monitoring Results: The results of this monitoring effort should be used to adjust management as necessary. The methodology is more sensitive in detecting drastic population declines than a general increase in numbers of tortoises, which fits well with goals of the Recovery Plan and the West Mojave Plan. As part of the West Mojave Plan, the Implementing Team will want to know if drastic declines are occurring so that emergency measures may be considered in the short-term. As identified in the Recovery Plan, it is important to know if the population is remaining stable or increasing in the long-term so that delisting may be considered.

Although distance sampling could detect such declines, biologists, land managers, and the Plan’s Implementing Team would still need to determine the cause(s) of those declines. If,

for example, monitoring indicated that tortoises were crashing in the Mud Hills area, the loss of tortoises could be due to drought and/or upper respiratory tract disease, which may be outside our control, or there could be an increase in vehicle impacts or poaching, which could be controlled.

In the absence of the monitoring program, however, a population crash would go undetected, there would be no emergency consultation to consider why this had occurred, and there would be no opportunity for adaptive management to curtail or reverse the decline.

Monitoring of Threats Affecting the Long-term Tortoise Survival and Recovery

The recommended conservation strategy is intended to off-set threats known to affect the tortoise. It is strongly recommended that the Plan set measurable milestones against which the success of Plan implementation can be measured. Rather than say that “highways should be fenced,” the Plan should dictate that, for example, “both sides of Highway 395 between Shadow Mountain Road and Kramer Junction will be fenced during the first three years of Plan implementation.” Rather than say that “roads designated as ‘closed’ will be scarified and otherwise camouflaged,” the Plan should indicate, for example, that “\$100,000 will be provided annually to close routes in the four DWMA’s.” Monitoring milestones should be identified by the Supergroup once it has developed the specific measures to be implemented.

Becky Jones of the Department (September 1999, pers. comm.) cautions the reader that terms such as “should,” “could,” and “would” currently associated with the potential management prescriptions will be replaced with “shall” once the Supergroup has agreed to the measures. Hence, “Highway 395 should be fenced,” would read, “Highway 395 shall be fenced” in the final Plan and permit authorization from the Department.

Monitoring the Plan’s Effectiveness in Mitigating and Minimizing Impacts

FESA requires that a conservation strategy mitigate and minimize the impacts of the authorized take to the maximum extent practicable. CESA requires that the “impacts of authorized take [are] minimized and fully mitigated;” and that measures to minimize and mitigate “shall be *roughly proportional* in extent to the impact of the authorized taking on the species.” A credible monitoring plan is necessary to determine if these standards are being met.

The term “minimize” refers to measures that are implemented on-site at the time of construction or immediately thereafter to alleviate the impacts to resident tortoises and occupied habitat. The recommendations to move tortoises from harm’s way, monitor construction where tortoise sign is found, and revegetate pipelines within DWMA’s and MUA’s are measures intended to minimize the impacts of project development. The term “mitigate” generally refers to measures implemented outside the area of impact to off-set

any adverse effects. Designation of DWMA's, closure of routes therein, fencing of highways, and increased ranger patrols are examples of measures implemented within conservation areas to mitigate impacts of take occurring elsewhere.

It is suggested that a process be developed to establish an impartial "watchdog" entity (perhaps the Implementing Team or other appropriate group), charging it to prepare an annual report regarding each jurisdiction's success in implementing minimization and mitigation measures. The purpose of the "watchdog" would be to ensure that all parties fairly and equitably share the responsibility of Plan implementation. If, for example, an independent monitoring team or panel determines that DWMA's were never designated as an amendment to the CDCA Plan, that no roads were closed, that no highways were fenced, and no new rangers employed, then it could report this failure, which would be deemed a violation of the 2081 permit, 10(a) permit, and/or biological opinion.

Part D

Determining Anticipated Take

An incidental take permit exempts the permittee from the take prohibitions of FESA and CESA, allowing the take of species covered by the permit so long as the take is incidental to, but not the purpose of, an otherwise lawful activity, or take that is inadvertent. The permit must identify the level of take that will be allowed.

Accordingly, the Supergroup (with assistance from the Service and Department) must determine the anticipated take level that would occur with Plan implementation. The following information is provided to the Supergroup to help determine take levels:

- In what terms should take be calculated (Acres of habitat modified? Number of animals harmed?)
- What should the level of authorized take be (e.g., How many acres could be modified over the term of the Plan?)
- How should cumulative take be tracked? (By what means could agencies and jurisdictions document the take that actually occurs over the term of the Plan?)
- Useful background information for the Supergroup to consider when it determines anticipated take levels (such as the portions of the planning area where take of tortoises is most likely to occur, and the level of take historically associated with different types of development projects).

IN WHAT TERMS SHOULD TAKE BE CALCULATED?

The Service's *Habitat Conservation Planning Handbook* (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1996) (HCP Handbook) suggests that "...in cases where the specific number of individuals is unknown or indeterminable," incidental take levels can be expressed in an HCP "...in terms of habitat acres ... to be affected generally;" take should be expressed in terms of numbers of animals "...if those numbers are known or can be determined." (HCP Handbook at 3-14.) In any event, "...habitat modification or destruction ... must be detailed in the HCP and authorized by the permit." (HCP Handbook at 3-15.)

The absolute number of tortoises in an area as large as the West Mojave Recovery Unit cannot be determined with precision. Therefore, it is *strongly suggested that anticipated take be expressed in terms of acres of occupied habitat* affected during the term of the West Mojave Plan.

The Clark County Desert Conservation Plan is an example of a regional HCP that expresses take in terms of acres. This HCP allowed for the loss of 113,900 acres of tortoise habitat over the term of the permit. It does not estimate the number of tortoises that would be displaced (RECON 1995).

The HCP Handbook offers the following suggestions for determining the level of take when take is expressed in terms of habitat modified or destroyed:

The next aspect [determining anticipated take] depends upon the number of ... habitat units that occur in the ... planning area, and the likelihood that any given activity will result in take. This can be determined by first "overlaying" data on proposed activities — often in the form of maps — with biological data compiled from existing sources and collected in the field.... When this is completed, the effects of particular activities on species ... can be analyzed.

Definitions

Take (FESA): Harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (Section 3 of FESA, as amended). "Harass" is further defined in federal regulations as an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns that include, but are not limited to, breeding, feeding, or sheltering. "Harm" is further defined as an act, which may include significant habitat modification or degradation, where it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

Take (CESA): Hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill. (Cal. Fish & Game Code Section 86.)

Incidental Take: Take that is incidental to, but not the purpose of, the carrying out of an otherwise lawful activity, or take that is inadvertent. Construction of transmission lines and installation of pipelines in occupied desert tortoise habitat are examples of "otherwise lawful activities" that have resulted in the take of tortoises in the planning area.

[HCP Handbook at 3-14] [E]xpected take levels [can be] ... estimated based on a comparison of proposed activities with species distribution in the plan area....
[HCP Handbook at 3-15]

The planning team will provide the Supergroup with both the biological data and GIS map library necessary to make this assessment.

WHAT SHOULD THE LEVEL OF AUTHORIZED TAKE BE?

The conservation strategy presented in Part C recommends the designation of three types of management areas for the desert tortoise: Desert Wildlife Management Areas, Managed Use Areas, and Incidental Take Areas. It suggests that different levels of take be authorized in each area, or that a percentage of the area be subject to new ground disturbance: 1 percent in DWMA's and 5 percent in MUAs. Within the ITA, this report suggests that all tortoises could be taken; no acreage threshold would be applied. These thresholds are suggestions only; the Supergroup could establish different levels, but it is recommended that whatever level of take of habitat is adopted, it should be identified by considering the current rate of growth, and the number of acres currently undisturbed within the West Mojave planning area.

These thresholds conform to the suggestion made above, that take be calculated in terms of acreage of habitat that could be disturbed during the term of the permit.

For each jurisdiction, therefore, this report suggests that authorized take be expressed as a certain number of acres of new habitat disturbance within each DWMA under its jurisdiction. This could correspond to 1 percent of the surface area of the jurisdiction that lies within DWMA's; 5 percent of the surface area of the jurisdiction that lies within the MUA; and an unlimited number of acres of new disturbance within ITAs under its jurisdiction. For example, if a jurisdiction had 100,000 acres of DWMA lands (70,000 in DWMA number 1, 30,000 in DWMA number 2), 100,000 acres of MUA lands and 100,000 acres of ITA lands, the authorized take for that jurisdiction would be as follows: 700 acres within DWMA number 1, 300 acres within DWMA number 2, 5,000 acres in the MUA, and 100,000 acres within the ITA.

If these acreage thresholds are reached, any additional ground disturbing activities within the particular management area would require independent FESA or CESA permits, on a case-by-case basis, from the Service and Department (as at present); that is, those projects would be outside the scope of the streamlined permitting process provided by the Plan. The Service and Department would need to determine on a case-by-case basis if the project would jeopardize the continued existence of the tortoise.

HOW SHOULD CUMULATIVE TAKE BE TRACKED?

The acreage affected by authorized projects within the three management areas should be tracked by a monitoring program. This will require the establishment of a baseline of disturbed acreage, and a mechanism for tracking and auditing the total number of acres disturbed in DWMA's and MUA's during the term of the Plan.

The planning team has digitized all existing urban and rural development within the planning area using 1:24,000 scale aerial photography from 1995. This analysis allows us to determine the undeveloped lands that may ultimately be lost through Plan implementation. Estimated growth trends can be applied to this acreage to determine the loss of potential habitat over time. To keep track of habitat loss, it is recommended that the Supergroup consider the following:

- Lands under the jurisdiction of each agency, city, and county could be separately tracked. For example, within DWMA's the recommended 1 percent acreage threshold would be separately tracked by the BLM, State, and county (for private lands).
- Temporary impacts, such as pipeline right-of-ways, should be factored into this take threshold.
- The restoration of degraded habitats should be considered. For example, if a 100-acre sand and gravel mine site is "successfully restored" such that it can be reoccupied by tortoises (additional success criteria need to be developed), 100 acres could be "credited" to the 1 percent threshold. The Department (Becky Jones, September 1999, pers. comm.) has indicated that "restored habitat...{should be}...equal to or better than undisturbed habitat adjacent to that area and be able to support a minimum of 50 tortoises per square mile."

USEFUL BACKGROUND INFORMATION TO CONSIDER WHEN DETERMINING ANTICIPATED TAKE

Regions Where Take of Tortoises Is Most, and Least, Likely

Activities occurring in certain regions of the planning area are likelier to affect tortoises than in other regions. Most of these habitats once supported tortoises, although some are now considered unsuitable (e.g., urban areas, agricultural fields, etc.). The likelihood of tortoises occurring in a given area can be estimated, in part, by considering the available data collected over the past 10 years, in particular. The following discussion identifies those areas where take of tortoises is likely to be high, moderate, or minimal.

- Take of tortoises is likely to be minimal or absent in Lancaster (Tierra Madre Consultants, Inc. 1991, Brian Hawley, pers. comm.), Palmdale (Feldmuth and

Clements 1990, Laurie Lile, pers. comm.), Hesperia (Tierra Madre Consultants, Inc. 1992, Dave Reno, pers. comm.), the southern portions of Apple Valley and eastern portions of Victorville (Tierra Madre Consultants, Inc. 1992, John Hnatek and Charles LaClaire, respectively, pers. comm.), and areas south of Highway 18, west of Lucerne Valley (Ed LaRue, pers. obs.). In Los Angeles County, there is very little likelihood that tortoises will be found in the vicinity of developed areas, such as Lancaster and Palmdale to the west and Lake Los Angeles to the east. Though marginally possible throughout the southern portions of the county, Inyo County is the least likely of the four participating counties where take would occur during project development.

- Take of tortoises is moderately likely to occur in undeveloped areas peripheral to existing development in Ridgecrest (Circle Mountain Biological Consultants 1997a), Yucca Valley (Tierra Madre Consultants, Inc. 1993a), southeastern parts of Twentynine Palms and peripheral areas of Lucerne Valley (Ed LaRue, pers. obs.), eastern portions of California City (1998-1999 survey results), and northern portions of Apple Valley and southern portions of Adelanto (Tierra Madre Consultants, Inc. 1992, Ed LaRue, pers. obs.). In Los Angeles County, take is relatively more likely as one proceeds from west to east.
- Take of tortoises is very likely to occur in undeveloped areas peripheral to existing development in Barstow (Circle Mountain Biological Consultants 1996), areas between Yucca Valley and Twentynine Palms (Circle Mountain Biological Consultants 1997c), and areas north of Adelanto and Apple Valley (Tierra Madre Consultants, Inc. 1992). Most undeveloped portions of Kern and San Bernardino counties located away from cities and other human development support tortoises where take during project development is likely. Areas in San Bernardino County, particularly between Irwin Road and Harper Dry Lake, and between Highway 395 and the Mojave River north of Shadow Mountain Road, appear to support the highest numbers of tortoises. Projects in such areas are more than likely to encounter tortoises and adversely affect them.

Anticipated Take of Tortoises by Specific Activities

A summary of the relative effects of various activities on desert tortoises can be found in Part A of this chapter, regarding threats to the tortoise. A more detailed treatment of this topic can be found in Boarman (1999).

In 1995, Circle Mountain Biological Consultants (CMBC) prepared an analysis of federal biological opinions for desert tortoises. Its findings are briefly discussed herein.

Between the listing of the tortoise in 1990 and 1995, there were approximately 150 federal biological opinions issued for projects that “may affect” the desert tortoise in California. Approximately 20 of those opinions were for organized off-highway vehicle events,

grazing, and other uses of the desert. CMBC's study focused on the other 126 opinions, which were associated with specific projects that would result in ground disturbance and potential take of tortoises. CMBC consulted about 145 different people affiliated with the projects for which opinions had been issued, and determined that those 126 opinions authorized 123 different projects, 101 of which had been constructed.

CMBC found that 11 different project types were authorized in California by Service biological opinions. Table 2-5 shows the project types and the number of tortoises reportedly handled (i.e., harassed) and accidentally killed by each project type. The project types are presented in descending order of harassment take, with projects resulting in the most take listed first.

<p align="center">Table 2-5 Tortoise Harassment and Mortality by Project Type California 1990 - 1995</p>			
Project Type	Number of Projects	Tortoises Handled	Tortoises Killed
Pipelines	22	583	38
Transmission Lines	15	227	7
Mining	23	59	2
Highways	14	16	1
Miscellaneous Military	8	14	5
Tract and Parcel Development	19	13	0
Programmatic Opinions	12	5	0
Miscellaneous	2	2	0
Hazardous Materials	3	0	0
Flood Control	2	?	?
Landfill	3	0	0
Total	123	919	53

Source: Appendix B, Section 1 in Circle Mountain Biological Consultants 1995

It is clear from this analysis that long, linear projects have resulted in the most prevalent, documented harassment and mortality impacts to tortoises. Whereas CMBC documented more mining projects than any other, only two tortoises were reportedly killed. We suspect that implementation of successful, on-site mitigation measures was responsible for the reduced mortality associated with mining activities.

There is no certain way to predict the types of projects that may occur in the planning area in the future. However, the types listed above and their relative impacts are likely to continue.

Part E

Permit Compliance Summary

EFFECTIVENESS OF CONSERVATION STRATEGY

The conservation strategy recommended by this report will attain the suggested biological goals and objectives if it protects valuable tortoise habitat and allows for the natural (or enhanced) recovery of the tortoise in the West Mojave.

The establishment of DWMA's, and the BLM's designation of these areas as ACECs and Multiple-Use Class L (Limited Use), will help meet those goals and objectives. This report recommends that 2,682 square miles, or 18 percent of the planning area, be designated for DWMA-ACEC status⁵. This compares to the 1,161 square miles, or 22.5 percent, proposed for ACEC status within the BLM's 3.3 million-acre Las Vegas Resource Area to protect tortoises (U.S. Bureau of Land Management 1998). Existing protection is currently provided in some wilderness areas, ACECs, State Parks, and at Goldstone, Edwards Air Force Base and China Lake, although the level of protection on military bases could vary if the current missions at these installations substantially changed. Data show that the proposed DWMA's would encompass lands that recently (since the 1970's) and presently support the largest numbers of tortoises in the planning area. Establishment of the DWMA's and implementation of appropriate conservation measures would predictably result in protection of large, unfragmented regions in which tortoises could persist for many generations.

The DWMA areas compare to 801 square miles, or 5.5 percent of the planning area, that would be within the City Incidental Take Areas and therefore lost from conservation as a result of the Plan. Much of this area, however, is already developed. County Incidental Take Areas would also be impacted, but these are areas that would be predictably lost to or impacted by development with or without the Plan. Through programmatic studies (in Adelanto, Apple Valley, Hesperia, Lancaster, Palmdale, Ridgecrest, and Victorville) and about 250 focused tortoise surveys in San Bernardino County, it is apparent that tortoises are mostly absent from these Incidental Take Areas already.

Designation of conservation and take areas, alone, would not protect habitat and lead to the recovery of the species. What are the conservation measures that would be implemented that would protect tortoises over and above protection currently provided?

⁵(2,017 mi² in the Fremont-Kramer and Superior-Cronese DWMA's, 404 mi² in the Ord-Rodman DWMA, and 261 mi² in the Pinto Mountain DWMA).

Although it is the responsibility of the participating jurisdictions to answer this question, this report identifies a wide range of measures intended to provide this extra protection. Fencing highways, closing unimproved routes in prime tortoise habitat, employing rangers to enforce route closure and apprehend poachers, minimizing impacts of BLM Open Areas on adjacent lands, eliminating the potential for future sheep grazing in DWMA's, and many other measures were identified. It is not expected that *every one* of these measures will need to be implemented to meet with Service and Department approval; it is recognized that the jurisdictions may conclude that some may not be feasible; others may prove too expensive or controversial to win acceptance from all parties. If a representative subset of the protective measures is implemented, however, this should allow the Service and the Department to approve the Plan, regulatory compliance will become streamlined, and tortoise conservation and recovery would be facilitated.

These conclusions presuppose that the Plan provide a funding mechanism to pay for these conservation measures, through a combination of grants, developer's fees, coordinated land acquisition, credits, and appropriated agency funds, the actual nature of which will be determined by the Supergroup. For example, it is expected that federal agencies will commit funds to make the Plan work. In fact agencies are already planning for this: the Management Oversight Group Technical Advisory Committee is pursuing ways to fund and implement distance sampling to monitor tortoise populations in the planning area and elsewhere (Ed Lorentzen, personal communication); and the BLM is seeking funding to implement route closure (Tom Egan, personal communication).

Success of the Plan and recovery of the tortoise (if measured in numbers of tortoises only) will always be hampered by local and regional catastrophic population declines that cannot be controlled. For example, a total of 110 tortoises died since about 1993 from unknown causes at Goldstone (Berry et al. 1998), which is one of the more protected desert regions in the planning area. However, as long as areas are relatively protected and not fragmented, there is a general consensus that tortoises may re-occupy these lands naturally or with human intervention (e.g., through head-starting or translocation), as these techniques are further developed and successes (and failures) documented.

EFFECTIVENESS OF FESA SECTION 10(A) AND SECTION 7

Current management with regards to section 10(a) incidental take of tortoises is not functioning well in the planning area. Since the listing of the tortoise in 1990, only six permits have been issued, implying that only six private projects have affected the tortoise during the last 10 years. Since no established time limit has been identified for issuance of section 10(a) permits, they have taken between six months and three years to process and issue. Thus, the conscientious developer is faced with uncertainties that may undermine or force abandonment of his or her development project (LaRue 1994). Without the streamlined section 10(a) provisions suggested by this report, it is expected that tortoise habitat will continue to be developed or degraded in unpredictable ways and tortoises will continue to be lost with no off-setting conservation measures implemented. With these

provisions, project proponents would obtain a streamline and timely program for compliance with FESA and CESA, and conservation measures would be implemented.

Section 7 consultations, by contrast to incidental take permits, are currently performing well throughout the planning area. Consultations are relatively more timely; they must be completed within 135 days. Terms and conditions of biological opinions are being successfully implemented under section 7, tortoises are being rescued from harm's way, tortoise mortalities are being reduced during construction activities, and practical conservation solutions, such as revegetating pipeline alignments and purchasing lands to be managed for species conservation, are being implemented (Circle Mountain Biological Consultants 1995). Worker education programs, which are typically required in the Service's biological opinions, have been very useful. It is difficult these days to find a construction worker in the desert who has not heard of the desert tortoise or worked side-by-side with a biological monitor. The main contribution of the recommendations of this report to the section 7 process would be to expedite the process and alleviate the regulatory burden of both the Federal Lead Agency (usually the BLM) and the Service (Tom Egan, personal communication), although specific measures are yet to be identified.

Part F

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CHAPTER THREE
MOHAVE GROUND SQUIRREL
(Spermophilus mohavensis)

Status: Federal: None California: Threatened

Date of Evaluation: April 1, 1998; May 5, 1998; October 28, 1998

Attendees: Black, Bransfield, Goss, Gustafson, Haigh, Jones, Laabs, LaPre, LaRue, Leitner, Recht (by phone), Thompson

[Findings and recommendations of this chapter are currently being developed by the planning team, the Department and the Service. When completed, this material will be provided to the Supergroup.]

CHAPTER FOUR COVERED PLANTS AND ANIMALS

Part A Covered Mammals

BATS – 8 species. **LONG-LEGGED MYOTIS** (*Myotis volans*), **FRINGED MYOTIS** (*Myotis thysanodes*), **CALIFORNIA LEAF-NOSED BAT** (*Macrotus californicus*), **POCKETED FREE-TAILED BAT** (*Nyctinomops femorosaccus*), **SPOTTED BAT** (*Euderma maculatum*), **PALLID BAT** (*Antrozous pallidus*), **WESTERN MASTIFF BAT** (*Eumops perotis*) **TOWNSEND'S BIG-EARED BAT** (*Corynorhinus townsendii*)

Status: Federal: Species of Concern (except pallid bat, pocketed free-tailed bat)
California: Species of Special Concern (except long-legged myotis, fringed myotis)
Date of Evaluation: October 21, 1998, CDFG Bishop office, October 27, 1998, FWS Ventura office, and September 2, 1999, CDFG Sacramento office.
Attendees: LaPré, Racine, Bransfield, Bolster. Reviewed by Nicol, Jones.

Findings

The pocketed free-tailed bat and fringed myotis could be dropped from the covered species list. These species appear to be accidental in the planning area.

Habitat: The California leaf-nosed bat and Townsend's big-eared bat are colonial cave-dwellers thought to have declining populations. The California leaf-nosed bat is known to be dependent on desert wash foraging habitat near the roosts. The Townsend's big-eared bat is dependent on riparian habitat within five miles of the roosts.

The spotted bat, pallid bat, and Western mastiff bat are cliff-dwellers. However, roosts of pallid bat have been located in mine adits at seven locations within the planning area. The only identified cliff roosts for spotted bat are within Red Rock Canyon State Park. No roosts of Western mastiff bat have been located, but roosts are suspected within Joshua Tree National Park.

The long-legged myotis is primarily a tree-dweller occurring at higher elevations than those found in the planning area. It has been found, however, in a building at a transient roost in the spring on China Lake NAWS.

The protection of roosts is the most important conservation measure that can be achieved. Several types of roosts have been defined: 1) maternity roosts, where the bats give birth and nurse their young, 2) hibernation roosts, where bats spend the winter, 3) night roosts, which provide shelter between foraging bouts, and day roosts, used by resident bachelor

males, as migratory stopovers, and for reproductive behavior. Roost sites are often traditional, being utilized for many successive years, and contain conditions of temperature, humidity, air flow, and light that are not easily replicated or available in many locations. Proximity to foraging areas is important for most roosts.

All maternity and hibernation roosts containing more than ten Townsend's big-eared bat or California leaf-nosed bats or 25 bats of the other six species are considered significant roosts. Eighteen significant roosts are known from the planning area. Of these, 12 are maternity roosts, 4 are hibernation roosts, 2 are both, and 1 is unspecified. In addition, approximately 30 other sites are known as bat roosts, but are not termed significant roosts.

Current Distribution: Two species, pocketed free-tailed bat and fringed myotis, are marginal or accidental in the planning area.

All except one of the identified significant roosts are on public (NPS and BLM) or military lands.

The Dale Mining District in the Pinto Mountains, including portions of Joshua Tree National Park, contains many shafts and adits known to harbor bats of several species. Six significant roosts have been located, and the potential for several more is present.

Biological studies on military bases have detected six significant roosts at China Lake NAWS, and one at Twentynine Palms MCAGCC.

The largest roost known, containing over 10,000 bats of several species, is under the Interstate 15 bridge at the Mojave River crossing. This site is currently under investigation. It may not be a significant roost for the eight target species.

Threats: The most serious direct threats to bats are disturbances of hibernation and maternity roosts and destruction of roosting habitat, primarily old mines and natural caves. Old buildings and bridges also provide roosts for some species. Loss and degradation of foraging areas threatens certain species.

Current Management: Long-term conservation is provided in State Parks where special steps have been taken to protect bat roosts including installation of bat-friendly grates, restricting human access to abandoned mines, and prohibiting rock climbing and rappelling near bat roosting areas.

BLM has established guidelines for conservation of bat roosts associated with caves and abandoned mines. Potential bat roosts located in abandoned mines have been protected by fences installed by BLM for public safety purposes.

Identified Shortfall: Protection of bats in the planning area has been limited to roosting sites on an as-found basis. Review of the current management activities shows that there is need for systematic identification and inventory of potential roosting sites within the planning area. In addition, known significant roost sites remain susceptible to human intrusion and need protection. No specific protections are in place for foraging habitat.

Biological Goals

Maintain and enhance viability of all bat populations in the planning area, regardless of species. Objective 1. Install bat-accessible gates at the entrance of all significant roosts. Objective 2. Protect foraging habitat.

Authorized Take

Take of bats and their roosting habitat should be limited to sites harboring ten or fewer bats for California leaf-nosed bat and Townsend's big-eared bat and 25 or fewer bats of all other species. Loss of significant roosts is not covered by incidental take permits. Projects involving take of bats under the limit and of non-significant bat roosts should follow procedures (specified below) to allow for safe exit of the bats.

Conservation Strategy

Recommend protecting all significant bat roosts by installation of gates over mine entrances and restricting human access. At China Lake NAWS, priority should be given to the mines in Mountain Springs Canyon, followed by Wilson Canyon. Interim protection should include posting of signs warning visitors of the sensitivity of the bat roosts. Continue fencing around (but not over) open abandoned mine shafts to provide bats access to roosts and to reduce hazards to the public.

Two bat management areas should be established. The first would be in the Pinto Mountains, on lands managed by Joshua Tree National Park and BLM. The second would be on China Lake NAWS. The Navy could develop a plan to protect bats as part of its Natural Resources Management Plan. For both areas, the recommended prescription is to systematically survey mines and other potential roosting sites within the management areas and provide gates or other measures to allow bat passage and prevent human entry at adits where significant roosts are found. Public lands outside military bases containing significant roosts could be withdrawn from mineral entry, subject to valid existing rights.

Riparian habitat should be preserved within five miles of known maternity roosts for Townsend's big-eared bat. Recommend prohibiting unauthorized water diversions. Grazing should be monitored, if present, to assure no undue degradation of the riparian habitat. Recommend a prohibition on woodcutting.

Recommend protecting desert wash vegetation within three miles of known or newly discovered maternity and hibernation roosts of California leaf-nosed bats. Vehicular use of washes in these locations should be prohibited using the BLM route designation process.

Water sources impacted (removed) near significant bat roosts should be replaced.

Survey requirements for determination of significant roosts: Projects which involve disturbance of natural caves, cliff faces, mine shafts, abandoned buildings or bridges have the potential to destroy significant bat roosts. These projects should be required by the lead agency to conduct surveys to determine use of these features by bats.

Surveys should be conducted both in winter and in summer to determine if a potential roost is utilized by bats for hibernation or for maternity colonies. Surveys that indicate a roost is used during one of the seasons should be repeated during the other season to determine if the roost is used by bats for both functions.

Colonial bats may move between roosts, or abandon roosts if disturbed. If the disturbance is eliminated, the bats may return. Therefore, a roost with substantial deposits of bat guano is assumed to be a significant roost, even if bats are not present. "Substantial deposits" should be determined by a qualified biologist and verified by the Department.

Safe exit of bats from non-significant roosts: Prior to disturbance or removal of a non-significant roost, a project sponsor should provide for safe eviction of any bats present by a qualified biologist in consultation with the Department. Safe procedures include:

- Eviction during the appropriate season. No eviction should occur during maternity or hibernation seasons for the species.
- Temporary closure of the roost after the evening exit flight, then entering the roost and capturing any remaining bats.
- This procedure should be repeated for at least two nights to insure that all bats have been removed safely.

Monitoring

Bat populations in all significant roosts should be censused every five years. Approved projects that impact bats under the take limit should be reported annually to the Department and the Service. Effectiveness of mitigation measures providing for safe exit of bats should be reported.

Permit Compliance Summary

Goal: Maintain bat populations by protecting and enhancing significant roosts and essential foraging habitat.

Take: Unspecified acreage, but take could be allowed for any site harboring 25 or less bats of any species and 10 or less bats of California leaf-nosed bat or Townsend's big-eared bat.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Gate all significant mine roosts. Close mine roads within ¼ of significant roosts. Withdraw from mineral entry. Close roads within desert washes and near riparian foraging sites.	Continue surveys of areas with high potential for containing significant roosts. Monitor status of known significant roosts every five years. Report take annually.	Gate mine entrances if new significant roosts are found. Withdraw from mineral entry. If populations decline or new threats are discovered, take corrective actions.	Golden eagle. Prairie falcon. Inyo California towhee.

Discussion: The management program addresses the threats by:

- preserving a minimum of 18 significant roosts.
- minimizing disturbance and degradation of desert wash and riparian habitat near significant roosts of California leaf-nosed bat and Townsend's big-eared bat.

This strategy generally meets the objectives of the permit applicants by providing a standard for permit coverage and mitigation and a uniform survey protocol. Mining would be unrestricted at sites not containing significant roosts.

The management program and withdrawal from mineral entry results in the retention of all of the existing known significant roosts, both maternity roosts and hibernation roosts. Unprotected mines containing significant roosts would be gated to prevent human entry. This would prevent further declines and may allow for increases in the bat populations.

Without the protective measures (gating of entrances), bat roosts could continue to be lost due to disturbance from entry at sensitive periods (maternity and hibernation). Mining and other projects which disturb occupied mine adits could be approved without knowing the importance of the site for bats if the survey protocol is not followed. Vehicle and other

disturbance of desert washes and riparian sites near roosts of Townsend's big-eared bats and California leaf-nosed bats could continue to degrade foraging habitat.

The proactive protection of known roosts will benefit a greater number of bats than the incidental take, which, although not specified, is limited to non-significant roosts. Permanent protection of significant roosts is provided by the relinquishment of claims and withdrawal of mining. The take is thus fully mitigated for the bat populations in the West Mojave.

BIGHORN SHEEP (*Ovis canadensis nelsoni*)

Status: Federal: None California: None

Date of Evaluation: April 2, 1998 BLM, Ridgecrest Field Office

Attendees: LaPré, Racine, Thompson, Jones, Pauli, Schlachter & Parker (briefly)

Findings

Habitat: Bighorn are found within most of the mountainous areas of the planning area and are more abundant in those ranges with natural water sources. Habitat has been classified as occupied and unoccupied, permanent and seasonal. Concentration areas are locations essential to bighorn and include traditional water sources and lambing areas. Cooperative management, including installation of waterholes, re-introductions, and monitoring of populations by telemetry has been successful on military bases.

Current Distribution: The majority of bighorn sheep herds are located on military bases, especially China Lake NAWS and Twentynine Palms MCAGCC. Additional populations are found in the Rodman and Ord Mountains, Newberry Mountains, and on the north slope of the San Bernardino Mountains. Much of the habitat is within designated Wilderness.

Threats: Potential threats to bighorn include loss or disturbance of springs and waterholes, incremental loss of habitat, contact with domestic sheep which can introduce disease, and blockage of linkages by roads, canals, or fences.

Rural development with fencing threatens corridors; one corridor extends through the city limits of 29 Palms. The dispersal corridor between the San Bernardino Mountains and the Granite Mountains is threatened by rural development.

Mining operations have not been shown to significantly impact bighorn in the San Bernardino Mountains, although the mines result in a small loss of habitat and bring new disturbances into the permanent range of the bighorn.

New cyanide heap leach mines have the potential to harm bighorn if open water containing

cyanide is present on operations within bighorn habitat.

Current Management: Conservation of bighorn sheep populations has been furthered by changes to BLM's livestock grazing management program within the Newberry and Ord Mountain ranges. The amount of forage for cattle has been reduced by 98 animal unit months to benefit bighorn sheep. In addition, ephemeral sheep grazing has been curtailed east of Highway 247 (east of Stoddard Valley) to increase forage for bighorn sheep and to reduce the potential for the transmission of disease by domestic sheep.

Rehabilitation of the habitat and other measures to implement the Afton Canyon and Big Morongo Canyon ACEC plans have improved access to water and forage for the bighorn sheep population in these areas. Designation has closed motorized vehicle routes and reduced human disturbance to the benefit bighorn sheep populations in the Ord Mountain, Rodman Mountain, Argus Mountains, San Gorgonio Mountains and the Cleghorn Lakes and Sheephole Valley wilderness areas.

In addition, four big game waters (guzzlers) have been installed, bighorn sheep have been successfully transplanted in two locations; and burros have been removed in the Argus Range resulting in the improvement of riparian habitat.

Identified Shortfall: Closure of vehicle routes is necessary near sensitive bighorn sheep population located outside of wilderness areas. Corridors should be identified for the passage of sheep between populations. Special management of these corridors should be provided, including freeway under passes at the most critical crossings, and the consolidation of public lands.

Biological Goals

Maintain and enhance the populations of bighorn throughout the planning area. Increase the population size in each metapopulation to conform with the statewide goals.

Authorized Take

Unspecified acreage of occupied habitat primarily consisting of expansion of existing mining operations on the north slope of the San Bernardino Mountains. No direct loss of individuals is anticipated. Take of most linkage habitat would be allowed throughout the planning area. Occupied linkage habitat near Twentynine Palms and Apple Valley should be conserved until crucial new linkages are established.

Conservation Strategy

Recommend protecting natural water sources. On military lands, suggest that bivouacs not be allowed near springs; post springs as off-limits. Water diversions at bighorn springs

should be prohibited.

Avoid helicopter overflights near lambing areas, at least seasonally. The Department should make these locations known to the military.

Recommend enforcement of "nine-mile rule", which is the standard for separation of domestic sheep and bighorn.

Continue re-introductions and monitoring on military bases.

Continue removal of burros in Argus Mountains because of damage to springs.

Mitigation measures for mining proposals in the San Bernardino Mountains and San Gabriel Mountains should include funds to monitor potentially impacted sheep herds.

Known and newly-discovered lambing areas should be conserved and withdrawn from mineral entry on public lands.

Suggest that the BLM require a longer time period for review of mine exploration plans and include the Department - current 3809 regulations require notice only with 15 day review. A minimum of 30 days is recommended.

Provide methods for crossing new freeways, aqueducts and canals that otherwise would impede movement of bighorn between seasonal and permanent occupied habitat.

Recommend consolidating BLM lands east of Twentynine Palms to create a public lands corridor between the Bullion Mountains and the Pinto Mountains.

Consider fencing heap leach pads if in bighorn habitat.

Acquire private lands within designated Wilderness through BLM/Wildlands Conservancy acquisition.

Consider creation of an open space corridor between the San Bernardino Mountains and the Granite Mountains (see map).

Designate off-highway vehicle routes as open or closed along the north slope of the San Bernardino Mountains consistent with the carbonate endemic plants conservation strategy (see map following carbonate endemic plants).

Monitor herd numbers following Department protocol for 2 ranges per year. Ten ranges now support bighorn, so monitoring is on a five-year cycle. Any re-introduced herds should be monitored.

Permit Compliance Summary

Goal: Maintain and enhance the populations of bighorn throughout the planning area. Increase the population size in each metapopulation to conform with the statewide goals.

Take: Take should be allowed as incremental loss of habitat in all classifications. No loss of animals should be allowed.

Minimization & mitigation	Monitoring	Adaptive Management	Other Species
Protect water sources. Enforce "nine mile" rule. Reduce OHV access on north slope of SB Mts. Create open space corridor between San Bernardino Mountains and Granite Mountains. Acquire wilderness inholdings.	Continue telemetry research in the San Bernardino Mountains. Monitor herd numbers in five year cycle.	Define occupied dispersal corridors, then protect as open space. Withdraw new lambing areas from mining.	Golden eagle. Prairie falcon. Inyo California towhee. Carbonate endemic plants. Pygmy poppy. Bendire's thrasher.

Discussion: The management program addresses the threats by:

- minimizing human disturbance in occupied habitat through reduction of road network in the northern face of the San Bernardino Mountains
- minimizing potential conflicts by acquiring private lands within Wilderness.

Provisions for re-introduction of bighorn into historical habitat on military bases will increase the acreage of occupied habitat. This increase exceeds the anticipated take of occupied habitat, so that take is fully mitigated.

Note: The Service did not agree to issue assurances for bighorn sheep. Reasons given were that this species is intensively managed by the Department, which also allows hunting of bighorn in regions outside the planning area.

The Department reserves the right to cancel assurances if the bighorn population goes below a minimum level based on the statewide metapopulation model. This model establishes minimum herd levels for each mountain range occupied by bighorn.

Part B Covered Reptiles

MOJAVE FRINGE-TOED LIZARD (*Uma notata*)

Status: Federal: None California: Species of Special Concern

Date of Evaluation: April 14, 1998 Riverside BLM District Office. August 17, 1999 Palm Springs BLM office.

Attendees: Nicol, Black, Haigh, LaPré

Findings

Habitat: This species is an obligate sand-dweller, found in dunes, sand fields, sand hummocks, and other sand deposits throughout the Mojave Desert in California. Its elevation ranges from 300 to 3000 feet. Its survival requires conservation of the blowsand ecosystem processes, including the sand source, fluvial sand transport areas, aeolian sand transport areas, wind corridors, and the occupied habitat.

Current Distribution: Mojave fringe-toed lizards occur at several disjunct localities in the planning area. Occupied habitat is found at the Saddleback Buttes region of Los Angeles County, Edwards Air Force Base, El Mirage, Mojave River near Barstow, Mojave Valley, Alvord Mountain, Pisgah, Cronese Lakes, Dale Lake, Twentynine Palms, and Harper Dry Lake.

Threats: Urban and rural development has fragmented populations along the Mojave River and at Twentynine Palms. Agricultural development has eliminated and fragmented populations in the Mojave Valley. These threats will continue during the duration of the permit.

Flood control structures which prevent the waterborne flow of sand towards the occupied habitat are a major threat.

Windbreaks that impede the aeolian transport of sand to the occupied habitat are a threat.

Vehicle use of the occupied habitat is a threat.

Current Management: Portions of habitat are within BLM's Harper Dry Lake, Cronese Lakes, and Afton Canyon ACECs; vehicle access controls have been implemented in all three. The Sheephole Mountains Wilderness protects a substantial portion of the Dale Lake population. Habitat also occurs within Saddleback Butte State Park; off highway vehicle use is prohibited within the Park. The Big Rock Creek drainage is partially within Los Angeles County has designated Significant Ecological Areas which protect fringe-toed lizards at Alpine Butte and Piute Butte, and the sand source and sand transport

system is within the Big Rock Wash Significant Ecological Area. Conservation of fringe-toed lizards at Edwards AFB is compatible with the Integrated Resource Management Plan.

Identified Shortfall: Habitat is not adequately protected at four of the seven remaining unfragmented sand habitats (El Mirage, Alvord Mountain, Pisgah, and Dale Lake) and is only partially protected in the Saddleback Butte Area. Protection needed consists of keeping vehicles off occupied sand dunes and insuring continuation of the source and flow of sand.

Biological Goals

Preserve the complete blowsand ecosystem at eight of the eleven sand habitats occupied by the Mojave fringe-toed lizard.

Authorized Take

Take should be allowed at the fragmented populations in the Mojave Valley, along the Mojave River, and at Twentynine Palms. The General Plan for the occupied sand dune habitat in Twentynine Palms depicts several residential and commercial designations, which are incompatible with conservation of the Mojave fringe-toed lizard.

Conservation Strategy

Recommendations: Recommend prohibiting flood control structures that would impede sand transport at Big Rock Creek, Sheep Creek, and the Mojave River. Aggregate mining in these drainages should be regulated to assure continued passage of sand downstream during flood flows.

Widen the bridge over Big Rock Creek when Highway 138 is improved to allow better sand and water flow and enhance the wildlife corridor between the desert and the San Gabriel Mountains. The existing double channel divided by fill material should be converted into a single long and high span.

Suggest a 100' setback for projects on undeveloped private lands from minor drainages flowing from the San Gabriel Mountains to the desert near El Mirage. These drainages are Boneyard Canyon, La Montaine Creek, Puzzle Canyon, Jesus Canyon, and Mescal Creek in Los Angeles County and Sheep Creek and one unnamed tributary west of Sheep Creek in San Bernardino County. The setback should maintain the integrity of the drainages which supply the sand to the El Mirage Mojave fringe-toed lizard population.

Acquire occupied habitat adjacent to the northeast edge of Saddleback Butte State Park, and west of Dale Lake.

Consider imposition of a mitigation fee for take of occupied habitat along the Mojave River and in the Mojave Valley.

Designate vehicle use on public lands with occupied habitat as closed.

Restrict the construction of windbreaks upwind of occupied habitat.

Widen the boundaries of the Big Rock Creek Significant Ecological Area to include more of Big Rock Wash and a linkage between Piute Butte and Saddleback Butte State Park (see map).

Suggest consolidating federal lands at the west edge of the dune habitat in the Dale Lake population. Retain public (BLM) lands within the Mojave River wash.

Recommend protective management at Fort Irwin. The Resource Management Plan for the base should insure that military operations are compatible with conservation of the sandy occupied habitat at Red Pass Lake and Bitter Springs.

If the blowsand on the west slope of Alvord Mountain area is included in the expansion of Fort Irwin, recommend that this occupied habitat be conserved.

Continue protective management at Edwards Air Force Base.

Amend the Cronese Basin ACEC Plan to include protection of the Mojave fringe-toed lizard as a primary goal.

Designate the Pisgah Crater area as an ACEC. This is a multispecies area also harboring the desert tortoise, white-margined beardtongue, crucifixion thorn and bats, though no significant roosts were located. Pisgah Crater and lava flow form a significant geological feature. The interface between white sand and black lava has attracted biological interest due to the contrasting modes of protective coloration found in reptiles and small mammals of the area. Factors that should be considered when boundaries are identified are the need to avoid existing mining operations, and the actual location of biological resources. Acquire lands from Catellus Development Corporation within the Pisgah blowsand habitat as part of the BLM-Wildlands Conservancy acquisition.

Monitoring: Sand sources for the conserved populations need to be better defined. Dune movement should be measured or estimated. This can be accomplished by placement of pole within the sand fields and noting accumulation of sand over time.

The extent of the population at El Mirage is unknown, and the lizards have not been recorded for many years. This site requires a delineation of blowsand habitat and census of the lizard population in order to determine if conservation measures are appropriate.

The extent of the blowsand habitat at Edwards Air Force Base, Alvord Mountain, Pisgah, Cronese Lakes, Dale Lake, and Harper Dry Lake should be determined with greater precision to better define the local distribution of occupied habitat.

Construction of windbreaks potentially affecting occupied habitat should be monitored.

Invasion of occupied habitat by exotic plants which could stabilize the blowsand should be monitored.

Permit Compliance Summary

Goal: Preserve the complete blowsand ecosystem at eight of the eleven sand habitats occupied by the Mojave fringe-toed lizard.

Take: Take should be allowed at the fragmented populations in the Mojave Valley, along the Mojave River, and at Twentynine Palms.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Prohibit vehicles on occupied habitat. Prohibit flood control barriers to waterborne sand transport. Disallow windbreaks in the aeolian sand transport areas. Purchase private lands within occupied habitat. Expand Big Rock Creek SEA and link Piute Butte SEA to Saddleback Butte State Park. Consider mitigation fee for development of occupied habitat in the Mojave Valley and Twentynine Palms. Require 100' setbacks along drainages from the San Gabriel Mountains. Consolidate public lands on west side of Dale Lake.	Delineate blowsand habitat at Edwards Air Force Base, Alvord Mountain, Pisgah, Cronese Lakes, Dale Lake, and Harper Dry Lake. Delineate habitat at El Mirage and census lizards. Define sand sources. Measure dune movement.	Prohibit vehicle traffic on occupied habitat. Delete conservation measures if not warranted; prohibit vehicles on habitat and protect sand sources if viable population is found. Adjust boundaries as necessary to protect drainages and wind transport area. Extend conservation downwind if warranted.	Desert tortoise. Mohave ground squirrel. Sand linanthus. Short-joint beavertail cactus. White-margined beardtongue. Crucifixion thorn.

Discussion: The management program addresses the threats by:

- Protecting the upstream and upwind elements of the blowsand ecosystem at Saddleback Buttes, El Mirage, Dale Lake, Pisgah, Cronese Lakes, Harper Dry Lake and Alvord Mountain.
- minimizing potential take and degradation of habitat through by prohibiting vehicles on dunes.
- minimizing potential conflicts by acquiring private lands within occupied habitat.
- conserving the fluvial sand transport system by imposing setbacks along sand source drainages.

This strategy generally meets the objectives of the permit applicants by allowing expansion of the community of Twentynine Palms, agricultural development in the Mojave Valley, and rural or urban expansion in Barstow and Lenwood.

Without minimization and mitigation measures, a high risk of disruption of the blowsand ecosystem would continue. Occupied habitats could be easily fragmented, becoming too small to support viable populations.

Taken as a whole, the anticipated take is fully mitigated by acquiring lands and applying management beneficial to the fringe-toed lizard populations in the West Mojave.

Note: This report generally recommends allowing unlimited take within existing city limits. The Department has recommended reconsideration of this policy for the large dune occupied by fringe-toed lizards in Twentynine Palms. This site may better conserve the Mojave fringe-toed lizard than conservation at El Mirage or Harper Dry Lake.

SAN DIEGO HORNED LIZARD (*Phrynosoma coronatum blainvillei*)

Status: Federal: FWS Species of Concern

California: Species of Special Concern

Dates of Evaluation: April 14, 1998 Riverside BLM District Office. August 17, 1999 Palm Springs BLM office.

Attendees: Nicol, Black, Haigh, LaPré

Findings

Habitat: Within the planning area, the San Diego horned lizard is restricted to juniper woodland, Mojave mixed woody scrub and chaparral habitats above 3,000 feet elevation. This lizard prefers areas with loose, fine soils, an abundance of open areas for basking, and

plenty of native ants and other insects.

Current Distribution: From the Antelope Valley California Poppy State Reserve east along the base of the San Gabriel and San Bernardino Mountains to Joshua Tree National Park. The distribution is approximately the same as that of the gray vireo and short-joint beavertail cactus. This lizard is believed to be extirpated from the Mojave River near Oro Grande and from many areas near Palmdale. Rural development on the north slope of the San Gabriel Mountains has fragmented habitat so much that few viable conservation areas remain.

Threats: Urban and rural development on the north slope of the San Gabriel Mountains are the primary threat to the long-term viability of the desert populations. Increased predation by cats and dogs are a threat.

Collection by collectors and children have contributed to the decline in numbers of this species, and this threat may continue today.

Off-road vehicles pose a potential threat, particularly at the Mojave Forks dam.

Current Management: Limited protection is currently provided on public land in the Juniper Flats ACEC, in the Antelope Valley Poppy Preserve and in Joshua Tree National Park. Only a small portion of the habitat is located in these areas, which are not subject to urbanization. Public outreach and education programs conducted by BLM stress the importance of not collecting lizards.

Identified Shortfall: No public lands conservation area large enough to support a viable population of the San Diego horned lizard exists. To ensure long-term conservation in key habitat areas, acquisition of private land from willing sellers should be considered. Activities in key sandy washes such as extraction of sand and gravel and construction of new flood control structures and roads need to be managed to protect habitat. Motorized vehicle access in areas adjacent to the San Bernardino National Forest and within the Juniper Flat ACEC needs to be reduced.

Biological Goals

Conserve two large representative areas, Big Rock Creek and Mescal Creek, with connectivity of the overall range through the National Forests. Maintain smaller populations within rural development areas along streamcourses.

Authorized Take

Take should be allowed outside the two major conservation areas.

Conservation Strategy

Suggest acquiring lands within the Desert-Montane Transect (Mescal Creek) Significant Ecological Area and the Big Rock Creek area (see map). Acquire lands to connect the Antelope Valley California Poppy Preserve with the Libre Ridge SEA.

Recommend setbacks of 100' for projects on undeveloped private lands along the drainage on the north base of the San Gabriel Mountains. These drainage are Banneret Canyon, La Montan Creek, Puzzle Canyon, Jesus Canyon, and Mescal Creek in Los Angeles County. In San Bernardino County these drainage include Sheep Creek, Horse Canyon, Manzanita Wash, Oro Grande Wash and twelve unnamed tributaries between the Los Angeles County line and Interstate 15. East of Interstate 15 to the Mojave River are an additional twelve tributaries.

Conserve this species within the carbonate endemic plants management zone by creation of one or two ACECs and reduction of the road network consistent with the carbonate endemic plants conservation strategy (see map following carbonate endemic plants).

The BLM Juniper Flats ACEC Plan should be amended to specifically provide protection for this species by designation of routes of travel and closure of unnecessary roads.

Control off-road vehicles at the Mojave Forks dam.

Monitoring: Determine if Forest Service management insures continuation of contiguous horned lizard populations from east to west.

Conduct periodic review of potential effects of adjacent developments on horned lizard populations at Big Rock Creek and Mescal Creek conservation areas.

Monitor vehicle use at Mojave Forks dam.

Permit Compliance Summary

Goal: Conserve two representative habitats, each supporting a large, viable population of the San Diego horned lizard. Maintain populations along drainages within rural development areas.

Take: Rural residential development north of the San Gabriel Mountains from Phelan to Palmdale, except for the two conservation areas, would continue. A 5% rate of growth for San Bernardino and Los Angeles counties is assumed.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Require setbacks from drainages. Route designation in the carbonate plants management zone. Acquisition of conservation lands.	Conduct periodic review of potential effects of adjacent developments on horned lizard populations at Big Rock Creek and Mescal Creek. Monitor vehicle use at Mojave Forks dam.	Fence conservation areas, post signs. Increase law enforcement, place additional barriers.	Short-joint beavertail cactus. Gray vireo. Carbonate endemic plants. Pygmy poppy.

Discussion: The management program addresses the threats by:

- minimizing human disturbance in occupied habitat through reduction of the road network in the San Bernardino Mountains within the carbonate plants management zone.
- minimizing encroachment on drainages from the San Gabriel and San Bernardino Mountains to the desert by requiring setbacks for development.
- acquisition of two large conservation areas.

This strategy meets the objectives of the permit applicants by allowing continued rural development in San Bernardino County and continued suburban development in Palmdale and Hesperia. The SEAs in Los Angeles County (Big Rock Wash and Mescal Creek [desert-montane transect]) should be enhanced by acquisition of the conservation areas.

Without minimization and mitigation measures, rural development would continue to fragment habitat from Phelan to Littlerock, and suburban development in Palmdale would continue to eliminate habitat. The population at the Antelope Valley California Poppy Preserve would continue to be isolated from the Libre Ridge Significant Ecological Area. No viable conservation area would be created, and connectivity with populations in the Angeles National Forest could be lost.

SOUTHWESTERN POND TURTLE (*Clemmys marmorata pallida*)

Status: Federal: FWS Species of Concern

California: Species of Special Concern

Date of Evaluation: April 14, 1998 Riverside BLM District Office

Attendees: Nicol, Black, Haigh, LaPré

Findings

Pond turtles are declining throughout southern California, and few viable populations remain. Most of the distribution is on the coastal slope, where river and stream channelization and urban development have extirpated many populations. A petition for federal listing of this species as threatened or endangered was submitted to the Fish and Wildlife Service, but rejected on the basis of insufficient evidence. The Mojave Desert populations are somewhat unique because they are discontinuous with the coastal drainage. Existing laws regulating modification of wetlands provide a measure of protection for this species.

Habitat: Pond turtles are found within and adjacent to perennial water, especially at locations containing ponds. The turtles utilize adjacent uplands as well as the wetland habitats. Nest sites may be located several hundred feet from the water's edge.

Current Distribution: The Southwestern pond turtle is found within the Mojave River in areas of permanent water, such as Mojave Narrows, Camp Cady, and Afton Canyon. It is known historically from Deep Creek at the southern edge of the planning area in the San Bernardino Mountains. A relatively large population is found west of Palmdale at Lake Elizabeth. It also occurs along Amargosa Creek and may occur along its tributaries.

Potential habitat is found on public and private land in the Kelso Valley at the northwest boundary of the planning area. Additional potential habitat is located within the Jawbone-Butterbrecht ACEC.

Threats: Urban and rural development on the north slope of the San Gabriel Mountains are the primary threat to the long-term viability of the Elizabeth Lake and Amargosa Creek populations.

Urban and agricultural demands on the water sources at the Mojave River pond turtle locations are a threat.

Collection by collectors and children have contributed to the decline in numbers of this species, and this threat may continue today.

Current Management: Long-term conservation is provided in the Afton Canyon and

Jawbone/Butterbrecht ACECS; the Mojave River Narrows Regional Park; and at Camp Cady Wildlife Management Area. Measures include removal of non-native plants and limitations on livestock grazing.

Identified Shortfall: There is a need for basic information to support management decisions including:

- Research to determine the cause of declining populations in the West Mojave region.
- Surveys to determine if the species is present in other riparian areas in the region.

Biological Goals

Conserve all remaining populations in the Mojave River, Lake Elizabeth and Amargosa Creek.

Authorized Take

Take would be allowed outside the conservation areas. This is expected to consist of small tributaries of Amargosa Creek west of Palmdale. No estimate of acreage or population numbers is available. If pond turtles are located in Kelso Creek and the Jawbone-Butterbrecht ACEC, take should not be permitted.

Conservation Strategy

Suggest that incompatible development within the wetland habitats of the Mojave River and Amargosa Creek not be allowed.

Retain a 200' upland buffer adjacent to the conserved wetlands where feasible.

Conduct surveys of Kelso Creek and Jawbone-Butterbrecht ACEC. Continue riparian restoration at Afton Canyon ACEC. Continue monitoring of turtle populations at Camp Cady Ecological Reserve and Afton Canyon ACEC.

Permit Compliance Summary

Goal: Conserve all remaining populations in the Mojave River, Lake Elizabeth, and Amargosa Creek.

Take: Take would be allowed outside the conservation areas. This is expected to consist of small tributaries of Amargosa Creek near Palmdale.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Require 200' setback from Mojave River and Amargosa Creek. Large-scale developments in Palmdale could preserve this species within open space.	Continue restoration and monitoring at Camp Cady and Afton Canyon. Conduct surveys of Kelso Creek and Jawbone- Butterbreedt ACEC.	Adjust setback based on research results. If turtles are found, establish setback. Exclude cattle from occupied habitat.	Riparian birds. Mojave River vole.

Discussion: The management program addresses the threats by:

- providing nesting areas adjacent to the wetlands with the 200' buffer.

PART C COVERED BIRDS

BENDIRE'S THRASHER (*Toxostoma bendirei*)

Status: Federal: None California: Species of Special Concern

Date of Evaluation: March 27, 1998 FWS Ventura Field Office

Attendees: LaPré, Black, Bransfield (briefly), Pereksta, Haigh

Findings

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

Current Distribution: The planning area comprises a small portion of the total range, which extends east to the east Mojave and Arizona. The historical range in the West Mojave was considerably larger, and the occupied habitat now consists of six disjunct populations.

Six populations are now known in the planning area: 1) Yucca Valley, where 38.5% of the land is managed by BLM, 2) Celso Valley (49% BLM), 3) Coolgardie Mesa (69% BLM), 4) Joshua Tree National Park, 5) SE Apple Valley (>99% private) and 6) N. Lucerne Valley (89% BLM).

A substantial amount of private land within the Yucca Valley population is owned and protected by The Wildlands Conservancy. The remaining San Bernardino County private lands are zoned for minimum 40 acre lot size, which is generally compatible with

Bendire's thrasher conservation. Some undeveloped habitat remains within the Yucca Valley city limits. Hillside Reserve (40 acre minimum lot size) is considered compatible zoning within the city. In addition, lands owned by the UC Burns Reserve and The Wildlands Conservancy within the city limits are conserved.

The Kelso Valley population is within an ACEC. Ranching operations are compatible with conservation of the Bendire's thrasher. Access within the ACEC is controlled by the BLM, and one side of the primary access road is fenced.

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

Rural housing has already fragmented stands of prime habitat containing cacti and Joshua trees in SE Apple Valley, and this pattern of development is expected to expand slowly over the term of the permit. Although not all of the land will be developed, the integrity of the habitat will be lost to fragmentation, and thrasher numbers are expected to decline below a viable population level.

In northern Lucerne Valley, 52% of the habitat is included within the sphere of influence of the Town of Apple Valley. Very little development is now present, but rural housing is expected to occupy private lands within the sphere over the long term.

No threats to the habitat on Coolgardie Mesa have been identified. The habitat within JTNP is adequately protected.

Current Management: Long-term commitment to conservation is provided by Joshua Tree National Park, the University of California's Burns Reserve, and Wildlands Conservancy lands. Most of the defined habitat outside of the Park is located on private land and not subject to long-term conservation of the species.

Identified Shortfall: There is a need for additional population data on which to base future possible land acquisitions. Extensive surveys conducted in the past and used to define significant habitat have not been updated.

Biological Goals

Protect five of the six known populations: Yucca Valley, Kelso Valley, Coolgardie Mesa, JTNP, and northern Lucerne Valley. Prevent fragmentation of these habitats. Provide connectivity of open space between JTNP and Yucca Valley.

Authorized Take

Estimation of take: 3,973 acres. Rural development in SE Apple Valley may result in the loss and fragmentation of the small resident population over the term of the permit. Assuming that 5% of the habitat in San Bernardino County, including the Apple Valley sphere of influence is developed, 703 acres of private land would be converted. In northern Lucerne Valley, using the same assumption, 74 acres of habitat could be converted. A portion of the JTNP population extends north into Twentynine Palms. An estimated 411 acres of occupied habitat could be developed during the term of the permit. Habitat loss within the Yucca Valley city limits is estimated at 2,785 acres.

Conservation Strategy

Recommend that public lands be consolidated in the northern part of Yucca Valley population and in the Kelso Valley through land exchanges. BLM lands should be retained within Yucca Valley city limits. Retain BLM lands within Apple Valley sphere of influence. Private lands should be purchased on Coolgardie Mesa.

Suggest consolidating public lands in the Yucca Valley-JTNP corridors or zone for lot size ≥ 40 acres.

OHV use on public lands within conserved areas should be limited to designated roads.

Amend the Jawbone-Butterbrecht ACEC management plan to include protections and monitoring specifically addressing the Bendire's thrasher.

Restrict vegetation harvesting, especially of cactus and yucca within conserved areas and the Yucca Valley-JTNP corridors.

Development projects in Kelso Valley and Yucca Valley within the conservation areas should retain Joshua trees, Mojave yuccas, and cactus as feasible. Large lot zoning (20 to 40 acre minimum) and/or density transfer is encouraged.

Monitor all protected populations. Monitoring can be habitat-based, using topography and vegetation as habitat parameters. A census of population numbers is needed for all conserved areas to establish baseline numbers. Require annual reporting by San Bernardino County, Kern County, and the cities of Yucca Valley and Twentynine Palms on development approvals within the conserved habitats. Require annual reporting by San Bernardino County and the Town of AppleValley for development approvals within the take areas. Conduct searches for Bendire's thrasher in the Yucca Valley-JTNP corridors.

Summary of land uses within habitat polygons

Population	Total Acreage	Developed	Acres Conserved	Acres of Take
Yucca Valley	77,273	2,785	71,703	2,785
Kelso Valley	16,273	0	16,273	0
Coolgardie Mesa	11,070	0	11,070	0
Joshua Tree NP	105,394	0	104,983	411
SE Apple Valley	14,065	1,081	12,282	702
Northern Lucerne Valley	11,440	0	11,366	74
Totals	235,515	3,866	227,677	3,973

Permit Compliance Summary

Goal: Protect five unfragmented disjunct populations. Protect corridors between Yucca Valley and Joshua Tree National Park.

Take: 3,973 acres. 776 acres in San Bernardino County, 411 acres in Twentynine Palms, 2,785 acres in Yucca Valley.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
<p>Large lot zoning. Retain BLM lands within Apple Valley sphere.</p> <p>Retain BLM lands within Yucca Valley city limits.</p> <p>Purchase private lands.</p> <p>Route designation. Prohibit vegetation harvesting.</p> <p>Establish local ordinances for retention of habitat within large lots.</p>	<p>Establish baseline numbers for all conserved populations.</p> <p>Report annual loss of habitat in take areas.</p>	<p>Adjust conservation area boundaries.</p> <p>Create mitigation bank or apply density transfers.</p>	<p>Burrowing owl.</p> <p>Little San Bernardino Mountains gilia.</p> <p>LeConte's thrasher. Desert tortoise. Mohave ground squirrel.</p>

Discussion: The management program addresses the threats by:

- minimizing rural development with lot size restrictions.
- minimizing urban development by retention of BLM lands within the Apple Valley sphere of influence and Yucca Valley city limits.
- retaining key habitat components by prohibiting vegetation harvesting on public lands within conserved areas and establishing development standards for large lots on private lands.
- eliminating disruption of nesting by designation of routes of travel.
- preventing fragmentation of habitat with consolidation of public lands on Coolgardie Mesa, Yucca Valley and Kelso Valley.

This strategy generally meets the objectives of the permit applicants by permitting development within the cities and their spheres. However, retention of BLM lands as habitat in northern Lucerne Valley excludes 5,703 acres of the Apple Valley sphere of influence from development.

The management and acquisition program results in the retention of 95% of the existing occupied habitat. A key result is prevention of fragmentation of the small habitat patches. Up to 13,000 acres of habitat consolidation could be achieved by land exchanges between the BLM and landowners. The purchase of 3,390 acres of private (Catellus) lands offsets some take of private lands and prevents fragmentation of the habitat patch on Coolgardie Mesa. Designation of routes of travel and closing of unnecessary roads will constitute habitat enhancement because disturbance of nesting sites will be reduced or eliminated. Prohibition of harvesting of yuccas and cacti will preserve key habitat components. Connectivity of the habitat patches in Yucca Valley and Joshua Tree National Park will enhance interchange between the populations.

Without minimization and mitigation measures, four of the six habitat patches would become fragmented and unsuitable for the thrasher over the term of the permit. Taken as a whole, the anticipated take (3,973 acres of private lands) is fully mitigated by preventing fragmentation of the five conserved areas and applying management beneficial to the Bendire's thrasher. The mitigation, purchase of 3,390 acres of private (Catellus) lands, is roughly proportional to the take (3,973 acres of private lands).

FERRUGINOUS HAWK (*Buteo regalis*)

Status: Federal: None California: Species of Special Concern

Date of Evaluation: April 2, 1998 BLM, Ridgecrest Field Office

Attendees: LaPré, Racine, Thompson, Jones, Pauli, Schlachter & Parker (briefly)

Findings

Habitat: Ferruginous hawk may be found throughout the West Mojave in winter, but prefers agricultural areas where prey is relatively abundant.

Current Distribution: Ferruginous hawk is relatively abundant in winter in the Antelope and Mojave Valleys, and is occasional elsewhere, such as at Mojave Narrows Regional Park.

Harper Dry Lake has been identified by the BLM as a Key Raptor Area for ferruginous hawk.

Threats: Electrocutation on electric transmission and distribution lines is a potential problem. Shooting remains a minor threat.

Current Management: Long-term conservation is provided at:

- Harper Dry Lake and Big Morongo Canyon Preserve ACECs; Coso Range, Darwin Falls and Sacatar Trail wilderness areas;
- King Clone and West Mojave Desert ecological reserves;
- Antelope Valley Poppy Reserve, Red Rock Canyon, Ripley Desert Woodland, and Saddleback Butte State parks;
- Joshua Tree National Park
- Camp Cady Wildlife Area.

BLM requires anti-perching devices on new and upgraded power poles as a condition of authorizing a right-of-way on public land.

Identified Shortfall: Data base to help define key raptor areas has not been maintained. Electrical transmission and distribution lines do not meet raptor-safe standards.

Biological Goals

Maintain wintering habitat. Prevent electrocution.

Authorized Take

No take of individuals should be allowed. Limited take of foraging habitat should be allowed throughout the planning area.

Conservation Strategy

Recommend that all construction of new electric utility lines be raptor-safe. The most important aspect is the spacing of the conductors, which should be greater than 6 feet (1.83 m), especially on poles with single crossbars. In addition, conductors can be insulated on corner and transformer poles. An alternative approach is the provision of perch guards to prevent perching on unsafe poles, or artificial perches above the conductors, which allow a safe landing place for eagles and large hawks. Existing electrical transmission and distribution lines located near regular ferruginous hawk wintering areas can be retrofitted to meet current design standards which prevent electrocution.

The BLM's Key Raptor Area database should be updated by conducting the periodic (5 year intervals) monitoring specified in the nationwide plan for raptors on public lands.

Retain agricultural zoning in the western Antelope Valley and Mojave Valley.

Permit Compliance Summary

Goal: Maintain wintering habitat. Prevent of electrocution.

Take: No take of individuals should be allowed. Limited take of foraging habitat should be allowed throughout the planning area.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Require raptor-safe electric lines. Maintain agricultural zoning.	Monitor hawk numbers at Harper Dry Lake, and in the Mojave and Antelope Valleys. Identify problem electrical towers.	If numbers decline, determine threats and take corrective action if problem stems from wintering habitat. Retrofit problem electrical towers.	Mountain plover.

Discussion: The management program addresses the threats by:

- eliminating the threat of electrocution by raptor-safe construction of new electric transmission and distribution lines.
- providing a continuation of use of the wintering habitat.

GOLDEN EAGLE (*Aquila chrysaetos*).

Status: Federal: None California: Fully Protected, Species of Special Concern

Date of Evaluation: April 2, 1998 BLM, Ridgecrest Field Office

Attendees: LaPré, Racine, Thompson, Jones, Pauli, Schlachter & Parker (briefly)

Findings

Habitat: Rugged and remote mountain ranges for nesting; forages over open desert in a range approaching 100 square miles.

Current Distribution: Golden eagle is widespread in mountainous areas of the planning area. The Argus Mountains are an important location for golden eagles. Within the China Lake NAWS Mojave B Range, the Eagle Crags provide outstanding habitat for golden eagle. The southern Sierra Nevada Mountains contain several golden eagle nest sites.

Where development has encroached on historical nesting sites, golden eagles sometimes make new nests on electrical transmission lines, as in Adelanto.

Threats: Few threats are known to the West Mojave populations of golden eagle. Protective management is in place at China Lake NAWS, and many of the nest sites are within Wilderness (e.g. Newberry Mountains, Owens Peak, Kiavah, Sacatar Trail). However, human disturbance at certain nest sites is a threat, and new mining projects occasionally threaten selected nest sites of golden eagle. Shooting remains a minor threat

Electrocution of golden eagles on electric transmission and distribution lines is a continuing problem.

Current Management: A nearly complete database of nest sites was established in 1978-1979 by the BLM. BLM has identified Key Raptor Areas at Red Mountain-El Paso Mountains and the Ord-Newberry Mountains for golden eagle. BLM requires anti-perching devices on new and upgraded power poles as a condition of issuing a right-of-way on public land.

Take is prohibited by the Fish and Game Code provisions governing fully protected

species. Take is also restricted by federal law (50CFR 22.25), and a permit is required prior to eliminating a nest site.

Long-term commitment to conservation is provided within the following designated areas:

- Afton Canyon, Big Morongo Canyon Preserve, Great Falls Basin , Harper Dry Lake, Jawbone/Butterbredt, and Rainbow Basin ACECS;
- Bright Star, Coso Range, Darwin Falls, El Paso, Golden Valley, Grass Valley, Kiavah, Argus Mountains, Owens Peak, and Sacatar Trail wilderness areas;
- Antelope Valley Poppy Reserve, Red Rock Canyon State Park, Ripley Desert Woodland, Saddleback Butte State Park, Camp Cady Wildlife Area;
- Indian Joe Spring, King Clone, West Mojave Desert ecological preserves; and
- Joshua Tree National Park.

Identified Shortfall: The BLM inventory of nest sites has not been maintained. Many utility lines do not meet raptor-safe standards. Certain nest sites face encroachment or disturbance from development, mining, or vehicles.

Biological Goals

Preserve all nest sites. Maintain the baseline number of territories.

Authorized Take

No take of individuals should be allowed. Unavoidable take of active nest sites should occur in the non-nesting season. Take of foraging habitat should be allowed throughout the planning area.

Conservation Strategy

Recommend that development projects stay 1/4 mile away from occupied nests where possible, unless the line-of-sight from the edge of development is obscured. No construction or disturbance within 1/4 mile of nest sites during the nesting season.

The following recommendations, developed for the prairie falcon, should be applied to golden eagle sites. Blasting should be avoided within 410 feet of occupied aeries and peak noise levels must not exceed 140 decibels at the aerie. No more than three blasts should take place on a given day nor more than ninety blasts during the nesting season.

All construction of new electric utility lines should be raptor-safe. The most important aspect is the spacing of the conductors, which should be greater than 6 feet (1.83 m), especially on poles with single crossbars. In addition, conductors could be insulated on corner and transformer poles. An alternative approach is the provision of perch guards to prevent perching on unsafe poles, or artificial perches above the conductors, which allow a safe landing place for eagles. Existing electrical transmission and distribution lines located within golden eagle territories could be retrofitted to meet current design standards which prevent electrocution.

Update the BLM's Key Raptor Area database by conducting the periodic (5 year intervals) monitoring specified in the nationwide plan for raptors on public lands.

Establish a new Key Raptor Area encompassing the Argus Mountains.

Purchase inholdings within designated Wilderness. The proposed BLM/Wildlands Conservancy acquisition would consolidate federal lands in the Newberry Mountains Wilderness.

Establish the Middle Knob ACEC, which would offer additional protection for eagle nests at that location.

Permit Compliance Summary

Goal: Preserve all nest sites. Maintain the baseline number of territories.

Take: No take of individuals should be allowed. Unavoidable take of active nest sites must occur in the non-nesting season. Take of foraging habitat should be allowed throughout the planning area.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Maintain 1/4 mile buffer from nest sites. Require raptor-safe electric lines. Observe blasting restrictions. Establish a new Key Raptor Area encompassing the Argus Mountains. No construction or disturbance within 1/4 mile of nest sites during the nesting season.	Conduct surveys to determine current activity at all nests present in 1979. Compile record of electrocutions. Update Key Raptor Area database.	Identify threats, if any, to selected nest sites and take corrective actions. Retrofit problem electrical towers.	Bighorn sheep. Inyo California towhee. Prairie falcon.

Discussion: The management program addresses the threats by:

- minimizing human disturbance at nest sites through seasonal closure of access roads at selected sites.
- minimizing potential conflicts by acquiring private lands within Wilderness.
- eliminating the threat of electrocution by raptor-safe construction of new electric transmission and distribution lines.

This strategy generally meets the objectives of the permit applicants by application of uniform mitigation requirements for projects affecting birds of prey.

INYO CALIFORNIA TOWHEE (*Pipilo crissalis eremophilus*)

Status: Federal: Threatened California: Endangered

Date of Evaluation: None

Findings

The Inyo California towhee is a narrow endemic whose range is almost entirely within the planning area. The Service has prepared a Recovery Plan and critical habitat has been designated. In 1998, an extensive survey of the entire range of this bird was conducted, and the findings were made available after the evaluation meetings were completed.

Habitat: The Inyo California towhee nests near riparian vegetation, including very small springs and seeps, and forages in mixed Mojave desert scrub. It ranges from 2680 feet to 5630 feet in elevation. All towhee sightings have been within 700 yards of a water source.

Current Distribution: This bird is restricted to the southern half of the Argus Range in Inyo County. The extent of occupied habitat has been estimated at 24,176 acres. This figure does not include mountainous areas between nesting territories that may be used for dispersal or in the non-nesting season.

Two thirds of the range of the Inyo California towhee falls within the boundaries of the China Lake NAWS. Current management is compatible with conservation of this bird, and the Resources Management Plan for the base will address conservation of this species. The remaining one third of the range is managed by BLM and the California Department of Fish and Game. These agencies have established the Great Falls Basin ACEC, the Argus Mountains Wilderness, and the Indian Joe Canyon Ecological Reserve.

The 1998 survey and census of the Inyo California towhee detected a total of 640 adult towhees, representing 317 breeding pairs and 23 single adults.

Threats: Destruction and degradation of habitat by feral burros and horses is a primary threat. Other potential threats include cattle grazing, off-highway vehicle activities, mining, and encroachment by rural residents.

Water exportation from occupied springs (Bainter Spring, Alpha Spring, Benko Spring, North Ruth Spring #3) is a current threat or potential threat.

Invasive exotic plants are present at some water sources used by towhees. These plants can displace native species, reducing the quality of the nesting habitat.

Trespass camping and hunting on China Lake NAWS near Benko Spring and North Ruth Spring may impact the birds and their habitat.

Current Management: Long-term commitment to conservation is provided at Indian Joe Spring Ecological Reserve, Great Falls Basin ACEC, and Argus Mountains Wilderness. Management actions have included removal of burros and horses; withdrawal of public land from mining (Argus Wilderness), acquisition of private land at Little Joe Spring; closure of motorized vehicle routes; and ongoing protection of water sources.

Identified Shortfall: Unresolved water diversion problems, and inadequate protection of water sources located within the China Lake NAWS from feral and domestic animals.

Biological Goals

Protect a viable population on public and military lands large enough to meet the Recovery Plan criteria for delisting. The Recovery Plan calls for delisting when the population has been sustained at a minimum level of 400 individuals for a five year period.

Authorized Take

Take should be allowed on private land at the edge of the towhee's range, such as at Crow Canyon. Less than 2% of the occupied habitat of the towhee is on private lands.

Conservation Strategy

Continue removal of feral burros from the Argus Mountains with a goal of zero (BLM and China Lake NAWS).

Reduce the wild horse population in Upper North Homewood Canyon, North Fork Water Canyon, and the upper portion of Side Canyon B of Water Canyon (all on China Lake NAWS).

Cease diversion of water at Benko Spring and North Ruth Spring #3 (within China Lake

NAWS). Determine legality and effect of water diversions at Alpha Spring and Bainter Spring and cease diversion if necessary. Secure water rights at all springs in Argus Mountains.

Exclosure fencing should be installed around springs at 12 designated sites (9 on China Lake NAWS and 3 on BLM lands). These sites should include the following:

- Site #1 in the canyon north of Sweetwater Wash.
- Site #1 in the canyon west of North Wilson Canyon.
- Sites #1 and #2 in the canyon east of North Wilson Canyon.
- Sites #6, #7, and Moscow Spring in the Moscow Spring complex.
- Site #9 of Side Canyon B of Homewood Canyon.
- Site #1 in Crow Canyon.
- Coyote Spring.
- Site #10 in Shepard Canyon.
- “Faultline” Springs.
- North Ruth Spring.
- Peach Spring.
- Sidehill Spring.

Remove salt cedar and *Phragmites* at designated springs and replant with native willows.

Install vehicle barriers at Christmas Spring, Nadeau Spring, North Ruth Spring, and Austin Spring. These BLM sites are disturbed by vehicle tracks and camping, and a method of directing the use away from the riparian vegetation must be devised.

Install signs indicating the China Lake NAWS boundary at Benko Spring and Ruby Spring.

Conduct surveys throughout the range of the Inyo California towhee every five years.

Permit Compliance Summary

Goal: Protect a viable population on public lands large enough to meet the Recovery Plan criteria for delisting.

Take: Take should be allowed on private land at the edge of the towhee's range. If all private lands were approved for incompatible development, at most two nesting pairs of towhees would be affected.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Protect water sources. Remove feral burros. Remove wild horses. Restrict vehicle and camping access near accessible occupied springs.	Conduct annual censuses to determine if Recovery Plan goals are met. Evaluate water diversions at New House Spring and Tennessee Spring. Monitor spread of tamarisk and <i>Phragmites</i>	If goals are met, initiate delisting. Secure water rights. Remove tamarisk and <i>Phragmites</i> as necessary.	Golden eagle. Panamint alligator lizard. Prairie falcon. Long-eared owl. Townsend's big-eared bat.

Discussion: The management program addresses the threats by:

- enhancement of the springs and seeps through removal of feral burros, removal of tamarisk and *Phragmites*, and removal of water diversions.
- restricting vehicle and camping access near accessible occupied springs.
- encouraging recovery of riparian vegetation by fencing selected springs.

The anticipated take is very small and is fully mitigated by application of proactive and remedial management measures on public and military lands. The delisting goal of the Recovery Plan for number of birds was attained in 1998, a year of above-average rainfall. Habitat improvements may allow the towhees to recover sufficiently so that this population size can be maintained in dry years.

LECONTE'S THRASHER (*Toxostoma lecontei*)

Status: Federal: None California: Species of Special Concern

Date of Evaluation: April 8, 1998 BLM Desert District Office, Riverside

Attendees: LaPré, Black, Pereksta, Haigh (briefly), Thompson, Jones, Davis

Findings

Habitat: Creosote bush scrub with stands of cholla cactus, Joshua trees, and thorny shrubs.

Current Distribution: LeConte's thrasher is widespread throughout the planning area, favoring areas of cacti, Joshua trees, and desert washes. It is absent from playas and

mountainous areas.

Threats: The primary threat is loss of habitat and fragmentation of habitat into segments too small to support a viable population in the long term.

LeConte's thrashers are sensitive to vehicle traffic during the nesting season, especially off-road travel in washes.

Current Management: Long-term conservation is provided by Joshua Tree National Park and a number of other ACECs, wilderness areas, and state parks. Within the broader range of this species, a lesser level of conservation is provided on BLM land designated "Limited" (Multiple-Use Class "L"), and within category I and II desert tortoise habitat in which sheep grazing has been discontinued.

Identified Shortfall: Need to reduce motorized vehicle access on public land throughout the range of the species, especially in washes during nesting.

Biological Goals

Conserve a large area capable of supporting viable populations in perpetuity. Outside the primary conservation area, the goal is maintenance of viable populations at all edges of its range.

Authorized Take

Take should be allowed within all planning area city limits and in all County areas outside the tortoise DWMAs. Development on county lands outside the DWMAs is estimated as 5% of the private lands. Within the DWMAs, a cap of 1% of the land area should limit the acreage of take.

Conservation Strategy

A large conservation area corresponding to that of the desert tortoise should be created.

Catellus Development Corporation lands should be acquired within the primary conservation zone. The BLM/Wildlands Conservancy proposal will acquire approximately 45,000 acres.

Reduce off-road vehicle routes within the conservation zone and on BLM lands that are known habitat for LeConte's thrasher.

Create an open space corridor between the San Bernardino Mountains and the Granite Mountains. This measure, also proposed for maintenance of dispersal habitat for bighorn

sheep, would include considerable acreage of high-quality LeConte's thrasher habitat.

Record all sightings of LeConte's thrashers when conducting biological studies for other species, e.g. desert tortoise. Compilation of sightings in the West Mojave GIS database has been an effective method of defining occupied habitat and establishing locations of the densest populations. Utilization of these data in the future may better define specific areas where more intensive vehicle management (route designation, law enforcement) is needed and where vehicle restrictions could be relaxed.

Permit Compliance Summary

Goal: Conserve a large area capable of supporting viable populations in perpetuity. Outside the DWMA, maintain viable populations at all edges of its range.

Take: Take should be allowed within all city limits and in all areas outside the DWMA. Within the DWMA, a cap of 1% of the land area should limit the acreage of take.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Reduction of off-road vehicle routes throughout the range. Acquire lands within conservation zone.	Continue compilation of records in West Mojave database.	Adjust boundaries of DWMA. Adjust route designations.	Bendire's thrasher. Desert tortoise. Mohave ground squirrel. Barstow woolly sunflower.

Discussion: The management program addresses the threats by:

- minimizing disturbance in occupied habitat through reduction of road network.
- creation of a large, central conservation area unfragmented by rural and urban development.

This strategy generally meets the objectives of the permit applicants by allowing development to proceed within city limits.

Without minimization and mitigation measures, habitat for LeConte's thrasher would continue to become fragmented with the potential for conservation of a large, contiguous habitat to be lost.

The anticipated take within cities and the 5% estimate of take in rural county areas is fully mitigated by creation of a very large central conservation area capable of supporting the

species in the long term. LeConte's thrashers would also be conserved within Edwards Air Force Base, Joshua Tree National Park, and areas conserved for Bendire's thrasher.

LONG-EARED OWL (*Asio otus*)

Status: Federal: None California: Species of Special Concern

Date of Evaluation: April 2, 1998 BLM, Ridgecrest Field Office

Attendees: LaPré, Racine, Thompson, Jones, Pauli, Schlachter & Parker (briefly)

Findings

Habitat: Riparian groves of willows and cottonwoods, stands of oaks in desert mountains, and dense stands of junipers are the preferred nesting habitat in the California desert. The long-eared owl disperses widely and can migrate long distances, and appears to exhibit low nest site fidelity. Therefore, protection of the woodland habitat is more important than protection of individual nest sites.

This species often roosts communally in the winter, preferring dense stands of trees, even plantings near human habitation.

Current Distribution: Long-eared owl has been found in several locations in the Argus Mountains, and is known to nest at the largest riparian sites in the West Mojave, including Big Morongo Reserve and Mojave Narrows Regional Park. Other recorded sites, presumably for nesting birds, are Leona Valley near Elizabeth Lake, and several sites near Lancaster. Communal winter roosts have been detected at Harper Dry Lake. An abundance of potential nest and roost sites are possible in the West Mojave; more specific information is needed on local distribution of this widespread species.

Threats: Flood control projects can impact or convert riparian habitat. Shooting remains a minor threat.

Current Management: Long-term conservation is provide at:

- Harper Dry Lake, Afton Canyon, Big Morongo Canyon Preserve, Sand Canyon, Jawbone/Butterbrecht, Short Canyon, and Desert Tortoise Natural Area ACECs;
- Bright Star, Coso Range, Darwin Falls, El Paso Mountain, Golden Valley, Kiavah, Owens Peak, Sacatar Trail, and Grass Valley wilderness areas;
- Red Rock Canyon State Park;
- Indian Joe Springs Ecological Reserve

- Joshua Tree National Park.

Identified Shortfall: Data base to help define key roosting/nesting areas has not been maintained. Population trends are poorly known.

Biological Goals

Preserve all nest sites and communal roosts.

Authorized Take

No take of individuals should be allowed. Take of foraging habitat should be allowed throughout the planning area.

Conservation Strategy

Recommend that development projects stay 1/4 mile away from occupied nests, unless the line-of-sight from the edge of development is obscured. No construction or disturbance should be allowed within 1/4 mile of nest sites during the nesting season.

Establish a new Key Raptor Area encompassing the Argus Mountains for the long-eared owl. Conduct monitoring at five year intervals and report to the national raptor database.

Permit Compliance Summary

Goal: Preservation of all nest sites and communal roosts.

Take: No take of individuals should be allowed. Take of foraging habitat should be allowed throughout the planning area.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Maintain 1/4 mile buffer from nest sites. Avoid construction within 1/4 mile of nests during nesting season.	Conduct periodic censuses at Argus Mountains, Mojave Narrows Park, Big Morongo ACEC.	Protect newly discovered nest and communal roost sites.	Bighorn sheep. Inyo California towhee. Riparian birds.

Discussion: The management program addresses the threats by:

- minimizing human disturbance at nest sites.

MOUNTAIN PLOVER (*Charadrius montanus*)

Status: Federal: Proposed as Threatened

California: Species of Special Concern

Date of Evaluation: April 8, 1998 BLM Desert District Office, Riverside

Attendees: LaPré, Black, Pereksta, Haigh (briefly), Thompson, Jones, Davis

Findings

Habitat: Mountain plovers do not nest within the planning area.

Mountain plovers are found almost exclusively in plowed or burned agricultural fields in winter. Original, ancestral wintering habitat is not well defined, but is thought to be edges of playas with short ground cover, such as alkali sink scrub.

Current Distribution: Mountain plovers are found in relatively limited portions of the agricultural area in western Antelope Valley near the Kern - Los Angeles County line. They have also been recorded at Harper Dry Lake, primarily in the fallow agricultural fields. Potential habitat exists along the Mojave River near Helendale and in the Mojave Valley.

Threats: Threats are unknown in wintering areas. Exposure to pesticides is a possible, but unproven threat. Loss of native habitat is believed to be a threat.

Current Management: Long-term conservation on public lands is provided by the Harper Dry Lake ACEC. Actions to conserve habitat on private lands have not been provided.

Identified Shortfall: Lack of information on threats to the wintering habitat, fidelity to specific agricultural areas, and use of natural playas.

Biological Goals

Maintain and enhance wintering habitat.

Authorized Take

There should be no take of individuals. Limited take of foraging habitat should be allowed throughout the planning area.

Conservation Strategy

Current agricultural zoning should be maintained in the western Antelope Valley and

Mojave Valley.

Continue monitoring of wintering populations to determine site fidelity of wintering plovers and to estimate the significance of the West Mojave populations to the species as a whole.

Adaptive management will be important for this species, as more is learned of the threats to West Mojave habitat. Continuing consultation with the Service is recommended. At a minimum, there should be annual meetings to review the adequacy of management measures. These meetings should take place after the annual monitoring is completed.

Permit Compliance Summary

Goal: Maintenance and enhancement of wintering habitat.

Take: No take of individuals. Limited take of foraging habitat should be allowed throughout the planning area.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Maintain agricultural zoning.	Census plover numbers at Harper Dry Lake, and in the Mojave and Antelope Valleys.	If site fidelity is high, target those areas for continuation of agricultural uses.	Ferruginous hawk. Northern harrier. Short-eared owl.

Discussion: The management program addresses the threats by:

- providing a continuation of use of the agricultural wintering habitat.

NORTHERN HARRIER (*Circus cyaneus*)

Status: Federal: None California: Species of Special Concern

Date of Evaluation: April 2, 1998 BLM, Ridgecrest Field Office

Attendees: LaPré, Racine, Thompson, Jones, Pauli, Schlachter & Parker (briefly)

Findings

Habitat: Northern harrier can be found throughout the West Mojave in the winter, although it is most frequently seen near agricultural areas and seasonal wetlands. Nesting sites are limited to locations with year-round marsh habitat or, in wet years, areas with wetlands persisting throughout the nesting season.

Current Distribution: Northern harrier appears to nest on Edwards AFB at Piute Ponds. Harper Dry Lake is an important wintering area, and has been identified by the BLM as a Key Raptor Area for northern harrier.

Threats: Insufficient water supply to permanent and seasonal wetlands is a problem in many areas, including Harper Dry Lake. Shooting remains a minor threat.

Current Management: Long-term conservation of nesting sites is limited to Harper Dry Lake ACEC and Piute Ponds located on Edwards AFB. Long-term conservation for wintering birds is provided potentially at a number of riparian ACECS and within designated wilderness areas located in the West Mojave region.

Identified Shortfall: Lack of dependable source of water on Harper Dry Lake. Inventory of nesting sites has not been maintained.

Biological Goals

Preserve all nest sites. Maintain and enhance wintering habitat.

Authorized Take

No take of individuals should be allowed. Take of foraging habitat should be allowed throughout the planning area.

Conservation Strategy

Recommend no construction or disturbance within 1/4 mile of nest sites during the nesting season.

Suggest that a permanent water supply be obtained to the marshes at Harper Dry Lake ACEC.

BLM's Key Raptor Area database should be updated by conducting the periodic (5 year intervals) monitoring specified in the nationwide plan for raptors on public lands.

Permit Compliance Summary

Goal: Preservation of all nest sites. Maintenance and enhancement of wintering habitat.

Take: No take of individuals should be allowed. Take of foraging habitat should be allowed throughout the planning area.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Maintain 1/4 mile buffer from nest sites. No construction or disturbance within 1/4 mile of nest sites during the nesting season.	Periodically census nesting and wintering numbers at Harper Dry Lake and Piute ponds.	If threats to nest sites arise, take corrective action, such as limiting access.	Short-eared owl. Snowy plover.

Discussion: The management program addresses the threats by:

- minimizing human disturbance at nest sites.

PRAIRIE FALCON (*Falco mexicanus*)

Status: Federal: None California: Species of Special Concern

Date of Evaluation: April 2, 1998 BLM, Ridgecrest Field Office

Attendees: LaPré, Racine, Thompson, Jones, Pauli, Schlachter & Parker (briefly)

Findings

Habitat: The prairie falcon is found throughout the West Mojave, although it generally avoids urbanized areas. Nests are located on cliffs in rugged mountain ranges, often within 1/2 mile of a water source. Mountain ranges near agricultural areas also are favored because of increased prey density near nest sites.

In winter, birds disperse widely, and are joined by migratory birds from northern latitudes.

Current Distribution: Prairie falcons are widespread in mountainous areas of the planning area.

Threats: Human disturbance at certain prairie falcon nest sites is a threat. New mining projects occasionally threaten selected nest sites of prairie falcon.

Robbing of nest sites for falconry was a threat in the past, but availability of captive-raised birds has virtually eliminated this problem.

Urbanization surrounding an historical eyrie gradually degrades the foraging habitat and increases disturbance at the nest site. One of the known nest locations for prairie falcon at Lovejoy Butte is no longer occupied for these reasons.

Current Management: A nearly complete database of nest sites was established in 1978-

1979 by the BLM. Key Raptor Areas have been identified by the BLM, in the Red Mountain-El Paso Mountains and the Ord-Newberry Mountains. Long-term commitment to conservation is provided within the following designated areas:

- Great Falls Basin, Trona Pinnacles, Jawbone/Butterbrecht, Cronese Lakes and Rainbow Basin ACECS;
- Black Mountain, Newberry, Rodman, Coso Range, Darwin Falls, El Paso, Argus Mountains wilderness areas, and Cady Mountains wilderness study area;
- Antelope Valley Poppy Reserve, Red Rock Canyon State Park, Ripley Desert Woodland, Saddleback Butte State Park, Camp Cady Wildlife Area;
- Indian Joe Spring, King Clone, and West Mojave Desert ecological preserves
- Joshua Tree National Park.

Identified Shortfall: BLM's inventory of nesting sites has not been maintained. Encroachment and disturbance, including vehicular access, near nesting sites should be further restricted especially during the nesting season. Target shooting is not restricted within a reasonable distance of nesting sites.

Biological Goals

Preserve all nest sites. Maintain the baseline number of occupied territories.

Authorized Take

No take of individuals should be allowed. Unavoidable take of active nest sites should occur in the non-nesting season. Take of foraging habitat should be allowed throughout the planning area.

Conservation Strategy

Recommend that development projects stay 1/4 mile away from occupied nests, unless the line-of-sight from the edge of development is obscured. Recommend that no construction or disturbance be allowed near nest sites during the nesting season.

Blasting should be restricted near nest sites. Blasting should be avoided within 410 feet of occupied aeries and peak noise levels must not exceed 140 decibels at the aerie. No more than three blasts should take place on a given day nor more than ninety blasts during the nesting season.

Target shooting should not be allowed within ½ mile of nest sites.

Suggest restricting vehicle access at selected locations. BLM should enforce road closure where practical (e.g. Robber's Roost, Owl Canyon).

Update the BLM's Key Raptor Area database by conducting the periodic (5 year intervals) monitoring specified in the nationwide plan for raptors on public lands.

Establish a new Key Raptor Area encompassing the Argus Mountains.

Establish the Middle Knob ACEC, which would offer additional protection for prairie falcon nests at that location.

Permit Compliance Summary

Goal: Preservation of all nest sites. Maintain the baseline number of occupied territories.

Take: No take of individuals. Unavoidable take of active nest sites should occur in the non-nesting season. Take of foraging habitat should be allowed throughout planning area.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Avoid nesting season. Maintain 1/4 mile buffer from nest sites. Restrict vehicle access at selected locations. Require raptor-safe electric lines. Observe blasting restrictions. Acquire private land within Wilderness.	Conduct surveys to determine current activity at all nests present in 1979. Update Key Raptor Area databases.	Identify threats, if any, to selected nest sites and take corrective actions.	Bighorn sheep. Inyo California towhee. Golden eagle.

Discussion: The management program addresses the threats by:

- minimizing human disturbance at nest sites through seasonal closure of access roads at selected sites.
- minimizing potential conflicts by acquiring private lands within wilderness.
- Imposing blasting restriction at mine sites near falcon nests.

This strategy generally meets the objectives of the permit applicants by application of uniform mitigation requirements for projects affecting birds of prey.

SHORT-EARED OWL (*Asio flammeus*).

Status: Federal: None California: Species of Special Concern

Date of Evaluation: April 2, 1998 BLM, Ridgecrest Field Office

Attendees: LaPré, Racine, Thompson, Jones, Pauli, Schlachter & Parker (briefly)

Findings

Habitat: Marshes and seasonal wetlands.

Current Distribution: Short-eared owl appears to nest on Edwards AFB at Piute Ponds. A large flock was observed in the winter at Cronese Basin ACEC in 1977.

Threats: Disturbance at nest sites is a threat.

Current Management: Long-term commitment to conservation is provide at the Harper Dry Lake ACEC (a key location in the West Mojave area); the Cronese Lakes and Jawbone/Butterbredd ACECs; the Antelope Valley Poppy Reserve, the Ripley Desert Woodland State Parks, and the Camp Cady Wildlife Area.

Identified Shortfall: Lack of dependable source of water on Harper Dry Lake. Inventory of nesting sites has not been maintained.

Biological Goals

Preserve all nest sites.

Authorized Take

No take of individuals should be allowed. Take of foraging habitat should be allowed throughout the planning area.

Conservation Strategy

Continue protective management of Piute ponds at Edwards AFB.

A permanent water supply to the marshes at Harper Dry Lake ACEC should be obtained.

Permit Compliance Summary

Goal: Preservation of all nest sites.

Take: No take of individuals should be allowed. Take of foraging habitat should be

allowed throughout the planning area.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Avoid disturbance during nesting season. Maintain 1/4 mile buffer from nest sites. Obtain a permanent water supply to the marshes at Harper Dry Lake ACEC.	Conduct periodic nesting censuses at Piute Ponds and Harper Dry Lake. Monitor water levels at Harper Dry Lake.	If threats develop to nest locations, reduce disturbance, increase law enforcement. Obtain additional water source for marsh if necessary.	Snowy plover. Northern harrier.

Discussion: The management program addresses the threats by:

- minimizing human disturbance at nest sites.
- enhancement of nesting habitat at Harper Dry Lake.

WESTERN SNOWY PLOVER (*Charadrius alexandrinus*)

Status: Federal: None. Pacific Coast populations are Threatened
California: Species of Special Concern

Date of Evaluation: April 8, 1998 BLM Desert District Office, Riverside

Attendees: LaPré, Black, Pereksta, Haigh (briefly), Thompson, Jones, Davis

Findings

Habitat: The Western snowy plover nests in the West Mojave on certain playas and wetland areas. Most appear to depart for the winter, but migrants and wintering birds are known from a few localities. They favor playas, seasonal wetlands, and sewage treatment ponds or ponds managed for wintering waterfowl.

Current Distribution: Western snowy plover appears to nest with regularity on Edwards AFB at Piute Ponds. Other reported nest locations are Harper Dry Lake, Koehn Lake, China Lake, Rosamond Lake, Dale Lake, and the evaporation ponds at the Edison facility in Daggett, although the birds may not use these sites every year. Suspected nesting habitat is found along the shoreline at Searles Lake. All of these sites may be used by this bird in winter.

Threats: Nests are vulnerable to human disturbance, including vehicle traffic and pets.

Insufficient water supply to permanent and seasonal wetlands is a problem in many areas, including Harper Dry Lake. Rising water levels that inundate nests is a problem at

managed ponds and during exceptional wet years at natural playas.

Snowy plovers are very susceptible to predators, including ravens, coyotes, foxes, and feral dogs and cats.

Current Management: Long-term conservation provided at Cronese Lakes ACEC and Harper Dry Lake ACEC.

Identified Shortfall: Lack of dependable source of water on Harper Dry Lake. Lack of survey data on nesting sites in on public lands, particularly at Koehn, Dale, and Searles dry lakes.

Biological Goals

Preserve all nest sites. Maintain and enhance nesting and wintering habitat on public and military lands.

Authorized Take

Take should be allowed on private lands throughout the planning area. Development pressure on the playa edge nesting habitat is minimal and sometimes compatible, such as at the former Saltdale site.

Conservation Strategy

Because the current occupied nesting habitat for snowy plover is not well known, much of the conservation for this species will be a result of adaptive management.

Continue compatible management of Piute ponds at Edwards AFB.

Census populations at Koehn Lake, Searles Lake, China Lake, Cronese lakes, Dale Lake, and Harper Dry Lake to determine occupied nesting areas. If nesting populations are discovered, restrict human and vehicle disturbance for a distance of 1/8 mile from nest sites during the nesting season (April 1 - August 1).

Suggest that a permanent water supply be obtained to the marshes at Harper Dry Lake ACT.

Projects in nesting habitat should allow the birds to complete the nesting season before construction begins.

Permit Compliance Summary

Goal: Preservation of all nest sites on public land with protection from human disturbance.

Take: Take should be allowed on private lands throughout the planning area.

Minimization & Mitigation	Monitoring	Adaptive Management	Other Species
Maintain 1/8 mile buffer from nest sites. No construction or disturbance within 1/4 mile of nest sites during the nesting season.	Conduct periodic censuses of Dale, Koehn, and Searles lakes.	Close playa edges to vehicular traffic in spring if nest sites are located.	Short-eared owl. Northern harrier. Alkali mariposa lily.

Discussion: The management program addresses the threats by:

- minimizing human disturbance at nest sites.
- identifying the occupied habitat through monitoring

PART D COVERED PLANTS

[Findings and recommendations of this part are currently being developed by the planning team, the Department and the Service. When completed, this material will be provided to the Supergroup. Plants which will be addressed include the following:

- Alkali mariposa lily
- Barstow woolly sunflower
- Carbonate endemics
- Clokey's cryptantha
- Crucifixion thorn
- Desert Cymopterus
- Kelso creek monkeyflower
- Lancaster milk vetch
- Lane mountain milkvetch
- Little San Bernardino Mountains gilia
- Mojave monkeyflower
- Mojave tarplant
- Parish's alkali grass
- Parish's phacelia
- Pygmy Poppy
- Salt Spring checkerbloom
- Shockley's rock cress
- Short-joint beavertail cactus
- White-margined beardtongue]

CHAPTER FIVE

VOLUNTARY CONSERVATION

These species can be protected by existing management or by specific voluntary conservation and management actions of the federal and state agencies or the private sector. Many occur only on federal lands; consequently, they lie outside the incidental take permit area and cannot be “covered” by a section 10a or section 2081 permit. Most are not listed species and are not subjects of a federal section 7 consultation. The BLM, National Park Service, and the military should voluntarily protect these species on public lands in order to prevent future listings. Others are restricted to state lands and should be protected within parks or ecological reserves. Some are single location disjuncts, or species with very small ranges that can be voluntarily conserved in place without extraordinary measures. No take is anticipated for these localized species.

Part A

Confined to Federal or State Lands; Protection in Place

Seventeen species (1 reptile, 1 mammal, and 15 plants) were found to occur entirely on federal or state lands. Threats to these species are minimal, and the protections in place are considered adequate for their long-term conservation within the planning area.

ARGUS MOUNTAINS KANGAROO RAT (*Dipodomys panamintinus argusensus*)

Status: Federal: FWS Species of Concern. California: None

Date of Evaluation: October 22, 1998 CDFG Bishop office
November 4, 1998 FWS Ventura office

Attendees: LaPré, Racine, Bransfield

Findings

This subspecies may be of doubtful validity, and clarification of the taxonomic status is needed. No threats identified, but possible impacts of cattle grazing should be determined.

Habitat: The habitat has not been defined.

Current Distribution: This subspecies is known only from the type specimen at the type locality, which is within China Lake NAWS.

Voluntary Conservation Measures

- Continue compatible management of the type locality. Encourage research by specialists to determine the validity of the subspecies.

PANAMINT ALLIGATOR LIZARD (*Elgaria panamintina*)

Status: Federal: FWS Species of Concern California: Species of Special Concern

Date of Evaluation: April 14, 1998 Riverside BLM District Office

Attendees: LaPré, Nicol, Black

Findings

Because this species is not known from private lands within the planning area, it is not subject to permit under the HCP. Because it is not a listed species, it is not the subject of a section 7 consultation. This species should be protected by state and federal agencies under a voluntary conservation agreement.

Habitat: Canyon bottoms and talus slopes near springs and riparian drainages.

Current Distribution: Only four documented records exist for the Panamint alligator lizard within the planning area, at Margaret Ann Spring (2 records), Haiwee Spring, and Water Canyon, all on the China Lake NAWS. Other canyons in the Argus Mountains on the base and off the base within the Great Falls Basin ACEC (BLM), Argus Mountains Wilderness (BLM) and Indian Joe Spring Ecological Reserve (CDFG) support similar vegetation and have been mapped as potential habitat. All known and potential habitat occurs on federal and state lands.

The distribution of this secretive species is not well known. Within the planning area, only the Argus Mountains are thought to provide suitable habitat. The White Mountains and Nelson Mountains to the north and the Panamint Mountains to the east support the majority of the populations of this lizard, as far as is known.

Voluntary Conservation Measures

- Protect this species on public and military lands through compatible management.
- Disallow water diversions.
- Continue program of removal of feral burros in Argus Mountains.
- Restrict military operations which may impact wetland vegetation near springs.
- Report all sightings to the Natural Diversity Data Base.

SOUTHERN SIERRA WILDERNESS PLANTS - 8 Species. ERTTER'S MILKVETCH (*Astragalus erterae*), **HALL'S DAISY** (*Erigeron aequifolius*), **MUIR'S RAILLARDELLA** (*Raillardiopsis muirii*), **OWENS PEAK LOMATIUM** (*Lomatium shevockii*), **SWEET-SMELLING MONARDELLA** (*Monardella beneolens*), **DEDECKER'S CLOVER** (*Trifolium dedeckerae*), **GILLMAN'S GOLDENBUSH** (*Ericameria gilmanii*), **THE NEEDLES BUCKWHEAT** (*Erigonum breedlovei* var. *Shevockii*).

Status: Federal: Ertter's milkvetch, Owens Peak lomatium – FWS Species of Concern.
Hall's daisy, Muir's raillardella, sweet-smelling monardella, Dedecker's clover,
Gillman's goldenbush, The Needles buckwheat - None
California: None

Date of Evaluation: By mail beginning June 17, 1998

Attendees: LaPré, Black, Rutherford, Showers, Thomas, Meyer

Findings

These species occupy higher elevations of the southern Sierra Nevada Mountains at the northwestern edge of the planning area. Some are narrow endemics with few known sites; others are more widespread with locations from the adjoining National Forest lands. No current threats were identified, although previous work on the Pacific Crest Trail damaged populations of some species. This has led to a program of modified trail maintenance and monitoring of the sites by the Ridgecrest Resource Area of the BLM. The sites are remote, requiring a 7 mile one-way hike, and are not affected by cattle grazing, vehicles, or timber sales.

Habitat: Peaks and ridges between 6,000 and 8,000' elevation in the southern Sierra Nevada Mountains.

Current Distribution: Within the planning area, all are found on federal lands in the Owens Peak Wilderness. Botanists working for China Lake NAWS have recently discovered Dedecker's clover at a single location on the NAWS.

Voluntary Conservation Measures

- Continue the BLM program of education of trail maintenance volunteers. Monitor populations at least once every two years and report findings to the NDDB and the Service.
- Continue botanical searches and monitoring of the location for Dedecker's clover at China Lake NAWS.

EL PASO MOUNTAINS ENDEMIC PLANTS - 2 Species. RED ROCK TARPLANT
(*Hemizonia arida*). **TWISSELMAN'S (RED ROCK) POPPY** (*Eschscholtzia minutiflora* ssp.
twisselmannii)

Status: Federal: FWS Species of Concern

California: Red Rock tarplant – Rare. Red Rock poppy – None.

Date of Evaluation: June 23, 1998 FWS Ventura office

Attendees: Showers, Rutherford, Thomas, Bransfield, Meyer, LaPre

Findings

These two species are very local endemics whose entire range is within the planning area. Both were recently described as separate taxa, the tarplant in 1958 and the poppy in 1991.

Habitat: Red Rock tarplant occupies seeps, springs, and seasonally moist alluvium within the arid creosote bush scrub community. Red Rock poppy may prefer rhyolite tuffs and granitically derived soils, which are common in the area, but the habitat requirements are not defined.

Current Distribution: Red Rock tarplant is found only in Red Rock Canyon and Last Chance Canyon within the State Park. Red Rock poppy is primarily confined to the park, although a few locations have been reported from BLM lands as far west as Searles Station.

Voluntary Conservation Measures

- Continue the protective management and monitoring of these plants at Red Rock Canyon State Park.

DEATH VALLEY ROUNDEAF PHACELIA (*Phacelia mustelina*)

Status: Federal: None. California: None

Findings

This species is not rare, threatened, or endangered, nor a federal species of concern. It was included on the West Mojave list of species based on the California Native Plant Society ratings (List 1B, RED 2-1-2).

Habitat: Gravelly or rocky slopes within creosote bush scrub or pinyon-juniper woodland communities at 3000 – 6300' elevation. The species appears to be non soil-specific. It grows in cracks of boulders and rock outcrops, regardless of the geologic origin.

Current Distribution: A single NDDDB record for this species within the planning area is located in the Coso Mountains on China Lake NAWS. More recent surveys have relocated Death Valley roundleaf phacelia on the base in the same location.

Voluntary Conservation Measures

- Continue management at China Lake NAWS compatible with the conservation of this species.
- Conduct periodic monitoring of the location to determine the numbers and extent of the population.

INYO HULSEA (*Hulsea vestita* ssp. *inyoensis*)

Status: Federal: None California: None

Findings

This species is not rare, threatened, or endangered, nor a federal species of concern. It was included on the West Mojave list of species based on the California Native Plant Society ratings (List 2, RED 2-2-1).

Habitat: This species is known from eastern California and western Nevada, where it occurs on steep rocky slopes of desert ranges.

A single record exists for the planning area, a collection by Coville in 1891 from the Coso Mountains. This location is within the China Lake NAWS. Efforts to relocate this population have been unsuccessful.

Voluntary Conservation Measures

- The locality in the Coso Mountains is in an area managed by the Navy in a manner compatible with its conservation. This protection should continue. Any new sightings should be reported to the California Natural Diversity Data Base.
- Because so little is known about this species, especially in the southern portion of its range, biologists should be made aware of its potential occurrence and requested to report botanical findings (positive or negative) when performing surveys in suitable habitat.

MOJAVE MILKVETCH (*Astragalus mojavensis*)

Status: Federal: FWS Species of Concern (for var. *hemigyus*) California: None

Findings

This species is known from a single record (of var. *hemigyus*) on Darwin Mesa in 1941. The plant is believed to be extirpated in California and is proposed as critically endangered in Nevada. Botanical searches at China Lake NAWS have not located the subspecies, but *A. m. mojavensis* has been found in the Argus Mountains.

Habitat: Limestone outcrops from 3800 – 5000' elevation.

Current Distribution: Known from a single historical location in Inyo County on Darwin Mesa.

Voluntary Conservation Measures

- BLM should assure that the single location is protected from disturbance and conduct periodic surveys to determine if this species can be relocated.

NINE MILE CANYON PHACELIA (*Phacelia novemmillensis*)

Status: Federal: FWS Species of Concern. California: None

Findings

Habitat: Found in sandy, gravelly, or rocky soils in the understory of pinyon and/or canyon live oak.

Current Distribution: Nine Mile Canyon phacelia is a narrow endemic species of the mountain crest in the southeast headwaters of the Kern River watershed (Chimney Creek) and on upper slopes of the adjacent east-facing canyons in the southern Sierra Nevada Mountains. The majority of this species range within the planning area is in the Owens Peak Wilderness at the upper elevations of Nine Mile Canyon.

Voluntary Conservation Measures

- Revisit the Sand Canyon location for this species to confirm the identification of the phacelias.
- Periodic monitoring of the type locality on Nine Mile Canyon should be conducted, with evaluation of the effects of grazing on the populations.

SMALL-FLOWERED ANDROSTEPHIUM (*Androstephium breviflorum*)

Status: Federal: None California: None

Findings

This species is not rare, threatened, or endangered, nor a federal species of concern. It was included on the West Mojave list of species based on the California Native Plant Society ratings (List 2, RED 3-1-1).

Small-flowered androstephium is very poorly known. No current threats have been identified. Construction of Interstate 15 at Midway destroyed portions of a population in the past. The proposed expansion of Fort Irwin could impact populations southeast of the existing base boundary.

Habitat: Open sandy flats and bajadas at low to moderate elevations within the creosote bush scrub community. Small-flowered androstephium is often found in stabilized blowsand.

Current Distribution: The majority of the known range is to the east, from the Needles area through southern Nevada and southern Utah to western Colorado and south to northern Arizona. In the planning area, only three populations are known, all on remote federal (BLM) lands.

Voluntary Conservation Measures

- Consider further botanical searches at Twentynine Palms MCAGCC and Fort Irwin to better define the range of this species in the planning area.
- Protection of known sites and monitoring of populations is recommended. Periodic censuses of plants at the known sites in Cronese Valley would better define year-to-year variation.

Part B **Adequately Protected or No Take Anticipated**

Nine species are adequately protected by the current management situation or could be with relatively minor conservation actions, such as continued monitoring. In some cases, laws governing modification of wetlands serve to limit alteration of the preferred habitat.

Two plant species are so vulnerable to extinction that the agencies recommend that no take be allowed. These species can be protected by voluntary conservation measures,

including measures enacted by governing jurisdictions for private lands.

Federally listed species may be covered under section 7 consultation, even though no take is anticipated.

YELLOW-EARED POCKET MOUSE (*Perognathus xanthonotus*)

Status: Federal: BLM Sensitive California: None

Findings

Although relatively little is known of the habitat requirements and distribution of the yellow-eared pocket mouse, most of its range is on public lands. Several areas are managed as ACEC's by the BLM. Take of this species on private land is expected to have non-significant impacts to the species overall.

Habitat: This rodent occurs primarily in sandy soils with moderate shrub cover within Joshua tree woodland, desert scrub, pinyon-juniper, and desert chaparral communities. Elevational range is 3380 – 5300 feet.

Current Distribution: Most of the range of the yellow-eared pocket mouse is within the planning area on the eastern slope of the Sierra Nevada Mountains. The species is known from Kelso Valley on the south to Sand Canyon on the north, and apparently suitable, unsurveyed habitat exists both north and south of its defined range.

Voluntary Conservation Measures

- BLM should continue its program of inventory surveys for this species in the Sand Canyon, Short Canyon, and Jawbone-Butterbredt ACECs. Studies should direct attention to the potential affects of grazing on the species and its habitat.

BROWN-CRESTED FLYCATCHER (*Myiarchus tyrannulus*)

Status: Federal: None California: Species of Special Concern

Date of Evaluation: April 8, 1998 Riverside BLM District Office

Attendees: LaPré, Black, Pereksta, Haigh (briefly), Thompson, Jones, Davis

Findings

The brown-crested flycatcher is habitat-dependent and conservation of habitat generally protects the species. It is a species of special concern in California because of its limited range in the state and restricted habitat.

Existing management of Big Morongo Preserve is adequate for this species.

Existing management at Cushenbury Springs by the private landowner is adequate.

Management in accordance with the Biological Opinion on San Bernardino County's Floodplain Management Plan for the Mojave River will be adequate for the Mojave River localities. However, the Biological Opinion does not cover the brown-crested flycatcher and a significant acreage of unsurveyed habitat exists between Interstate 15 and Helendale.

Modification of riparian and wetland habitat requires permits under the federal Clean Water Act from the Corps of Engineers and Streambed Alteration Agreements from the California Department of Fish and Game. These regulations will remain the primary method of protection of the riparian habitat along the Mojave River. Additional survey data would be very beneficial, however, to determine the best ways to provide advice on avoidance, mitigation, and compensation.

Habitat: This species occupies riparian forest found along major streams, springs, and other wetlands within the planning area.

Current Distribution: Occurrences are limited to discrete locations within the planning area, especially the Mojave River at Victorville, and Big Morongo Preserve. It has also nested, although not every year, at Cushenbury Springs.

Voluntary Conservation Measures

- For the occurrence on private land at Cushenbury Spring, retention of the riparian habitat in its current situation is adequate for the protection of brown-crested flycatcher.
- Conduct surveys of the riparian habitat in the Mojave River from Interstate 15 downstream to Helendale. Report locations to the Natural Diversity Data Base.
- Prohibit clearing of riparian habitat during the nesting season

LEAST BELL'S VIREO (outside Mojave River)

Status: Federal: Endangered California: Endangered

Date of Evaluation: April 14, 1998 Riverside BLM District Office

Attendees: LaPré, Nicol, Black

Findings

The least Bell's vireo is habitat-dependent and conservation of habitat generally protects

the species.

The goal for desert populations of this species is protection of all remaining occupied habitat (no take).

Existing management of Big Morongo Preserve is adequate for this species.

Management in accordance with the Biological Opinion on San Bernardino County's Floodplain Management Plan for the Mojave River will be adequate for the Mojave River localities subject to clearing by San Bernardino County.

Modification of riparian and wetland habitat requires permits under the federal Clean Water Act from the Corps of Engineers and Streambed Alteration Agreements from the California Department of Fish and Game. These regulations will remain the primary method of protection of the riparian habitat along the Mojave River. Additional survey data would be very beneficial, however, to determine the best ways to provide advice on avoidance, mitigation, and compensation.

Habitat: This species occupies riparian forest found along major streams, springs, and other wetlands within the planning area.

Current Distribution: Occurrences are limited to discrete locations within the planning area, especially the Mojave River at Victorville and at Big Morongo Preserve. Nesting has also been reported in the Leona Valley near Elizabeth Lake.

Voluntary Conservation Measures

- Recommend that Los Angeles County and City of Palmdale require focused surveys for this species as part of the environmental review process for developments proposed for lands in Leona Valley containing riparian and wetland habitat. Conditions of approval protecting nesting vireos and their habitat should be required.
- Conduct surveys of the riparian habitat in the Mojave River from Interstate 15 downstream to Helendale. Report locations to the Natural Diversity Data Base. Although the areas periodically cleared by San Bernardino County are covered by a Biological Opinion, survey information is needed to insure that future projects along the river do not impact this species.
- Prohibit clearing of riparian habitat during the nesting season.

SUMMER TANAGER (*Piranga rubra*)

Status: Federal: None California: Species of Special Concern (Nesting)

Date of Evaluation: April 8, 1998 BLM Desert District Office, Riverside

Attendees: LaPré, Black, Pereksta, Haigh (briefly), Thompson, Jones, Davis

Findings

The summer tanager is habitat-dependent and conservation of habitat generally protects the species. It is a species of special concern in California because of its limited range in the state and restricted habitat.

Existing management of Big Morongo Preserve is adequate for this species at that location. Existing management at Cushenbury Springs and Big Rock Creek by the private landowners is adequate.

Management in accordance with the Biological Opinion on San Bernardino County's Floodplain Management Plan for the Mojave River will be adequate for the Mojave River localities. However, the Biological Opinion does not cover the summer tanager and a significant acreage of unsurveyed habitat exists between Interstate 15 and Helendale.

Modification of riparian and wetland habitat requires permits under the federal Clean Water Act from the Corps of Engineers and Streambed Alteration Agreements from the California Department of Fish and Game. These regulations will remain the primary method of protection of the riparian habitat along the Mojave River. Additional survey data would be very beneficial, however, to determine the best ways to provide advice on avoidance, mitigation, and compensation.

Habitat: Riparian forest found along major streams, springs, and other wetlands within the planning area.

Current Distribution: Occurrences are limited to discrete locations within the planning area, especially the Mojave River at Victorville, at Big Morongo Preserve, and at Big Rock Creek near Valyermo. It has also nested, although not every year, at Cushenbury Springs and at Camp Cady and the Yucca Valley golf course.

Voluntary Conservation Measures

- For the occurrences on private land at Cushenbury Spring and Big Rock Creek, retention of the riparian habitat in its current situation is adequate for the protection of summer tanager.
- Acquisition of lands near Big Rock Creek is recommended for the protection of

San Diego horned lizard and short-joint beavertail cactus. If this conservation area is established, it would offer additional protection for the summer tanager.

- Conduct surveys of the riparian habitat in the Mojave River from Interstate 15 downstream to Helendale. Report locations to the Natural Diversity Data Base.
- Prohibit clearing of riparian habitat during the nesting season.

VERMILION FLYCATCHER (*Pyrocephalus rubinus*)

Status: Federal: None California: Species of Special Concern

Date of Evaluation: April 8, 1998 BLM Desert District Office, Riverside

Attendees: LaPré, Black, Pereksta, Haigh (briefly), Thompson, Jones, Davis

Findings

The vermilion flycatcher is habitat-dependent and conservation of habitat generally protects the species. It is a species of special concern in California because of its limited range in the state and restricted habitat. Populations within the planning area appear to be expanding.

Existing management of Big Morongo Preserve is adequate for this species at that location, where it also occurs in the adjacent Covington Park. Habitat at the golf course and Cerro Coso College in Ridgecrest appears to be adequately maintained by existing programs. The nesting birds in Ridgecrest may be threatened by domestic cats.

Management in accordance with the Biological Opinion on San Bernardino County's Floodplain Management Plan for the Mojave River will be adequate for the Mojave River localities. However, the Biological Opinion does not cover the vermilion flycatcher and a significant acreage of unsurveyed habitat exists between Interstate 15 and Helendale.

Modification of riparian and wetland habitat requires permits under the federal Clean Water Act from the Corps of Engineers and Streambed Alteration Agreements from the California Department of Fish and Game. These regulations will remain the primary method of protection of the riparian habitat along the Mojave River. Additional survey data would be very beneficial, however, to determine the best ways to provide advice on avoidance, mitigation, and compensation.

Habitat: This bird occupies riparian forest found along major streams, springs, and other wetlands within the planning area.

Current Distribution: Occurrences are limited to discrete locations within the planning area, especially the Mojave River at Victorville and Apple Valley, and Big Morongo

Preserve. Riparian habitat bordering the Yucca Valley golf course and Ridgecrest golf course supports this species. Nesting has also been reported from Fort Irwin, Leona Valley, and China Lake.

Voluntary Conservation Measures

- Recommend periodic monitoring of the populations found at China Lake NAWS and Fort Irwin NTC.
- Conduct surveys of the riparian habitat in the Mojave River from Interstate 15 downstream to Helendale. Report locations to the Natural Diversity Data Base.
- Prohibit clearing of riparian habitat during the nesting season

YELLOW-BREASTED CHAT (*Icteria virens*)

Status: Federal: None California: Species of Special Concern (Nesting)

Date of Evaluation: April 8, 1998 BLM Desert District Office, Riverside

Attendees: LaPré, Black, Pereksta, Haigh (briefly), Thompson, Jones, Davis

Findings

The yellow-breasted chat is habitat-dependent and conservation of habitat generally protects the species. It is a species of special concern in California because of its limited range in the state and restricted habitat.

Existing management of Big Morongo Preserve is adequate for this species. Existing management at Camp Cady, the Mojave River, and Cushenbury Springs is adequate.

Riparian restoration at Afton Canyon has improved and increased the habitat available for nesting yellow-breasted chats

Management in accordance with the Biological Opinion on San Bernardino County's Floodplain Management Plan for the Mojave River will be adequate for the Mojave River localities. However, the Biological Opinion does not cover the yellow-breasted chat and a significant acreage of unsurveyed habitat exists between Interstate 15 and Helendale.

Modification of riparian and wetland habitat requires permits under the federal Clean Water Act from the Corps of Engineers and Streambed Alteration Agreements from the California Department of Fish and Game. These regulations will remain the primary method of protection of the riparian habitat along the Mojave River. Additional survey data would be very beneficial, however, to determine the best ways to provide advice on avoidance, mitigation, and compensation.

Habitat: This species occupies riparian forest found along major streams, springs, and other wetlands within the planning area

Current Distribution: Occurrences are limited to discrete locations within the planning area, especially the Mojave River at Victorville, and Camp Cady, Big Morongo Preserve and Cushenbury Springs. This species has also nested at Afton Canyon.

Voluntary Conservation Measures

- For the occurrences on private land at Cushenbury Springs, retention of the riparian habitat in its current situation is adequate for the protection of yellow-breasted chat.
- Continue monitoring efforts at Big Morongo Preserve. Initiate periodic monitoring at Camp Cady and Afton Canyon.
- Conduct surveys of the riparian habitat in the Mojave River from Interstate 15 downstream to Helendale. Report locations to the Natural Diversity Data Base.
- Prohibit clearing of riparian habitat during the nesting season.

YELLOW WARBLER (*Dendroica petechia brewsteri*)

Status: Federal: None California: Species of Special Concern (Nesting)

Date of Evaluation: April 8, 1998 Riverside BLM District Office

Attendees: LaPré, Black, Pereksta, Haigh (briefly), Thompson, Jones, Davis

Findings

The yellow warbler is habitat-dependent and conservation of habitat generally protects the species. It is a species of special concern in California because of its limited range in the state and restricted habitat.

Yellow warbler is very susceptible to parasitism by the brown-headed cowbird.

Existing management of Big Morongo Preserve is adequate for this species at that location.

Management in accordance with the Biological Opinion on San Bernardino County's Floodplain Management Plan for the Mojave River will be adequate for the Mojave River localities. However, the Biological Opinion does not cover the yellow warbler and a significant acreage of unsurveyed habitat exists between Interstate 15 and Helendale.

Modification of riparian and wetland habitat requires permits under the federal Clean Water Act from the Corps of Engineers and Streambed Alteration Agreements from the California Department of Fish and Game. These regulations will remain the primary method of protection of the riparian habitat along the Mojave River. Additional survey data would be very beneficial, however, to determine the best ways to provide advice on avoidance, mitigation, and compensation.

Habitat: This species occupies riparian forest found along major streams, springs, and other wetlands within the planning area.

Current Distribution: Occurrences are limited to discrete locations within the planning area, especially the Mojave River at Victorville and Camp Cady, at Big Morongo Preserve and at Big Rock Creek. A single pair nested in the Argus Mountains in 1998, and others may be present in the larger riparian springs and seeps.

Voluntary Conservation Measures

- For the occurrences on private land at Big Rock Creek, retention of the riparian habitat in its current situation is adequate for the protection of yellow warbler.
- Acquisition of lands near Big Rock Creek is recommended for the protection of San Diego horned lizard and short-joint beavertail cactus. If this conservation area is established, it would offer additional protection for the yellow warbler.
- Continue monitoring of this species at China Lake NAWS in conjunction with the periodic monitoring surveys of Inyo California towhee.
- Conduct surveys of the riparian habitat in the Mojave River from Interstate 15 downstream to Helendale. Report locations to the Natural Diversity Data Base.
- Prohibit clearing of riparian habitat during the nesting season.

CHARLOTTE'S PHACELIA (*Phacelia nashiana*)

Status: Federal: BLM Sensitive California: None

Findings

Charlotte's phacelia has a very small distribution, nearly entirely within the planning area. Extensive work by Mary Dedecker has defined its disjunct populations with a high degree of precision. Most of the sites (30 of 37) are under federal and state protection, within Areas of Critical Environmental Concern, Wilderness Areas, and Red Rock Canyon State Park. Loss of some plants on private lands would not significantly impact this species.

Habitat: Generally on granitic substrates within pinyon pine woodland at elevations of 2000 – 7200 feet. Grows on naturally disturbed sites, such as talus and washes.

Current Distribution: Charlotte's phacelia is found in several of the East Sierra Canyons, including Sand Canyon, Short Canyon, and Nine Mile Canyon, and in the Owens Peak Wilderness. It also ranges east to the El Paso Mountains within Red Rock Canyon State Park and to Volcano Mountain on China Lake NAWS.

Voluntary Conservation Measures

- Monitoring of the populations in Short Canyon and Sand Canyon ACEC's is recommended, as well as at Red Rock Canyon State Park.
- Periodic monitoring of the Volcano Mountain location at China Lake NAWS would better define the numbers and extent of this easternmost population.

KERN BUCKWHEAT (*Eriogonum kennedyi* var. *pinicola*)

Status: Federal: FWS Species of Concern California: None

Date of Evaluation: June 23, 1998 FWS Ventura office

Attendees: LaPré, Showers, Rutherford, Thomas, Bransfield, Meyer

Findings

Kern buckwheat is a very restricted endemic subspecies known from only four populations. Without protection, it is in danger of extinction, and agency biologists recommend no take for this plant. Wind energy development has impacted two populations, but the remaining stands are fenced.

Habitat: Kern buckwheat is found on poorly draining depressions in white bentonite soil. These areas are similar to vernal pools, and also similar to the "pebble plains" of the Big Bear Valley because the surface of the soil contains pebbles, gravel, and rock cemented into the soil surface.

Current Distribution: The four known locations are all within the planning area at the western edge in the southern Sierra Nevada Mountains.

Voluntary Conservation Measures

- BLM and Kern County should assure that proposals for wind energy development located near the Kern buckwheat populations strictly avoid the plants and their clay soil habitat. Surveys to search for this species should be required for any proposed developments within five miles of the known locations.

- Restoration of habitat near one of the populations is needed to prevent continuing erosion from a spur road off the primary wind turbine access road. Barriers will be placed near this location to prevent motorcycles from entering the Pacific Crest Trail.
- Fencing on both sides of the road near the Sweet Ridge population will be accomplished.
- Seasonal or permanent closure of an access road from Mojave has been assessed by BLM. Bollards (barriers composed of upright telephone poles) will be placed adjacent to the road to prevent vehicle entry into the clay soil habitat. The condition of the habitat and buckwheat populations will be monitored annually.
- The BLM should establish a Middle Knob Area of Critical Environmental Concern and prepare a management plan that includes protection of the Kern buckwheat populations. Wind energy development should not be permitted within the Middle Knob ACEC.

ROBISON'S MONARDELLA (*Monardella robisonii*)

Status: Federal: FWS Species of Concern California: None

Date of Evaluation: April 14, 1998 Riverside BLM District Office

Attendees: LaPré, Nicol, Black

Findings

Robison's monardella is very doubtfully distinct from narrow-leaved monardella, and the status of the species as a separate taxon needs resolution.

Habitat: This species is found among granitic rock outcrops and boulders at elevations of 3800 – 4500 feet. It primarily occurs in the pinyon-juniper community, but has also been detected in Joshua tree woodland and creosote bush scrub vegetation.

Current Distribution: Endemic to the southern portion of the planning area, primarily in the Little San Bernardino Mountains. A few records exist from the north part of Yucca Valley.

Voluntary Conservation Measures

- Until the taxonomic status of this species is resolved, protection of the known sites is recommended. These are primarily within Joshua Tree National Park at Key's Ranch.

- Surveys for this species should be required for development proposals in the northern portion of Yucca Valley and adjoining San Bernardino County within the range of this species.

TRIPLE-RIBBED MILK VETCH (*Astragalus tricarinatus*)

Status: Federal: Endangered California: None

Findings

Triple-ribbed milkvetch was listed as an endangered species on October 6, 1998. Critical habitat was not designated. This is a narrow endemic species that is very susceptible to extinction. Recommend no take for triple-ribbed milkvetch.

Habitat: Restricted to sandy or gravelly soils in arid canyons at desert's edge. Most commonly found along washes, canyon bottoms and the alluvial fans below. Populations occur at elevations between 1300 and 4000 feet, but are primarily below 2000 feet.

Current Distribution: The range of triple-ribbed milkvetch is at the southwest boundary of the planning area, within Big Morongo Canyon. All occurrences are on public (BLM) lands within the Big Morongo Preserve and Area of Critical Environmental Concern. The single location on private land is not threatened by development, nor is it likely to be threatened for the duration of the Plan. Additional locations have recently (1998) been discovered outside the planning area near Desert Hot Springs.

Voluntary Conservation Measures

- Monitor populations at least once every year and report findings to Natural Diversity Data Base and U. S. Fish and Wildlife Service.
- Initiate surveys within conserved area to attempt to locate new populations.
- Notify Arco (Four Corners Pipeline Company) of listing. Require notification to BLM prior to pipeline maintenance. Pipeline maintenance should be monitored.
- San Bernardino County should require surveys for this species for proposed projects on private lands within five miles of any known locality. Avoidance measures should be specified as mitigation for potential project impacts. Financial compensation to private owners for land acquisition may be required if mitigation is infeasible.

CHAPTER SIX DELETED AND DROPPED SPECIES

DELETED SPECIES

In 1996, the West Mojave Supergroup recommended that approximately 100 specifically identified plants and animals be considered by the Plan. Species accounts were prepared by a team of scientists assembled by the Biological Resources Division of the United States Geological Survey. During the course of the evaluation, biologists from the West Mojave planning team reviewed the species accounts, and as a result of their review recommend that thirteen species be deleted from the list of species to be considered in the Plan. The reasons for this recommendation include the following: 1) the species does not occur within the WMPA, 2) it is peripheral to the WMPA, 3) it is vagrant or accidental within the WMPA, or 4) it is too common and no protection measures are needed within the WMPA. Service and Department biologists met with the West Mojave team on January 29, 1998 and concurred with this decision. The species deleted from further consideration by the West Mojave Plan are listed below. Numbers in parentheses correspond to the reasons for deletion given above.

California gull (4)	Hepatic tanager (3)
Double-crested cormorant (4)	Virginia's warbler (2)
Bank swallow (2)	Vaux's swift (2)
American white pelican (2)	Yuma clapper rail (3)
Sharp-shinned hawk (4)	Long-billed curlew (2)
Pocketed free-tailed bat (3)	Fringed myotis (3)
Spanish Needle onion (1)	

DROPPED SPECIES

The evaluation team reviewed all remaining species on the list developed by the Supergroup. The Department and the Service recommend that twenty-one species not be addressed by the Plan because of insufficient data, because they were being separately addressed by other Habitat Conservation Plans and Biological Opinions already underway, because they were too common, or for other reasons.

Insufficient data

The available information on certain plants and animals was judged to be insufficient to prepare a conservation plan, to estimate take, or to predict with reasonable certainty that the conservation measures suggested would be appropriate. Additional information developed in the future about the range and habitat of these species may allow for their later inclusion in the Plan. For some species, the validity of the taxon is in question, for others, information on specific distribution within the planning area is lacking. None of

- | | |
|----------------------------------|--|
| | Summit Valley development (Hesperia) |
| ● Red-legged frog | BO issued for improvements on Elizabeth Lake Road (Palmdale) |
| ● Least Bell's vireo | BO issued for Mojave River Floodplain Management Plan (Hesperia downstream to Barstow) |
| ● Southwestern willow flycatcher | BO issued for Mojave River Floodplain Management Plan (Hesperia to Barstow) |
| ● Western yellow-billed cuckoo | BO issued for Mojave River Floodplain Management Plan (Hesperia to Barstow) |

Too common

After review and analysis, the following species were judged to be too common within the planning area to merit coverage under the West Mojave Plan. Existing threats to these species, if any, are not likely to result in their future designation as threatened or endangered. Protection of individuals and habitat appears to be adequate.

Cooper's hawk
 Foxtail cactus
 Loggerhead shrike
 Sand Linanthus

Other Reasons

Two species were determined to be best addressed on a case-by-case basis. They are listed below with the reasons for individual consideration.

Mojave Tui Chub: The Mojave tui chub is a small fish native to the Mojave River. It now occurs at a single natural site, Soda Spring near Zzyzx, east of the planning area and two introduced locations, Lark Seep at China Lake NAWA and Camp Cady. The deep pools and sloughs that represent the original habitat of this fish have nearly disappeared from the Mojave River. Reintroduction is not very feasible because of the presence of arroyo chubs in the river, which hybridize with the Mojave tui chub and have virtually eliminated pure populations.

The Mojave tui chub is listed as endangered by both the state and federal governments, and a recovery plan has been prepared. Agency biologists agree that the Department and the Service will continue to manage the existing populations of this fish at their protected

sites. Any fish re-introduced into the Mojave River would be considered experimental, non-essential populations, reducing the need for incidental take permits. Secure habitats must be created that have an assured clean water supply, are free of invasive plants such as tamarisk, are free of arroyo chubs, other non-native fish and bullfrogs, and that will not be disturbed by human activity. The wildlife agencies will manage this species, and specific conservation measures by the private sector have not been identified at this time.

Swainson's hawk: Swainson's hawk is known from less than five nesting locations within the planning area, all on private land. It is sighted throughout the planning area during fall and spring migration. This bird is not currently threatened where it occurs in the planning area. A regional plan cannot be developed for such a localized species, and it will be considered by the Department and the Service individually if threats arise or development plans are proposed in the future for the nesting locations.