

3.0 Plan Development

This section describes the development of the Plan, including the conservation planning methodology, the Covered Species and conserved natural communities addressed in the Plan, the mapping process used to identify areas of high Conservation value, and the alternatives considered. The resulting Conservation plan is described in Section 4.

3.1 Overview of Conservation Planning Process

The conservation planning process reflects the broadest goals of the Plan, which are to:

- Represent native ecosystem types or natural communities across their natural range of variation in a system of conserved areas.
- Maintain or restore viable populations of the species included in the Plan so that Take Permits can be obtained for currently Listed animal species and Non-listed animal species can be covered in case they are listed in the future.
- Sustain ecological and evolutionary processes necessary to maintain the viability of the natural communities and habitats for the species included in the Plan.
- Manage the system adaptively to be responsive to short-term and long-term environmental change, including climate change.

CVAG worked with the Scientific Advisory Committee (SAC), the Wildlife Agencies, CVMC, the County, BLM, and GIS specialists from BLM, the County, and CVAG to develop the Plan. For purposes of this document, this group is referred to as the planning team.

3.1.1 Role of the Scientific Advisory Committee (SAC)

The Plan was developed in consultation with a SAC, using best available information. (See Section 3.1 in Appendix I for additional information on the SAC.) The SAC developed a methodology for use in assessing the relative biological value of lands within the Plan Area and the subsequent development of a preferred alternative conservation plan. Major emphasis was placed on the integration of defensible science throughout all phases of the planning process. The SAC was established in 1994 to provide input on a Scoping Study, which was prepared to determine if a multiple species habitat conservation planning effort was needed in the Coachella Valley.

When the planning effort began, the SAC was charged with developing a recommendation for a biologically based Conservation program for the protection of the Covered Species and conserved natural communities in the Plan. The Peninsular bighorn sheep conservation strategy was primarily based on the *Recovery Plan for Bighorn Sheep in the Peninsular Ranges, California*, which was approved by BLM, USFS, the Agua Caliente Band of Cahuilla Indians, CDFG, State Parks, and USFWS.

Throughout the planning process, the SAC provided input into the development of the Plan. The SAC also participated in workshops in 1996 and 1999 with the ISA. The SAC sought input from other scientific experts through hosting workshops. SAC members made site visits to various locations during the reserve design process; provided assistance in the identification and delineation of species' habitat parameters, ecosystem processes, and other significant features in the GIS mapping effort; and reviewed map products and draft documents whenever necessary.

The conservation planning methodology is described in greater detail in Section 3.2 of Appendix I.

3.1.2 Role of the Independent Science Advisors

The ISA are scientists who provided information for use in, and peer review of, the Plan. Three of the ISA participated in early phases of the planning process at a workshop in 1996 to provide suggestions and information for use in developing the conservation planning process and at a second workshop in 1998 to provide peer review of components of that process, including species habitat modeling and the Site Identification Process. Other scientists also participated as ISA by providing information and expertise regarding specific species. To incorporate independent peer review of the species distribution models, these knowledgeable individuals with expertise on one or more Covered Species reviewed and critiqued the habitat distribution models for these species.

In 2001, a peer review process by ISA was facilitated by TNC. This team was provided with a series of questions and asked to respond to the questions in their review. The questions were assembled through suggestions from the SAC and the Wildlife Agencies. In addition, the PAG provided an opportunity for any interested person to propose a question. In January 2001, documents providing information on the conservation planning process, including maps of Conservation Alternatives 1, 2, and 3; species distribution models and known occurrence maps and associated documentation; maps illustrating land ownership, natural features, parcel boundaries, and natural communities within the Plan Area; and information regarding target species and natural community conservation strategies were distributed to the ISA. A meeting was held in February 2001 to provide an opportunity for the ISA to discuss the conservation planning process with the SAC. The ISA also met with outside participants to discuss the Plan. In mid-April 2001 they submitted a report detailing their findings. The report, "Independent Science Advisors' Review: Coachella Valley Multiple Species Habitat Conservation Plan/Natural Community Conservation Plan (MSHCP/NCCP)" is included in its entirety in Section 3.3 of Appendix I.

3.1.3 Best Available Science Standard

The planning team used the best available scientific data in developing the Plan. The data used in Plan development was a combination of existing biological data and new data collected during Plan development. The location and extent of biological data gathered during Plan development was determined by available funding and access to private property. Survey areas for species were selected to help identify the likely limits of distribution of the species in the Plan Area. A list of all the surveys conducted to assist with the preparation of this Plan is found in

Section 3.4 of Appendix I. Annual plant species surveys were conducted only in years when sufficient amounts of rainfall resulted in germination of the plant species. In addition to a fine filter approach for a select group of species, a coarse filter approach (Noss 1987, Noss and Cooperrider 1994, TNC 2000) was utilized. The coarse filter approach emphasizes Conservation of Core Habitat areas, conserved natural communities, and Essential Ecological Processes, Biological Corridors, and Linkages.

3.1.4 Planning Process

Identification of the Conservation Areas involved the steps described below.

1. *Determine the species and natural communities to be included in the Plan.* The planning team developed the initial list of species and natural communities to be considered. The list was narrowed down through the planning process, as described in Section 3.2.
2. *Gather information on the species and natural communities.* Information was gathered on individual species from the following sources: (1) existing information from the literature, including EIRs and other environmental documents, museum records, and other reports on species distribution and ecological requirements; (2) Natural Diversity Data Base (CNDDDB) records; (3) presence/absence surveys for species about which more information was needed in selected areas where they have a probability of occurring and some potential to be protected; and (4) information and location maps provided by individual biologists. Information on the natural communities was gathered from: (1) the University of California at Santa Barbara Gap Map (Davis et al. 1995), (2) LANDSAT satellite thematic mapping imagery, (3) color infrared aerial photographs, (4) blue-line aerial photographs of the Plan Area, (5) aerial photographs from 1939 and 1954 for historic natural communities, and (6) the CNDDDB and the Palm Springs Desert Museum for desert fan palm oases woodland.
3. *Prepare accounts of individual species and natural communities.* These accounts summarize available information on species' life history, Habitat and ecological requirements, overall range, distribution within the Plan Area, threats, and Conservation needs. Similar accounts were prepared on the composition and distribution of conserved natural communities, threats, and Conservation needs.
4. *Gather other pertinent information.* Information was also gathered and entered into the Geographic Information Systems (GIS) database regarding existing conservation areas, topography and other natural features, watersheds, ecological processes, roads, and current land uses. Information on projected land uses, parcel configuration, and political boundaries was also gathered for use in developing implementation measures.
5. *Prepare a Natural Communities Map.* A Natural Communities Map was prepared to delineate the distribution of the natural communities in the Plan Area. This information was used in a variety of ways: (1) in modeling species' Habitat distribution, (2) in developing the Site Identification Maps, and (3) in evaluating whether adequate protection will be afforded to the conserved natural communities on which the Plan focuses pursuant to the NCCP Act. (See Section 3.5 of Appendix I for information on the development of the Natural Communities Map.)

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6. *Analyze biological resource information to map species' distribution.* Species' Habitat distribution maps were prepared for all species except burrowing owl using known occurrences, Habitat associations based on the Natural Communities Map, and, where relevant, elevation ranges of the species, landform data, sand source data, and soils data. Consensus of the planning team was then obtained as to the adequacy and accuracy of information about the distribution of species in the Plan Area. Models were prepared for species for which sufficient data existed to use in developing a model. For the burrowing owl only known location information was used in conservation planning. Specific information on the model used for each species is found in Section 3.6 of Appendix I.
7. *Develop Site Identification Maps.* Site Identification Maps were developed by mapping at the quarter-section level and analyzing data regarding species richness, natural communities richness, habitat heterogeneity, and habitat fragmentation, and refining the resulting maps using information about ecological processes necessary to sustain habitats, Core Habitat, endemic species occurrences, and other pertinent information. The Site Identification Maps delineate the areas of highest biological resource value in the Plan Area. See Section 3.7 of Appendix I for a detailed description of the Site Identification Process and how it led to the development of conservation alternatives.
8. *Delineate Core Habitat areas, Essential Ecological Process areas, and Biological Corridors and Linkages.* For each of the Covered Species for which sufficient data were available, the planning team delineated Core Habitat areas, defined as areas of unfragmented Habitat with intact ecological processes large enough for a self-sustaining population of the species. Areas needed to maintain Essential Ecological Processes, Core Habitat, Biological Corridors and Linkages were also identified.
9. *Develop Conservation alternatives.* Three Conservation alternatives were initially developed for consideration. Conservation Alternative 1 consisted of existing public and Private Conservation Lands only. This alternative was included to assess the extent to which Existing Conservation Lands would suffice to protect the Covered Species and conserved natural communities included in the Plan. Based on the Site Identification Maps, Conservation Alternative 2 was developed to provide Core Habitat for the Covered Species, protect Essential Ecological Processes to sustain those habitat areas, provide Biological Corridors and Linkages among Conservation Areas, and conserve natural communities as functioning ecosystems. The corridors were intended to provide not only for movement of Covered Species, but also for other species, including coyotes, bobcats, mountain lions, and foxes, necessary to maintain predator-prey relationships, general biological diversity, and the opportunity for species adaptation in response to potential climatic change. Conservation Alternative 3 included additional areas with potential Conservation value as habitat, corridor, and process areas. A statistical analysis of the Conservation alternatives was prepared to provide information about the acreage of Habitat protected for each Covered Species and natural community under each alternative. The statistical analysis provided quantitative information on species and natural community protection, which was useful in conjunction with the qualitative analysis conducted in Step 10 using the conservation criteria.
10. *Develop and use criteria for evaluating the conservation alternatives.* Criteria were created to evaluate whether or not the Conservation Areas provide adequate protection for the species and natural communities on which the Plan focuses. (See Section 3.4 for details.)

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11. *Conduct ISA Review.* During the course of the planning process, two workshops were held with leading conservation biologists Dr. Reed Noss, Dr. Michael Soulé, and Dr. C. Richard Tracy to get their input on the Plan. In early 2001, the ISA reviewed the work completed to date. The ISA included the aforementioned conservation biologists as well as other scientists. In addition, a preliminary draft of a study titled Long-term Sand Supply to Coachella Valley Fringe-toed Lizard (*Uma inornata*) Habitat in the Northern Coachella Valley, California (United States Geological Survey (USGS) 2002) was made available.
12. *Develop a Preferred Alternative.* The Conservation Area maps prepared by CVAG were discussed in a series of meetings among the Wildlife Agencies, CVAG staff, and local jurisdictions to evaluate land use, economic, and biological considerations. Through this process, the proposed Conservation Areas were further refined and a Preferred Alternative was developed.
13. *Delineate Conservation Goals and Objectives.* Conservation Goals and specific Conservation Objectives were developed for each Covered Species, natural community, Essential Ecological Process, Biological Corridor, and Linkage in the Conservation Areas to ensure that Conservation would be accomplished and that the tools for compliance monitoring were in place.

The following is a general chronology of the development of the Plan:

- 1994 - 1995 Development of initial list of species and natural communities to be included in the Plan.
- 1995 - 1996 Initial biological surveys conducted; initial Natural Communities Map developed.
- 1997 - 1998 Natural Communities Map refined and initial Habitat Distribution Models developed.
- 1999 - 2000 Site Identification Mapping and development of initial alternatives.
- 2001 ISA conducted peer review. The planning team developed preliminary draft Preferred Alternative.
- 2002 - 2004 Review and analysis, with local jurisdictions, CDFG, and USFWS, of planning team preliminary draft Preferred Alternative, followed by completion of the Public Review Draft and DEIR/EIS.
- 2004 - 2006 The draft Plan was finalized and released for public review, and responses to comments were prepared for comments received during public review. The Plan and Final EIR/EIS were released in early 2006 for local jurisdiction approval. In June 2006, the City of Desert Hot Springs voted not to approve the Plan. The CVAG Executive Committee then rescinded its approval of the Plan and directed that the Plan be revised to remove Desert Hot Springs as a Permittee and reflect other project description modifications that had been suggested during public review. Subsequent to the 2008 approved Plan, the City of Desert Hot Springs and Mission Springs Water District became Permittees through a Major Amendment.

3.2 Species and Natural Communities Considered

This section delineates the species and natural communities identified in the Planning Agreement and identifies those now included in the Plan. Species considered but not covered by the Plan, and natural communities not included in the Conservation Areas are also identified. Information on the Covered Species and conserved natural communities that are protected in the Conservation Areas is presented in Sections 9 and 10.

3.2.1 Review of Species Identified in the Planning Agreement

The Planning Agreement among the local, state, and federal agencies comprising the Plan Participants that initiated development of the Plan identified 52 species to be considered for inclusion in the Plan and targeted all the natural communities in the Plan Area. As information was gathered through the planning process, the planning team continuously reviewed the list. Other experts on individual species were also consulted. The Covered Species in the Plan are listed in Table 3-1. These are species for which sufficient information existed or was gathered during the planning process to enable the development of Conservation measures.

Table 3-2 lists the species from the Planning Agreement that are not proposed for coverage under the Plan. Generally, the reasons for not covering a species include lack of known locations in the Plan Area or insufficient data to facilitate Conservation planning. Section 3.8 of Appendix I provides additional information on reasons why these species are not proposed for coverage.

Table 3-1: Species Covered under the Plan

<p><u>Plants</u> Mecca aster, <i>Xylorhiza cognata</i>¹ Coachella Valley milkvetch, <i>Astragalus lentiginosus</i> var. <i>coachellae</i> (FE) Triple-ribbed milkvetch, <i>Astragalus tricarinatus</i> (FE) Orocopia sage, <i>Salvia greatae</i>¹ Little San Bernardino Mountains linanthus, <i>Linanthus maculatus</i> (or <i>Gilia maculata</i>)¹</p> <p><u>Invertebrates - Insects</u> Coachella Valley giant sand-treader cricket, <i>Macrobaenetes valgum</i> Coachella Valley Jerusalem cricket, <i>Stenopelmatus cahuilensis</i></p> <p><u>Fish</u> Desert pupfish, <i>Cyprinodon macularius</i> (FE/SE)</p>

Table 3-1: Species Covered under the Plan (cont.)

Amphibians

Arroyo toad, *Bufo californicus* (FE/CSC)

Reptiles

Desert tortoise, *Gopherus agassizii* (FT/ST)

Flat-tailed horned lizard, *Phrynosoma mcallii* (CSC)

Coachella Valley fringe-toed lizard, *Uma inornata* (FT/SE)

Birds

Yuma clapper rail, *Rallus longirostris yumanensis* (FE/ST/SFP)

California black rail, *Laterallus jamaicensis* (ST/SFP)

Burrowing owl, *Athene cunicularia* (CSC)

Southwestern willow flycatcher, *Empidonax traillii extimus* (SE/FE)

Crissal thrasher, *Toxostoma crissale* (CSC)

Le Conte's thrasher, *Toxostoma lecontei* (CSC)

Least Bell's vireo, *Vireo bellii pusillus* (FE/SE)

Gray vireo, *Vireo vicinior* (CSC)

Yellow warbler, *Dendroica petechia brewsteri* (CSC)

Yellow-breasted chat, *Icteria virens* (CSC)

Summer tanager, *Piranga rubra*¹

Mammals

Southern yellow bat, *Lasiurus ega* or *xanthinus*¹

Coachella Valley round-tailed ground squirrel, *Spermophilus tereticaudus chlorus* (C/CSC)

Palm Springs pocket mouse, *Perognathus longimembris bangsi* (CSC)

Peninsular bighorn sheep, *Ovis canadensis nelsoni* (FE/ST/SFP)

(Footnotes are explained below.)

The status codes used in the table are identified in the following key, as listed in the *California Natural Diversity Data Base Special Animals List and Special Plants List* from July 2000 (CNDDDB 2000).

Key:	FE	=	Federal Endangered
	FT	=	Federal Threatened
	FC	=	Federal Candidate
	SE	=	State Endangered
	ST	=	State Threatened
	SC	=	State Candidate
	SFP	=	State Fully Protected
	CSC	=	Species of Special Concern (a state list of species that are at risk due to habitat modification or destruction, over-collecting, disease, or other threats)
	CNPS	=	Rare in California

¹ These species have no official status at this time; however, USFWS, CDFG, and the SAC have recommended inclusion of the species because of the likelihood of their being elevated to listing status in the coming years due to their rarity and decline. Note, also, that the Department of the Interior eliminated the category of FC2 subsequent to the adoption of the Planning Agreement.

Table 3-2: Species Considered but Not Proposed for Coverage under the Plan

Plants

California ditaxis, *Ditaxis californica*
Cliff spurge, *Euphorbia misera*
Flat-seeded spurge, *Chamaesyce platysperma*
Glandular ditaxis, *Ditaxis clariana*
Robison's monardella, *Monardella robisonii*

Invertebrates - Insects

Casey's June beetle, *Dinacoma caseyi*
Coachella Valley grasshopper, *Spaniacris deserticola*
Pratt's dark aurora blue butterfly *Euphilotes enoptes cryptorufes*

Invertebrates - Other

Morongo desert snail, *Eremarionta morongoana*
Thousand Palms desert snail, *Eremarionta millepalmarum*

Amphibians

California red-legged frog, *Rana aurora draytonii* (FT)
Desert slender salamander, *Batrachoseps aridus* (FE)
Lowland leopard frog, *Rana yavapiensis*
Mountain yellow-legged frog, *Rana muscosa* (FE)

Reptiles

California legless lizard, *Anniella pulchra pulchra*
San Diego horned lizard, *Phrynosoma coronatum blainvillei*

Mammals

California leaf-nosed bat, *Macrotus californicus*
California (Western) mastiff bat, *Eumops perotis californicus*
Fringed myotis, *Myotis thysanodes*
Long-eared myotis, *Myotis evotis*
Long-legged myotis, *Myotis volans*
Pallid bat, *Antrozous pallidus*
Pocketed free-tailed bat, *Nyctinomops femorosaccus*
Townsend's (Western) big-eared bat, *Corynorhinus townsendii pallescens*
Western small-footed myotis, *Myotis ciliolabrum*
Yuma myotis, *Myotis yumanensis*

3.2.2 Review of Natural Communities Identified in the Planning Agreement

The Planning Agreement listed 23 natural communities known to occur in the Plan Area. Through the planning process a total of 46 natural communities were identified in the Plan Area. Of these, 27 natural communities provide Habitat for the Covered Species and are the focal point for the establishment of Conservation Areas. The conserved natural communities included in the

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Plan's Conservation Areas are listed in Table 3-3, as named and described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), with the addition of five new natural community types developed by the SAC to distinguish better among the blow-sand communities in the Plan Area. Figure 3-1 depicts the natural communities within the Plan Area, as well as developed areas.

Table 3-3: Natural Communities Included in the Plan

Active desert dunes
Stabilized and partially stabilized desert dunes
Active desert sand fields
Ephemeral desert sand fields
Stabilized and partially stabilized desert sand fields
Stabilized shielded desert sand fields
Mesquite hummocks
Sonoran creosote bush scrub
Sonoran mixed woody and succulent scrub
Mojave mixed woody scrub
Desert saltbush scrub
Desert sink scrub
Chamise chaparral
Red shank chaparral
Semi-desert chaparral
Interior live oak chaparral
Cismontane alkali marsh
Coastal and valley freshwater marsh
Southern arroyo willow riparian forest
Sonoran cottonwood-willow riparian forest
Mesquite bosque
Desert dry wash woodland
Desert fan palm oasis woodland
Southern sycamore-alder riparian woodland
Arrowweed scrub
Mojavean pinyon and juniper woodland
Peninsular juniper woodland and scrub

The other natural communities are already adequately protected in the Plan Area on public lands outside the Conservation Areas, except for tamarisk scrub, active shielded desert dunes, and Riversidean desert scrub. This existing protection adds to the overall Conservation value of the Plan in protecting watersheds, providing Habitat for large predators, protecting overall biological diversity in the Plan Area, providing buffers for Conservation Areas established under this Plan, and providing areas that could become important to Covered Species under conditions of potential future climatic change. With regard to tamarisk scrub, it is not a "natural" community in that it is dominated by an exotic plant species, i.e. tamarisk. In areas where some tamarisk scrub is included in the Conservation Areas, the intent is to restore it to the appropriate natural community to the maximum extent possible. The natural communities that are not included in the Plan are listed in Table 3-4. Additional information about these natural communities and why they were not included in the Plan is found in Section 3.9 of Appendix I.

Table 3-4: Natural Communities Considered but Not Included in the Plan

Tamarisk scrub
Active shielded desert dunes
Riversidean desert scrub
Mojave mixed steppe
Blackbush scrub
Upper Sonoran mixed chaparral
Upper Sonoran manzanita chaparral
Mixed montane chaparral
Northern mixed chaparral
Scrub oak chaparral
Canyon live oak forest
Black oak forest
Coulter pine forest
Bigcone spruce-canyon oak forest
Westside ponderosa pine forest
Sierran mixed coniferous forest
Jeffrey pine forest
Jeffrey pine-fir forest
Southern California subalpine forest

3.3 Sources of Biological Data

Biological data for the Plan were obtained from a variety of sources. The data were compiled, analyzed, and stored to support various components of the Plan preparation and implementation process. The occurrence information for Covered Species and conserved natural communities used in this Plan include:

- Field data collected during surveys for the Plan in 1995, 1997, 1998, 1999, 2002, and 2003. These surveys were conducted by participating agency biologists and biologists working under contract to conduct focused surveys for some of the Covered Species. Surveys were generally conducted during the spring months. Survey protocols were developed and approved by the Wildlife Agencies. Information on location, habitat characteristics, range and other variables for species surveyed were described in written reports submitted to CVAG.
- EIRs, Biological Assessments, and other environmental documents prepared throughout the Plan Area since 1979.
- CNDDDB records.
- CDFG, BLM, NPS (Joshua Tree National Park), State Parks, USFWS, and other agency data.
- Data collected from biologists and others knowledgeable about the Plan Area and/or a given species. Data were obtained in meetings and a September 1997 workshop hosted by

the SAC to gather information about known locations and the distribution of target species. Biologists and other individuals with expertise on one or more of the species participated in the workshop. Records provided by individuals were carefully documented; records were mapped on 7.5 minute topographic quads and later digitized into a GIS data layer. Relevant information was obtained on each record before it was included in the database.

- Location data from voucher specimens held in museums, herbaria, and public-trust institutions.
- Published records and species distribution information from peer-reviewed journal articles, where information on species or natural community distribution has been described at an appropriate scale.

These data are maintained in GIS (digital) coverages and on GIS maps that can be identified by area based on jurisdiction boundaries, township/range information, or other map parameters. All data were assembled into a GIS database using Environmental Systems Research Institute (ESRI) software. The vast majority of the GIS data is in vector format. Calculations of existing natural communities acreages and overlay analyses of various project scenarios and alternatives were completed using this database. Calculations involving two or more vector layers may have minor overlapping polygons or polygon slivers with blank attribute records, resulting in slightly different acreage calculations when conducting re-analyses of alternatives and scenarios. These discrepancies are minor and do not alter the overall conclusions of the analysis or comparison of the relative merits of various alternatives and scenarios. Over the course of this decade-long planning effort, various vector layers were updated with more current and higher resolution data. These updates also result in minor deviations from previously calculated acreages, not affecting overall analysis conclusions, but allowing for more reproducible results should re-analyses of alternatives and scenarios be conducted in the future. As noted in Appendix I, Section 3.5.2, an accuracy assessment was completed for the natural communities mapping. For additional details on biological data sources, see Section 3.10 of Appendix I.

3.4 Evaluation of Initial Conservation Alternatives

The planning team evaluated the three Conservation alternatives described in Section 3.5 using the following measures of adequacy.

1. **Size of Habitat patches.** For each Covered Species, the planning team assessed whether a Conservation Area provided Core Habitat. The Core Habitat concept was not applied to species that were considered to occur as metapopulations; these are burrowing owl, Le Conte's thrasher, Yuma clapper rail, California black rail, the riparian bird species, and southern yellow bat. A Conservation Area was not deemed inadequate because of the lack of Core Habitat for these species. The concept of Core Habitat was not used with conserved natural communities.

2. **The number of Core Habitat areas protected in Conservation Areas for each Covered Species.** Where possible, the planning team sought to conserve a minimum of three Core Habitat areas for each Covered Species. In some cases, more than three Core Habitat areas for a Covered Species occurred in the Conservation Areas. In other instances, fewer than three Core Habitat areas for a Covered Species occurred in the Plan Area to include in the Conservation Areas.
3. **Representative range of environmental conditions, including temperature, moisture, and elevation gradients, under which the species or natural community occurs in a viable population.** For each Covered Species, the planning team assessed whether the Conservation Areas included Other Conserved Habitat that provided for the conservation of the range of environmental conditions in which the species occurs in the Plan Area.
4. **Essential Ecological Processes.** These could include hydrological processes (both subsurface and surface), blowsand movement, erosion, deposition, substrate development, soil formation, and biological processes such as reproduction, pollination, dispersal, and migration. The planning team assessed the Conservation Areas to evaluate whether the Essential Ecological Processes necessary to sustain Covered Species' Habitat and conserved natural communities present were included in the Conservation Areas.
5. **Biological Corridors and Linkages.** For each Covered Species, the planning team assessed whether connectivity of the population in each Conservation Area was maintained with populations in other Conservation Areas and to populations outside the Plan Area to the maximum extent Feasible.

The tables in Section 9 show the extent to which the Conservation Areas in the Preferred Alternative, which evolved from Conservation Alternative 2 developed by the planning team at this stage of the process, contain Core Habitat (and how many Core Habitat areas) and Other Conserved Habitat. The conservation analysis for each Covered Species in Section 9 describes the protection of Essential Ecological Processes in the Conservation Areas and the Biological Corridors and Linkages between Conservation Areas that are protected.

3.5 Conservation Alternatives Considered

Section 10(a)(2)(A)(iii) of FESA requires that an HCP analyze alternative actions which would not result in Take of Listed Species (animal species) or would reduce such Take below levels anticipated for the project proposal and state the reasons why such alternatives are not being utilized. Therefore, the following alternatives are analyzed in the Plan. (More information on and analysis of the alternatives is found in the EIR/EIS.)

3.5.1 Preferred Alternative

The Preferred Alternative is the Plan, as described in Section 4.

3.5.2 Alternative 1, Public Lands Alternative

This alternative includes all local, state, and federal agency land, and Private Conservation Land, in the Plan Area with Conservation Levels 1, 2, and 3 (See Figure 3-2). No new areas would

be acquired for Plan purposes. The local jurisdictions would contribute to the management of the Existing Conservation Lands as mitigation for the Habitat loss allowed under the Plan. Covered Activities would be the same as under the Preferred Alternative.

Under this alternative, substantial areas would be protected in the mountainous portions of the Plan Area: the San Gorgonio Wilderness and Whitewater Canyon ACEC in the San Bernardino Mountains; Mission Creek west of Highway 62, Morongo Canyon ACEC, and Joshua Tree National Park, in the Little San Bernardino Mountains; portions of the CVFTL Preserve in the Indio Hills; the Mecca Hills Wilderness in the Mecca Hills; the Orocopia Mountains Wilderness in the Orocopia Mountains; the Santa Rosa Mountains Wilderness, Deep Canyon Desert Research Center, Hidden Palms Ecological Reserve, Carrizo Canyon Ecological Reserve, Magnesia Springs Ecological Reserve and portions of the new Santa Rosa and San Jacinto Mountains National Monument in the Santa Rosa Mountains; and portions of the Santa Rosa and San Jacinto Mountains National Monument, the San Jacinto Wilderness, Mount San Jacinto State Park, and Oasis de los Osos in the San Jacinto Mountains. Some of these areas are well protected, but habitat fragmentation is a problem in other areas where considerable private lands still exist. On the valley floor, the only significant Conservation Areas would be the three existing CVFTL preserves and Dos Palmas ACEC.

This alternative entails no land acquisition; only Core Habitat, Essential Ecological Processes, and Linkages that happen to be on existing public conservation lands or Private Conservation Lands would be protected. As a result, sand transport, watershed, and other ecological processes would not be adequately protected; Biological Corridors would not be conserved; and Core Habitat areas would be fragmented in many instances. As a result, the Conservation Goals and Objectives for the Covered Species and conserved natural communities would not be met. This alternative is fully analyzed in Section 4 of the EIR/EIS, which also discusses this alternative's ability to meet the basic project objectives, its feasibility, and ability to reduce project impacts.

3.5.3 Alternative 2, Core Habitat with Ecological Processes

This alternative would establish Conservation Areas intended to protect Core Habitat for the species and natural communities included in the Plan, as well as ecological processes necessary to sustain these Habitats. (See Figure 3-3.) Covered Activities would be the same as under the Preferred Alternative.

The Conservation Areas include most of the Alternative 1 lands as well as private lands to conserve Core Habitat and ecological processes. This alternative would protect private lands in the mountains surrounding the Coachella Valley. On the valley floor, this alternative builds on the existing CVFTL preserves and Dos Palmas ACEC by adding adjacent Habitat and ecological process areas for the species and natural communities included in the Plan. In addition, this alternative creates new preserve areas in the Snow Creek area, east of Highway 62 along Mission Creek and Morongo Wash, and at the Whitewater River delta at the northwest end of the Salton Sea. Based on comments in the ISA report, comments received from CDFG and USFWS, and additional information in the Long-term Sand Supply to Coachella Valley Fringe-toed Lizard (*Uma Inornata*) Habitat in the Northern Coachella Valley, California (USGS 2000) this alternative was subsequently revised to develop the Preferred Alternative.

The Conservation Goals and Objectives for the Covered Species and conserved natural communities would not be fully met under this Alternative. This alternative is fully analyzed in Section 4 of the EIR/EIS, which also discusses this alternative's ability to meet the basic project objectives, its feasibility, and ability to reduce project impacts.

3.5.4 Alternative 3, Enhanced Conservation Alternative

This alternative expanded on Alternative 2 by including all additional areas that were recommended for further consideration by USFWS and CDFG in their response to the Site Identification Maps. Alternative 3 is depicted in Figure 3-4. Covered Activities would be the same as under the Preferred Alternative.

This alternative would result in less Take than the Preferred Alternative; However, due to the minimal additional biological value, significant land use conflicts, high acquisition and management costs, severe edge effects and the potential impossibility of creating a manageable reserve configuration, the enhanced Conservation alternative was not selected as the preferred alternative. Based on field visits with the SAC and representatives from various jurisdictions, it was determined that not all areas included in this alternative were biologically viable or feasible to conserve. Additionally, much of the area anticipated for Conservation under this alternative would cause significant land use conflicts and increased costs. Some of the proposed area already has approved development, greatly increasing acquisition costs. Existing Development near these areas would also create severe edge effects. Additionally, the additional Conservation are proposed under this Alternative would include existing ground water recharge basins operated by CVWD, which would require realigning the recharge basins at great cost. This alternative would have increased the number of acres to be conserved by approximately 10,200 acres even though the amount of Habitat included in the Preferred Alternative is sufficient to adequately conserve all of the Covered Species. Thus, the Enhanced Conservation Alternative would significantly increase the cost of the Project without significantly increasing the Habitat value of the Reserve. This alternative would also conflict with Project Objectives because it would not be economically efficient and would not limit the expenditure of public and private funds to the amount necessary to maintain a reserve that can adequately conserve the Covered Species. This alternative is fully analyzed in Section 4 of the EIR/EIS.

3.5.5 Alternative 4, Full Protection Alternative

In their joint letter dated April 17, 2000, the Wildlife Agencies recommended inclusion of an alternative that "fully protects those areas encompassed by the current composite modeled distribution and known locations of target species in the Plan Area." By seeking to protect all Habitat for the Covered Species in the Plan, this alternative would result in a significant reduction in Take Authorization and significant increase in costs. Thus, this alternative was determined to be not Feasible and was not analyzed further.

3.5.6 No Action/No Project Alternative

The No Project alternative entails no Plan being developed and no Permits issued. Individual projects would have to seek their own Take Permits or avoid Take by not developing portions of the project site that would result in Take of a Listed Species (animal species). While

this alternative would preclude impacts to Listed Species from Take authorized under the Plan, Conservation of species and Habitats provided through mitigation and compensation under the existing regulatory framework would likely result in a pattern of Conservation that is fragmented and managed in a piecemeal fashion. The No Project Alternative is incapable of conserving certain Essential Ecological Processes, particularly the fluvial sand deposition and aeolian transport areas, which are necessary to support occupied Habitat by Covered Species in the dunes and other blowsand Habitats. There would not be a coordinated system of Biological Corridors and Linkages provided to connect Conservation Areas, and the ability to provide Linkages through project-by-project mitigation may be precluded over time through continued Development. Further, the No Project Alternative would not provide protection for Non-listed Species or for natural communities that do not provide Habitat for Listed Species. Over time, Non-listed Species would likely become listed, thereby increasing regulatory burdens and difficulty for Development.

3.6 Plan Benefits for Covered Species and Conserved Natural Communities

This section discusses the benefits of the Plan for the Covered Species and the conserved natural communities. With respect to impacts likely to result from the proposed Take of the Covered Species, Section 4.6 provides summary tables that quantify the loss of habitat for each Covered Species and the amount of loss of the conserved natural communities. An additional table in Section 4.6 summarizes the effects of this loss on each Covered Species. Complete descriptions of the impacts resulting from Plan implementation are presented in Section 9 in the species accounts.

Pursuant to the FESA, all Take authorized under the Permit will be incidental to otherwise lawful activities and not the purpose of such activities. Covered Activities for which Take is provided are described in Section 7. As described there, Take associated with the implementation of the Management and Monitoring Programs is also authorized by the Permit.

To issue a Permit, USFWS must find that Take has been avoided, minimized, and mitigated to the maximum extent practicable. Similarly, CDFG must have sufficient information demonstrating that the Plan will provide for the Conservation of the Covered Species. The Plan provides the following benefits to Covered Species and conserved natural communities and minimizes and mitigates impacts of the Take of Covered Species to the maximum extent practicable as follows:

- *Reserve System Assembly.* As described in Section 4.2, a Reserve System will be established to conserve Core Habitat for the Covered Species, conserve the natural communities included in the Plan, protect Essential Ecological Processes, and maintain Biological Corridors and Linkages. The specific goals of establishing the Reserve System are to:
 - (1) Represent native ecosystem types or natural communities across their natural range of variation in a system of conserved areas.
 - (2) Maintain or restore self-sustaining populations or metapopulations of the species included in the Plan to ensure permanent Conservation so that Take Authorization can

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be obtained for currently Listed species (animal species) and Non-listed Species can be covered in case they are listed in the future.

- (3) Sustain ecological and evolutionary processes necessary to maintain the functionality of the natural communities and Habitats for the species included in the Plan.
- (4) Maximize connectivity among populations and avoid Habitat fragmentation within Conservation Areas to conserve biological diversity, ecological balance, and connected populations of Covered Species.

The Conservation Areas have been designed to ensure that the Reserve System can conserve the highest quality Habitat for the Covered Species, as well as protect the Essential Ecological Processes necessary to maintain Habitat quality and maintain connectivity among large blocks of Habitat. The Reserve System has been designed to support viable populations of the Covered Species or, in the case of species which may not have viable populations in just the Plan Area, to conserve the best Habitat available for the species in the Plan Area and support connectivity with populations outside the Plan Area. Absent the Plan, future Development in the Plan Area would be expected to fragment this high quality Habitat, disrupt the Essential Ecological Processes that sustain the Habitat, and create significant edge effect problems. The Plan focuses Development in areas of lesser quality Habitat, typically where Habitat fragmentation and edge effects are already impacting Habitat quality. As delineated in Table 4-1 in Section 4.0 the Permittees mitigation obligation relative to Reserve System Assembly includes:

- ◆ Conservation of 88,900 acres through acquisition or other means.
 - ◆ Management consistent with the MSHCP of 8,800 acres of Existing Conservation Lands by the Local Permittees.
 - ◆ Conservation of 7,700 acres of land owned by the Permittees but not currently conserved.
 - ◆ Management consistent with the MSHCP of 6,800 acres of Existing Conservation Lands by State Parks.
 - ◆ Acquisition of 640 acres by State Parks.
 - ◆ Management consistent with the MSHCP of 2,600 acres of Existing Conservation Lands by CVMC.
 - ◆ In addition, the Permittees will maintain the fluvial sand transport process in designated areas in the Cabazon, Long Canyon, and West Deception Canyon Conservation Areas through means other than acquisition, as described in Section 4.2.2.2.4.
- *Reserve System Monitoring Program.* The lands described above, which are a Permittee mitigation obligation, total 115,140 acres. Habitat on the Permittee mitigation lands in the Conservation Areas will be preserved, enhanced as needed, and permanently monitored and managed to maximize the values of the mitigation lands for the Covered Species. The biological value of these lands will also be enhanced by the Existing Conservation Lands, Complementary Conservation lands, and the Additional Conservation Lands contributed by state and federal agencies. As described in Sections 4.1 and 4.2, these lands will be part of a Reserve System that also includes Existing Conservation Lands, Complementary Conservation Lands, and Additional Conservation Lands to be acquired by the state and

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federal governments. The Reserve System in its entirety will include approximately 723,480 acres.

As described in Section 8, the Plan provides a comprehensive Monitoring Program in perpetuity for all Reserve System lands to ensure adequate information on which to base management decisions and determine when Adaptive Management actions designed to ensure the biological success of the Reserve System are needed. During the first 75 years of the Plan, a total of \$254,294,000 is budgeted for the Monitoring Program. Thereafter, funding in perpetuity will be provided from the Endowment Fund established to fund the Monitoring Program, the Management Program, and Adaptive Management. See Section 5.14 for details on funding for the Monitoring Program.

- *Reserve System Management Program.* Section 8 provides detailed information on the Management Program, which includes Adaptive Management. The goal of the Management Program is to implement management actions and prescriptions that ensure Conservation of the Covered Species and conserved natural communities on lands in the Reserve System for which the Permittees are responsible. State and federal lands in the Reserve System will be managed by the relevant state and federal agencies consistent with the MSHCP. CVCC will enter into MOUs with the state and federal agencies to ensure this management. Finally, CVCC will use its best efforts to enter into MOUs with non-profit conservation organization which own land within the Reserve System to ensure management of those lands consistent with the MSHCP. During the first 75 years of the Plan, a total of \$221,252,000 is budgeted for the Management Program. Funding thereafter, in perpetuity, will be provided from the Endowment Fund established to fund the Monitoring Program, the Management Program, and Adaptive Management. See Section 5.14 for details on funding for the Management Program. Section 8 describes the Plan's provisions for Adaptive Management. During the first 75 years of the Plan, a total of \$14,903,000 is budgeted for Adaptive Management. Funding thereafter, in perpetuity, will be provided from the Endowment Fund. See Section 5.14 for details on funding for Adaptive Management and Section 8.2.4.2 for details on what constitutes Adaptive Management.
- *Avoidance, Minimization, and Mitigation Measures, including Land Use Adjacency Guidelines.* The Conservation Areas in Section 4.3 list specific Required Measures to avoid, minimize, and mitigate Take in the Conservation Areas, including avoiding activities during certain periods, restricting Development activities near nest sites, installing wildlife underpasses in conjunction with road improvement projects, and taking measures to maintain fluvial sand transport. Section 4.4 provides additional information on required avoidance, minimization, and mitigation measures. Section 4.5 describes Land Use Adjacency Guidelines designed to further avoid, minimize, and mitigate Take associated with the edge effects of Development in or adjacent to Conservation Areas by minimizing unauthorized entry into the Reserve System, and avoiding the introduction of exotic species, intrusive lighting, harmful runoff, and excessive noise levels.
- *Assure adequate funding and procedures to deal with Unforeseen Circumstances.* Procedures to deal with Unforeseen Circumstances are described in Section 6.8.

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- *The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild.* The Conservation Areas have been designed to ensure that the Reserve System can conserve the highest quality Habitat for the Covered Species, as well as protect the Essential Ecological Processes necessary to maintain Habitat quality and maintain connectivity among large blocks of Habitat. The Reserve System has been designed to support viable populations of the Covered Species or, in the case of species which may not have viable populations in just the Plan Area, to conserve the best Habitat available for the species in the Plan Area and support connectivity with populations outside the Plan Area. The Plan focuses Development in areas of lesser quality Habitat, typically where Habitat fragmentation and edge effects are already impacting Habitat quality. Additionally, adequate funding will be provided for management of the lands in the Reserve System for which the Permittees are responsible. For these reasons, the Take will not appreciably reduce the likelihood of survival and recovery of the species in the wild. The species accounts in Section 9 of the Plan provide an in depth analysis of the Plan's impacts on and benefits to the Covered Species.

Under the Plan and Permits, approximately 152,600 acres could potentially be lost to Development during the 75 year term of the Permits. This figure reflects all the vacant, private land outside the Conservation Areas plus the maximum Development that could occur in the Conservation Areas. In actuality, the acreage is expected to be substantially less for several reasons. One, since 1994, the rate of Development in the Plan Area has averaged approximately 1,370 acres per year. Projected over the 75-year term of the Permits, this would result in approximately 102,750 acres being Developed. Two, much of the vacant land both within and outside of Conservation Areas is severely constrained due to restrictions on Development on slopes, lack of access, and flood plain designations. Three, acquisition and conservation through other means may exceed the minimum acreage objective in the Conservation Areas. This would reduce the level of Take that occurs in the Conservation Areas.