APPENDIX E
SPECIES ACCOUNTS

Arroyo Toad – *Bufo microscaphus californicus*
Status: Federal – Endangered
State – None

Distribution, Abundance, and Trends.
The arroyo toad is endemic to California and Baja. Historically it occurred from the upper Salinas River in San Luis Obispo County south along the coast to the Rio Santo Domingo system in Baja California, Mexico. There are records from six desert side drainages. The species has disappeared from 76% of its historic range as of 1994 (Jennings and Hayes 1994a). The northern, central, and eastern potions of the range have lost all of their populations. It is currently known from only a few scattered locations within its historic range. About 40% of the known extant populations occur in areas owned or managed by the U.S. Forest Service (Brown 1993). The arroyo toad has highly specialized habitat requirements. Arroyo toad breeding sites are known to be streams of second to sixth order with overflow pools, depending somewhat on latitude (Sweet 1992, Griffin 1999). The streams and pools should be free of predatory fish. Adults breed in pools that have little woody vegetation along the margins and are shallow, sand, or gravel-based. The current velocity is generally low. The breeding pools occur near juvenile and adult habitat. This habitat is a shoreline or central bar and stable sandy terraces. The juveniles prefer areas that provide shelter either through drying algal mats or small damp refuges or depressions. The sand terraces have an over story of scattered shrubs and trees such as mulefat, California sycamore, Fremont cottonwood, or coast live oak. There is an absence of vegetation at ground level (Brown 1993, Jennings and Hayes 1994a). Arroyo toads have been found up to 1.08 km from water (Griffin 1999).

Occurrence within the Coachella Valley CDCA Plan Amendment Area
Whitewater River, Riverside County - This critical habitat subunit includes portions of the Whitewater River and adjacent uplands, from near Red Dome downstream to one-quarter mile south of Interstate 10. The unit encompasses approximately 5,900 ac., of which about 56 percent is BLM land and 44 percent is private land. BLM parcels. Six BLM parcels are near (101, 52, 26, 2, and 2 ac.) or below (86 ac.) the mouth of the Whitewater Canyon. Three larger parcels (1758, 1329, 52 ac.) extend up the canyon and include portions of the riverbed. The current status of arroyo toads in this subunit is poorly known, but recent sightings have occurred, and high-quality habitat still exists in the area. The range of the arroyo toad on BLM-managed lands within the planning area, based on modeled habitat, is 1, 260 acres. This land is within the San Gorgonio and the Whitewater Area of Critical Environmental Concern and thus is in conservation status.

Patten and Myers (1992) found a small population of Arroyo toads in the Whitewater River, 3-5 kilometers (2-3 miles) north of Interstate 10 at an elevation of about 420 meters (1,380 feet). The extent of breeding habitat for Arroyo Toads in the Whitewater River is unknown.

Threats and Limiting factors. Arroyo toad breeding habitat is created and maintained by the fluctuating hydrological, geological, and ecological processes operating in riparian ecosystems and the adjacent uplands within a Mediterranean climate. These riparian/wash habitats as well as adjacent upland habitats are essential for the species' survival. Periodic and unpredictable flooding that reworks stream channels and channel sediments and alters pool location and form, coupled with upper terrace stabilization by vegetation, is required to keep a stream segment suitable for all life stages of the arroyo toad. There are many threats to this species throughout its range, all of which could potentially be a problem to the Whitewater population. Human activities that affect water quality, influence the timing and amount of non-flood flows or frequency and intensity of floods, affect riparian plant communities, or alter sedimentation dynamics can reduce or eliminate the suitability of stream channels for arroyo toad breeding habitat. The development and alteration of streamside gravel bars and terraces is probably the main factor in the loss of habitat (Jennings and Hayes 1994a). Degradation or loss of surrounding uplands reduces and eliminates foraging and over-wintering habitat. This species is especially vulnerable to predation by exotic fishes and bullfrogs. Exotic plants can also adversely impact the habitat. The streamside bank and terrace habitat is popular for human uses such as camping, wading, ORV use, and suction dredge mining. The extent of impacts from human uses such as camping and wading is unknown. Livestock grazing can affect arroyo toads directly and indirectly through impacts on habitat features.

Burrowing Owl
Speotyto cunicularia
Status: Federal – Species of Concern
State – Species of Concern

Distribution, Abundance and Trends. The Burrowing Owl has a broad distribution that includes open country throughout the Midwest and western United States, Texas and southern Florida, parts of central Canada, and into Mexico and the drier regions of Central and South America. In Southern California, it is known from lowlands over much of the region, particularly in agricultural areas. This species is greatly reduced in numbers throughout its range (DeSante 1991, 1992).

Within the Plan area, burrowing owls are scattered in low numbers on open terrain throughout the lowlands. They occur in open desert areas, in fallow fields, along irrigation dikes and levees, wherever burrows (generally dug by ground squirrels) are available away from intense human activity. They can occur adjacent to residential development, as evidenced by regular observations of these owls in sandy substrates along Washington Avenue in Bermuda Dunes (prior to development of empty lots) (C. Barrows pers. comm.), and around the Palm Springs Airport (Cornett, pers. comm.).

Burrowing owls are notably common in Imperial County along roads and levees in the agricultural areas. They may occur along roads and levees in agricultural areas at the eastern end of the Coachella Valley, within the Plan area. However, our efforts to locate reliable records for burrowing owls in these agricultural areas met with limited success. Biologists from the California Department of Fish and Game (Keeney, pers. comm.) and Coachella Valley Water District who routinely visit the agricultural drains and associated levees around the Salton Sea reported only one burrowing owl observation (Thiery, pers. comm.).

An influx of wintering burrowing owls may occur in the Coachella Valley. The known location information for this species does not allow a determination of wintering birds as the month of observation is not consistently reported; four of the known locations report only the year of observation. Of the 40 known locations, four are listed as observations during the winter months (December to February). The remaining known locations are from observations in the spring and summer months, which probably indicate resident birds, potentially on breeding territories.

Burrowing owls occupy burrows dug by others, primarily ground squirrels. If left undisturbed, they will use the same burrow year after year for nesting. A clutch of 7 to 9 eggs is laid between March and July. Both parents take part in incubation for about 28 days. The young emerge from the nest and spend daylight hours at the burrow entrance with one or both adults. Their distress call is a low rattle, said to be a mimic of a rattlesnake. The burrows selected by these owls are typically abandoned rodent burrows, however, they also commonly use old pipes, culverts or other debris that simulates a hole in the ground.

Though their occurrence, distribution, and habitat preferences in the Coachella Valley are not well documented, burrowing owls are well studied elsewhere. Aspects of their biology that have been well documented include their food habits (Maser et al. 1971, Brown et al. 1986, Green et al. 1993) and their nesting requirements (Gleason and Johnson 1985, MacCracken et al. 1985, Rich 1986).

Burrowing owls follow a crepuscular habit, being most active during the early morning and evening hours. They are often observed perched on fence posts or utility wires. They typically live 8 years or more. Their diet is predominantly large insects and small rodents, but they will also take small birds, reptiles, amphibians, fish, scorpions, and other available prey. One study found that during the breeding season they feed on both vertebrates (mainly rodents) and invertebrates (mainly beetles) (Belthoff et al 1995). This study also noted that factors that provide for recruitment of young into the breeding population, including post-fledging behavior, dispersal and survival of young burrowing owls, are important to reversing population declines in this species.

The number of burrowing owl pairs that occur in the Plan area is not known. The relative population size and distribution of burrowing owls is highly variable, depending on local

conditions of burrow and food availability. In a summary of the relative distribution and abundance of burrowing owls in California, DeSante et al. (1996) report that burrowing owls often move their breeding locations over short (less than two to three km) distances from year to year, but do not appear to move over large distances. They designated "breeding groups" according to the following standard, "any location of known or presumed breeding burrowing owls found to lie within 3.0 km of any other location in continuous breeding habitat, or within 2.0 km of any other location from which it was separated by non-breeding habitat, was considered to be part of the same breeding group . . . most owl pairs were found to lie either well within 2 km or well over 3 km of each other." Further research would be necessary to determine if this standard applies to burrowing owls in the Coachella Valley.

Occurrence within the Coachella Valley CDCA Plan Amendment Area
Burrowing owls occur on BLM-managed lands in the Coachella Valley, particularly areas adjacent to agricultural fields and along unpaved roads. Precise distribution is not known.

Threats and Limiting Factors The most significant factor to the continued persistence of burrowing owl is habitat destruction. Their ground-nesting habit leaves them susceptible to predation by domestic cats and dogs. Individuals may be killed on roadways while foraging at night. Some studies indicate that road mortality may be a significant factor for this species; vehicle collisions caused three of five known mortalities in one study (Konrad and Gilmer 1984) and 37% of known mortality in another (Haug and Oliphant 1987). In agricultural areas, levees and irrigation dikes where rodent burrows are present can provide suitable nest sites. In these areas, burrowing owls may be threatened by disturbance as a result of maintenance activities along dikes and levees and by poisoning from pesticide use or rodent poisoning campaigns. Off-road vehicle use is a threat to the habitat of this species because their burrows can be crushed and their nest sites disturbed or destroyed. Illegal trash dumping has also been observed to impact burrowing owls (Corey personal communication).

California black rail
Laterallus jamaicensis
USFWS: No status
CDFG: Threatened

Distribution, Abundance, and Trends. Historically, black rails occurred along the Pacific coast from Bahia San Quintin in Baja California to San Diego, Los Angeles and north to San Francisco. Inland, these rails occurred from the delta of the Colorado River north to the central valley of California and on to eastern Oregon marshlands. Today the coastal and inland wetlands are greatly reduced from their historic range. A desert strong hold for this species appears to be along the lower Colorado River where over a hundred birds have been observed repeatedly during censuses in recent years. Black rails are known to occur within the Salt Creek watershed of the Dos Palmas region, both in the wetlands in the Dos

Palmas Springs area at and at the mouth of Salt Creek. No accurate numbers are available. There is also a record from the Whitewater delta area at the north end of the Salton Sea. Appropriate management of both Dos Palmas and the Whitewater delta could expand existing habitat for this species.

Black rails are birds of dense coastal and inland marsh habitat. Based on radio telemetry data gathered on the lower Colorado River, black rails selected habitat dominated by California bulrush, *Scirpus californicus* and three square bulrush *S. americanus*. They either avoided cattails *Typha domingensis* or utilized cattail habitat in proportion to its availability. However, nests were often constructed of cattail leaf blades, even though cattails were rarely the dominant vegetation type surrounding the nest. Preferred habitat sites had a shallow water depth of <2.5 cm, with 25% of the substrate covered in water. They preferred areas closer to the shoreline than would have been expected in random distribution.

Home range size along the lower Colorado River varied from 0.43 to 0.55 ha., depending on sex and time of year. The birds are resident year-round. The home range sizes described above are three to four times smaller than those described for the eastern black rail, and may result from more stable water levels than found in tidal habitats. The rails were found to be entirely diurnal in their activity.

Black rails are omnivorous, eating both invertebrates and bulrush seeds. Predators include house cats, short-eared owls, northern harriers, great blue herons and great egrets.

Occurrence within the Coachella Valley CDCA Plan Amendment Area
Black rails are known to occur at the Dos Palmas ACEC, north of the Salton Sea in eastern Riverside County. Although there is approximately 1125 acres of potential black rail habitat in the Coachella Valley, only 257 acres is BLM land.

Threats and Limiting Factors
Threats to black rails include water diversions that reduce marsh habitat, including the lining of the earthen Coachella Canal above Dos Palmas. The Coachella Canal Lining Project includes mitigation measures for lost habitat and water at Dos Palmas and rail habitat will be conserved and maintained at Dos Palmas. Habitat modification for flood control at the Whitewater River delta, tamarisk infestations which degrade and dry up marsh habitat, and predation from exotic bullfrogs all impact black rails.

Casey's June Beetle
Dinacoma caseyi
Status: None

Distribution, Abundance and Trends. Casey's June beetle has an extremely limited distribution that includes the alluvial plains bordering the San Jacinto and Santa Rosa Mountains along the southern edge of the Coachella Valley. At present it is known from only two specific locations in the south Palm Springs area. One location is at the junction of South Palm Canyon Drive and Bogert Trail, on private land. A second location is within the Smoke Tree Ranch development, south of Highway 111 and east of Sunrise Road. Potential habitat has been described in this vicinity on land within the Agua Caliente Indian Reservation but the species has not been detected there in recent surveys.

Based on descriptions of historic range and early collections, this species is presumed to have occurred from Palm Springs, possibly as far west as Snow Creek, to the vicinity of Indian Wells. All of the historic and extant localities occur on alluvial fans where dissipated flows deposit finer silts and sands (Hovore 1997). The known population at Bogert Trail occurs on the Carsitas gravelly sand, 0 to 9% slopes, (CdC) soil type as mapped by the Soil Conservation Service. Hovore (1997) has proposed that Carsitas gravelly sand on 9 to 30% (CdE) slopes may also be suitable. These soils are gravelly sands, often with a noticeable "crypto-biotic crust," of nitrogen-fixing blue-green algae and fungi. These soils tend to occur along the base of the mountains in areas most extensively used for agriculture and urban development, so that very little potential habitat may still exist.

The Casey's June beetle emerges and "swarms" in mid-to-late spring (usually late May through June). They generally fly on warm nights when temperatures at dusk are 70° F, when daytime temperatures range from 90° to 100° F. The males fly swiftly over the ground from dusk to shortly after dark in search of flightless females. A larval food plant may be cheesebush, *Hymenoclea salsola*, as females have been collected immediately below this plant.

Surveys during the spring and early summer months of 1997 through 1999 have failed to detect additional known occurrences of the Casey's June beetle. Surveys conducted in 1999 for the Agua Caliente Band of Cahuilla Indians (for their separate MSHCP covering reservations lands) failed to detect any individuals of this species. Efforts will continue to coordinate with the surveys and Agua Caliente planning effort. Other locations where potentially suitable habitat may still occur, such as the mouth of Deep Canyon and Dead Indian Canyon, require additional survey under appropriate climatic conditions.

Occurrence within the Coachella Valley CDCA Plan Amendment Area
There are no known occurrences of Casey's June Beetle in the planning area on BLM land.

Coachella Valley Fringe-toed lizard
Uma inornata
Status: Federal – Threatened
State – Endangered

Distribution, abundance, and trends. The Coachella Valley fringe-toed lizard is restricted to the Coachella Valley and was found historically from near Cabazon at the northwestern extreme to near Thermal at the southeastern extreme. It is associated with a substrate of aeolian sand to which is has developed morphological and behavioral adaptations (Heifetz 1941, Stebbins 1944, Norris 1958). It occurs wherever there are large patches of the appropriate substrate (England and Nelson 1976, LaPre and Cornett 1981, Turner et al. 1981, England 1983, Barrows 1997). As development of the Coachella Valley progressed, fringe-toed lizard habitat declined from about 171,000 acres historically (HCP 1985) to 63, 360 acres in 1980 (Federal Register 1980) to 27, 206 acres estimated by GIS modeling in 2000 (Coachella Valley Multiple Species Habitat Conservation Plan/Natural Communities Conservation Plan).

Coachella Valley fringe-toed lizard abundance, calculated as density, was estimated at several sites considered representative of habitat in the Coachella Valley by Turner et al. 1981 and 1983. These estimates, made from surveys in only one year, ranged from 4 to 18 per acre in unstabilized habitat. However, a long-term demographic study by Muth and Fisher (in prep) revealed density variations among years from 7 to 60 per acre at one site. Availability of food resources appears to be causal to these fluctuations in density, as reproduction and mortality are correlated with annual rainfall.

The Coachella Valley fringe-toed lizard is omnivorous and diet changes as a function of food availability. During normal to wet years it eats primarily flowers and plant dwelling arthropods. During dry periods the diet shifts to primarily leaves and ants (Durtsche 1987, 1995). The dietary content differs also between breeding and non-breeding seasons for males, but does not differ significantly for females (Durtsche 1992).

Coachella Valley fringe-toed lizards differ sexually in their spatial use of habitat. Males have a significantly larger home range size than do females. On average, the home range for males is 1,070 square meters and 437 square meters for females (Horchar 1992

Coachella Valley fringe-toed lizards are active from March to mid-November (and sometimes December when the weather is accommodating), although adults are primarily active from April to October with a peak in May-June (Mayhew 1965). Springtime activity is triggered when subsurface temperatures exceed the minimum voluntary temperature at –5 cm where the lizards hibernate, and end when these temperatures drop below minimum voluntary in the fall (Cowles 1941, Brattstrom 1965, Muth and Fisher 1991). Daily activity is also associated with temperature. Mayhew (1964) found them active when their body temperatures ranged from 25.8-44.0 degrees C. They must have access to cool temperatures to survive midday temperatures during the hottest months. Muth and Fisher

(1991) found that surface temperatures in the shade and subsurface temperatures at – 5 cm in the sun exceeded the critical thermal maximum for the species (Brattstrom 1965). Fringe-toed lizards must burrow 5 cm in the shade or much deeper in direct sun to escape extreme heat. Not all individuals are active on any given day, despite appropriate temperatures. Muth (1987) and Muth and Fisher (1991 and unpublished data) found that on average, only 20% of a marked population was active each day, with much individual variation. Although Fisher and Muth watched the lizards excavate relatively deep burrows in the sun on the hottest days, Pough (1970) states that fringe-toed lizards do no bury deeper than 3-4 cm "even under near-fatal heat stress".

Breeding occurs from late April into August and eggs are laid from May into September (Mayhew 1965). This prolonged breeding season, along with distinct size classes among hatchlings, the simultaneous presence of enlarged eggs in both oviduct and ovary, and the recurrence of breeding color in individual females suggests that they lay multiple clutches per year when food resources are abundant (Mayhew 1965, Muth and Fisher, unpublished data). Young of the year hatch the first week of August at Whitewater Floodplain Preserve (Muth and Fisher, unpublished data) but a week or two earlier at the Coachella Valley Preserve where temperatures are higher. Growth rate is positively correlated with annual rainfall and young reach adult size one to three years after hatching. Fewer females breed during dry years and they lay fewer egg clutches (Muth and Fisher unpublished data).

Coachella Valley fringe-toed lizards are known to live eight years in the wild but annual survivorship is about 35%. Size, sex, or age related differences in mortality are not detectable (Muth and Fisher 1991). Known predators include larger conspecifics, leopard lizards (*Gambelia wislizenii*), coachwhip snakes (*Masticophis flagellum)*, sidewinders (*Crotalus cerastes)*, loggerhead shrikes (*Lanius ludovicianus)*, American kestrels (*Falco sparverius)*. Coyotes (*Canis latrans)*, kit foxes (*Vulpes macrotis)*, Palm Springs ground squirrels (*Spermophilus tereticaudus* spp. *Chlorus*), red-tailed hawks (*Buteo jamaicensis)*, prairie falcons (*Falco mexicanus)*, greater road runners (*Geococcyx californianus*), and burrowing owls (*Speotyto cunicularia)* utilize fringe-toed lizard habitat and are known to eat lizards.

Trepanier and Murphey (2001) analyzed nine populations of Coachella Valley fringe-toed lizards using mitochondrial DNA and found them to be nearly identical. They found the species to be most similar to its nearby congener, the Colorado Desert fringe-toed lizard, confirming earlier analyses of anatomical characters (Norris 1958, de Querioz 1989) and display behavior (Carpenter 1963). However, genetic differences among the nine populations are considerably less than genetic differences among populations of the Colorado Desert fringe-toed lizard, indicating a relatively recent genetic isolation.

<u>Occurrence within the Coachella Valley CDCA Plan Amendment Area</u>
The population is rapidly declining due to ongoing loss of habitat, especially in the area south of Interstate 10 near La Quinta, Palm Desert, Rancho Mirage and Cathedral City. Remaining habitat is dwindling and heavily fragmented. Fifty-seven percent (57%) of the

170,880 acres of historic habitat described in the Habitat Conservation Plan (HCP 1980) has been lost to human development (Johnson, pers. com.). Some authorities contend that the amount of historic habitat is substantially less than this figure (Barrows, pers. com.), in which case the percentage of historic habitat lost is much greater. This discrepancy may be due to the absence of aerial photographs from the 19th century. On BLM-managed lands within the Coachella Valley, 2, 557.1 acres of suitable habitat has been modeled, 2, 312,8 acres of which are designated critical habitat. The majority of these acres occur within the Coachella Valley Preserve system and BLM ACECs and thus are protected. The BLM lands at Windy Point are proposed for protection under the preferred alternative in the DEIS.

The portion of the population south of Interstate 10 and east of Palm Drive can be expected to go extinct within the next 10 years as habitat is converted to human use. There are no BLM-managed lands in this area south of I-10. Remaining populations will occur only on the Coachella Valley Preserve's three units, on the Valley's wind farms, and from Windy Point to Fingal's Finger. Wind farms under BLM right-of-way grants are protected from public entry. Existing wind parks are operating under existing Biological Opinions. Future projects would be subject to Section 7 consultation. Population monitoring on the Coachella Preserve indicates a stable population in this area. A total of 27, 205 acres of suitable habitat has been modeled for the fringe-toed lizard; 2, 557 acres occur on BLM-managed lands, primarily in the Windy Point area and the Coachella Valley Preserve.

Threats and limiting factors. Primary threats are loss or degradation of habitat and the processes that drive that habitat. Habitat is lost when urban, agricultural and other types of development replace suitable with unsuitable habitat. Habitat is degraded by off-highway vehicle (OHV) abuse, illegal dumping, and invasion by exotic weeds, etc. Floodwaters transport sediment downstream from its source to where it is gradually sorted and the sand is then transported by wind to form dunes. To maintain the habitat, floodwaters must not be blocked or redirected from the sorting area. There must also be no barriers blocking the movement of wind and its sand load between the sorting area and the habitat. These barriers impound sand and cause shielding effects, which, eventually, will "extend to the downwind end of the region because of the unidirectional sand movement pattern" (HCP 1985).

In the Coachella Valley, edge effects are related to urban development adjacent to habitat. Roads, feral pets, collecting, etc. increase mortality of fringe-toed lizards, especially around the perimeter of a habitat patch. The size of the perimeter is relative to the total area – thus the larger the perimeter the larger the area affected by adjacent development.

Coachella Valley Giant Sand treader Cricket
Macrobaenetes valgum
Status: Federal – Species of Concern (No official status)
State – None

Distribution, Abundance and Trends. The Coachella Valley giant sand treader cricket occurs exclusively in the active sand hummocks and dunes in the Coachella Valley. They are most abundant in the active dunes and ephemeral sand fields at the west end of the Coachella Valley, west of Palm Drive at least to Snow Creek Road, adjacent to the Whitewater River and San Gorgonio River washes. Suitable habitat also occurs within the Whitewater River Floodplain Preserve and at the Coachella Valley Preserve, on the main dunes and the Simone dunes. Despite the low numbers reported below from pit-trap samples at the Thousand Palms Preserve, burrows of these crickets are commonly observed in the more active portions of the aeolian sands in the southern dunes (C. Barrows, 1998). The distinctive cone-shaped excavation tailings of this species' diurnal burrows can be easily identified and used to confirm this species occurrence at a given location (C. Barrows, 1998); these distinctive excavations were common on the Simone Dune at the Thousand Palms Preserve, and at the Snow Creek and Windy Point locations. They were not as common at Willow Hole, and were not observed at a La Quinta site and at the east end of the Indio Hills. The east end of the Indio Hills also includes suitable active blowsand habitat, but this species has not been observed there; their apparent absence at this location may relate to moisture regimes where they occur in lower numbers in the drier eastern portion of the Plan area.

Perennial shrubs including creosote bush, burrobush, honey mesquite, Mormon tea, desert willow, and sandpaper bush dominate the preferred habitat of this species in windblown environments. Stabilized sand areas appear to be avoided. Evidence for their affiliation with active, unshielded sand habitats again comes from trapping results reported by Barrows (1998). Cameron Barrows reports that after more than 900 trap nights, using pitfall traps and drift fences, no sand treader crickets were captured on a stabilized and previously disturbed sand area of the Thousand Palms Preserve.

The historic range of this species is entirely within the Plan area, from Fingal's Finger east to the sand dune areas in the vicinity of Indio. Tinkham (1962) describes them as occurring on "sand dune ridges to two miles west of Indio"; this description would include portions of the Big Dune area. Information on the occurrence of this species in the remnants of the Big Dune, from Palm Springs east to La Quinta and Indio, is limited as most of the land is privately owned and has not been accessible for surveys. The species distribution model indicates that potential habitat occurs on the Big Dune, however, the active blowsand areas apparently preferred by the Coachella giant sand treader cricket will not persist in the absence of an intact sand transport corridor. The occupied range for this species has been greatly reduced as a result of development and sand stabilization.

The giant sand treader cricket has its primary period of activity during the spring. They are nocturnal, coming to the surface to forage on detritus blown over the dunes, or to look for mates. During the day they conceal themselves in self-dug burrows from five to twenty meters deep in the sand. These burrows are often associated with the roots of perennial shrubs or under boards, rocks, and other hiding places. The life history of these insects is not well known. The adult and juvenile instars disappear during the warm months of the year, perhaps spending the summer in the egg stage. Activity of small juvenile instars begins in the late fall through early winter. By mid to late spring the adults have disappeared.

Occurrence within the Coachella Valley CDCA Plan Amendment Area
Habitat for the giant sand treader cricket overlaps with the Coachella Valley fringe-toed lizard.

Threats and limiting factors
The most significant limiting factor for this species is the availability of the aeolian sand ecosystem and the sand sources and corridors that maintain it. Threats to this species include cumulative habitat loss and degradation of the existing habitat as a result of development, in particular where sand transport processes are disturbed. Off-road vehicle activity is a threat because shallow burrows can be crushed and the sand compacted. Non-native species such as Saharan mustard (*Brassica tournefortii)* and Russian thistle (*Salsola tragus)* can significantly stabilize active sand habitats and may decrease habitat availability and habitat quality for these crickets.

Coachella Valley Grasshopper
Spaniacris deserticola
Status: Federal – None
State – None

Distribution, Abundance and Trends. The Coachella Valley Grasshopper is a rare grasshopper that uses *Tiquilia palmeri* as a food plant. It also occasionally uses *Tiquilia plicata* which grows in sandy flats and washes (Hawks 1995). According to Tinkham (1975) *Tiquilia palmeri* may be the preferred host because it provides green foliage all summer long and occurs in edaphic conditions which provide greater protection for the eggs. Hawks (1995) indicates that all life stages of this species are associated with *Tiquilia palmeri.* This grasshopper is typically associated with the lower fringes of rocky bajadas, particularly where the soil is partly of rock, sand, and clay (Tinkham 1975), low sandy ridges, and sandy alluvial fans, if the host plant is present.

Known sites where this species has been observed outside the Plan area include the vicinity of Rice in San Bernardino County where Tinkham (1975) reported finding a female on *Tiquilia plicata,* on a “rather level sweep of sand well covered with sand mat.” He also reported a large colony on a low sand ridge about a mile east of Plaster City in Imperial

County; this colony was extirpated by 1961 after construction of a highway department borrow pit (Tinkham 1975). This grasshopper also occurs in the Borrego Springs area and in the 1960s, several specimens were collected near stabilized sand dunes southeast of San Luis Rio Colorado in Sonora, Mexico. A number of other known colonies have been extirpated as reported by Tinkham (1975) near Dale Lake, 25 miles east of 29 Palms, in the vicinity of Smoke Tree Ranch in Palm Springs, and west of Thousand Palms. Within the Plan area, colonies of this species have been recorded along the alluvial slopes of the Indio Hills, from Washington Street to Willow Hole, including the southern slopes of Edom Hill (Hawks 1995), on the Coachella Valley Preserve, and at scattered locations north of Ramon Road and west of the Coachella Valley Preserve, near Thousand Palms. Writing in the Independent Science Advisors Review (Noss et al. 2001), suggests that it may now be restricted to sites north of I-10, including portions of the Thousand Palms Preserve and Willow Hole areas.

The distribution of this species in the eastern and southern parts of the Plan area needs further verification. As noted below, Matt McDonald from the U.S. Fish and Wildlife Service collected some specimens that appeared to be this species from Dos Palmas and near the Salton Sea; input from experts on this species ultimately suggested they were not. Greg Ballmer (Noss et al. 2001) suggests that if the historical populations in Imperial County are extirpated, the remaining populations in the Coachella Valley are of greater significance.

This insect is not well known and it has not been widely surveyed throughout its potential range. Its food plant, *Tiquilia palmeri,* is distributed throughout the lower elevations of the Colorado Desert; it is not common though and tends to occur in small isolated clusters in sandy soils. It is likely that the Coachella Valley grasshopper may be found throughout the area of distribution of *T. palmeri*.

A distinctive characteristic of this grasshopper species is the activity period of the adults which occurs in the hottest months of the year, during mid-day, and at the lowest elevations within the Coachella Valley. Adults can tolerate soil temperatures of at least 60° C. In areas where *Tiquilia palmeri (*and apparently sometimes *Tiquilia plicata*) occurs, nymphs may be found during the spring months. The adults are much easier to detect and are active from late June through August. At this time of year, *Tiquilia plicata* is one of the few plants with green foliage available.

Occurrence within the Coachella Valley CDCA Plan Amendment Area
This species is known to occur within the Thousand Palms Preserve, the east end of the Indio Hills, and Willow Hole areas.

Threats and limiting factors
Within the known habitat of this species, the primary threats are sand and gravel mining and urbanizations. This species is vulnerable to development as its colonies occur at low elevation sites in the Coachella Valley. The Coachella Valley grasshopper may also be vulnerable to being crushed by passing cars on roads because *Tiquilia palmeri* often grows

well along road margins. This species is apparently limited to areas where the host plant occurs.

Coachella Valley Jerusalem Cricket
Stenopelmatus cahuilaensis
Status: Federal – Species of Concern
State – None

Distribution, Abundance and Trends. The Coachella Valley Jerusalem Cricket is known from the Snow Creek area from Fingal's Finger east to Windy Point, and remnants of sand dune habitat around the Palm Springs Airport. They occur in sandy to somewhat gravelly sandy soils and have been called an obligate sand species. They do not necessarily require active blow sand habitat but have been found in loose wind blown drift sands, dunes, and sand in vacant lots if native vegetation exists. They have been found associated with the roots of members of the sunflower family, including *Ambrosia* sp. and *Encelia* sp. (Weissman and Ballmer, pers. comm.).

According to Hawks (1995) these Jerusalem crickets require high humidity and most observations have been following winter and spring storms while the soil substrate remains moist. They are most often located beneath surface debris during the cooler and wetter months of the year. During the summer months they spend daylight hours in deep burrows in the ground; they may rarely be encountered at the surface during the night (Hawks 1995). Because these Jerusalem crickets have been observed more widely at the western edge of the Coachella Valley, and because of their affiliation with cool, moist conditions, it has been suggested that they may be limited in distribution by temperature and moisture regimes (Tinkham 1968, Hawks 1995).

The Coachella Valley Jerusalem cricket feeds at night on roots, tubers, and detritus; they have also been occasionally observed feeding on dead animals and may be cannibalistic. Male and female Jerusalem crickets drum their abdomens against the bottom of their burrows or the ground to attract one another. Small clusters of their relatively large eggs are laid by the female in soil pockets. Their complete life cycle may extend three years or more.

Tinkham first described this species in 1968 from collections made in 1962 and after. The type locality of the species is described as "undulating dunes piled up at the northern base of the San Jacinto Mountains," reached by traveling south from the old Palm Springs Depot (10 miles west of Palm Springs). This location is likely at or near the Snow Creek dunes area. The known range also includes portions of what is now northern Palm Springs and Cathedral City. Known locations where this species has been observed occur on some of the lands owned by the BLM in the Windy Point area, and on lands recently purchased by the BLM or by the Friends of the Desert Mountains along Snow Creek Road. In a 1995 survey for this Plan, Dave Hawks (1995) reported finding these crickets only in the vicinity

of Fingal's Finger. Scientific Advisory Committee member Cameron Barrows has also reported observing these crickets only in the Snow Creek area; this Jerusalem cricket has not been detected on the Thousand Palms Preserve despite trapping efforts in this area (C. Barrows, pers. comm.). They have not been found in the vicinity of the Whitewater Floodplain Preserve and Hawks (1995) suggests that suitable habitat does not exist in this area. The easternmost known location is in the vicinity of Thousand Palms, near Bob Hope Drive and Interstate 10; this location may not longer be extant as the area is increasingly developed; Greg Ballmer suggests this record is probably an outlier. The lack of observations of this species east of Windy Point are very limited and suggest that they may not occur in significant numbers in the central Coachella Valley. Greg Ballmer suggests in the ISA review (Noss et al. 2001) that a predicted climatic shift toward warmer and drier conditions would emphasize the importance of protecting habitat for this species at the western end of its range (he suggests especially along the Whitewater River wash from Palms Springs westward to Fingal's Finger.

Occurrence within the Coachella Valley CDCA Plan Amendment Area

The known range also includes portions of what is now northern Palm Springs and Cathedral City. Known locations where this species has been observed occur on some of the lands owned by the BLM in the Windy Point area. The lack of observations of this species east of Windy Point are very limited and suggest that they may not occur in significant numbers in the central Coachella Valley. There are 23, 017 acres of modeled suitable habitat in the Coachella Valley for this species; 3,381 acres is on BLM-managed lands.

Threats and limiting factors

The most significant threats to the Coachella Valley Jerusalem cricket are habitat fragmentation and off-road vehicle use within their habitat. Off road vehicles damage their habitat by crushing underground burrows and eliminating native vegetation. Conversely, clean up and removal of surface debris may not benefit this species as they use debris piles. This species is apparently limited to sand dunes and sand fields at the west end of the Plan area where the temperature/moisture gradients are within their tolerance levels. Greg Ballmer in his report on a trapping survey for the Coachella Valley Jerusalem cricket (1993) has suggested that average annual precipitation and floral community components may be used to predict the occurrence of this species. He suggests that dunes east of Ramon Road (Bob Hope Drive?), at the Coachella Valley Preserve, and in Indian Wells/La Quinta (mostly extirpated) appear to be drier than sites where S*. cahuilaensis* was found, as evidenced by the comparative lack of winter/spring annuals and herbaceous perennials. He describes observations of sand near Windy Point that was wet to a depth of several inches following winter storms, while sand at Washington Street would be damp, at most, to a depth of one to two inches.

Coachella Valley Milkvetch
***Astragalus lentiginousus* coachellae**
Status: Federal – Endangered
State – None

Distribution, abundance, and trends. The Coachella Valley milkvetch occurs in dunes and sandy flats, along the disturbed margins of sandy washes, and in sandy soils along roadsides where they occur adjacent to existing sand dunes. Within the sand dunes and sand fields, this milkvetch tends to occur in the coarser sands at the margins of the dunes, not in the most active blowsand areas. This species is strongly affiliated with sandy substrates and may occur in localized pockets where sand has been deposited by wind or by active washes. It may also occur in sandy substrates in creosote bush scrub, not directly associated with sand dune habitats. In the Plan area, populations are known from the Snow Creek area, on the Whitewater Floodplain Preserve, the Edom Hill-Willow Hole Preserve/ACEC, and the Coachella Valley Preserve. Other concentrations of the species occur along Gene Autry Trail near the airport in Palm Springs, on and around Flat Top Mountain, along Varner Road at the base of Edom Hill, and in scattered locations in the southern parts of Desert Hot Springs. Though suitable habitat appears to be present in the Indio and La Quinta areas, this species has not been recorded there. Within the plan area, the easternmost known location for the Coachella Valley milkvetch that is still extant is on the Thousand Palms Preserve. Information on the distribution of the species has been compiled from a variety of sources, including biological surveys completed in the spring and summer of 1995 (Sanders, 1995, Barrows, 1995), data from the Natural Diversity Data Base (NDDB 1994), environmental assessment documents, annual monitoring data for the Coachella Valley Preserve (C. Barrows 1987-1995) and previous surveys (Barrows 1987).

This federally-listed endangered species is an erect winter annual, or short-lived perennial, which blooms from February to May, producing pink to deep magenta-colored flowers. It is distinguished in part from the other milkvetches by its strongly inflated, two-chambered, mottled pods. These pods, when dried, fall to the ground and are blown along the dunes. In good years, hundreds to thousands of individuals have been described in a population, but often reports are of less than 20 plants. Specific data on population size and dynamics are not available for this species. The factors controlling population size through effects on seed germination, seedling establishment, and plant longevity have not been studied, but presumably involve moisture availability and soil and air temperatures (Sanders 1995).

The Coachella Valley milkvetch was first described by Rupert Barneby in Shreve and Wiggins (1964) based on a collection made by Alice Eastwood in 1913 near Palm Springs, Riverside County. Extensive dune systems, now much reduced, at the base of the Santa Rosa Mountains, in what are now the cities of Palm Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells, and La Quinta provided suitable habitat for the Coachella Valley Milkvetch.
This species is known from locations from One Horse Spring near Cabazon to the sand dunes off Washington Avenue, north and west of Indio, in a longitudinal west to east range

of approximately 33 miles. The distribution of this species is restricted to the Coachella Valley in Riverside County, between Cabazon and Indio, with the exception of six outlying occurrences within a 5-mile area along Rice Road in the Chuckwalla Valley north of Desert Center (BLM 2000). These Desert Center "outliers", most recently observed in March 1998, are not within the plan area. While the overall range (east to west) of this species may not be significantly reduced from the historical distribution, the number of known locations has declined dramatically (Barrows 1987).

Occurrence within the Coachella Valley CDCA Plan Amendment Area

Of forty-nine extant observations of the Coachella Valley milkvetch (*Coachella Valley Multiple Species HCP database)*, only 6 of those occurred on BLM-managed lands. Three of these observations were made within existing Areas of Critical Environmental Concern (ACECs) and three on unclassified land within the Coachella Valley. A model of the potential distribution of this species has been prepared for use in the Coachella Valley Multiple Species HCP. This model shows suitable habitat extending as far as northeast of Indio and into La Quinta. Suitable habitat also is found east of Highway 62 south of Dillon Road. No observations of the Coachella Valley milkvetch have been made in these two areas. There are 5,059.6 acres of suitable habitat on BLM-managed lands within the planning area. The majority of these fall within existing ACECs such as the Coachella Valley Preserve, Edom Hill, and the Whitewater Floodplain Preserve/ACEC. These lands are already within protective status. The modeled habitat at Windy Point would be protected under the proposed preferred alternative in the attached DEIS.

Threats and limiting factors. The primary threat to this species is habitat destruction due to continuing urban development, including the direct effects of habitat conversion. Other impacts to the species are from increased human activity, including off-road vehicle use, trampling, and the introduction of non-native plants, including Russian thistle (*Salsola tragus*) and Saharan mustard (*Brassica tournefortii)*. Development of wind energy parks has impacted this species, although the plants can persist associated with wind parks as long as disturbance to the species' sandy habitat is minimized. Many of the sand dune areas where this milkvetch occurs have been developed, been stabilized by adjacent development, or fragmented by urbanization. Each of the impacts described above relates to the sand dune ecosystem and the interference with the windblown sand transport system. These ecosystems require a source of new sand to be maintained over long periods of time and a wind corridor to maintain dune dynamics. Though Coachella Valley milkvetch does not necessarily occupy active blow sand dune habitats, the species does appear to be dependent on sand dune ecosystems.

The annual variation in population size that has been observed in this species, associated with drought conditions and the occurrence of seasonal rainfall, is also of concern. The small size of populations in drought years could leave this milkvetch vulnerable to extinction from stochastic events. The number of individuals of this species in known locations can vary dramatically from year to year, depending upon available soil moisture and other factors. For example, during the course of a biological survey for the Army Corps of

Engineers at the Cabazon Windpark site in May 1979, 209 individuals were observed (Wright and LaPre 1979); a survey of this same area in May 1987, a dry year, only six were observed (Barrows 1987).

Desert Bighorn Sheep (outside the Peninsular Ranges**)**
Ovis Canadensis nelsoni
Status: Federal – Sensitive
State – None

Distribution, abundance and trends
Desert bighorn sheep occur in the Little San Bernardino Mountains on the Big Morongo Canyon Preserve, in the Mecca Hills, and the Orocopia Mountains. This BLM sensitive species is also fully protected under state law. Desert bighorn sheep have declined across the southwest since the early 1900's (Buechner 1960). Bighorn sheep typically utilize habitat that is steep, rugged, and open, habitat that provides escape routes from predators, forage, and water during the hot summer months. Bighorn sheep habitat tends to be patchily distributed and connected by movement corridors with high visibility and nearby escape terrain (Risenhoover et al. 1988).

The Little San Bernardino Mountains are located in central Riverside County and are bordered on the south by the Coachella Valley, and include parts of Big Morongo Canyon Preserve and Joshua Tree National Park. Sixty-one sheep in 16 separate groups were observed during surveys conducted in the western portion of the Little San Bernardino Mountains in September 2001. The largest concentrations of sheep were observed near known water sources in Little Morongo and Long Canyons. No sheep and little trailing was observed in the lower portions of these canyons.

The Orocopia Mountains are located east of Indio in south-central Riverside County. This area is bordered by the Coachella Canal on the west and southwest, the Bradshaw Trail on the south, and I-10 on the north. Gas Line Road is the eastern boundary and the western border of the adjacent Chuckwalla Mountains. The Orocopia Mountains run into the Mecca Hills to the west. Bighorn sheep surveys in the Orocopia Mountains indicate that the population is stable at 60-80 animals (CDFG files). However, dependence upon water from the Coachella Canal has caused some concern among CDFG biologists. The need for guzzlers in the Orocopia Mountains has long been discussed. There are a number of existing guzzlers in the Orocopia Mountains, some specifically for bighorn sheep and some for gallinaceous birds. This sub-population of the Sonoran metapopulation has been identified as a transplant source population by the California Department of Fish and Game. No transplants have occurred recently.

Desert Pupfish
Cyprinodon macularius macularius
Status: Federal – Endangered
State – Endangered

Distribution, abundance and trends. Historically, desert pupfish occurred in the lower Colorado River in Arizona and California, from Needles downstream to the Gulf of Mexico and into the delta in Sonora and Baja. In California, pupfish inhabited springs, seeps, and slow-moving streams in the Salton Sink Basin, and backwaters and sloughs along the Colorado River. Desert pupfish also occurred in the Gila River Basin in Arizona and Sonora, including the Gila, Santa Cruz, San Pedro, and Salt Rivers; the Rio Sonoyta of Arizona and Sonora; Pureto Penasco, Sonora; and Laguna Salada basin of Baja California. The Quitobaquito pupfish, found only in Quitobaquito Spring, Arizona, was recognized as a subspecies of desert pupfish; however, a recent phylogenetic study supports the recognition of this pupfish (as well as pupfish from the Rio Sonotya) as the species *Cyprinodon eremus* Miller and Fuiman (Echelle 1999).

In the Salton Sink, desert pupfish populations are the remnants of those that inhabited ancient Lake Cahuilla. Four to five hundred years ago, the Colorado River was diverted away from the lake and into the Gulf of California, leaving pupfish isolated in springs. After the Salton Sink was flooded in the early 1900s by diversion of the Colorado River, desert pupfish colonized the Salton Seas. The Salton Sea, its tributary streams, irrigation drains, and shoreline pools, supported large pupfish populations until the populations began declining in the mid to late 1960s. A 1991 California Department of Fish and Game survey (Nichol et al. 1991) found pupfish in a majority of irrigation drains, some shoreline pools and several tributaries of the Salton Sea. Currently, California desert pupfish populations are restricted to portions of San Felipe Creek and its associated wetland, San Sebastian Marsh (Imperial County), portions of Salt Creek (Riverside County), some shoreline pools and irrigation drains along the Salton Sea (imperial and Riverside Counties), and various artificial refugia (Riverside and San Diego counties).

Adequate water quantity and quality must be maintained in desert streams, springs, irrigation drains, and shoreline pools. Surface and groundwater from upper Salt Creek Canyon and other canyons in the Orocopia and Chocolate Mountains may contribute to the groundwater system. Seepage from the Coachella Canyon also contributes to the groundwater in the Salt Creek drainage system. Ground water pumping, channel erosion, water diversion, contaminants, and other threats must be reduced.

Occurrence within the Coachella Valley CDCA Plan Amendment Area
Dos Palmas ACEC- In the Plan area, pupfish are found in upper and lower Salt Creek, the mouth of Salt Creek (Sutton 2000), several irrigation drains emptying into the Salton Sea, some shoreline pools, and several refugia: Dos Palmas ACEC, the Coachella Valley Preserve; Oasis Springs Ecological Reserve; the Living Desert; and Salton Sea State Recreation Area. The Plan area contains a substantial portion of the remaining pupfish

habitat, including one of only two natural tributary streams, most of the refugia, and some of the shoreline pools and irrigation drains. A small, but stable, population exists in Salt Creek. The majority of fish inhabit an upstream portion of the creek, but a few pupfish were found at the mouth as recently as 1995 and again in 1999 (Sutton 1999). Surveys conducted by the California Department of Fish and Game in 1997, 100 pupfish and 700 mosquito fish were captured in the upstream section of Salt Creek. Recent surveys conducted by the Department of Fish and Game found pupfish in approximately 30% of the irrigation drains emptying into the Salton Sea, significantly fewer than in 1991. This is likely the result of substantial increase in tilapia numbers during this time. Pupfish seem to be doing better along the west end of the Sea, where habitat is more suitable. Along the east end of the Sea, the substrate in many of the drains consists almost entirely of tilapia nests and very little aquatic vegetation remains in these drains.

Threats and limiting factors. The major threat to desert pupfish is the presence of exotic fish species, particularly tilapia (*Tilapia* spp), sailfin molly (*Poecilia latipinna)*, and mosquitofish (*Gambusia affinis)* in habitats occupied by pupfish. These and other introduced fish species affect pupfish populations through predation, competition, and behavioral interference. In addition, the non-native bullfrog (*Rana catesbeiana)* is a serious predator of pupfish. Introduced plant species such as salt cedar (*Tamarisk)* also pose a threat to pupfish populations. Evapotranspiration by salt cedar may result in a lack of water at crucial times, especially in smaller habitat patches where water supply is limited. Salt Creek is particularly vulnerable to the effects of salt cedar. Other threats within the planning area include groundwater pumping, dewatering, water diversion, drain maintenance activities, off-road vehicle use, contaminants, the lining of the Coachella Canal, and fluctuations of the Salton Sea. The pupfish requires shallow, slow-moving clear water with a moderate amount of aquatic vegetation and soft substrate. On BLM-managed lands within the Dos Palmas ACEC, pupfish ponds are behind locked gates and the area is patrolled daily by an on-site caretaker. It is unlikely that illegal OHV activity impacts desert pupfish at Dos Palmas.

Desert slender salamander
Batrachoseps aridus
Status: Federal – Endangered
State – Endangered

Distribution, Abundance, and Trends. *B. aridus* is known from only two canyons in the Santa Rosa Mountains, the entire occupiable habitat comprising perhaps several acres. In addition to the population at Hidden Palms Oasis, an additional population of slender salamanders was found in the vicinity of Guadalupe Creek, in a canyon separated from Hidden Palms by 4.5 miles of continuous desert (Duncan and Esque 1986). Comparative genetic analysis of the two populations has not been completed but preliminary results have confirmed that Guadalupe Creek is a disjunct population of *B. aridus* (K. Nicol, pers. comm.).

There is no indication that the geographic range of the species has declined historically. The current range has probably changed little since shortly after the last pluvial period, about 10 million years ago. The habitat of *B. aridus* is a steep-walled desert canyon with permanent water seeping from fractured bedrock. The species uses cracks in the bedrock and sheet-like limestone deposits for shelter from desiccation and temperature extremes. The combination of permanent water, shade, and availability of retreat sites appears important to the distribution of the species. The area receives only 8 inches of rainfall annually (M. Fisher, pers. comm.), and the dry hillsides adjacent to the seeps are uninhabitable by the salamander.

Perennial plants in the canyon from where the species is known include desert fan palm, *Washingtonia filifera*; southern maidenhair fern, *Adiantum capillus-veneris*; narrow-leaved willow, *Salix exigua*; squaw waterweed, *Baccharis sergiloides*; honey mesquite, *Prosopis glandulosa*; and sugarbush, *Rhus ovata* (Zabriskie 1980). Common perennial plants on the hillsides surrounding the canyon include desert agave, *Agave deserti*; big galleta grass, *Pleuraphis* (*Hilaria*) *rigida*; desert apricot, *Prunus schottii*; desert tea, *Ephedra aspera*; Santa Rosa sage, *Salvia eremostachya*; buckhorn cholla, *Opuntia acanthocarpa*; California barrel cactus, *Ferocactus cylindraceus* (*acanthodes*); creosote *Larrea tridentata*; Jojoba, *Simmondsia chinensis*; and catclaw acacia, *Acacia greggii*. (Zabriskie 1980, Hickman 1993).

Little is known specifically about the natural history of *B. aridus*. Most sightings have been in the period from late February to early April. Information from the California Department of Fish and Game indicates that they are active year round and that there does not seem to be any seasonal preference. Like its congeners, *B. aridus* lacks an aquatic larval stage; instead, eggs are laid in moist soil and hatch as fully developed young. Other species of *Batrachoseps* eat primarily small arthropods.

Threats and limiting factors

The major threats to the species involve degradation of habitat. Although the area is closed to public access, it is still susceptible to damage by vandals and illegal collectors. In addition, the water that feeds the seep comes from the northwest near Asbestos Mountain. This recharge area includes undeveloped BLM, USFWS and CDFG land as well as portions of the communities of Pinyon Crest, Royal Carrizo, and Chapman Ranch (Denver 1990). Water use by these communities may significantly decrease water available to the salamander. Also, water quality may degrade as nitrates and nitrites enter the water from septic systems. Invasion of the habitat by exotic plants such as tamarisk is another potential threat.

Desert Tortoise
Gopherus agassizii
Status: Federal – Threatened
State – Threatened

Distribution, Abundance, and Trends. The desert tortoise is widely distributed through an exceptionally broad array of habitats that span 1,100 kilometers from northern Sinaloa State, Mexico where it occupies deciduous forest, across the Sonoran (including the Colorado Desert Subdivision in California) and Mojave Deserts, to the edge of the Colorado Plateau in arid southwestern Utah (Ernst et al., 1994; Germano, 1994). Populations north and west of the Colorado River were listed as threatened in April 1990 under the Federal ESA. The species is listed by California as a threatened species, and it is the official State reptile. In California, the tortoise is naturally absent from most areas west of the Salton Sea (Luckenbach, 1982). Thus, the Imperial Valley and portions of the southern Coachella Valley do not support native populations of tortoises. Tortoises, however, are found naturally along the northern, eastern and western rim of the Coachella Valley in the foothills of the Little San Bernardino Mountains, the Painted and Whitewater Hills (in the latter they are common), and the San Jacinto and northern Santa Rosa Mountains.

Range wide, occupied habitats include desert alluvial fans, washes, canyon bottoms, rocky hillsides, and other steep terrain. In the Whitewater Hills and environs tortoise burrows were found on slopes averaging 17.7^{o} and ranging from 0-45^{o} (Lovich and Daniels, unpublished). Areas with gravelly or coarse sandy soil are preferred, but tortoises can be found in boulder piles in some areas near the Coachella Valley. Desert tortoises have been recorded at elevations of at least l,070 m in some portions of their range. Elevational records for desert tortoises in the Whitewater Hills and the Painted Hills average 735 m and range from 661-817 m (based on 150 records of 27 specimens in 1997). The particular habitat types utilized vary geographically with a preference for rocky slopes in the eastern part of the range (Schamberger and Turner, 1986; Barrett, 1990). However, it is important to emphasize that tortoises can occupy a surprising range of habitat types.

The spatial distribution of desert tortoises in relation to plant communities is not random (Baxter, 1988). High diversity plant ecotones and communities, and possibly soil characteristics, are important features in determining tortoise densities (Wilson and Stager, 1992). This may explain the relatively high density of tortoises in the Whitewater Hills as the area is situated in a transition zone between plant communities from the San Bernardino Mountains, the Mojave and Colorado Deserts, and coastal assemblages. The clustered nature of tortoise burrows in the western Coachella Valley environs is consistent with the observations of others throughout the range of the tortoise: desert tortoises frequently exhibit a contagious distribution, with clusters of individuals in some areas and large intervening areas of what appears to be suitable habitat without tortoises. Home ranges of tortoises vary from about 1-642 acres with males typically having larger home ranges than females. In southern Nevada males had an average home range of 80 acres while females used 37 acres (data summarized by Luckenbach, 1982).

In the western Coachella Valley the nesting season extends from April through at least July. Of 10 females radio-tracked and x-rayed at weekly intervals from early April through July, 1997 in the Whitewater Hills, 9 produced 72 eggs in 16 clutches. Seven produced second clutches and one tortoise produced a third clutch. Clutch sizes ranged from 1-8 (including a single female with 1 egg in the Painted Hills) with the first clutch averaging 4.33 eggs and the second clutch averaging 5.0 eggs (Lovich, unpublished). In contrast, during the same time period, only 1 of 8 females tracked and x-rayed in Joshua Tree National Park produced eggs; a single clutch of 5. The difference is attributed to the fact that winter rain produced high biomass of annuals in the Whitewater Hills, whereas tortoises in the Park are in the second year of drought conditions.

Occurrence within the Coachella Valley CDCA Plan Amendment Area
The Plan area represents a small, but perhaps biologically significant portion of the tortoise's overall range. Tortoises in the foothills of the southeastern San Bernardino Mountains (especially in the Whitewater Hills) represent the western-most reproductively active population of tortoises in the Colorado Desert ecosystem. The western-most records of tortoises in the San Gorgonio Pass are represented by a series of eight active burrows (with scat at four) found by Jeffrey Lovich on July 7, 1997 in T3S, R3E, NW ¼ Sec 5. Significant geographic variation in ecology, morphology, allozymes, plasma proteins markers, gene sequences and mitochondrial DNA has been noted among populations of tortoise range wide (Weinstein and Berry, 1987; Rainboth et al., 1989; Lamb et al., 1989; Glenn et al., 1990; Lamb and Lydeard, 1994; Morafka et al., 1994), but no published comparisons have included tortoises from the Coachella Valley. Within the planning area, there is a total of 216,215.4 acres of potentially suitable desert tortoise habitat. Of this, 59, 910.5 acres are designated critical habitat. These recovery units are in the overlap area of the Northern and Eastern Colorado Desert Plan (NECO).

Threats and Limiting Factors. Coyotes (*Canis latrans*), bobcats (*Lynx rufus*), ravens (*Corvus corax*), golden eagles (*Aquila chrysaetos*), and Gila monsters (*Heloderma suspectum*) [which do not occur in the Plan area] are known predators of either eggs, juveniles or adults (Hensley, 1950; Barrow, 1979; Luckenbach, 1982; Barrett and Humphrey, 1986), and ring-tailed cats (*Bassariscus*), badgers (*Taxidea*), skunks (*Mephitis*, *Spilogale*), kit foxes (*Vulpes*), domestic dogs (*Canis familiaris*), large hawks (*Buteo*), owls (*Athene*), roadrunners (*Geococcyx*), bullsnakes (*Pituophis*), and coachwhip snakes (*Masticophis*) are suspected predators (Ernst and Barbour, 1972; Luckenbach, 1982; H. Avery, pers. comm.). The presence of a high density of local ravens (*Corvus corax*) has a detrimental affect on populations of *G. agassizii* through predation on young tortoises (Boarman, 1993).

Desert tortoise habitat can be lost to urbanization and other human-related activities, including off-highway-vehicle use, overgrazing of domestic livestock, and construction of roads and utility corridors. Secondary contributions to degradation include the proliferation of exotic plant species and a higher frequency of anthropogenic fire. Effects of these

impacts include alteration or destruction of macro- and microvegetation elements, establishment of climax plant communities, destruction of soil stabilizers, soil compaction, erosion, and pollution (Lovich, 1992). Off-road vehicle (ORV) use may contribute to declines of tortoise populations directly by crushing individuals (above or below ground), or by collapsing burrows. Vehicle activity may also destroy vegetation used by tortoises for food or cover, making habitat unsuitable for sustaining their populations.

Certain key tortoise food plants may comprise over 40% of the cattle diet, and, since cattle are larger and more mobile than tortoises, these plants may be severely depleted with heavy grazing (Berry, 1978; Coombs, 1979). The Whitewater Grazing Allotment managed by the BLM overlaps significant tortoise habitat in the Whitewater and Painted Hills. Cattle have been observed to step on burrows and cause their collapse in the area, including burrows occupied by tortoises or used as nest sites. Recent research by Hal Avery of the U.S. Geological Survey demonstrates conclusively, for the first time, that cattle can out-compete tortoises for key forage species. Cattle grazing in the Whitewater Hills tortoise habitat has also lead to visible increases in soil destruction and increased erosion in some areas.

Disease has contributed to declines of some desert tortoise populations. Wild and captive desert tortoises are afflicted with Upper Respiratory Tract Disease (URTD) in many areas within the geographic range. Jacobson et al. (1991; 1995) isolated a species of Mycoplasma, a small bacterium lacking a cell wall, as a potential pathogen causing URTD. Introductions of infected captive tortoises into the desert may have caused the spread of this potentially lethal disease in wild tortoise populations. No evidence of URTD has been observed in tortoises in the Whitewater Hills or the Painted Hills (Lovich). A new disease, called shell disease, has recently been reported in tortoises. In extreme cases, the scutes overlying the bony shell flake off, exposing skeletal tissue to desiccation and invasion by pathogens (Jacobson et al., 1994). Evidence of incipient shell disease on the lower shell of tortoises in the Whitewater Hills has been observed (Lovich), but no cases of scute exfoliation or mortality have been observed.

Jeff Lovich believes that fire is the biggest threat to the continued survival of tortoises in the western Coachella Valley. He reports that the proliferation of exotic annual grasses and forbs in the region has dramatically increased the frequency and extent of wildland fires in an ecosystem poorly adapted to perturbations of such periodicity or magnitude (Jeff Lovich, pers. comm.). Other than direct mortality, habitat conversion of desert scrub and semi-desert chaparral to exotic grasslands will diminish the prospects for long-term survival of viable tortoise populations.

Flat-tailed Horned Lizard
Phrynosoma mcallii
Status: Federal – Proposed
State – Species of Special Concern

Distribution, Abundance and Trends. The flat-tailed horned lizard is often associated with sand flats and sand dunes, although it is rare on larger dunes. It also occurs far from blowsand on concreted silt and gravel substrates (Beauchamp *et al*. 1998; C. Barrows, pers. comm.; Muth and Fisher 1992). In their comparisons of habitat types, Turner *et al*. (1980) determined the "best" habitat consisted of hard packed sand or desert pavement overlain with fine blowsand. The most common perennial plants associated with habitat for this lizard are creosote bush, *Larrea tridentata* and white bursage, *Ambrosia dumosa* (Turner *et al*. 1980; Muth and Fisher 1992).

The flat-tailed horned lizard lives in low elevation desert characterized by extremely high temperatures and low rainfall and humidity. The flat-tailed horned lizard has a higher preferred body temperature than its congener the desert horned lizard, *Phrynosoma platyrhinos* (Brattstrom 1965). This enables this lizard to exploit a hotter environment, but at the same time may restrict it to that environment. Thus there is little overlap in the geographic ranges of the two horned lizards found in the Coachella Valley (*P. mcallii* and *P. platyrhinos*).

Like related species, flat-tailed horned lizards are myrmecophageous; they eat ants. Ants, especially harvester ants, comprise about 98% of their diet. The proportion of ants in the diet is substantially higher in the flat-tailed horned lizard than in any other horned lizard (Pianka and Parker 1975, Turner and Medica 1982).

The flat-tailed horned lizard is relatively active for a desert lizard. A majority (54%) of the day is spent in some kind of activity, including feeding, digging burrows, and running (Muth and Fisher 1992). They eat ants they encounter while moving. They dig burrows to escape hot midday temperatures, and for winter hibernation. Most of the remaining activity involved running to locate food, suitable burrow sites, and mates. The mean home range size is nearly 300,000 sq. ft. (over 6½ acres), a large portion of which is covered daily. When approached by a potential predator, a flat-tailed horned lizard usually stops running and flattens its body against the ground. It relies on cryptic coloration to avoid predation and will usually remain immobile until after the threat has passed. This behavior makes the species difficult to locate in the field; in blowsand habitats, they may be located by following tracks left in freshly deposited sand (C. Barrows, pers. comm.).

Adult flat-tailed horned lizards are obligatory hibernators (Mayhew 1965). They hibernate from mid November to mid February in shallow burrows, although at least some juveniles are active on warm days during the winter (C. Barrows, pers. comm.). Reproductive activity begins in the spring and the first clutch of eggs hatches in late July. A second cohort may hatch in September. One or both of these cohorts may be lacking if

environmental conditions are severe. Females lay about five eggs per clutch, on average. Young grow quickly and reach sexual maturity by one year of age.

About 50% of all individuals survive from one year to the next, with most mortalities in mid summer. Population density estimates range from 0.5 (Muth and Fisher 1992) to 2.4 (Turner and Medica 1982) flat-tailed horned lizards per acre. The lower value may underestimate the true density, and the higher value may overestimate it. In addition, density may vary annually with changes in environmental conditions.

Occurrence within the Coachella Valley CDCA Plan Amendment Area

Within the Plan area, the flat-tailed horned lizard occurs at low elevations in the valley. Nearly all sightings in California and Arizona were below 800 feet (250 m) elevation (Mayhew and Carlson 1986, Turner et al. 1980, M. Fisher, pers. comm.). This lizard is found in two protected areas created by the Coachella Valley Fringe-toed Lizard Habitat Conservation Plan: the Coachella Valley Preserve and the Whitewater River Floodplain Preserve. The Coachella Valley Preserve and the Whitewater River Floodplain Preserve consist of BLM land, private land, and other state and federal holdings. Another population is known from an unprotected area at the east end of the Indio Hills on the north side of the Coachella Canal at Avenue 38. A potential habitat corridor was identified between the east end of the Indio Hills and the Coachella Valley Preserve. In a survey conducted to evaluate the suitability of this corridor in 1999 it was concluded that the corridor is not presently suitable for *P. mcallii* based on vegetation and substrate (Hays, LaPointe and Wright 1999). The Plan area represents the northernmost and westernmost limits of flat-tailed horned lizard geographic range. The populations in the Coachella Valley are isolated from all other flat-tailed horned lizard populations by agricultural, urban development and by the Salton Sea. As a group, the Coachella Valley population can be viewed as a distinct vertebrate population pursuant to the federal Endangered Species Act and as such is a candidate for future listing action. To date, no analyses have been completed to determine if this distinct population differs genetically from the more southeastern populations. The historic range of this species included suitable habitat in southeastern California, southwestern Arizona, northwestern Sonora, Mexico, and northeastern Baja California, Mexico. In California, they occurred in the Lower Colorado River Basin and the Salton Basin (Coachella and Imperial Valleys) from Palm Springs south-southeast to the Mexican border; an area of about 3,462 square miles. Historically there were about 694 square miles in the Coachella Valley Plan area of Riverside County. Currently, less than 50% of the historic habitat in California remains (Turner et al. 1980). Models developed for the Coachella Valley Multiple Species Habitat Conservation Plan and Natural Communities Plan indicate that there are 3,037 acres of potential habitat for flat-tailed horned lizards on BLM-managed lands in the Coachella Valley. However, surveys conducted in July 2002 by BLM staff revealed no flat-tailed horned lizards, scat, or tracks at the proposed Drop 31 Open OHV area.

Threats and Limiting Factors. Threats to the species include increased mortality and loss of habitat. A Population Viability Analysis indicates that populations are particularly sensitive to changes in mortality rate and fecundity. A slight change in mortality or fecundity can lead

to extinction (Rorabaugh *et al*., unpublished data). Threats to habitat within the Coachella Valley MSHCP include agricultural development, urban development, expansion of the Salton Sea, expansion of utility corridors, and off-highway vehicle use. Here, 84% of the historic habitat has been lost to urban and agricultural development (K. Nicol, pers. comm.). This estimate is conservative because much of the remaining habitat is now discontinuous and fragmented. Off-road vehicle use, use of dirt roads and paved roads dramatically increase mortality of desert reptiles, including flat-tailed horned lizards, and may deplete the population for as much as one mile from the road edge. Another serious edge effect is predation by household pets that are allowed to wander into habitat from surrounding urban development. Non-native species including Saharan mustard (*Brassica tournefortii*) and Russian thistle (*Salsola tragus*) may impact this species as well.

Gray Vireo
Vireo vicinior
Status: Federal – None
State – Species of Concern

Distribution, Abundance, and Trends. The gray vireo is a small passerine about the size of a house sparrow that inhabits arid, shrub-covered slopes in pinyon-juniper, juniper, and chamise-redshank chaparral habitats on foothills and mesas. Suitable habitat typically occurs from 2,000 to 6,500 feet (600-2,000 m) (Zeiner et al. 1990). In its preferred habitat it is found in areas with sparse to moderate cover and scattered small trees. While junipers are the dominant tree in gray vireo habitat, oaks may also be common.

The summer range of the gray vireo is from New Mexico, southern Nevada, southern Utah, southern Colorado, western Texas, Arizona, and southeastern California. This species winters primarily south of the Mexican border and in southwestern Arizona. In California, breeding gray vireos are known from the northeastern slopes of the San Bernardino Mountains in the vicinity of Rose Mine and Round Valley, in San Jacinto and Santa Rosa Mountains, from Mountain Center to Pinyon Flat and Sugarloaf Mountain, and on the southern slopes of the Laguna Mountains near Campo and Kitchen Creek. It is also known from the mountains of the eastern Mojave Desert, including the Grapevine, Kinston, Clark and New York Mountains.

The summer range of the gray vireo was formerly more widespread, with breeding birds recorded in the Walker Pass area of Kern County, in Joshua Tree National Park, in the northern and western foothills of the San Gabriel Mountains, and at many additional locations on the desert slopes of San Bernardino, Riverside and San Diego counties. The gray vireo is also known as a migrant in Whitewater Canyon (McCaskie 1963, Garrett and Dunn 1981).

Descriptions by Grinnell and Swarth (1913) indicate that the gray vireo was a common summer resident on the slopes of the Santa Rosa and San Jacinto Mountains. Their

observations include on a ridge at 4,200 feet near Potrero Spring and north of Asbestos Mountain, and down to 3,000 feet near the head of Palm Canyon. Along the trail from Vandeventer Flat to Pinon Flat, "many birds" were noted at 3,000 to 4,500 feet, as far east as Omstott Creek, which coincided with the limit of *Adenostoma* species. Based on known territory size and amount of suitable habitat, they estimated that 480 pairs were present. While it is not known how many birds may still exist in the area, sightings are rare. One pair was present near Pinyon Flats in 1977 (Goldwasser 1978a). One to four pairs were observed south of Highway 74 near the Santa Rosa Peak Road in 1979 and a nesting pair was observed in there in 1981 (McKernan pers. comm.). According to U.S. Forest Service records (Freeman pers. comm.) one individual was seen in Pinyon Flat in July 1997. According to Garrett and Dunn (1981) much fieldwork is needed to document the extent and causes of decline of this formerly more widespread species. Regular surveys for this species have not been conducted in the Plan area.

The gray vireo usually arrives from its wintering areas in Mexico from the end of March to early May. It generally departs by the end of August. The nest of the gray vireo is an open cup of plant fibers, bits of leaves, spider silk, and bark strips, often hung from twigs or a forked branch in a shrub or small tree, usually two to eight feet above ground (Zeiner et al. 1990). Eggs are laid from mid-May to mid-June. Gray vireos feed by gleaning insects and invertebrates from bushes and small trees. In New Mexico, territories encompass 100 acres or more (Schwarz 1991).

Occurrence within the Coachella Valley Plan Amendment Area
The gray vireo occurs in the Santa Rosa and San Jacinto Mountains National Monument. Modeled habitat on BLM land equals 14, 078 acres.

Threats and limiting factors
The reasons for the decline in gray vireo populations in recent decades are not well understood. One major cause of this decline may be parasitism by the brown-headed cowbird. Remsen (1978) has described that this species is highly susceptible to cowbird parasitism. Human activities, including residential development, golf courses and agriculture, attract cowbirds thereby increasing this potential threat to gray vireos. Another possible cause for their decline could be habitat changes and senescence of the vegetation due to fire suppression activities since the turn of the century.

Least Bell's Vireo
Vireo bellii pusillus
Status: Federal – Endangered
State – Endangered

Distribution, Abundance, and Trends. The least Bell's vireo inhabits riparian woodland habitats along the riverine systems of southern California, primarily in San Diego, Santa Barbara, and Riverside counties. They also breed in northern Baja California and are seen

in migration in southern Baja California. This vireo species occurs at sites with two primary features: 1) a dense shrub cover within 1 to meters (3 to 6 feet) of the ground, where nests are typically placed, and 2) a dense, stratified canopy for foraging (Goldwasser 1981, USFWS 1998). Typical riparian habitats are those which may include cottonwoods (*Populus fremontii*), oak woodlands, and a dense understory of species such as willow (*Salix* spp.), mulefat (*Baccharis salicifolia*), and California wild rose (*Rosa californica*); in desert areas, arrow weed (*Pluchea sericea*) and wild grape (*Vitis girdiana*) may be dominant species in these riparian woodlands.

The least Bell's vireo was formerly known to inhabit dense willow thickets along streams throughout California's Sacramento and San Joaquin Valleys, from Red Bluff south, from coastal areas inland to the foothills of the Sierra Nevada, and in Owens and Death Valleys. Currently, U.S. populations are known only from Santa Barbara County and southern California. Major causes of the decline are cowbird parasitism and destruction of riparian habitats. In San Diego County, however, significant population increases in the period from 1986 to 1996 are primarily due to management of local cowbird populations (USFWS 1998).

The least Bell's vireos typically arrive in southern California to breed from mid-March to early April and remain until late September. Most birds spend the winter in southern Baja California and Mexico. During the breeding season, male vireos establish and defend territories; they maintain a stubborn attachment to these sites throughout the breeding season. Nests are constructed in dense thickets of willow or mulefat, one to two meters from the ground. These vireos may also make their nests in other riparian tree and shrub species.

<u>Occurrence within the Coachella Valley CDCA Plan Amendment Area</u>
The least Bell's vireo is known to occur as a breeding bird in Big Morongo Canyon Preserve/ACEC, Chino Canyon and in Andreas Canyon. Although LBVI have been detected in Chino Canyon, there is no BLM land in Chino Canyon and very little at the mouth of Andreas Canyon, near the gauging station. Other suitable breeding habitat may occur in Millard Canyon, Whitewater Canyon, Mission Creek, Palm Canyon, and Murray Canyon, at Oasis de Los Osos, at the Willow Hole-Edom Hill Preserve/ACEC, Big Morongo Preserve/ACEC, along the Whitewater River near the Salton Sea and at Dos Palmas. There are no records of breeding occurring at any of the above-mentioned areas but potential exists. BLM-managed lands occur in Whitewater Canyon, Mission Creek, Willow-Hole Edom Hill ACEC, and along the Whitewater River Delta and Dos Palmas. Breeding and other habitat in Andreas, Palm and Murray Canyons is on the Agua Caliente Indian Reservation, is part of the Indian Canyons Heritage Park, and is not included in this Plan. Some Bell's vireos, particularly if sighted near the Salton Sea or at other locations on the valley floor, could be subspecies *arizonae,* but the Plan will address all Bell's vireo habitat as if occupied by subspecies *pusillus*. Modeled habitat indicates that there are 68,358 acres of potentially suitable habitat for least Bell's vireo in the planning area, about one-

third (20,740 acres) occurs on BLM-managed lands. Most of this land is within the Big Morongo Canyon Preserve

During 2001, protocol surveys were conducted in the Whitewater River drainage. No breeding LBVI were observed. Habitat suitability was determined to be marginal because the drainage is too narrow and linear for breeding. Small numbers of brown-headed cowbirds were seen along the survey routes.

Least Bell's vireos migrate through the Plan area en route to other breeding areas. In migration, they may use desert fan palm oasis woodland, mesquite hummocks, mesquite bosque, arrowweed scrub, desert dry wash woodland, southern sycamore-alder riparian woodland, Sonoran cottonwood-willow riparian forest, and southern arroyo willow riparian forest.

Threats and Limiting Factors. The most significant threats to the least Bell's vireo in the Plan area are nest parasitism by brown-headed cowbird, destruction of habitat as a result of flood control activities, invasion of non-native plants in riparian habitats, and degradation of habitat as a result of edge effects related to human activities. Brown-headed cowbird parasitism has been described as a primary cause for the decline of least Bell's vireos in central and northern California as well as southern California. The decline in breeding populations of lowland riparian passerine species, including the least Bell's vireo, along with other small, insectivorous, open-cup nesting birds -- among them the yellow warbler and southwestern willow flycatcher -- is well documented. It has been suggested that because the least Bell's vireo is most restricted to lowland riparian forests where cowbird parasitism is likely to be greatest, this species has suffered the largest aggregate reduction in numbers. Parasitized vireo pairs either desert the nest or raise the young cowbird at the expense of their own young. Human activities, including golf courses and agriculture, attract cowbirds thereby increasing the threat to least Bell's vireos. Annual breeding bird surveys at Big Morongo Canyon ACEC in the past four years have not detected any brown-headed cowbirds. Cowbird management during the past 4 years has effectively eliminated cowbird parasitism at the ACEC (Robin Kobaly, Preserve Mgr. BLM, personal communication 2002).

Le Conte's thrasher
Toxostoma lecontei
Status: Federal – None
State – Species of Special Concern

Distribution, Abundance, and Trends. Le Conte's thrasher is an uncommon resident of the deserts of the American southwest and northwestern Mexico. It is found in the San Joaquin Valley and in the Mojave and Colorado deserts of California and Nevada southward into northeastern Baja California, and farther south into central and coastal Baja California. It also occurs in the Sonoran Desert from extreme southwest Utah and western Arizona

south into western Sonora, Mexico. Within this range, distribution is patchy. Its elevational distribution is generally between sea level and 1,150 meters; though in Death Valley it occurs down to -81 meters, and in the Mojave Desert it is known up to approximately 1,600 meters. The species requires undisturbed substrate for foraging under desert shrubs. Agriculture and urban development have eliminated considerable former habitat in the San Joaquin Valley, portions of the Mojave Desert, Imperial and Coachella valleys, the Las Vegas area, and south and west of Phoenix. Based on false-infrared satellite imagery of 243 historic localities in the U.S. as of 1993, at least 26% no longer had suitable habitat patches within 3 km.

Its typical habitat consists of sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills having a high proportion of one or more species of saltbush (*Atriplex* spp.) and/or cylindrical cholla cactus (*Opuntia* spp.) 0.9 - 1.9 meters high. It also occupies other desert habitats with similar structural profiles but lacking saltbush/shadscale or cholla cactus. In its typical habitat, shrubs are well scattered with contiguous or closed cover usually less than 15 meters in any direction, even along the sides of arroyos. The ground is generally bare or with sparse patches of grasses and annuals forming low ground cover (average height less than 30cm.). It is rarely found in habitats consisting entirely of creosote bush (*Larrea*). The majority of shrubs rarely exceed 2.5 meters in height, except for isolated desert trees, yuccas, or tall, thin shrubs such as ocotillo. Substrates are typically sandy and rarely composed of a large proportion of rock or of deep silty clays. The habitat requires accumulated leaf litter under most plants as diurnal cover for most arthropod prey. Surface water rarely exists anywhere within several kilometers of most territories except temporarily following infrequent rains.

Typical territories rarely have topographical relief greater than 10 - 20 meters, although many broad canyon floors with large flood plains and poorly vegetated sides are acceptable. Narrow, boulder-strewn canyons with little or no sand deposition are used infrequently. The species commonly uses small arroyos, depressions, or streambeds traversing more level terrain with associated larger saltbush/shadscale and other desert shrubs. It is also uses the vegetated margins of large, rolling sand dunes. Crissal and California thrashers prefer nearly continuous cover of shrub or riparian vegetation; both occupy habitats with far more contiguous or closed cover that is far denser and usually taller than any vegetation typically inhabited by Le Conte's thrasher.

For nesting, Le Conte's thrasher prefers thick, dense, and thorny shrubs or cholla cactus. Cholla cactus and saltbush were used in 85% of 289 nest sites throughout the distribution of the species. The remaining 15% were in a large variety of desert shrubs, small trees, and yucca.

Within the Plan area, there are historical records in the Natural Diversity Database and a few recent records. Historic records (the date follows the location in parentheses) include the mouth of Whitewater River Canyon (1930), Desert Hot Springs (1968), Edom Hill (1984), Andreas Canyon alluvial fan (1923), Mecca (1908), Indio (1924), Cabazon (1916),

Whitewater River east of Palm Springs Airport (1920), 2 miles west of Thousand Palms (1921), Palm Canyon wash (1923), Whitewater River in Indian Wells (1919), and Shavers Valley (1986). Many of these areas have been impacted by development. Records since 1990 include 4 records for the Desert Hot Springs area, 2 of which are west of Highway 62, a record for the area below Cottonwood Canyon (west of Whitewater Canyon), a record for the area south of I-10 and west of Gene Autry Trail, a record for the Willow Hole ACEC area, a record for Pushwalla Canyon, a record for the Thousand Palms Oasis area, and a record for Indian Wells. These historical and current records suggest a widespread distribution of the species in the Plan area, where there is appropriate habitat. This would include most of the non-mountainous areas that have not been disturbed by urbanization or agriculture.

No data are available on population density in the Plan area. However, average density in Maricopa, California was 4.63 pairs/km^2. Other density estimates have ranged from less than one pair per square kilometer to 1.7 pairs/km^2. Other estimates have been 6 pairs/mi^2, or 2.3 pairs/km^2, (Engels, 1940), and 10 pairs/mi^{2,} or 3.86 pairs/km^2 in one study area in the San Joaquin Valley and 0 - 5 pairs/mi^2, or 0 - 1.93/ km^2, throughout the range (Sheppard, 1970). The home range limits vary with time and interactions with neighbors, if any; pairs may occupy about 40 - 100 ha in aggregate over a period of a few years.

Little San Bernardino Mountains Linanthus
Linanthus maculatus (formerly Gilia maculata)
Status: Federal Species of Concern, Candidate for listing
State - No official status

Distribution, Abundance and Trends. The Little San Bernardino Mountains Linanthus is a tiny endemic plant found in a restricted range in the vicinity of the Little San Bernardino Mountains near Desert Hot Springs, in Mission Creek canyon across Hwy. 62 to Dry Morongo Wash and Big Morongo Canyon and near the mouth of Dry Morongo Canyon in the northwestern portion of the Coachella Valley, in Whitewater Canyon in the eastern San Bernardino Mountains, and from Whitewater to Palm Springs. There is one very recently described location in Rattlesnake Canyon on the north side of the San Bernardino Mountains. The most extensive populations of this species are outside the Plan boundary, along washes at the northern edge of Joshua Tree National Park, in the vicinity of Joshua Tree, Yucca Valley and Twentynine Palms. It seems likely that additional populations of this species may occur in the area of approximately 22 miles between Rattlesnake Canyon and Yucca Valley.

The size and ephemeral habit of the Little San Bernardino Mountains Linanthus have made it difficult to find and hence it is little collected and studied. This tiny desert annual was first described by Parish in 1892 from a collection at “Agua Caliente” (= Palm Springs) in 1889; the location of this collection was described as just west of the hot springs in Palm Springs. The next collection was at Joshua Tree in 1924. It was little known until Patterson (1989)

described more exactly its preferred habitat. More records have been reported in the last five to ten years.

Recently, the nomenclature for this species has been revised and it is included in the genus *Linanthus*.

The preferred habitat of Little San Bernardino Mountains Linanthus is in loose soft sandy soils on low benches along washes, generally where the substrate shows some evidence of water flow. It seems to occur in areas where few or no competing species are found, with little shrub or tree cover in the immediate vicinity. The sand is loose and well aerated, soft and unconsolidated (Sanders 1999). The known locations within the Plan area are on the margins of washes on shallow sandy benches, not on areas where a hard surface layer occurs, and not on loose blowsand away from washes. This Linanthus has a slender taproot that can extend over 6 cm into the sand, presumably allowing it to avoid atmospheric drying. It is associated with creosote bush scrub, but avoids growing in the shadow of other plants. The elevational range of the species is from 500 to 4000 feet.

Little is known of the life history of this species. Its pollinators, germination requirements, seed longevity, and population parameters have not been described. The flower form and color are indicative of insect pollination but no information on pollination ecology is available. The plants are very small, generally reaching a height of only 0.8 to 1.2 inches. They have a slender, little-branched taproot that may extend over 6cm into the sand, probably allowing the plants to tap subsurface supplies of moisture and thus avoid atmospheric drying. They are nevertheless very ephemeral.

Occurrence within the Coachella Valley CDCA Plan Amendment Area

No comprehensive population estimates have been made, but records for the species give an idea of the size of the known populations. In Dry Morongo Canyon Helmkamp (in Sanders 1999) reported a few hundred plants in 1995 but only six in 1996. At the mouth of Big Morongo Canyon north of Indian Avenue more than 10,000 plants were in spring of 1996. Populations in the Whitewater River area have been reported in the range of 200 individuals. In Mission Creek wash east of old Highway 62, Helmkamp reported a single population of more than 2,000 plants in 1992. Clearly, populations vary with environmental conditions in a given year. Modeled habitat for this species indicates that 3515 acres of potential habitat exists in the Coachella Valley; of this, 384 acres of potential habitat occur on BLM-managed lands.

Threats and limiting factors

The greatest threat to this species is growing urbanization in the vicinity of Desert Hot Springs and Highway 62 where the largest populations exist. Only 6% of the known locations for Little San Bernardino Mountains Linanthus are currently protected in existing public or private conservation areas. Urbanization spreading westward from Desert Hot Springs could eliminate the most significant populations in the long term. Development pressures are a concern primarily in the Mission Creek drainage east of Hwy. 62 and in the

vicinity of Dry Morongo Wash near Hwy. 62 and Indian Avenue. One disturbance that may impact this species is flood control maintenance activities in the Whitewater Canyon and Mission Creek drainages. Another threat to this species is OHV activity in the wash habitat where it occurs. The small size of the plants and their occurrence along the margins of washes, which may serve as routes of travel for OHV users, make them particularly vulnerable to vehicle damage.

Mecca Aster
Xylorhiza cognata
Status: Federal – None
State – None

Distribution, Abundance and Trends. Mecca Aster is endemic to the Indio Hills and the Mecca Hills. It typically occurs in these fluvial mud hills in washes and along the lower slopes. It is known to occur from Macomber Palms and Biskra Palms on the Coachella Valley Preserve east along the base of the Indio Hills. The easternmost location in the Indio Hills is in the vicinity of Curtis Palms, east of the Granite Construction facility. In the Mecca Hills, it occurs in Painted Canyon, in Box Canyon along Hwy 195, and in Hidden Spring Canyon. Most of the known occurrences are along roads or well-traveled hiking routes; it is likely that the species has a scattered distribution throughout the Mecca Hills (Stewart 1991). Information on population size and density is not available. The following table summarized the number of plants observed at 17 occurrences reported by the California Natural Diversity Data Base (CDFG 1997).

Jon Stewart, a botanist familiar with the species, has suggested that it may be associated with two intergraded geologic formations found in these hills, the Palm Springs formation and the Canebrake formation (Stewart 1991). These formations are similar in age and are both fluvial deposits; the Palm Springs formation is composed of sandstones and clays while the Canebrake formation includes granitic conglomerates of larger materials. Stewart noted a strong correlation between the known occurrences of this species and the Palm Springs and Canebrake geologic formations. It should be noted that these two formations are not restricted to the Coachella Valley.

It may be that the observation of this species in proximity to major roads has given the false impression that the plants are very common. While the species may be numerous in places, its limited geographic distribution and restricted soil preferences suggest that it is only very locally common.

Threats and limiting factors
Threats to this species include cumulative habitat loss and degradation of the existing habitat from off road vehicle activity, illegal dumping, sand and gravel mining (J. Dice pers. comm.) and edge effects. Off-road vehicle activity that formerly threatened populations in the Mecca Hills has been eliminated with the designation of this area as wilderness. Off-

road vehicle activity in the Indio Hills may threaten several populations and may increase as other areas become unavailable through development or protection. For example plants in the vicinity of Macomber Palms occur in a wash where they are vulnerable to off-road vehicles. Isolation of the two significant populations in the Indio Hills and Mecca Hills may reduce genetic diversity.

Orocopia Sage
Salvia greatae
Status: Federal – None
State – California Species of Special Concern

Distribution, Abundance and Trends. The Orocopia sage is endemic to the Orocopia Mountains, Mecca Hills, and Chocolate Mountains in the eastern part of the Plan area. Orocopia sage occurs in a longitudinal west to east range of approximately 30 miles. This species has also been reported by BLM from the north side of the Chuckwalla Mountains, outside the Plan area. This location, south of Desert Center, was visited in 1986 but the presence of Orocopia sage was not confirmed (Barrows 1986).

The preferred habitat of Orocopia sage is in gravelly or rocky soils on broad bajadas or fans, often adjacent to desert washes, or on the rocky slopes of canyons. It may occur on alluvial terraces and sandy or rocky benches elevated above the flood plain of a wash, as the in Salt Creek Wash along the Bradshaw Trail. The species does not appear to occur within the immediate wash zone. This species has been recorded up to 2800 feet in the Orocopia Mountains. Although thorough surveys have not been completed, it has only been observed on the south-facing slopes of the Orocopia Mountains. Surveys completed several years ago in the Chocolate Mountains Aerial Gunnery Range (CMAGR) indicate it is fairly common in these mountains, which are outside the CVMSHCP boundary. A report of Orocopia sage from limestone outcrops in the Marble Mountains of San Bernardino County near Cadiz is considered questionable and has not been confirmed since it was reported 20 years ago; a search for this species at this location was made but no plants were found (Barrows 1986). Information on population size and density of Orocopia sage is not available. Observations at known locations of the species by Barrows (1986) were reported as ranging from 50 plants to 1000 or more plants.

Though Orocopia sage is patchy in its distribution, where it occurs it is typically one of the dominant members of the vegetation. Plants may be three to four feet tall and usually form dense, rounded clumps, sometimes as large as four or five feet in diameter. Multiple branching from near ground level results in a very bushy habit. This species is associated with desert dry wash woodland and Sonoran creosote bush scrub.

Little is known of the life history and ecology of Orocopia sage. Its remarkable ability to withstand long periods of drought was noted by Jaeger (1941). During drought periods it may lose nearly all its leaves. In dry years this plant may be virtually dormant, forming only

a few new shoots and perhaps no flowers (Clary, in Jepson 1943), whereas in wet year the plants may bloom by early April. Orocopia sage is reportedly pollinated by bees (Jones 1995).

Threats and limiting factors

Threats to this species are few in that its habitat is largely protected within the Mecca Hills, Orocopia Mountains, and Chuckwalla Mountains Wilderness Areas, established by the 1994 Desert Protection Act. There may be some threat from illegal off-highway vehicle activity, for example along the Bradshaw Trail where lands on either side of this road were excluded from the wilderness areas. Fortunately, Orocopia sage populations are typically on rocky slopes or alluvial fans and are either inaccessible to vehicle traffic or are some distance from major roads. Barrows (1986) reported that no evidence of OHV impacts within Orocopia sage populations was observed along the Bradshaw Trail. Plants within the Chocolate Mountain Aerial Gunnery Range are essentially protected by the fact that the area is off-limits to the public and bombing does not occur along the perimeter of the range, where Orocopia sage occurs, because of its close proximity to recreational use areas.

Coachella Valley Round-tailed Ground Squirrel
Spermophilus tereticaudus chlorus
Status: Federal – None
State – Species of Special Concern

Distribution, Abundance and Trends. The Coachella Valley ground squirrel is a subspecies of the round-tailed ground squirrel which occurs in the Coachella Valley associated with sandy substrates. Within the Plan area, the current and historical distribution for the Palm Springs ground squirrel is from San Gorgonio Pass to the vicinity of the Salton Sea (Grinnell and Dixon 1918). Individuals of this species have been observed at the south end of La Quinta near Jefferson Ave. and along the Coachella Canal near Box Canyon. The range of this species in the eastern part of the Plan area is not well known. The Plan area includes all of the known range for the Coachella Valley subspecies of the more widely distributed round-tailed ground squirrel.

The Coachella Valley ground squirrel is typically associated with sand fields and dune formations (Bradley and Deacon 1971), although it does not require active blow sand areas. This small ground squirrel seems to prefer areas where hummocks of sand accumulate at the base of large shrubs that provide burrow sites and adequate cover (Grinnell and Dixon 1918, C. Barrows pers. comm.). Various authors have referred to the use of mesquite habitat by Coachella Valley round-tailed ground squirrels (Allen 1895, Elliot 1904, Grinnell and Dixon 1918, Vorhies 1945, Drabek 1973, Dunford 1975). Although numerical data were not presented McDonald (1999) reported relatively high densities of Coachella Valley round-tailed ground squirrel in a mesquite hummock and active sand field habitat at the east end of the Indio Hills. In surveys for this Plan, Dodero (1995) reported observing this squirrel at Willow Hole in the central portion of the dune as well as at the

southern periphery, at the edge of mesquite clumps. He also reported that these squirrels are most abundant at Willow Hole in the dune area where the transition from desert dune to Sonoran creosote scrub takes place. Barrows (2001) suggests that they are most abundant in more mesic sand dune habitats, often associate with mesquite hummocks. They may also be found in areas where sandy substrates occur in creosote bush scrub and desert saltbush or desert sink scrub that supports herbaceous growth. In addition to wind blown sand habitats, they may occur in areas of more coarse sands, associated with washes. According to Mark Fisher of the University of California Deep Canyon Desert Research Center, the Coachella Valley round-tailed ground squirrel used to occur on this reserve in sandy patches associated with washes and was reported from 1979 to 1984 (see known locations data for this species). He indicated that this ground squirrel has not been observed in the Deep Canyon area since the 1980's when the sandy substrates were removed by a large flood event and have not been restored. According to Ryan (1965) the highest concentrations of this species in the Deep Canyon area were not in aeolian dunes but in areas of somewhat coarser sand, slightly pebbly ground cover, or packed silt.

Very little quantitative data are available to describe the population density for this species throughout the Plan area. Density estimates for round tailed ground squirrels in Arizona range from 2.1 individuals/acre (5.3/ha) on a 63 hectare site in southcentral Arizona (Drabek 1970) to 16/acre (40/ha) on a crowded site (Dunford 1977). It is likely that densities in the Coachella Valley would be less than in Arizona where average annual rainfall and vegetation density are relatively higher. The Coachella Valley round-tailed ground squirrel occurs in small colonies widely scattered in suitable sandy habitats (Ryan 1968). According to Jaeger (1961) 10 to 15 animals per square mile (0.01 to 0.02/acre) is probably an average number. From trap data in the creosote-palo verde habitat, Ryan (1968) estimated 1.1 individual/acre during 30 April-2 May, 2.3 individuals/acre during October, and 1.1 individual/acre during January. Drabek (1973) found mean home range estimates of 0.74/acre for adults and 0.77/acre for juveniles.

Based on input from various observers, including members of the SAC, areas where the Palm Springs ground squirrel occurs in relatively high density have been identified. This squirrel occurs in good populations in the vicinity of Snow Creek, from Fingal to Windy Point; it has also been observed further west near Cabazon. It occurs around the Whitewater river channel north and west of Palm Springs, including the Whitewater Floodplain Preserve. It has been observed along the Mission Creek wash and likely occurs in suitable habitat in the southern parts of Desert Hot Springs. Habitat, including mesquite hummocks and sand dunes, at the Edom Hill-Willow Hole Preserve/ACEC has been described as high quality for this species (Dodero 1995) and many individuals were observed there during surveys for the Plan. Data on the number of individuals of Palm Springs ground squirrel along a 1 km. transect at the Willow Hole-Edom Hill preserve have been collected during annual monitoring surveys for the fringe-toed lizard (CNLM 2000); the mean number of squirrels per survey per year ranges from 2 to 7 squirrels from 1990 to 1994 and from 4 to 10 squirrels from 1998 to 2000. From the Willow Hole-Edom Hill ACEC it can be found in sandy habitats east toward the Thousand Palms Preserve. It occurs in

good numbers on the dunes of the Thousand Palms Preserve. It is also common on the sand dunes at the east end of the Indio Hills. Habitat is still present for this ground squirrel on the so-called Big Dune south of Interstate 10, although surveys for this species have not been conducted in this area because it is private land without access.

The burrows of the Coachella Valley round-tailed ground squirrel are typically located at the base of a large creosote bush or other shrub, often on a small mound or hummock. The entry is several inches across leading to tunnels that are not usually deep nor over five or six feet in length (Jaeger 1961). Young are born in March or April in litters of four to twelve. In winter, they remain in their underground burrows for much of the time. They feed on seeds and green leaves of desert plants, including the stems of Mormon tea (*Ephedra* sp.), leaves and beans of mesquite, cactus fruit, ocotillo blossoms, and agricultural crops but may occasionally take small lizards (including flat-tailed horned lizards) and insects; they have also been observed to feed on carrion.

Threats and limiting factors

Threats to the Coachella Valley round-tailed ground squirrel in the Plan area include loss of habitat as a result of urbanization and agricultural development, including the loss of mesquite hummocks due to lowered water tables, and related impacts. As ground dwelling small mammals, they are susceptible to impacts from off-road vehicles and other surface disturbances that could crush their burrows. At the urban interface, impacts from domestic pets (cats and dogs) and small predator populations could pose a threat. As they seem to prefer open areas with adequate visibility, invasive exotic plants such as Saharan mustard (*Brassica tournefortii*) and Russian thistle (*Salsola tragus*) may reduce habitat suitability. This species has been observed crossing two and four-lane roads; in high traffic areas, however, roads within suitable habitat could increase mortality significantly. While the Coachella Valley round-tailed ground squirrel does not require active blow sand areas, maintenance of their habitat will depend on protection of ecosystem processes associated with sand dunes.

Palm Springs pocket mouse
Perognathus longimembris bangsi
Status: Federal – None
State – Species of Special Concern

Distribution, Abundance, and Trends. The Palm Springs pocket mouse is one of seven subspecies of *Perognathus longimembris*, the “silky pocket mice” that occur in southern California. The species is the smallest of the Heteromyidae family that also includes kangaroo rats, kangaroo mice, and spiny pocket mice. The Palm Springs pocket mouse was originally described by Mearns (1898) with the type locality in Palm Springs. This subspecies occurs in the lower Sonoran life zone from the San Gorgonio Pass area east to the Little San Bernardino Mountains and south along the eastern edge of the Peninsular Range to Borrego Valley and the east side of San Felipe Narrows (Hall 1981). There is no

evidence that this subspecies' range is different than what has been described in the past (Dodd 1996), although its habitat has been greatly reduced by urbanization and agriculture in the Coachella Valley.

The Palm Springs pocket mouse is known to hybridize with the Los Angeles pocket mouse (*P.l. brevinasus*) along its western boundary. Hybridization also occurs, although the extent is not known, with other subspecies, the Jacumba pocket mouse (*P. l. internationalis*) to the south, and little pocket mouse (*P. l. longimembris*) to the north.

Generally, their habitat is described as having level to gently sloping topography, sparse to moderate vegetative cover, and loosely packed or sandy soils. The species was found broadly distributed in the Plan area on slopes ranging from 0% to approximately 15% (Dodd 1996). The Plan area contains the major portion of the range of this species, including the western, northern, and eastern limits of the species' range. The southern boundary of the range extends out of the Plan area into Imperial, and San Diego counties. The species occurs on three existing preserves: the Coachella Valley Preserve, the Whitewater Floodplain Preserve, and the Willow Hole-Edom Hill Preserve/ACEC. It occurs at the highest reported densities for the Plan area in the Snow Creek area. Three individuals were captured in a small mammal-trapping grid (Tierra Madre Consultants 1999) in the blowsand habitat adjoining the San Gorgonio River wash just north of One Horse Spring; this location is approximately 3 miles west of Snow Creek Road. Surveys completed for this plan (Dodd 1999) confirmed that the species also occurs at Dos Palmas Preserve/ACEC and in the Cottonwood Canyon area of Joshua Tree National Park. Tests to determine that the subspecies captured in these areas is *bangsi* and not *longimembris* have not been finalized.

Our understanding of the ecology of the Palm Springs pocket mouse arises largely from the observations of mammalogists studying other species. Pocket mice of the *P. longimembris* group are nocturnal, solitary, and generally exhibit strong intraspecific aggression (Dodd 1996). They spend the day in burrows they construct, comprised of a system of tunnels and resting areas, with the entrance plugged. This species generally breeds from January to August, with a peak of activity from March to May (Dodd 1996). Several studies suggest that reproduction in heteromyids may be dependent on availability of annual vegetation. The little pocket mice hibernate in winter and are active above ground in spring, summer, and fall (Bartholomew and Cade 1957).

Estimates of home range size are not available for the Palm Springs pocket mouse. In Joshua Tree National Park, home ranges of *P. longimembris* range from 38.7 to 84.4 meters (Chew and Butterworth 1964); in this study densities ranged from 0.85 to 1.74 individuals/ha. In Nevada, home ranges of males ranged from 12.4 to 31.6 meters and home ranges of females from 13.7 to 40.5 meters (Maza et al. 1973). O'Farrell (1978) determined that home range for both sexes varied from 0.28 ha in early spring to 0.80 ha in late fall.

According to the survey results of Shana Dodd in 1995 and 1999 (Dodd 1996, 1999) the highest densities of this pocket mouse occur at the western end of the Plan area, with lower densities occurring further east. Her live trapping data, which are summarized in the table below, indicate that this species is most abundant throughout the Snow Creek to Windy Point area. She describes the Palm Springs pocket mouse as moderately abundant in the Highway 62/Mission Creek area, where the species is not currently protected. Considerable unprotected habitat also occurs adjacent to the Willow Hole Preserve; Dodd (1996) describes the density of this species at Willow Hole as moderate. Additional density estimates were made for the Palm Springs pocket mouse, based on live trapping on two 0.5 ha grids located west or Snow Creek Road, approximately ½-mile north of Snow Creek Village in the Snow Creek area (Spencer et al. 2000). The minimum density was 32.6 individuals/acre (81.6 individuals/ha) and 25.3 individuals/acre (63.3 individuals/ha), on two adjacent grids. Further discussion of the density estimates for this species is included in the section below entitled "Verification of Core Habitat Sufficiency."

Threats and limiting factors

Threats to this species and its habitat within the Coachella Valley include agricultural development, urban development, construction of roads, railroads, airports and other structures, off-highway vehicle use, illegal trash dumping, and domestic animal predators.

Peninsular Ranges Bighorn Sheep
Ovis Canadensis nelsoni
Status: Federal – Endangered
State – Threatened

Distribution, Abundance, and Trends. The Peninsular Ranges population of desert bighorn sheep was listed as endangered by the USFWS on March 18, 1998. During the past 26 years, the population has declined dramatically from about 1,100 animals to as few as 300 sheep. This decline has been attributed to a variety of causes, including disease, automobile collisions, mountain lion predation, exotic plant invasion, toxic plant ingestion, competition with cattle, habitat loss, degradation and fragmentation, and recreational disturbance.

The Peninsular bighorn sheep is restricted to the east facing, lower elevation slopes (below 1400 meters) of the Peninsular Ranges in the Sonoran desert life zone. Range wide estimates of abundance for the U.S. population, from the San Jacinto Mountains to the Mexican border, began in the 1970's. The highest population estimate was 1,171 in 1974. Surveys in the 1970's, 1980's, and 1990's indicate that significant declines have occurred in multiple ewe groups. The synergistic effects from habitat loss, disease, human disturbance, and predation are believed to have caused the decline. The 2000 range-wide population was estimated to be 400 animals (excluding lambs). Approximately half of these were in the Plan area in four subpopulations, or ewe groups. The ewe groups in the Plan area are the San Jacinto Mountains group, the northern Santa Rosa Mountains (northwest of Highway

74) group, the Deep Canyon group (southeast of Highway 74 to Martinez Canyon), and the southern Santa Rosa Mountains group (south of Martinez Canyon). The subpopulations in the northern Santa Rosa Mountains and San Jacinto are the smallest populations, estimated at 41 (19 ewes) and 32 (4 ewes) respectively, excluding lambs. These two groups are especially vulnerable to extirpation.

During the past four years, the population has stabilized and appears to be increasing. BLM has implemented interim measures to promote recovery of bighorn sheep populations. Through implementation of the CVMSHCP and BLM's CDCA plan amendment, long-term management direction will be established. The Bighorn Sheep Recovery Plan, completed in October 2000, provides recommendations for developing and assessing conservation and management activities in order to achieve recovery of the bighorn. Because the ESA permitting process is tied to the CVMSHCP planning process, BLM's CDCA plan amendment has primary responsibility for implementing recovery actions and protecting Peninsular Ranges bighorn sheep on BLM-managed lands.

Occurrence within the Coachella Valley CDCA Plan Amendment Area
Range-wide, there are 782,049.2 acres of suitable bighorn sheep habitat. Of that, 84, 551.8 acres are designated critical habitat, of which 84, 216.4 acres occur within the planning area. These lands are within the Santa Rosa and San Jacinto Mountains National Monument and the Santa Rosa Wilderness Area.

Threats and Limiting Factors. The Peninsular bighorn sheep is endangered because of the loss and fragmentation of habitat, disease, and predation. A limiting factor is that the sheep live in a narrow band of habitat in which they must find the resources needed to survive in a harsh desert environment. This band of habitat is at the lower elevations of the Peninsular Ranges and includes canyon bottoms, alluvial fans, and mountain slopes. Within the narrow band of habitat, bighorn sheep need to be able to move daily, seasonally, and annually to make use of the sparse and sometimes sporadically available resources found within their home ranges. Habitat loss is considered to be one of the greatest threats to the species' continued existence. As humans encroach into the habitat, the resources, and the survival potential of a particular ewe group that depends on them, may be eliminated. Habitat loss can impact the sheep's ability to forage, reproduce, find water, avoid predators, and move among important resource areas and between ewe groups. Habitat fragmentation is recognized as a major threat to Peninsular bighorn sheep because of the dual effect of restricting animals to a smaller area and severing connections between ewe groups, thus creating genetic isolation. Roads and human use of an area can create habitat fragmentation. Habitat modification, such as constructing golf courses and residences in bighorn habitat that attract sheep, creates threats in the form collisions with vehicles, poisoning by toxic landscape plants, entanglement in wire fences, harassment by dogs, and exposure to pathogens and chemicals such as herbicides and insecticides. The human population in the Coachella Valley is predicted to increase from approximately 312,000 in 2000 to 456,000 by 2020, a 41% increase. As the population in the valley increases, threats to bighorn sheep also increase. Increased demands for recreation opportunities,

home sites, and other development may result in greater habitat fragmentation and loss. Traffic on SR 74 will likely increase, thereby increasing the effects of fragmentation on bighorn sheep in the Santa Rosa Mountains. Disease and predation, particularly by mountain lions, are also significant threats.

Southern yellow bat
Lasiurus ega (xanthinus)
Status: Federal – None
State – Species of Special Concern

Distribution, Abundance, and Trends. The southern yellow bat occurs in extreme southeastern California, the southwest to Texas and the northwestern portion of Mexico, including Baja (Burt and Grossenheider 1976). Its range appears to be expanding due to the use of palm trees for landscaping. While very few surveys have been conducted for the species in the Plan area, and it is known to occur only at the Coachella Valley Preserve, Dos Palmas Preserve/ACEC, and on the Applegarth Ranch in the Thermal area, the yellow bat is believed to occur throughout the Coachella Valley in the palm oases and in residential areas with untrimmed palm trees. The Coachella Valley is probably very important to this species, as it has a significant number of the native palm oases in southeastern California. There is no estimate of the population size of this species in the Plan area.

This species roosts in trees, primarily palm trees. It appears to prefer the dead fronds of palm trees. It feeds on flying insects such as beetles and true bugs, and forages over water and among trees. This species is thought to be non-colonial, although aggregations of up to 15 have been found in the same roost site. Yellow bats probably do not hibernate; activity has been observed year-round in both the southern and northern portions of the range. This species probably forms small maternity groups in trees and palms. Pregnancy occurs from April to June, with lactation occurring in June and July. Females carry from one to four embryos. In Texas, bat pups have been found on fronds that have been trimmed from trees (Mirowsky 1997). There is very little information available on the life history of this species.

Occurrence within the Coachella Valley CDCA Plan Amendment Area
Modeled habitat for this species occurs on 315 acres of BLM-managed lands, mostly within the Dos Palmas ACEC.

Threats and limiting factors
The most serious threat to this species would be loss of dead palm fronds. This can result from fire or pruning when trees are used for landscape purposes. If loss of fronds occurs in the spring before the young can fly, it could result in the loss of a year's reproduction. Fires may be naturally occurring from lightning or may be the result of vandalism. Small colonies may be lost in residential areas or resorts and golf courses where the fronds from the trees

are trimmed. Pesticides may impact food availability for this species, particularly where agricultural areas occur adjacent to roosting habitat.

Southwestern Willow Flycatcher
Empidonax traillii extimus
Status: Federal – Endangered
State – Endangered

Distribution, Abundance, and Trends. The southwestern willow flycatcher is restricted to dense riparian woodlands and forests along the river and stream systems of southern California, primarily in Kern, San Diego, San Bernardino, and Riverside counties. Their breeding range also includes southern Nevada, Arizona, New Mexico, Utah, western Texas, and possibly southwestern Colorado. They are reported as breeding birds in Mexico, in extreme northern Baja California and Sonora. They winter in Mexico, Central America, and northern South America. This flycatcher can be found at sites where a dense growth of willows (*Salix* sp.), *Baccharis,* arrowweed (*Pluchea* sp.), or other plants occurs in thickets. These thickets are often associated with a scattered overstory of cottonwood (*Populus fremontii*) and other riparian trees. This species has also been found nesting in southern California in relatively narrow bands of riparian habitat and can utilize extremely small remnant riparian areas (one medium size willow tree) during migration (Theresa Newkirk, pers. comm.).

The historic range of the southwestern willow flycatcher in California included riparian areas throughout the southern third of the state; it was reported as common in the Los Angeles basin, the San Bernardino/Riverside area, and in San Diego County. It was also a common breeder along the lower Colorado River, near Yuma. Currently, stable nesting groups are reported from only two locations, along the South Fork of the Kern River and along the Santa Margarita River on Camp Pendleton. Elsewhere, they exist only in small scattered, remnant and isolated populations. Major causes of the decline are cowbird parasitism and destruction or disturbance in riparian habitats.

The birds begin to arrive in southern California to breed late in the spring, generally from May 15 on through the summer months, until August. Males establish and defend territories beginning shortly after arrival in mid-May. Most birds begin nesting within one week after pair formation, which occurs 10 to 14 days after their arrival. The young fledge in early July and begin to disperse approximately two weeks after leaving the nest.

They construct their nests in dense thickets of willows, mulefat, and other trees and shrubs approximately 4 to 7 meters in height. They virtually always nest near surface water or saturated soil. They have not been found nesting in habitats where the riparian zone is very narrow, or where distances between willow patches and individual shrubs is great. The southwestern willow flycatcher is an insectivore, foraging within and above dense riparian vegetation, sometimes adjacent to nest sites.

Occurrence within the Coachella Valley CDCA Plan Amendment Area
The breeding status of the southwestern willow flycatcher within the Plan area is not well known. Of the known locations at which this species has been observed, only one was confirmed as supporting breeding birds, sited by Bob McKernan in Mission Creek. Suitable breeding habitat is present in a number of locations where riparian habitat exists, in Chino Canyon, Andreas, Murray, and Palm Canyons, Millard Canyon, Whitewater Canyon, possibly Stubbe and Cottonwood Canyons. Suitable breeding habitat may also occur at Oasis de Los Osos, along the Whitewater River near the Salton Sea, at the Coachella Valley Preserve, and at Dos Palmas Preserve/ACEC. No breeding southwestern willow flycatchers were observed during surveys conducted in the Whitewater River drainage during 2001. Migrant willow flycatchers were observed once in upper Whitewater Canyon. Habitat suitability is marginal in this area due to small patch size. Few brown-headed cowbirds were seen at this site and on survey routes. Modeled suitable habitat for southwestern willow flycatcher is the same as for Least Bell's Vireo, 68,358.9 acres range-wide within the planning area, and 20,740.1 acres on BLM-managed lands.

Southwestern willow flycatchers also migrate through the Plan area en route to other breeding areas. In migration, they may use desert fan palm oasis woodland, mesquite hummocks, mesquite bosque, arrow weed scrub, desert dry wash woodland, southern sycamore-alder riparian woodland, Sonoran cottonwood-willow riparian forest, and southern arroyo willow riparian forest. Canyons on the north side of the Coachella Valley on the boundary of Joshua Tree National Park may provide migratory habitat for this species. In addition, there are two records of migrant southwestern willow flycatchers at Dos Palmas ACEC.

Threats and Limiting Factors. The most significant threats to the southwestern willow flycatcher in the Plan area are loss and modification of riparian habitats upon which they depend and nest parasitism by the brown-headed cowbird. BLM-managed lands where southwestern willow flycatchers have been documented are in conservation status at this time. These areas include Big Morongo Canyon Preserve, Dos Palmas ACEC, and the San Gorgonio Wilderness Area. Other factors that have contributed to their decline include disturbance of riparian habitat by cattle, fragmentation of breeding areas, flood control activities, invasion of non-native plants in riparian habitats, degradation of habitat as a result of edge effects related to urbanization and other human activities, and sand/gravel mining. Other localized threats may include changes in fire frequency and concentrated human access within some of the riparian areas. For example, the Whitewater River area near Bonnie Bell appears to be heavily used by people. Brown-headed cowbird parasitism rates of southwestern willow flycatcher nests has been reported as ranging from 50 to 80 percent in California, to 100% in the Grand Canyon. The decline in breeding populations of the southwestern willow flycatcher, along with other small, insectivorous, open-cup nesting birds -- among them the yellow warbler and least Bell's vireo -- is well documented. It has been reported (Unitt 1987) from historical and contemporary records that the southwestern willow flycatcher has declined precipitously throughout its range in the last 50 years. Parent

birds in parasitized nests either desert the nest or raise the young cowbird at the expense of their own young. Human activities, including golf courses and agriculture, attract cowbirds, thereby increasing the threat to southwestern willow flycatchers. Cowbird control has been implemented at Big Morongo Canyon Preserve for the past four years. At this time, cowbird parasitism is not a limiting factor for southwestern willow flycatchers at Big Morongo Canyon Preserve (Robin Kobaly, preserve mgr. Pers. Comm., 2002)

Summer tanager
Piranga rubra cooperi
Status: Federal – None
State – Species of Special Concern

Distribution, Abundance, and Trends. The summer tanager breeds across the southern United States from California, as far north as the Kern River valley, to Florida, and in the eastern United States as far north as 40° N. Two subspecies are currently recognized. One, *P. r. cooperi*, breeds in the southwest from California to west Texas and northern Mexico. The other, *P. r. rubra*, occupies the remainder of the range to the east. The western subspecies inhabits riparian woodlands and, at higher elevations, woodlands dominated by mesquite and salt cedar. The summer tanager winters from central Mexico south through Central America to Bolivia and Brazil. It occurs in small numbers in winter in southern California, southern Arizona and in southern Florida.

The North American breeding population has remained generally stable since the mid-1970's, although some populations in the eastern United States and along the Colorado River have declined. It was formerly considered common in the lower Colorado River valley by Grinnell (1914), but only 216 individuals were estimated to be present by 1976 (Rosenberg et al. 1991). Habitat destruction is the likely cause of the decrease.

Little is known of the breeding biology of the species. Summer tanagers nest in mature riparian groves dominated by cottonwoods and willows. Early arrivals from wintering grounds may appear in late March, but the main migration is April through early May. Nesting is primarily May through June. The nest is built on a horizontal limb of large trees including cottonwoods, usually 10 to 35 feet above the ground, and often over an opening such as a creek bed. The nest is a loosely built, shallow cup of weed stems, leaves, bark, and grasses, lined with fine grasses. From 3 to 5, but usually 4 eggs are laid. Incubation is approximately 12 days. Tanagers eat insects, including bees and wasps, and small wild fruits.

This species is known or suspected to nest in the Plan area in Mission Creek, the Whitewater River Canyon, and Palm Canyon, and also migrates through the area on its way to more coastal and northern habitats. There are also records from the Whitewater River delta and the Coachella Valley Preserve, but whether it nests in these areas or only uses them in migration is not known.

Threats and Limiting Factors. The major threat is loss of habitat due to human activity, including flood control. Cowbird parasitism may be a contributing factor, although parasitism of summer tanager nests appears to vary significantly by geographic area. In southern Illinois, 11 of 13 nests observed were parasitized, while in the South Fork Kern River Valley only 1 of 16 nests was subject to parasitism. The extent of cowbird parasitism in the Plan area is not known. Collisions with wind turbines and other towers during migration could also be a source of mortality. In Leon County, Florida, 146 summer tanagers were killed at a television tower during spring migration. The actuality or potential of mortality from wind turbines, communication towers, and transmission towers in the Plan area is not known. Overall in California, the population of summer tanagers has declined severely in response to elimination of riparian willow and cottonwood forest. The species is designated a Species of Special Concern by the state.

Triple-ribbed milkvetch
Astragalus tricarinatus
Status: Federal – Endangered
State – None

Distribution, Abundance and Trends
The triple-ribbed milkvetch is an endemic species that is found in a narrow range primarily from the northwestern portion of the Coachella Valley, from the vicinity of Whitewater Canyon, the type locality, in Mission Creek canyon across Hwy. 62 to Dry Morongo Wash and Big Morongo Canyon. Another location where the species has been collected is Agua Alta Canyon, a branch of Martinez Canyon in the Santa Rosa Mountains in the southern portion of the Plan area; this record is for one individual collected by Jon Stewart and identified by Andy Sanders of the U.C. Riverside herbarium. It is of interest that Munz and Keck (1959) and Barneby (1964) described the range of the species from Whitewater to the Orocopia Mountains, east of the Martinez Canyon location. The Martinez Canyon known location has led some to suggest that this species could occur in the rugged canyons of the Santa Rosa/San Jacinto Mountains. Much of the Deep Canyon area has received a fair amount of attention from botanists, particularly in the Deep Canyon watershed near Palm Desert (Zabriskie 1979) where the triple-ribbed milkvetch has never been recorded. It is a very difficult species to detect, however. The species is also known from several locations outside the Plan boundary in San Bernardino County, including the upper reaches of Big Morongo Canyon, Dry Morongo Canyon just north of the county line, and a somewhat anomalous, relatively high elevation, location (Sanders 1999) near Key's Ranch in Joshua Tree National Park. These locations in San Bernardino County are within the boundaries of BLM's West Mojave Planning Area. There are 3085 acres of modeled habitat for triple-ribbed milkvetch within the Coachella Valley CDCA Plan amendment planning area. Of these, 1634 acres occur on BLM-managed lands.

Most of the populations of this species appear to be in the eastern end of the San

Bernardino Mountains and at the western end of the Little San Bernardino Mountains. Much of the suitable habitat along the southern margin of these mountains is rugged and poorly explored and so it is possible that additional populations occur in the upper reaches of Mission, Dry Morongo, and Big Morongo Canyons, as well as in the westernmost portions of Joshua Tree National park (Sanders 1999).

The preferred habitat of the triple-ribbed milkvetch has been characterized as sandy and gravelly soils of dry washes or on decomposed granite or gravelly soils at the base of canyon slopes. Recent observations of the species have illustrated that its habitat requirements are very poorly understood. Most, if not all, observations of the species are in disturbed areas, such that it may be require some disturbance, whether natural or man-made. In Big Morongo Canyon it is found on decomposed granite “slides” at the base of canyon slopes. Other disturbed sites include along washes, on canyon bottoms where slides or flooding occurs. In Mission Creek canyon, the species was observed in 1998 growing along the rocky edge of the stream, in the middle of roads, in a “rip-rap” barrier above the U.S.G.S. gauging station, in open soils in a recently burned willow thicket at the margins of the cienega, and on gravelly sandbars in the midst of the stream channel (K. Barrows, pers. obs.).

Andy Sanders (1999) has suggested that washes may not in fact be the typical habitat for this species, which may be more common on the slopes above washes. Very limited surveys by Andy Sanders and Katie Barrows in Mission Creek Canyon between 1995 and 1998 have not located triple-ribbed milkvetch on these slopes. It may be that the species requires a very specific set of environmental conditions for germination and growth. In this scenario, seeds only find these conditions infrequently in various years such that plants are only seen in good numbers in certain years. In its wash habitat, large-scale floods may be a necessary condition for the successful germination of many seeds of triple-ribbed milkvetch. These large, scouring flood events occur only infrequently in this arid desert habitat. A question remains as to how this species can persist given the small size of most known populations and the relative level of disturbance that could, presumably, wipe out a substantial number of individuals. Consideration should be given to retaining an active and intact hydrological regime for this listed species.

In his summary of the species for the West Mojave Desert HCP (Sanders 1999), Andy Sanders nicely summarizes the questions about the habitat requirements and population status of this species: “It is apparent that this species is most commonly collected along washes and on canyon bottoms, but whether this represents the preferred habitat of the species or is simply the place that people collect, and hence find waifs, is yet to be determined. Given the small size of most populations and the instability of the habitats occupied, it is difficult to see how this species could maintain itself if washes truly are its main habitat. With every flood, seeds and plants will be destroyed or washed downstream out of the habitat area. If there is not a substantial population, some of which will escape destruction, or a permanent population in areas not subject to scouring, it is difficult to see how a scarce fugitive can maintain itself at all. Seed longevity should be investigated to

determine if seeds are able to survive prolonged burial in sand following a flood so that they might wait for many years until another flood again exposes them and makes open habitat available. There is a great need for careful and thorough surveys of the slopes above the washes where this species is usually found. If there are no permanent populations found there, then it should be concluded that this species is in fact a wash inhabitant and that the plants are few in number and their status precarious indeed."

Where it does occur, triple-ribbed milkvetch is apparently never common. Surveys for the species in the Mission Creek area in 1998 detected only 13 plants, in spite of what would appear to have been favorable growth conditions with relatively high rainfall that year; the 13 plants were large and laden with fruits (K. Barrows, pers. obs.). Reported observations of the number of individuals of the triple-ribbed milkvetch in Whitewater Canyon, Dry Morongo Wash, and Big Morongo Canyon are mostly of one to 13 plants, with the exception of 120 plants reported in 1991 (in 1997 6 to 8 individuals were observed at this site), 35 plants reported in 1992 (both by G. Helmkamp, pers. comm.), and 70 plants in 1993 (Jacobsen 1993). The known location in Martinez Canyon is a single observation of one plant, which has not been observed since it was reported in 1985; additional casual surveys of this location have been accomplished several times since 1985, but no plants have been found (W. Miller 1997; J. Dice, pers. comm.).

As noted, the factors that control the distribution and size of populations of this species are not understood. During some years, the species is difficult to find, while in other years it may be relatively common at some sites. The occurrence in Big Morongo Canyon consists of approximately 50 plants, occupying a total area of about 36 acres; these plants occur in scattered locations along the canyon bottom, north of and within the Plan area. As previously noted, George Helmkamp (pers. comm.) has seen this population vary from 6 to 120 plants. In the year when 120 plants were observed (ca. 1991) heavy rains resulting in floodwaters had scoured the bottom of the canyon; the plants appeared in the open canyon bottom. The Big Morongo Canyon has been monitored from 1983 and 1998, with changes in abundance apparently dependent on the amount of winter rainfall.

The triple-ribbed milkvetch may be a short-lived perennial, but more commonly behaves as an annual. It may best be described as a short-lived perennial, persisting for about 3 to 5 years (Sanders 1999). Healthy individuals appear as a somewhat bushy herb, which at maturity are usually 12-20 inches (30-50 cm) tall. The lower stem is somewhat woody, with a tap root. The white to pale cream- colored flowers appear from February through April, with fruits appearing as early as March and present until at least May. The fruits are distinctive, narrow pods, 2 to 4 cm long and three-ribbed in cross section. Most aspects of the biology of this species are unknown including pollinators, germination requirements, longevity of seeds in the soil and specific habitat requirements.

Threats and Limiting Factors. This species occurs in locations within the Plan area where there are few if any human-caused threats. Most of the known locations, 85%, occur on existing conservation lands in protected status, including those in Mission Creek on land

owned by BLM or the Wildlands Conservancy, in Big Morongo Canyon on BLM land, or in Whitewater Canyon on BLM land. In the wash bottom habitat and along roads, the species may be subject to trampling by vehicles, but most of the known locations receive very limited vehicle traffic. Development pressures are a concern primarily in the Mission Creek drainage on private lands immediately west of Hwy. 62 and in the vicinity of Dry Morongo Wash near Hwy. 62 and Indian Avenue. One disturbance that may impact this species is flood control maintenance activities in the Whitewater Canyon and Mission Creek drainages. Sand and gravel mining is not a current threat, although there is some potential for mining in Whitewater Canyon. Road widening along Hwy. 62 could impact the Dry Morongo Canyon location in the future, although no widening is proposed. Grazing is not a threat in the known locations for this species. Illegal berming and drainage diversions are potential impacts that may have or might in the future affect the structure and function of canyon habitats. In the upper reaches of Big Morongo Canyon, outside the Plan boundary in San Bernardino County, habitat for triple-ribbed milkvetch has been disturbed by pipeline construction and maintenance. This is a threat with mixed impacts as, while individual plants may be destroyed, some plants may germinate in soil freshly disturbed by pipeline construction activities (G. Helmkamp, pers. comm.). In 1995, however, a pipeline realignment project may have impacted this milkvetch. With the low population numbers reported by most observers, a significant threat may be impacts to the species from stochastic natural events.

Yellow-breasted chat
***Icteria virens* (SC)**
Status: Federal – None
State – Species of Special Concern

Distribution, Abundance, and Trends. The yellow-breasted chat is found throughout most of the United States, southern Canada, parts of Mexico, and south to Panama in the appropriate habitat. It is more often heard than seen, preferring to stay under cover in dense riparian thickets. The yellow-breasted chat nests in dense riparian thickets and brushy tangles in the lower portions of foothill canyons and in the lowlands. Its nest is a cup of dried leaves, coarse straw, and bark, lined with grasses, fine plant stems and leaves, built low in a bush, vine, or briar; there are typically 3 - 5 eggs laid from early May to mid July. It is primarily an insect eater but also eats wild berries and wild grapes.

This species is known to breed or is likely to breed in Whitewater Canyon, Mission Creek, Chino Canyon, and the Whitewater River between Mecca and the Salton Sea. It is possible that it breeds elsewhere in the Plan area as well. In migration, the yellow-breasted chat may use desert fan palm oasis woodland, mesquite hummocks, mesquite bosque, arrowweed scrub, desert dry wash woodland, desert sink scrub, desert saltbush scrub, southern sycamore-alder riparian woodland, Sonoran cottonwood-willow riparian forest, valley freshwater marsh, and cismontane alkali marsh in the plan area. It has been observed at Dos Palmas, the Coachella Valley Preserve, and Willow Hole. It has also been

observed in Andreas Canyon on the Agua Caliente Indian Reservation. Individuals observed in these locations may have been in migration to other breeding areas outside the Plan area.

The yellow-breasted chat is in a general state of decline. The primary threat is loss of habitat, mainly due to flood control activities. They are also subject to cowbird parasitism. Human activities, including golf courses and agriculture, attract cowbirds, thereby increasing the threat to the species.

Threats and Limiting Factors. The primary threat to the yellow-breasted chat in the Plan area is destruction or degradation of habitat from flood control and other human activities. The extent to which this species is impacted by cowbird parasitism is not known.

Yellow warbler
Dendroica petechia brewsteri
Status: Federal – No Status
State – Species of Special Concern

Distribution, Abundance, and Trends. The yellow warbler occurs in riparian areas throughout Alaska, Canada, the United States, and parts of Mexico. A tropical subspecies occurs in Central and South America. The yellow warbler prefers wetlands and mature riparian woodlands dominated by cottonwoods, alders, and willows. It also uses well watered, second growth woodlands and gardens. The yellow warbler winters south to the Bahamas, Central America and South America to Peru, Bolivia, and Brazil. The species breeds throughout the United States and Canada. The population is fluctuating in North America: declining in some areas and increasing in others. It was once a common to locally abundant summer resident in riparian areas throughout California. Currently, populations are reduced and locally extirpated (e.g., Sacramento Valley and San Joaquin Valley). Once a common resident in San Francisco, there are no recent breeding records for this area. Breeding populations in Marin County have declined, but the species is still common in Santa Cruz County. Numbers have also declined in Siskiyou County, but are steady in some areas of the Sierra Nevada. Yellow warblers are common along streams below about 8,000 feet in the eastern Sierra. The yellow warbler has declined significantly as a breeding bird in the coastal lowlands of southern California and is believed to be extirpated from the Colorado River. Destruction of riparian habitats and cowbird parasitism are the major causes of the decline.

The yellow warbler is known or believed to occur as a breeding bird at Whitewater Canyon, Mission Creek, Chino Canyon, Andreas Canyon, in the Whitewater River near the Salton Sea, and at Cottonwood Spring in Joshua Tree National Park. Many yellow warblers also migrate through the Plan area en route to other breeding areas. In migration, the yellow warbler may use desert fan palm oasis woodland, mesquite hummocks, mesquite bosque, arrowweed scrub, desert dry wash woodland, desert sink scrub, desert saltbush scrub,

southern sycamore-alder riparian woodland, Sonoran cottonwood-willow riparian forest, valley freshwater marsh, and cismontane alkali marsh in the plan area. The species would also use urban areas in migration. No conservation measures are proposed in urban areas; however, it is anticipated that suitable landscape trees and shrubs will continue to thrive in urban areas.

The yellow warbler typically arrives from their wintering areas from late March to May. It tends to nest in locations of intermediate height and shrub density. The nest is built in an upright fork or crotch of a large tree, or sometimes a sapling or bush, generally 6 to 8 feet above the ground. The nest is a well-formed cup of interwoven plant fibers and down, fine grasses, lichens, mosses, spider's silk, hairs, etc. Usually 4 to 5 eggs are laid in spring or early summer. Incubation is 11 days, and the young leave the nest at 9 to 12 days old. The yellow warbler feeds on caterpillars, cankerworms, moth larvae, bark beetles, borers, weevils, small moths, aphids, grasshoppers, and spiders, and occasionally feeds on a few species of berries.

Threats and limiting factors
The primary threats to the yellow warbler in the Plan area are cowbird parasitism and destruction or degradation of habitat from flood control and other human activities. Cowbird parasitism is well documented, and the yellow warbler is one of the most common hosts. One cowbird may lay an egg in up to 12 different nests in a breeding season, and yellow warblers lay a single clutch per season. Human activities, including golf courses and agriculture, attract cowbirds, thereby increasing the threat to yellow warblers.

Yuma Clapper Rail
Rallus longirostris yumaensis
Status: Federal – Endangered
State – Threatened

Distribution, Abundance, and Trends. Yuma clapper rails are and have been restricted to the region of the lower Colorado River, the Colorado River delta, and appropriate habitats surrounding the Salton Sea and in the Whitewater River north of the Sea. There are rare records for this species in marshland habitat along the eastern shore of the Sea of Cortez. Within this historic range, appropriate habitat along the lower Colorado River and delta areas has been severely reduced through water diversions and salt cedar infestations. The Plan area is at the northern edge of the Yuma clapper rail distribution. There are records from the Whitewater River delta and upstream, in scattered locations, for approximately 10 miles along the Whitewater River channel, and from two agricultural drains on the west side of the Salton Sea. The Salton Sea and Whitewater River habitats are potentially impacted due to chemical contaminants, salt cedar infestations, and flood control channel maintenance. The Yuma clapper rail occurs at the Salton Sea State Recreation Area at the mouth of Salt Creek. The Yuma clapper rails occur within the Dos Palmas marshland complex in unknown numbers. The Dos Palmas area may have particular importance in

that it may be one of the few occupied sites throughout this bird's entire range that is relatively free of chemical contaminants. Both Dos Palmas and the Whitewater River delta/Salton Sea could, if managed appropriately, provide additional habitat to what already exists there. The population size of Yuma clapper rails within this area is not known, nor are the trends in its population numbers known, but it is likely that this population will require immigration from occupied habitat to the south to maintain long term viability. Surveys conducted at Dos Palmas ACEC in 2001 and 2002 detected no breeding Yuma Clapper Rails. However, BLM biologists observed a single rail in July 2002 in the central pond at Dos Palmas on two separate occasions (R. Huddleston-Lorton, K. Doran, BLM, pers. Comm. 2002).

There are 1,177.1 acres of modeled habitat within the planning area, of which 257.2 acres occur on BLM-managed land.
Yuma clapper rails are found in marsh habitats of cattails *Typha domingensis* and bullwhip/California bulrush *Scirpus californicus.* In habitats found along and adjacent to the lower Colorado River, these rails selected some combination of cattails and bulrush for breeding. There was a post-breeding shift at some sites concurrent with a rise in water level, to higher elevation willows, arrow weed and salt cedar dominated habitats. Common reed *Phragmites communis* was also used as habitat, but usually occurred in areas too dry for breeding and foraging. Water depth appears to be an important habitat character, with average preferred depths varying from 6.5 cm to 20 cm depending on the study site In deeper water a residual mat of decaying vegetation was important to allow the rails to have access and use throughout their home range. The rails also preferred habitat edges and generally less dense habitat to facilitate the birds' mobility and access. Home ranges for male birds were found to average 7.7 +/- 5.9 ha, and for females 9.9 +/- 9.6 ha.

Threats and Limiting Factors. Water diversions, salt cedar infestations, habitat manipulation for flood control and chemical contamination (the last two pertain primarily to the Whitewater delta) are the primary threats to Yuma clapper rails within the Plan area. Another potential threat is the lining of the Coachella Canal; leakage from the Coachella Canal currently provides a portion of the water supply to rail habitat at the Dos Palmas Preserve/ACEC. The canal lining may also be a threat to the water supply in Salt Creek. There are small amounts of Yuma clapper rail habitat in the Plan area, and it is unknown whether the habitat areas are large enough to sustain a viable population. Additional surveys are needed as part of Plan implementation to determine patch sizes and whether they are adequate to sustain a viable population. There are opportunities for habitat restoration and enhancement in the Plan area.