CHAPTER 3
NATURAL RESOURCES OF THE ACTION AREA

Most of the Action Area lies within the Colorado Desert, a subdivision of the much larger Sonoran Desert. On the floor of the Coachella Valley, annual rainfall averages approximately six inches, with peaks occurring in both the winter and summer months. Winter temperatures are generally mild, with average temperatures reaching approximately 70 degrees Fahrenheit (°F) during the day and approximately 50°F at night. With summer daytime highs averaging 108°F, the month of July brings the hottest temperatures. Variation from these general climatic conditions occurs in the San Jacinto Mountains, where temperatures are cooler and precipitation is greater. In the higher elevations of the Action Area, freezing temperatures and snow can be expected during winter.

As described in Chapter 2, the Action Area contains a wide variation in elevation and physical features, ranging from the valley floor to mountain peaks in the San Jacinto and Santa Rosa mountains. These changes in elevation and topography with accompanying differences in temperature, precipitation, and other environmental variables are significant factors contributing to the Action Area's high biological diversity.

Many canyons in the San Jacinto and Santa Rosa mountains support riparian areas not typical of a desert environment. Streams and seeps support many palm oases. Where the water drains into the sands, desert dry wash woodland results. The alluvial fans associated with the canyon mouths provide still another distinctive biological community. Additionally contributing to the biological diversity are the strong winds that funnel through the San Gorgonio Pass from the west, which pick up sand in areas of river-deposited sand from the San Gorgonio and Whitewater rivers and transport it downwind, thus creating an aeolian (wind-deposited) dune system. In the past, this dune system occupied much of the center of the valley; much of this area is now developed and the aeolian sand supply to the remnant portions of the dune system is largely cut off by intervening development.

Historically, the Cahuilla people utilized naturally occurring flora and fauna for a wide variety of uses, particularly for survival. Pronghorn sheep (antelope), bighorn sheep, and mule deer were the common large animals hunted for sustenance.

This Chapter describes the Natural Plant Communities and the sensitive plant and animal species that occur or potentially occur in the Action Area. These natural resources are the focus of this Plan.

3.1 SOURCES OF BIOLOGICAL DATA

Biological data for the Tribal HCP were obtained from a variety of sources, including the following:

- **Known location information for sensitive plant and wildlife species and Natural Plant Communities**. These data are maintained on Geographic Information System (GIS) maps by the Tribe and have been made available to the Tribe from the Coachella Valley Mountain Conservancy and CVAG. In addition, the Tribe conducted several field surveys for vegetation and habitat mapping as well as presence or absence surveys for sensitive species between 1999 and 2006. Results of these surveys were used to update the Tribe's GIS data layers.

- **Species information summaries prepared in connection with CVAG's conservation planning efforts**. These summaries, prepared by members of the Scientific Advisory Committee or Coachella Valley Mountains Conservancy staff, give general status, habitat, and life history information for each species, including general descriptions of the habitat and known distribution of each species within the Action Area.

3.2 NATURAL PLANT COMMUNITIES OCCURRING WITHIN THE ACTION AREA

The following is a list of 15 Natural Plant Communities located within the Action Area that may provide habitats for federally listed and Tribal sensitive species.

- Sonoran Creosote Bush Scrub
- Sonoran Mixed Woody and Succulent Scrub
- Desert Fan Palm Oasis Woodland
- Black Oak Forest
- Interior Live Oak Chaparral
- Peninsular Juniper Woodland and Scrub
- Red Shank Chaparral
- Sonoran Cottonwood-Willow Riparian Forest
- Southern Sycamore-Alder Riparian Woodland
- Active Sand Fields
- Stabilized and Partially Stabilized Shielded Sand Fields
- Ephemeral Sand Fields
- Desert Dry Wash Woodland
- Mesquite Hummocks
- Desert Saltbush Scrub

Figure 10 shows the location of the Natural Plant Communities in the Action Area. Table 3-1 lists the acreage for each of these communities by region. The plant communities and sensitive plant and animal species potentially occurring in the Action Area are discussed below as they relate to the VFPA and MCCA. The baseline for extent of development within the Plan Area is August 2007, when the Tribal HCP was circulated for public review.

3.2.1 Natural Plant Communities Occurring in the Mountains and Canyons

Just above the edge of the Coachella Valley are floodplain areas consisting of alluvial fans, bajadas, and canyon washes. Within the Reservation, these include the alluvial fans of the Palm, Wentworth, Murray, Andreas, Tahquitz, and Chino canyons. The various canyons found on the Reservation, off-Reservation Tribal Lands, and in the BLM Exchange Areas are characterized by intermittent surface flows with permanent pools, seeps, and other waters in their upper reaches.

Beyond the top end of the alluvial fans, the slopes between 400 and 1,200 feet AMSL are largely composed of granitic boulders and talus. Although many annual plants grow here during "wet" years, few perennial plants do except for scattered creosote bushes, brittlebushes, and occasionally indigo bush and small barrel cactus.

Approximately 61 acres of urban development occur within the MCCA, all of which are on the Reservation.

Plant communities and associated dominant plant species found primarily in the MCCA (some of which also extend into the VFPA) are described in the following paragraphs.

Table 3-1
Natural Plant Communities Distribution in the Action Area (acres)

Natural Plant Community	MCCA on Reservation[1]	MCCA Other Tribal Lands	VFPA on Reservation	VFPA Other Tribal Lands	Subtotal: Plan Area	BLM Exchange Areas	Off-Reservation Target Acquisition Areas[2]	Subtotal: Lands Outside Plan Area	Action Area Total
Sonoran Creosote Bush Scrub	1,127	0	148	144	1,419	214	17,732	17,946	19,365
Sonoran Mixed Woody and Succulent Scrub	8,587	3,514	2,910	0	15,011	2,894	14,858	17,752	32,763
Desert Fan Palm Oasis Woodland	467	390	12	0	869	148	138	266	1,135
Black Oak Forest	32	79	0	0	111	266	0	268	379
Interior Live Oak Chaparral	3,823	1,161	0	0	4,984	1,719	0	1,719	6,703
Peninsular Juniper Woodland and Scrub	89	0	0	0	89	229	0	229	318
Red Shank Chaparral	889	0	0	0	889	223	0	223	1,112
Sonoran Cottonwood-Willow Riparian Forest	9	0	0	0	9	0	4	4	13
Southern Sycamore-Alder Riparian Woodland	245	41	0	0	286	104	15	119	405
Active Sand Fields	0	0	227	0	227	0	4,547	4,547	4,774
Stabilized and Partially Stabilized Shielded Sand Fields	0	0	2,971	0	2,971	0	2,854	2,854	5,825
Ephemeral Sand Fields	0	0	344	0	344	0	4,121	4,1121	4,465
Desert Dry Wash Woodland	25	0	35	0	60	0	9001	901	961
Mesquite Hummocks	0	0	0	0	0	0	184	184	184
Desert Saltbush Scrub	0	0	0	0	0	0	170	170	170
Urban Development	63	0	8,654	71	8,786	2	880	882	9,668
TOTAL	**15,354**	**5,185**	**15,301**	**215**	**35,055**	**5,799**	**46,404**	**52,180**	**88,240**

Notes: Of the total approximately 30,655 acres of Reservation land outside of Federal ownership, about 8,715 acres currently contain urban development.
[1]Does not include BLM Exchange Areas that are within the Reservation boundaries.
[2]Does not include Target Acquisition Areas in the Plan Area.

RANGE 4 EAST

RANGE 5 EAST

RANGE 6 EAST

RANGE 7 EAST

TOWNSHIP 3 SOUTH

TOWNSHIP 4 SOUTH

TOWNSHIP 5 SOUTH

Dillon Road

Gene Autry Trail

Vegetation

- Sonoran Creosote Bush Scrub
- Sonoran Mixed Woody and Succulent Scrub
- Semi-Desert Chaparral
- Chamise Chaparral
- Upper Sonoran Mixed Chaparral
- Scrub Oak Chaparral
- Red Shank Chaparral
- Interior Live Oak Chaparral
- Peninsular Juniper Woodland and Scrub
- Black Oak Forest
- Coniferous Forest
- Desert Fan Palm Oasis Woodland
- Sonoran Cottonwood-Willow Riparian Forest
- Southern Sycamore-Alder Riparian Woodland
- Riparian/Wetland
- Desert Dry Wash Woodland
- Active Sand Fields
- Ephemeral Sand Fields
- Stabilized and Partially Stabilized Shielded Sand Fields
- Desert Saltbush Scrub
- Mesquite Hummocks
- Mojave Mixed Steppe
- Blackbrush Scrub
- Urban

Action Area

- Target Acquisition Area
- 2 Agua Caliente Reservation Boundary
- 5 BLM Exchange Area
- 7 Tribal Lands Outside Reservation
- MCCA/VFPA Boundary

N W E S

2.5 1.25 0 2.5

Miles

Job No: TSC-07 Date: 07/22/10

Source: CVAG 2003; urban areas on Reservation updated by Tribe

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Natural Plant Communities

AGUA CALIENTE THCP

Figure 10

3.2.1.1 Sonoran Creosote Bush Scrub

Sonoran creosote bush scrub is the most widespread vegetation type in the Colorado Desert. It is dominated by creosote (*Larrea* sp.). It characterizes the vast intermountain bajadas, reaching greatest development on coarse, well-drained soil with a total salinity of less than 0.02 percent. The structure of the creosote bush scrub community is simple because of low species diversity and the broad spacing of the shrubs, usually with bare ground between and limited structural diversity (approximately 5 to 10 feet tall). The co-dominant species in the community is white bursage (*Ambrosia dumosa*), a much shorter shrub varying from 8 to 24 inches in height. Many species of ephemeral herbs may flower in late winter/early spring if winter rains are sufficient. There are approximately 1,419 acres of Sonoran creosote bush scrub within the Plan Area: 1,127 acres within the northwestern corner of the Reservation in the MCCA and 292 acres in the VFPA near the central portion of the Reservation and on other Tribal Lands to the northwest. In addition, 214 acres of this plant community occur in BLM Exchange Areas (all of which are in the MCCA) and 17,732 acres occur within the off-Reservation Target Acquisition Areas, for a total of 19,365 acres in the Action Area.

3.2.1.2 Sonoran Mixed Woody and Succulent Scrub

This is the only Sonoran desert community with substantial dominance of cacti and other succulents. It is similar to Sonoran creosote bush scrub but is more varied and usually denser with shrubs standing 5 to 10 feet tall. It includes species from Sonoran creosote bush scrub and desert dry wash woodland, with no single species clearly dominating. Most stands have desert agave (*Agave deserti*), brittlebush (*Encelia* sp.), ocotillo (*Founqueria splendens*), pygmy-cedar (*Peucophyllum schottii*), and Mohave yucca (*Yucca schidigera*) in varying proportions. It is found on rocky, well-drained slopes and alluvial fans of the San Jacinto Mountains to the south/southwest and Indio Hills to the northeast. It is the most abundant plant community in the Plan Area, comprising 15,011 acres. Approximately 12,101 acres are found throughout the eastern portion of the MCCA, with an additional 2,910 acres in the VFPA in Indian Canyons and the northeastern corner of the Reservation. Outside of the Plan Area, 2,894 acres occur within the BLM Exchange Areas (all of which are in the MCCA) and 14,858 acres occur in the off-Reservation Target Acquisition Areas, for a total of 32,763 acres in the Action Area.

3.2.1.3 Desert Fan Palm Oasis Woodland

This community is composed of open to dense groves dominated by fan palms from 75 to 100 feet tall. The understory is sparse in dense groves where the ground is mulched by fallen fronds. More open or favorable sites may have a dense understory of riparian shrubs. This community is restricted to areas with available water and high summer temperatures, mild winters, and little rain. The largest groves are found in steep-sided canyons with permanent streams or adjacent to large springs. Smaller groves occur in canyon bottoms with intermittent surface water, moist canyon sides, or seeps. Oases often have alkaline soils due to high evaporation. This community merges (often abruptly) with desert dry wash woodland or Sonoran creosote bush scrub.

The palms are fire tolerant, whereas understory species are not. Fire opens the understory, allowing seedlings to establish. Fire also increases the water supply to the fire-tolerant palm by removing competition. Within the Plan Area, desert fan palm oasis woodlands located in Palm, Murray, and Andreas canyons comprise approximately 869 acres, including 857 acres within the MCCA and 12 acres in the VFPA. An additional 148 acres occur within the BLM Exchange Areas and 138 acres occur in the off-Reservation Target Acquisition Areas, for a total of 1,135 acres in the Action Area. Desert fan palm oasis woodlands have particular cultural significance to the Tribe.

3.2.1.4 Black Oak Forest

This is a persistent sub-climax forest dominated by black oak (*Quercus kelloggii*) with scattered ponderosa pine (*Pinus ponderosa*) or Jeffrey pine (*P. jeffreyi*). Most stands are even-aged, reflecting past disturbances, primarily fire. This community occurs on mountain slopes, benches and coves, and upper foothill slopes. Approximately 111 acres of black oak forest occur in the Plan Area in the San Jacinto Mountains in the extreme southwestern corner of the MCCA, with an additional 266 acres in the BLM Exchange Areas, for a total of 379 acres in the Action Area.

3.2.1.5 Interior Live Oak Chaparral

This community is a dense, tall (to 20 feet) chaparral dominated by interior live oak (*Quercus wislizenii*) and scrub oak (*Q. berberidifolia*). Interior live oak stumps sprout readily following fire. Persistent leaf litter and dense canopy preclude a substantial understory. Approximately 4,984 acres of interior live oak chaparral can be found in the Plan Area along the western boundary of the MCCA. An additional 1,719 acres occur within the BLM Exchange Areas, for a total of 6,703 acres in the Action Area.

3.2.1.6 Peninsular Juniper Woodland and Scrub

This community is fairly dense woodland dominated by California juniper (*Juniperus californica*). Other species include turbinella oak (*Quercus turbinella*), Mojave yucca, bear grass or nolina (*Nolina* sp.), four-leaf pinyon (*Pinus quadrifolia*), and Great Basin sagebrush (*Artemisia tridentata*). This community occurs on the desert slopes of the San Jacinto Mountains at elevations between 3,500 and 5,500 feet AMSL. A total of approximately 318 acres of Peninsular juniper woodland and scrub occur within the Action Area, including approximately 89 acres within the Plan Area in the extreme southeastern portion of the MCCA and 229 acres in the BLM Exchange Areas.

3.2.1.7 Red Shank Chaparral

This community is typically 6 to 12 feet tall and often forms nearly pure stands of red shank (*Adenostoma sparsifolium*). Red shank itself is an open shrub or small tree with multiple branches from the base

covered with rust-red, shaggy bark. Red shank chaparral is often adjacent to and may intergrade with chamise chaparral. It is abundant in the San Jacinto and Santa Rosa mountains. Small, remnant populations occur in Ventura, Santa Barbara, and San Luis Obispo counties. It ranges in elevation from 300 to 6,000 feet AMSL across its range. Approximately 1,112 acres of red shank chaparral occur in the Action Area, including 889 acres within the Plan Area in the extreme southern portion of the MCCA and 223 acres in the BLM Exchange Areas.

3.2.1.8 Sonoran Cottonwood-Willow Riparian Forest

This community consists of a winter-deciduous, broad-leaved streamside forest to about 60 feet tall, dominated by Fremont cottonwood (*Populus fremontii*) with dense understories of willow (*Salix* sp.) species. Approximately 9 acres of Sonoran cottonwood-willow riparian forest can be found in the Plan Area in the northwestern corner of the MCCA in the San Jacinto Mountains, with an additional 4 acres occurring in the off-Reservation Target Acquisition Areas, for a total of 13 acres in the Action Area.

3.2.1.9 Southern Sycamore-Alder Riparian Woodland

This community consists of a tall, open, broad-leaved, winter-deciduous streamside woodland dominated by sycamore (*Platanus* sp.) and often white alder (*Alnus rhombifolia*). It occurs along rocky streambeds subject to occasional high-intensity flooding. Alder increases in abundance on more perennial streams, while sycamore favors more intermittent water flow. Within the Plan Area, there are approximately 286 acres of this community, located in Tahquitz Canyon, Andreas Canyon, and the west fork of Palm Canyon within the MCCA. Approximately an additional 104 acres occur within the BLM Exchange Areas and 15 acres occur in the off-Reservation Target Acquisition Areas, for a total of 405 acres in the Action Area.

3.2.2 Natural Plant Communities Occurring on the Valley Floor

The Target Acquisition Areas and the majority of the northeastern half of the Reservation (VFPA) comprise the Valley Floor. The Valley Floor supports several Natural Plant Communities along with a large section of urban development. Urbanization typically clears the land, removing native vegetation and its inherent wildlife habitat value. Landscaping within urbanized areas consists primarily of non-native plants. These plant species have little or no habitat value for native wildlife, and many are invasive species that compete with native plants for nutrients and water in undeveloped areas. There are approximately 8,654 acres of urban development within the VFPA on the Reservation, 71 acres within the Plan Area in the VFPA off the Reservation, 2 acres in the BLM Exchange Areas, and 1,808 acres in the off-Reservation Target Acquisition Areas. (Please note: the Tribe would not cause the acquisition of developed areas as part of mitigation measures for Covered Activities, but these developed areas are included within the identified Target Acquisition Area, which will largely remain outside Tribal and Plan control.)

For those undeveloped areas on the Valley Floor, Sonoran creosote bush scrub and Sonoran mixed woody and succulent scrub are the dominant plant communities at 18,024 acres and 17,768 acres, respectively. These communities comprise approximately 68 percent of the total undeveloped area on the valley floor of the Action Area.

The Coachella Valley is subjected to high winds funneling through San Gorgonio Pass. Sand is carried by streams and rivers (fluvial transport) out of the surrounding mountains by occasional storms and deposited in valley floodplains. This sand is later picked up by prevailing winds (aeolian transport) and carried down the valley to deposition areas. These aeolian deposition areas include active sand fields, stabilized and partially stabilized shielded sand fields, and ephemeral sand fields. Although most sand fields on the Reservation are shielded from receiving blowsand by structures and non-native vegetation associated with relatively recent human development, portions of the Action Area (including the northeast corner of the Reservation) provide sufficient native habitats and are subject to intact ecological and physical processes such that, if protected from further degradation, they will continue to sustain these ecosystems, plant communities and their associated wildlife species in the long term. Many of these plants and wildlife are unique to the Valley Floor and the blowsand ecosystem, which is characteristic of the Coachella Valley. The following describes those native plant communities and associated dominant species found primarily on the Valley Floor.

3.2.2.1 Active Sand Fields

Active sand fields are areas of active sand movement with little or no vegetation where accumulated sand is not of sufficient depth to form classic formations that characterize dune systems. Sand fields may intergrade with active dunes, mesquite hummocks, and stabilized and partially stabilized dunes and sand fields. Many of these sand fields were probably historic dune formations prior to development of portions of the valley.

Active sand fields occur in what is known as the active blowsand environment. Within these same areas, mesquite hummocks occur in areas of higher soil moisture content (i.e., groundwater relatively close to the ground surface). Wind movement and deposition of sand (aeolian erosion, transport, and deposition) occurs as a natural geologic process in the Coachella Valley. The environment associated with this aeolian process system, and particularly the sand deposits themselves, represent the sole habitats of several endemic sensitive species (see section 3.3.2). The entire region of major aeolian sand transport activity in the Coachella Valley covers approximately 130 square miles, extending some 35 miles from near Cabazon to south of Indio. The region lies primarily between the San Jacinto Mountains and the Whitewater River channel, extending to the San Bernardino Mountains and the Indio Hills and exhibiting a maximum width of about 11 miles. This blowsand corridor passes through the northeastern corner of the Reservation on both sides of the I-10 freeway. Approximately 227 acres of this community occur

within a creosote bush scrub matrix in the VFPA on the Reservation, while approximately 4,547 acres occur in the off-Reservation Target Acquisition Areas, for a total of approximately 4,774 acres in the Action Area.

3.2.2.2 Stabilized and Partially Stabilized Shielded Sand Fields

This community consists of desert sand accumulations that lack dune formations stabilized by vegetation and where important aeolian sand transport processes are interrupted by barriers such as roads, buildings, and landscaping. This community occurs most extensively north of Highway 111 from Windy Point to approximately Indian Avenue. It also occurs west of Windy Point and at the east end of the Indio Hills as well as throughout areas where development has interrupted sand transport. Creosote bush scrub matrix dominates this community.

On the Reservation, stabilized and partially stabilized shielded sand fields occur in patches along I-10 and scattered locations within the urbanized areas in the VFPA, totaling approximately 2,971 acres. An additional 2,854 acres occur within the off-Reservation Target Acquisition Areas, for a total of approximately 5,825 acres in the Action Area.

3.2.2.3 Ephemeral Sand Fields

Ephemeral sand fields are desert sand accumulations that lack dune formations and are characterized by irregular deposition of sand materials such that sand accumulations may be blown off site and not replaced by additional sand except after major flood events or other movement processes. This community occurs within a Sonoran creosote bush scrub matrix and is most abundant in the upper portions of the Coachella Valley. Approximately 4,465 acres of ephemeral desert sand fields occur in the Action Area, including approximately 344 acres in the north-central portion of the Reservation and approximately 4,121 acres in the off-Reservation Target Acquisition Areas.

3.2.2.4 Desert Dry Wash Woodland

The desert dry wash woodland community is an open to dense, drought-deciduous, riparian woodland with trees 8 to 20 feet tall dominated by such species as palo verde (*Cerdidium* sp.) and smoketree (*Psorothamnus spinosus*). This woodland occurs in sandy or gravelly washes and arroyos associated with canyon mouths and alluvial fans, largely in frost-free areas. Approximately 60 acres of desert dry wash woodland can be found in the central portion of the Reservation within and north of Palm Canyon. Approximately 35 acres of desert dry wash woodlands occur in the VFPA on the Reservation; the remaining 25 acres are located at low elevations in Palm Canyon within the MCCA, also on the Reservation. An additional 901 acres occur in the off-Reservation Target Acquisition Areas, for a total of approximately 961 acres in the Action Area.

3.2.2.5 Mesquite Hummocks

Mesquite hummocks are large clumps of low-growing honey mesquite (*Prosopis glandulosa*) shrubs. These shrubs may form hummocks over sand dunes, such as at Willow Hole and the Thousand Palms Preserve, or may occur on level terrain at the margins of palm oases or in the area south and east of Indio to the north end of the Salton Sea. Within the Coachella Valley, they are typically associated with high soil moisture, often associated with fault areas (where the fault act like a dam to groundwater) or springs. This community type does not occur in the Plan Area in sufficiently large units to warrant mapping at a Plan-level scale. A total of approximately 184 acres of mesquite hummocks occur in the off-Reservation Target Acquisition Areas.

3.2.2.6 Desert Saltbush Scrub

The desert saltbush scrub community can include various species of saltbush (*Atriplex* sp.) in a nearly uniform stand of shrubs about three feet tall, forming a more complete cover than in creosote bush scrub. It occupies areas where generally moist, fine-textured, poorly drained sandy loam soils with high salinity (in the range of 0.2 to 0.7 percent) and/or alkalinity occur. Four-wing saltbush (*Atriplex canescens* var. *linearis*) shows greater dominance in drier, coarser soils and occurs throughout the desert saltbush scrub community. Screwbean mesquite (*Prosopis glandulosa* var. *torreyana*) is a common associate that reaches greater development in lower-elevation areas with a shallow water table or capillary fringe. In the Action Area, this community occupies approximately 170 acres in the off-Reservation Target Acquisition Areas.

3.3 SENSITIVE PLANT AND WILDLIFE SPECIES THAT OCCUR OR HAVE THE POTENTIAL TO OCCUR WITHIN THE ACTION AREA

Nineteen sensitive wildlife species and three sensitive plant species that occur or have potential to occur in the Plan Area will be protected by the conservation measures in the Tribal HCP. Several of these species are listed as threatened or endangered under the ESA. Others are Tribal sensitive species that could be federally listed in the future, absent conservation measures. Several of these species have adapted to and are essentially restricted to habitats within these regions; many are endemic to the Coachella Valley. These species constitute those that the Tribe is seeking to have covered under a Section 10(a) Permit, enabling it to authorize or engage in activities that may result in incidental take of such species (collectively Covered Species; see Table 3-2). Conservation measures included in the Tribal HCP, therefore, are tailored to these species and their habitats.

With the exception of Peninsular bighorn sheep, riparian species, and burrowing owl, the distributions of the Covered Species presented in this section are based on modeling developed by CVAG as part of its

MSHCP planning process. CVAG based its models (which are somewhat generalized by necessity) on such habitat parameters as Natural Plant Community associations, soils, sand source associations, landform associations, topographic characteristics, elevation limits, and known occurrences based on field observations. This information was prepared by CVAG's Scientific Advisory Committee, which is comprised of recognized biological experts, and reviewed by the USFWS. All species models were updated based on September 2005 aerial photography to reflect areas that have been developed since the models were created.

Information on the Peninsular bighorn sheep was gathered directly from the Recovery Plan for the Bighorn Sheep in the Peninsular Ranges (USFWS 2000). The Tribal HCP model for Peninsular bighorn sheep is based on the Recovery Plan's essential habitat boundary at the upper elevational limits and has been modified primarily by using the 800-foot elevation contour as the lower limit for Peninsular bighorn sheep habitat. Section 4 (Township 4 South Range 4 East) and Sections 2 and 11 (Township 5 South Range 4 East) were also modified because of existing take authorizations and/or existing conservation programs already in place in these locations. The modeled habitat was expanded in Section 10 (Township 4 South Range 4 East) because of recent evidence of Peninsular bighorn sheep use in this area. This lower elevational limit was used because it captured nearly all recent Peninsular bighorn sheep locational data points while avoiding potential land use conflicts in areas not considered critical for Peninsular bighorn sheep conservation.

The CVAG modeling for avian riparian species was modified to remove desert dry wash woodland on the Reservation from the potential habitat modeling because the Tribe does not believe it is likely to provide appropriate habitat for the subject species (least Bell's vireo, southwestern willow flycatcher, summer tanager, yellow-breasted chat, and yellow warbler). Modeling for mountain yellow-legged frog was based on habitat assessments conducted for the Tribe by qualified biologists. Because modeling was not available from CVAG for burrowing owl, the Tribe developed estimates of acreage potentially supporting this species based on known habitat associations.

Table 3-2
Status of Covered Species in the Action Area

Common Name	Scientific Name	Status[1]	Habitat[2]	Presence/ Absence	Reservation Lands (acres)	Other Tribal Lands	BLM Exchange Lands	Off-Reservation Target Acquisition Areas	Total (acres)
MOUNTAINS AND CANYONS SPECIES									
Peninsular bighorn sheep	*Ovis canadensis nelsoni*	FE	~700-4,000 ft AMSL	Present	11,965	4,384	4,178	0	20,527
Least Bell's vireo	*Vireo bellii pusillus*	FE	R	Present	732	431	251	1,433	2,847
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE	R	Present	732	431	251	1,433	2,847
Summer tanager	*Piranga rubra cooperi*	None	R	Present	732	431	251	1,433	2,847
Yellow-breasted chat	*Icteria virens*	None	R	Present	732	431	251	1,433	2,847
Yellow warbler	*Dendroica petechia brewstri*	None	R	Present	732	431	251	1,433	2,847
Mountain yellow-legged frog	*Rana muscosa*	FE	R	Historical records only	136	56	18	0	210
Southern yellow bat	*Lasiurus ega (xanthinus)*	None	PO	Present	479	390	148	159	1,176
Triple-ribbed milk-vetch	*Astragalus tricarinatus*	FE	DW	Not observed	0	0	0	1,105	1,105
Desert tortoise[3]	*Gopherus agassizii*	FT	SCBS, SMWSS	Present	9,714	3,549	2,564	5,022	20,849
Burrowing owl[3]	*Athene cunicularia*	BCC	SF, SCBS, DW	Present	4,283	144	214	21,574	26,215
Gray vireo	*Vireo vicinior*	BCC	CHP, PJ	Not observed	978	0	451	0	1,429

Table 3-2 (cont.)
Status of Covered Species in the Action Area

Common Name	Scientific Name	Status[1]	Habitat[2]	Presence/ Absence	Reservation Lands (acres)	Other Tribal Lands	BLM Exchange Lands	Off-Reservation Target Acquisition Areas	Total (acres)
VALLEY FLOOR SPECIES[4]									
Coachella Valley fringe-toed lizard	*Uma inornata*	FT	SF	Present	3,391	0	0	11,647	15,038
Coachella giant sand-treader cricket	*Macrobaenetes valgum*	None	SF	Present	3,391	0	0	11,647	15,038
Flat-tailed horned lizard	*Phrynosoma mcalli*	FPT	SF, SCBS, SMWSS	Present	3,392	0	0	12,182	15,574
Palm Springs pocket mouse	*Perognathus longimembris bangsi*	None	DW, SF, SCBS, SMWSS	Present	6,517	149	0	42,021	48,687
Palm Springs (Coachella Valley round-tailed) ground squirrel	*Spermophilus tereticaudus* var. *coachellae*	FC	SF, DW, MS, SCBS, SMWSS	Present	5,430	149	0	25,260	30,839
Coachella Valley Jerusalem cricket	*Stenopelmatus cahuilaensis*	None	SF, SMWSS	Not observed	3,507	112	0	10,077	13,696
Coachella Valley milk-vetch	*Astragalus lentiginosus coachellae*	FE	SF, DW, SCBS, SMWSS	Present	4,696	116	0	18,376	23,188
Le Conte's thrasher	*Toxostoma lecontei*	BCC	SF, DW, SCBS, SMWSS	Present	5,281	144	0	27,275	32,700
Crissal thrasher	*Toxostoma crissali*	BCC	DW, MS	Not observed	0	0	0	354	354
Little San Bernardino Mountains gilia	*Linanthus maculatus*	None	SF, SCBS, SMWSS	Not observed	0	0	0	2,449	2,449

[1]FE=federally listed endangered; FT=federally listed threatened; FPT=federally proposed threatened; FC=candidate for federal listing; BCC=birds of conservation concern; None=no formal federal listing status.
[2]AMSL=above mean sea level; SF=sand fields; R=riparian; SCBS=Sonoran creosote bush shrub; PO=palm oases; DW=dry wash; MS=mesquite scrub; CHP=chaparral; PJ=pinyon-juniper woodland and scrub; SMWSS=Sonoran mixed woody and succulent scrub.
[3]Desert tortoise and burrowing owl also have potential to occur on the valley floor.
[4]Some species that primarily occur in the VFPA also may occur in lower elevations of the MCCA.

3.3.1 Covered Species Potentially Occurring in the Mountains and Canyons Conservation Area

The MCCA is located in the western and southern portions of the Action Area and includes all portions of the San Jacinto and Santa Rosa mountain ranges within the Action Area, including all lands above the 800-foot elevation contour as well as some lower-elevation areas. This region consists of steep, rugged slopes incised with deep canyons. The changes in elevation and topography as well as accompanying differences in temperature, precipitation, and other environmental variables are significant factors contributing to the diversity of species and Natural Plant Communities found in this region. The Covered Species described below are typically restricted to habitats found in these environments, although some also have potential to occur on the valley floor (i.e., desert tortoise and burrowing owl). Several other species may occur in the lower elevations of the MCCA but are more likely to be found in the VFPA and so are discussed in that section.

3.3.1.1 Peninsular Bighorn Sheep (*Ovis canadensis nelsoni*) Federal Endangered

The Peninsular bighorn sheep is limited to the Peninsular Ranges of southern California and Baja California, Mexico (Baja) and was listed as a distinct population segment (DPS) within the U.S. as an endangered species on March 18, 1998. A Recovery Plan was approved in October 2000, and critical habitat was designated in February 2001. The critical habitat designation was challenged by the Tribe and other parties. A consent decree issued on August 3, 2006, removed approximately 29,924 acres of critical habitat from the 844,897 acres originally designated, leaving approximately 814,973 acres of critical habitat.

In the underlying action, plaintiff and plaintiff-intervenors challenged the USFWS's February 1, 2001, final rule designating critical habitat for the Peninsular bighorn sheep because, *inter alia*, the USFWS failed to analyze the economic impacts properly of designating critical habitat pursuant to Section 4 of the ESA 16 USC § 1533(b)(2). Plaintiff and plaintiff-intervenors also challenged the final rule on other grounds, claiming, for example, that it failed to identify the physical or biological features essential to the conservation of the species, failed to identify the specific areas where the essential physical or biological features are found, failed to identify the specific areas that may require special management considerations or protections, failed to identify the geographic areas occupied by the species, failed to consider the best scientific and commercial data available, failed to conduct a mandatory exclusion analysis, failed to provide adequate public notice, failed to adequately respond to public comments, and failed to describe specifically the actual areas of critical habitat.

During litigation, the Federal defendants informed the District Court that they did not intend to contest liability in the matter and would request that the court remand the final rule to the USFWS for reconsideration.

In the consent decree, the signatories agreed that the USFWS would remand the final rule to reconsider the critical habitat designation in light of the plaintiff's and plaintiff-intervenors' allegations, and that the

USFWS would conduct a revised economic impacts analysis pursuant to Section 4(b)(2) of the ESA, and in particular, the rejection of the "baseline" analysis of economic impacts that the USFWS had employed in promulgating the final critical habitat rule for the Peninsular bighorn sheep given the holdings in New Mexico Cattle Growers Association v. U.S. Fish & Wildlife Service, 248 F.3d 1277 (10th Cir. 2001) and Home Builders Association of Northern California v. U.S. Fish & Wildlife Service, 268 F.Supp.2d 1197 (E.D. Cal. 2003) rejecting the use of the baseline analysis of economic impacts under Section 4(b)(2).

As part of the settlement, the signatories agreed on partial vacatur of the final rule during remand to the USFWS. Thus, the majority of the final rule remained in effect during remand, except for certain lands specifically removed from critical habitat. Included in this "carve out" were certain mining lands in Coyote and Jacumba Mountains and Fish Canyon areas, private lands used by the Desert Riders, and lands within the exterior boundaries of the Agua Caliente Indian Reservation.

The U.S. District Court approved the consent decree in an amended order entered on August 3, 2006. Pursuant to the consent decree, a proposed Revised Rule was scheduled to be published in the Federal Register by September 30, 2007, with a final Revised Rule due to be published by September 30, 2008. A Revised Analysis of Economic Impacts was required to be circulated for public review for at least 30 days, concurrently with the initial public comment period for the proposed Revised Rule, or with any subsequent reopening of the comment period.

The USFWS published the proposed Revised Rule on October 10, 2007 (72 FR 57740). The rule proposed to designate 384,410 acres as critical habitat for Peninsular bighorn sheep. The proposed rule would reduce the amount of land designated as critical habitat by more than 460,000 acres, or more than 50 percent, relative to the 2001 final rule. The proposed rule indicated that the USFWS was evaluating private lands that were included in the proposal because those lands are in the Plan Area for the Coachella Valley MSHCP, as well as the USFWS's inclination to exclude Reservation lands that were included in the proposal in consideration of the authorities described in Section 1.8.3.3 and the proposed Tribal HCP. The Final Rule was published on April 14, 2009 (74 FR 17287). The rule designated approximately 376,938 acres as critical habitat for Peninsular bighorn sheep. Lands within the Plan Area of the Coachella Valley MSHCP and Reservation lands were excluded from designation under the Final Rule.

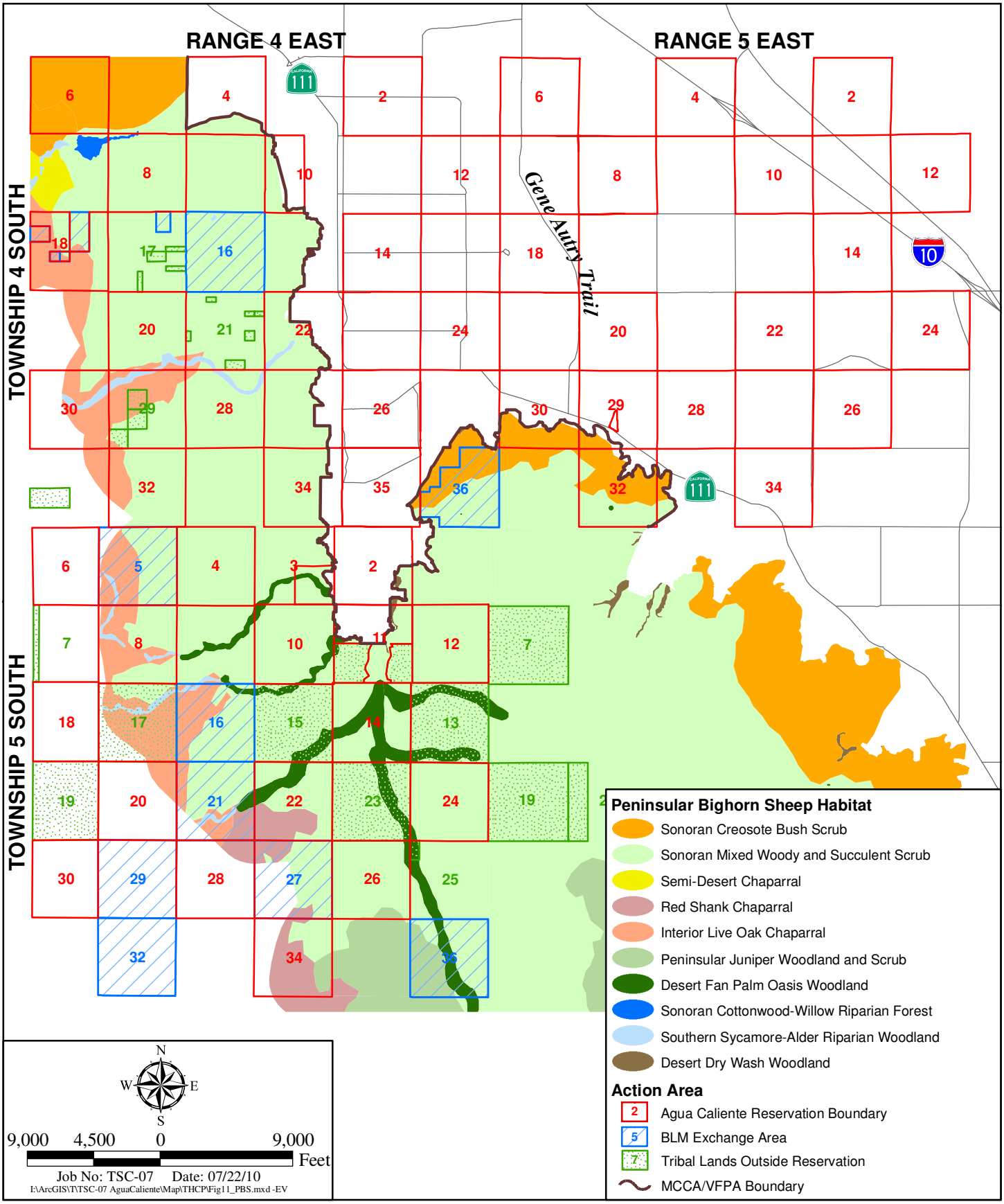
The Peninsular bighorn sheep is restricted to the east-facing, lower-elevation slopes (below 4,600 feet AMSL) of the Peninsular Ranges in the Sonoran Desert life zone (Jorgensen and Turner 1975). Peninsular bighorn sheep avoid higher elevations, likely because of decreased visibility (and therefore an increased predation risk) associated with the denser vegetation found at higher elevations (Risenhoover and Bailey 1985; Etchberger et al. 1989). The elevational patterns of vegetation associations, in combination with this predator avoidance behavior, has resulted in habitat use that is restricted to lower elevations than most other bighorn sheep populations. At the lowest elevation of their range, Peninsular bighorn sheep movement onto the valley floor is limited because of their typical hesitancy to venture far

from escape terrain. The available habitat of Peninsular bighorn sheep can, therefore, be visualized as a long, narrow band that runs north-south along the lower elevations of the San Jacinto and Santa Rosa mountains. This habitat includes canyon bottoms, alluvial fans, and mountain slopes.

Peninsular bighorn sheep habitat within the Action Area totals approximately 20,527 acres, including approximately 11,965 acres on the Reservation in the MCCA; on Tribal lands outside the Reservation, 4,384 acres in the MCCA; and in the BLM Exchange Areas 4,178 acres in the MCCA (Figure 11).

In the Peninsular Ranges, Peninsular bighorn sheep use a wide variety of plant species as food sources. Turner (1973) recorded the use of at least 43 species, with browse being the food category most frequently consumed (Turner 1976; Scott 1986). Cunningham and Ohmart (1986) determined that the Peninsular bighorn sheep diet consisted of 57 percent shrubs, 32 percent forbs, 8 percent cacti, and 2 percent grasses. Water is considered to be an important resource for Peninsular bighorn sheep (Jones et al. 1957; Blong and Pollard 1968; Leslie and Douglas 1979; Turner and Hansen 1980; Elenowitz 1984; Cunningham and Ohmart 1986). A number of studies have shown that Peninsular bighorn sheep will concentrate around water sources in the summer, with most animals found within a two- to three-mile radius of water (Jones et al. 1957; Leslie and Douglas 1979; Cunningham and Ohmart 1986). Lactating ewes and lambs often are more dependent on water and thus may be found closer to water (Blong and Pollard 1968; Leslie and Douglas 1979; Bleich et al. 1997). Water sources are most valuable to Peninsular bighorn sheep if they occur in proximity to adequate escape terrain with good visibility. The Peninsular bighorn sheep have been observed to use areas without known perennial water during some months, including the lambing season (Rubin, pers. comm. 2000).

Peninsular bighorn sheep are primarily active during the day (Krausman et al. 1985) but may be active at any time of day or night (Miller et al. 1984). Their daily activity pattern includes feeding and resting periods that are not synchronous either within or between groups. The Peninsular bighorn sheep relies on vigilance to detect predators, and it benefits from gregariousness and group alertness (Geist 1971; Berger 1978). In the Peninsular Ranges, movement of radio-collared ewes between ewe groups is rare. Genetic and observational data suggest, however, that ram movements among ewe groups are common (Boyce et al. 1997; Deforge et al. 1997; Rubin et al. 1998; Bighorn Institute 1998, 1999). Peninsular bighorn sheep response to human activity is highly variable and depends on many factors, including but not limited to the type of activity, the animal's previous experience with humans, size or composition of the Peninsular bighorn sheep group, location of Peninsular bighorn sheep relative to the elevation of the activity, distance to escape terrain, and distance to the activity (Weaver 1973; McQuivey 1978; Hicks and Elder 1979; MacArthur et al. 1979, 1982; Wehausen 1980; Hamilton et al. 1982; Whitacker and Knight 1998; Papouchis et al. 1999). Though the effect of human activity in bighorn habitat is not always obvious, human presence or activity in many cases has been found to detrimentally alter normal behavioral and habitat use patterns.



Source: USFWS 2000 as modified by Tribe

Peninsular Bighorn Sheep Habitat

AGUA CALIENTE THCP

Figure 11

The highest population estimate for the Peninsular bighorn sheep was 1,171 in 1974 (Weaver 1975). Surveys during the 1970s, 1980s, and 1990s indicate that declines have occurred in multiple ewe groups. The synergistic effects of exotic pathogens, mountain lion (*Felis concolor*) predation, and habitat loss appear to be the primary causes for the decline. The current population of approximately 793 animals (Torres 2007) is distributed in eight known ewe groups (subpopulations) from the San Jacinto Mountains south to the Mexican border.

In the Peninsular Ranges, ewes estimated to be between 2 and 16 years of age have been documented to produce lambs (Rubin et al. 2000; Ostermann et al. 2001). The breeding period, or rut, occurs in the late summer and fall months (USFWS 2000). As parturition approaches, ewes seek isolated sites with shelter and unobstructed views (Turner and Hansen 1980), and seclude themselves from other females while finding sites to bear their lambs (Etchberger and Krausman 1999). The lambing season in the Peninsular Ranges generally extends from January through August (DeForge et al. 1997; Bighorn Institute 1997, 1998; Rubin et al. 2000). In a four-year study of four different ewe groups, 87 percent of the lambs were born between February and April, and 55 percent of the lambs were born in March (Rubin et al. 2000). However, the Rubin et al. study did not include the San Jacinto Mountain ewe group. Lambing season was estimated to begin in February or March for 1992 through 1996 in the San Jacinto Mountains (DeForge et al. 1997) and in January for 1997 and 1998 (Bighorn Institute 1997 and 1998).

Pregnancy and lactation have well-documented behavioral and ecological effects on ungulates such as bighorn sheep (Festa-Bianchet 1988; Berger 1991). These effects include increased feeding rates and more selective diets to compensate for increased energetic demands (Clutton-Brock et al. 1982; Carl and Robbins 1988). The energetic cost of lactation for ewes is typically two to three times higher than the cost of gestation and may range from four to seven times the basal metabolic rate (Robbins 1993). Inadequate nutrition during pregnancy and lactation can result in poor survival of newborn ungulates (Robinson and Forbes 1968; Thorne et al. 1976; Berger 1991). Both Festa-Bianchet (1988) and Berger (1991) found that seasonal habitat selection by bighorn sheep was influenced by a combination of nutritional and antipredator constraints. Plant phenology is predictable in deserts, with growth proceeding from the valley floors (in late winter) to mountain tops (in summer), creating habitats that vary in nutritional quality and predation risk (Wehausen and Hansen 1988). Bighorn sheep in the Great Basin and Sonoran deserts (Santa Rosa Mountains) were found to leave mountainous habitat during late winter to feed on alluvial fans where emergent new grasses were highest in protein (Berger 1991). Berger (1991) provided evidence of the importance of alluvial fans to ewes by demonstrating that ewes tolerated heightened predation risk in order to obtain the nutritious forage available on alluvial fans.

Lambs usually are weaned by six months of age (Hansen and Deming 1980; Wehausen 1980), although they remain with their mothers for the first year of life (Geist 1971). Bighorn sheep learn their habitat selection patterns from their mothers and are philopatric (faithful to natal home ranges). Gregarious and philopatric behaviors are thought to confer an adaptive advantage to prey species such as bighorn sheep

because home range familiarity (i.e., knowledge of the location of escape terrain and movement routes) and group alertness decrease the risk of predation (Festa-Bianchet 1986).

In the San Jacinto Mountains, low fall lamb-to-ewe ratios were documented from 1977 to 1983. This group exhibited variable recruitment thereafter, with relatively high (greater than or equal to 0.50) fall lamb-to-ewe ratios from 1994 to 1996 (Deforge et al. 1997).[3] Most ewe groups in the Peninsular Ranges appear to have exhibited such pulses of high recruitment, but declining population trends suggest that they have not been sufficient to balance adult mortality over longer time periods (USFWS 2000).

Habitat loss is considered to be one of the greatest threats to continued Peninsular bighorn sheep existence (Burgman et al. 1993). As humans encroach into the habitat, resources and survival potential of a particular ewe group may be eliminated. Loss of any critical aspect of Peninsular bighorn sheep habitat, such as lambing and low-elevation feeding areas, escape terrain, and travel routes between these habitats as well as routes between isolated inhabited areas, could have impacts on populations. Such loss can impact ability to forage, reproduce, locate water, avoid predators, and move among important resource areas and between ewe groups. Habitat fragmentation is recognized as a major threat to the 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 that can attract Peninsular bighorn sheep, creates threats in the form of 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 Peninsular bighorn sheep is extremely sensitive to disease. Numerous pathogens that are associated with livestock have been isolated or detected in the Peninsular bighorn sheep (USFWS 2000). Diseases (potentially transmitted by species such as goats, sheep, and cattle) that have been isolated from the Peninsular bighorn sheep and found in association with long-term low lamb recruitment include contagious ecthyma virus, blue tongue virus, *Pasteurella* bacteria, and parainfluenza virus (DeForge et al. 1982). Wild horses, burros, and livestock may compete with Peninsular bighorn sheep for limited water resources; therefore, all management aspects of these species must take into account their potential impacts on Peninsular bighorn sheep. There currently are no known populations of wild horses, burros, goats, sheep, or cattle on the Reservation, although some of these species have been present in the past. The stable (housing horses only) nearest to Peninsular bighorn sheep habitat in the Plan Area is approximately two miles from the Indian Canyons tollbooth.

Mountain lion predation is a demonstrated cause of Peninsular bighorn sheep mortality in the Peninsular Ranges (DeForge et al. 1997; Hayes et al. 2000) and may be a long-term limiting factor. The presence of tamarisk represents a serious threat to the Peninsular bighorn sheep because (1) it reduces or eliminates standing water on which Peninsular bighorn sheep depend; (2) it outcompetes plant species on which

[3]Fall lamb-to-ewe ratios are used because they count lambs that have survived their first summer.

Peninsular bighorn sheep feed; and (3) it blocks access of Peninsular bighorn sheep to water sources and provides cover for predators (USFWS 2000).

3.3.1.1 (a) *Peninsular Bighorn Sheep in the San Jacinto Mountains*

As described in the Peninsular bighorn sheep Recovery Plan, the conservation needs for the sheep include the following:

- Isolation from potential sources of domestic livestock disease, especially those transmitted from domestic sheep and goats;
- Steep, rugged topography isolated from human disturbance for lambing and rearing habitat, which allows Peninsular bighorn sheep to avoid predation;
- Steep escape terrain of adequate area and forage that minimize predation risk;
- Open vegetation with good visibility to allow Peninsular bighorn sheep to detect predators visually;
- Access to permanent water sources;
- Potential habitat linkages to other subpopulations for the purpose of maintaining genetic diversity;
- Alluvial fans and washes that have forage critical to Peninsular bighorn sheep nutrition, especially during times of drought; and
- Large blocks of undisturbed land that allow for the current small population to expand numerically and spatially in order to establish a large, self-sustaining, healthy population. Bighorn sheep are wide-ranging mammals; each individual Peninsular bighorn sheep uses approximately 20 to 25 square kilometers of habitat (DeForge et al. 1997), although their ranges usually overlap.

The San Jacinto Mountains support the northernmost subpopulation of the Peninsular bighorn sheep and represent one of nine Peninsular bighorn sheep recovery regions designated in the Peninsular bighorn sheep Recovery Plan (USFWS 2000). Results from helicopter surveys and a five-year study of radio-collared Peninsular bighorn sheep in the San Jacinto Mountains found that Peninsular bighorn sheep in this range were restricted to a narrow band of habitat generally between 700 and 3,400 feet AMSL. In the Palm Springs area, virtually all of the gentler terrain spreading out from the toe-of-slope is developed. The only alluvial fans or bajadas that remain in a relatively natural state include Chino, Tachevah, Tahquitz, and Little Eagle canyons.[4] This population is now isolated from other desert bighorn sheep populations farther north, in the San Bernardino Mountains, by I-10 and valley floor development.

According to a USFWS GIS analysis of bighorn sheep habitat in the San Jacinto Mountains, there are 36,080 acres of essential bighorn sheep habitat in this mountain range (USFWS 2007). Annual helicopter surveys between 1983 and 1988 recorded Peninsular bighorn sheep in Hurricane, Blaisdell, Chino, and

[4]A Biological Opinion issued March 14, 2007 (USFWS 2007) authorized development of a portion of Chino Canyon.

Tachevah canyons (DeForge et al. 1997). With the exception of a ram released north of Chino Canyon and later euthanized, surveys since 1990 have not recorded Peninsular bighorn sheep in Hurricane or Blaisdell canyons. Such surveys have recorded the species in Chino, Tachevah, and the canyons further south: Tahquitz, Eagle, and Andreas (DeForge et al. 1997).

Approximately 41 percent of bighorn sheep habitat in the San Jacinto Mountains (from southern Andreas Canyon to the southern side of Chino Canyon) is currently occupied by bighorn sheep and has been regularly occupied since monitoring of radio-collared bighorn sheep in this range began in 1992 (DeForge et al. 1997). The USFWS refers to this area as the southern San Jacinto Mountains.

Approximately 33 percent of Peninsular bighorn sheep habitat in the San Jacinto Mountains is located between Chino Canyon and Snow Creek. This portion of the Peninsular bighorn sheep's range historically was recognized as a permanent and high-use bighorn sheep area by Weaver and Mensch (1970) but is not known to sustain any part of the population at the present time or within the last 15 years. Though rams may still occasionally range north of Chino Canyon (near the northern end of the Reservation), no ewe home ranges have existed north of Chino since 1988 (DeForge et al. 1997). This area is referred to as the central San Jacinto Mountains.

Fifty-five percent of historic ewe habitat in the San Jacinto Mountains is located south of Chino Canyon and is currently inhabited by 100 percent of the current ewe group population. The remaining 45 percent of historical ewe habitat is north of Chino Canyon in the central San Jacinto Mountains; three rams were released in this area in 2006, but it was unsuccessful.

Waterhole counts in 1973 estimated over 200 sheep inhabited the San Jacinto Mountains. The population subsequently declined rapidly, and no sheep were counted at waterholes in 1982. Bighorn sheep in the San Jacinto Mountains have been radiocollared and monitored on a regular basis since 1992. Since annual population estimates began in 1993, the number of ewes in this population has fluctuated between 4 and 13 adults (DeForge et al. 1997, Bighorn Institute annual reports from 1998 to 2005). The Peninsular bighorn sheep population estimate for the San Jacinto Mountains as of 2007 was 22 adults (12 males, 10 females), of which 7 females were captive-reared and released from the Bighorn Institute. Table 3-3 shows Peninsular bighorn sheep population estimates for the San Jacinto Mountains between 1993 and 2005. The San Jacinto Mountains population represents about 3 percent of the current rangewide population of the Peninsular bighorn sheep (22 out of 700+ individuals).

Table 3-3
Ewe Population Estimates for the San Jacinto Mountains from 1993 to 2005

Year	Number of Ewes (yearlings and adults)
1993	10
1994	7
1995	8
1996	7
1997	9
1998	8
1999	6
2000	6
2001	7
2002	4
2003	6
2004	12 (4 captive reared)
2005	11 (6 captive reared)

Source: DeForge et al. 1997; Bighorn Institute 1997, 1998, 1999, 2000, 2001, 2006; Ostermann, pers. comm. 2001

The cause of continuing low Peninsular bighorn sheep population numbers in the San Jacinto Mountains is not known with certainty. Adult survival rates have been low, averaging 0.81 for the 7 years of data available. Cause-specific mortality within this population has been monitored at varying intensities (due to field effort and the number of collared animals) since 1993. Mountain lion predation is the leading known cause of Peninsular bighorn sheep mortality (DeForge et al. 1997, Bighorn Institute annual reports) and accounted for 50 percent of the 16 documented mortalities of wild Peninsular bighorn sheep in the San Jacinto Mountains between December 1992 and June 2005. The challenges of determining cause-specific mortality of bighorn sheep include the difficulty of conducting fieldwork in extremely steep and rugged terrain, and the tagging of an adequate sample size of collared individual sheep. The relevant threats to sheep in this area include loss of habitat, predation, disease, urbanization, and human disturbance (USFWS 2000).

Between the years when the San Jacinto Mountains Peninsular bighorn sheep population declined from over 200 to 22 animals, their distribution contracted greatly. During annual helicopter surveys between 1983 and 1988, DeForge et al. (1997) found ewes distributed north and south of Chino Canyon. From 1989 to 2007, ewes have been found only south of Chino Canyon, except for one instance in 2005, when two yearling females were documented moving from Tachevah Canyon to Chino Canyon, and then north to Blaisdell Canyon and back to Tachevah Canyon within a two-week period. This range contraction north of Chino Canyon left approximately 45 percent of historical ewe habitat vacant at a time of a severe population decline in this ewe group. This area is the central San Jacinto Mountains area.

Due to the inability of this ewe group to naturally maintain itself, it has become the primary focus of augmentation and reintroduction efforts for the Peninsular bighorn sheep rangewide. Between 1997 and 2007, 16 captive-reared Peninsular bighorn sheep have been released into the population. Augmentation with captive-reared yearlings on an annual basis began in 2002 when the wild ewe population dropped to four adults. The Recovery Plan recognizes augmentation and reintroduction as valuable recovery tools, but also states that they are only one set of tools, and that they are meant to play supportive roles to other measures that protect bighorn sheep, such as habitat management and protection (USFWS 2000).

Chino Canyon

The Peninsular bighorn sheep was once relatively numerous in the Chino Canyon area in the northwesternmost portion of the Reservation prior to the 1980s (DeForge et al. 1997). A movement corridor has been confirmed by sightings of Peninsular bighorn sheep north of Chino Canyon in the relatively recent past (a yearling ram, tracks, and fecal pellets documented in 1995). Although the typical route across the corridor remains unknown, historic and recent Peninsular bighorn sheep sightings indicate that Chino Canyon provides a linkage to large amounts of Peninsular bighorn sheep habitat that was regularly occupied as recently as 1988. This movement corridor utilized by Peninsular bighorn sheep to cross Chino Canyon must remain intact for the ewe group to recolonize this habitat.

Sheep have used Chino Canyon in historical times, but this use has diminished dramatically over the past few decades. Occasional sightings have been made in the Chino Canyon area currently proposed for development by the City of Palm Springs, but sheep appear to be currently transient in this area. The decline in sheep numbers within this ewe group and the paved road to the tram station are the probable causes of this decline in use (Cornett 1992).

In the last 10 years, observations of Peninsular bighorn sheep in Chino Canyon have been infrequent. With the ewe population unable to sustain stable population levels since 1989, future survival of the ewe group is questionable unless the factors responsible for this condition are adequately addressed. The area to the north of Chino Canyon (central San Jacinto Mountains) has been abandoned by the Peninsular bighorn sheep and the recolonizing of this area without population supplementation is unlikely due to currently low population numbers and lack of water sources.

Tachevah Canyon

Tachevah Canyon is located immediately south of Chino Canyon in the San Jacinto Mountains in the northwestern portion of the Reservation. It is isolated from urban development by a 40-foot tall dam. The canyon contains all of the necessary habitat components required by the Peninsular bighorn sheep, as demonstrated by its current and historic use of Tachevah Canyon for foraging, watering, bedding, movement, and lambing (DeForge, pers. comm. 2003). The juxtaposition and quantity of required habitat

components makes Tachevah Canyon very important to the continued existence and recovery of the Peninsular bighorn sheep in the San Jacinto Mountains. The canyon is one of the last strongholds for the Peninsular bighorn sheep in the mountain range. Peninsular bighorn sheep regularly use the bajada at the mouth of the canyon for foraging, and there is reliable evidence of use below 800 feet ASML (e.g., tracks, sightings, photographs, and fecal pellets).

Even with the limited availability of data, Peninsular bighorn sheep use has clearly been documented within the lower elevations of Tachevah Canyon, and many ewe and lamb sightings have been documented within direct view of potential development sites located west of Tachevah Dam.

Tahquitz Canyon

Tahquitz Canyon is located immediately south of Tachevah Canyon in the San Jacinto Mountains in the central portion of the Reservation. There are limited park-related uses in the lower portion of the canyon. Similar to Tachevah, the canyon contains all of the necessary habitat components required by Peninsular bighorn sheep. The area between Tahquitz and Tachevah canyons has the highest number of sheep sightings over the past 15 years within the MCCA. The juxtaposition and quantity of required habitat components makes Tahquitz Canyon very important to the continued existence and recovery of the Peninsular bighorn sheep in the San Jacinto Mountains.

Little Eagle Canyon

Limited historic Peninsular bighorn sheep use of this area has been documented and current use is transient. There is no documented permanent use of the area. Based on observations by a Tribal Environmental Technician, Little Eagle Canyon lacks permanent water. In addition, it provides a very limited amount of escape terrain (less than 0.2 square mile). Although adjacent Eagle Canyon is a well-documented, high-use Peninsular bighorn sheep area that includes lambing habitat, Little Eagle Canyon receives transient use, lacking these two physical features to make it attractive to permanent or regular Peninsular bighorn sheep use. Nonetheless, it may still provide valuable resources and a buffer from urbanization.

3.3.1.2 Least Bell's Vireo (*Vireo bellii pusillus*) Federal Endangered

The least Bell's vireo is federally listed endangered; Critical Habitat and Recovery Units (pursuant to the species' Recovery Plan) designated for this species do not extend into the Action Area. The species is a migratory songbird inhabiting riparian woodlands with a dense understory along riverine systems. Vireos typically arrive in southern California to breed from mid-March to early April and remain until late September. Nests are constructed in dense thickets of willow or mule fat (*Baccharis salicifolia*) three to six feet from the ground. These vireos may also make their nests in other riparian tree and shrub species.

This vireo species occurs at sites with a generally dense, stratified tree and shrub cover with very little open area. Typical habitat will have an overstory of cottonwoods with a dense willow and mule fat understory; in desert areas, arrowweed (*Pleurocoronis* sp.) and wild grape (*Vitis* sp.) may be dominant species in these riparian woodlands. Least Bell's vireo also may occur in desert fan palm oasis woodland.

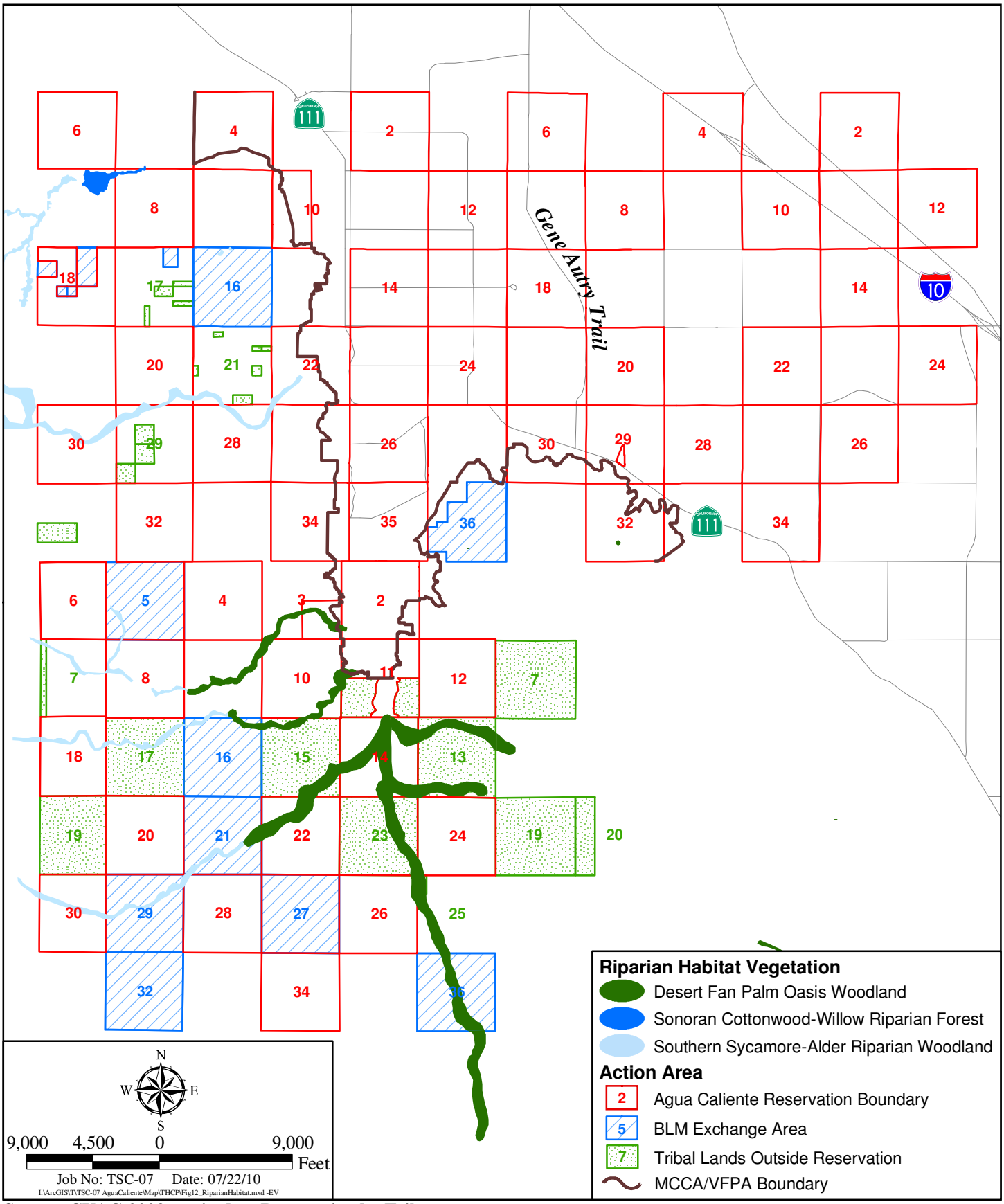
The least Bell's vireo was once common in California, ranging from southern California north throughout the Central Valley to Tehama County. The largest populations are present along coastal drainages in San Diego County and the Prado Basin in western Riverside County. The vireo also occurs in numerous drainages within Anza Borrego State Park to the south.

The least Bell's vireo is known to breed in Chino, Palm, Murray, and Andreas canyons on the Reservation. It was observed in Murray (Tierra Environmental Consultants 2003) and Andreas (UCR 2003) Canyons in 2003. In 2005, two pair of vireo bred in Andreas Canyon and one pair bred at Pelton Crossing along the west fork of Palm Canyon. One solitary male and one additional pair also were observed in Andreas Canyon early in the breeding season, but did not persist in the area. A solitary male was found during one survey of Palm Canyon (Haas and Nordby 2006). Figure 12 depicts riparian areas within the Action Area potentially supporting habitat for this bird species. The Action Area includes approximately 2,847 acres of potential habitat for this species, including, on the Reservation, approximately 720 acres in the MCCA and 12 acres in the VFPA; 431 acres of Tribal Lands outside the Reservation in the MCCA; 251 acres in the BLM Exchange Areas in the MCCA; and 1,433 acres in the off-Reservation Target Acquisition Areas. Suitable breeding habitat may also occur in Millard and Whitewater Canyons; Mission Creek; Oasis de Los Osos; in the Willow Hole-Edom Hill Reserve/ACEC; along the Whitewater River near the Salton Sea; and at Dos Palmas outside of the Reservation.

Brown-headed cowbird (*Molothrus ater*) 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. Parasitized vireo pairs either desert the nest or raise the young cowbird at the expense of their own young. In San Diego County, a significant population increase of the least Bell's vireo in the period from 1986 to 1996 is primarily due to management of local brown-headed cowbird populations (USFWS 1998a).

Other potential threats to the least Bell's vireo in the Action Area are destruction of habitat as a result of certain development activities, invasion of non-native plants in riparian habitats, and degradation of habitat as a result of edge effects related to human activities. Human activities, including golf courses and agriculture, attract cowbirds, thereby increasing the threat to least Bell's vireos.

Because the vireo occurs in riparian habitat, some protection is afforded through the need to obtain Clean Water Act Section 404 permits prior to impacting habitats that are determined to be USACE



Source: CVAG 2003; revised on Reservation by Tribe

Riparian Habitat

AGUA CALIENTE THCP

Figure 12

jurisdictional. Additionally, many of the areas where appropriate habitat occurs in the Coachella Valley are located in steep canyons, limiting development pressure.

3.3.1.3 Southwestern Willow Flycatcher (*Empidonax traillii extimus*) Federal Endangered

The southwestern willow flycatcher is a federally listed endangered species (USFWS 1993, 1995). This bird is an insectivore, foraging within and above dense riparian vegetation, sometimes adjacent to nest sites. 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. 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 are great. This species of flycatcher occurs at sites where dense growth of willows, mule fat, arrowweed, or other plants form dense thickets that are often associated with a scattered overstory of cottonwood and other riparian trees. 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. The Recovery Units designated for this species in the August 2002 Final Recovery Plan (USFWS 2002a) and designated critical habitat (70 Federal Register 60885) do not extend into the Action Area.

The breeding status of the southwestern willow flycatcher within the Coachella Valley is not well known. Of the known locations at which this species has been observed, only one pair located in Mission Creek was confirmed as breeding. A southwestern willow flycatcher was observed in Palm Canyon in 2003 (Jones & Stokes 2003). A willow flycatcher was observed in Murray Canyon in June 2003, but the subspecies was not confirmed (UCR 2003). Figure 12 depicts riparian areas in the Action Area potentially supporting migration habitat for this bird species; however, no suitable breeding habitat for the species occurs within the Plan Area (Haas and Nordby 2006). The Plan Area includes approximately 2,847 acres of potential migration (non-breeding) habitat for this species, as described above for least Bell's vireo.

The most significant threats to the southwestern willow flycatcher are destruction and alteration of riparian habitats upon which they depend and nest parasitism by the brown-headed cowbird. 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. Human activities, including golf courses and agriculture, attract cowbirds, thereby increasing the threat to southwestern willow flycatchers.

3.3.1.4 Summer Tanager (*Piranga rubra cooperi*) No Official Status

The summer tanager breeds across the southern U.S. from California (as far north as the Kern River Valley) to Florida. The species' distribution extends throughout the southeastern half of the country. Tanagers typically arrive from wintering grounds between April and May, but individuals can be observed as early as late March. Nesting primarily occurs in May or June. Two subspecies of summer tanagers are recognized, *P.r. rubra* and *P.r. cooperi*.

The summer tanager (*P.r. cooperi*) breeds in the southwest from California to west Texas and northern Mexico. This subspecies generally inhabits riparian woodlands but will utilize woodlands dominated by mesquite and salt cedar at higher elevations. The summer tanager is migratory, wintering from central Mexico south through Central America to Bolivia and Brazil and in small numbers in southern California, southern Arizona, and southern Florida.

Summer tanagers nest in mature riparian groves dominated by willows and cottonwoods. The nest is usually built between 10 and 35 feet above the ground in a large tree, often a cottonwood. The species generally nests in areas with openings near water, where it can forage for insects.

This species has been observed by biologists from UCR in Andreas (2002), Palm (2002, 2005), and Tahquitz (2003, 2005) canyons on the Reservation; it also was observed on private land in Chino Canyon. The modeled habitat for this species is the same as described above for the least Bell's vireo (Figure 12).

The primary factors causing a decline in populations of the species are the destruction and alteration of riparian habitats and cowbird parasitism. Although tanager populations have remained stable throughout much of the species' range, the population has declined drastically in California, likely in response to the loss of riparian forests.

3.3.1.5 Yellow-breasted Chat (*Icteria virens*) No Official Status

The yellow-breasted chat is found throughout most of the U.S. and southern Canada during the breeding season. The bird spends the rest of the year in parts of Mexico south to Panama.

The yellow-breasted chat is most often found under cover in riparian areas with dense vegetation. The bird nests in dense thickets and brushy tangles, where it builds its nest low in bushes, vines, or briar. It usually occurs in the lower portions of foothill canyons and lowlands. It is primarily an insectivore but also eats wild berries and wild grapes, all of which occur more frequently near water. This species has been observed in Murray Canyon on the Reservation (Tierra Environmental Consultants 2003; Haas and Nordby 2006). The modeled habitat for this species is the same as described above for the least Bell's vireo (Figure 12).

Populations of chats are declining. The primary factors causing a decline in populations of this species are the destruction and alteration of riparian habitats and cowbird parasitism.

3.3.1.6 Yellow Warbler (*Dendroica petechia brewstri*) No Official Status

The yellow warbler inhabits riparian areas throughout the U.S., Alaska, Canada, and portions of Mexico. A subspecies of the yellow warbler occurs in Central and South America. The yellow warbler is migratory, spending the non-breeding season south of the U.S. from the Bahamas and Central America to Peru, Bolivia, and Brazil. Populations of yellow warblers appear to be fluctuating in North America. In California, the bird was once common in the Sacramento Valley, the San Joaquin Valley, San Francisco, and along the Colorado River, but little or no breeding now occurs in these locations. The yellow warbler has declined significantly as a breeding bird in the coastal lowlands of southern California.

The yellow warbler occurs in wetlands and mature riparian woodlands dominated by cottonwoods, alders, and willows, usually at elevations of less than 8,000 feet AMSL. The species tends to nest approximately 6 to 8 feet from the ground in vegetation of intermediate height and shrub density.

This species has been observed in Palm and Tahquitz canyons on the Reservation (Haas and Nordby 2006) and on private property in Chino Canyon (UCR 2003). Riparian habitat in the Action Area potentially supporting this bird species totals approximately 2,847 acres, as described above for the least Bell's vireo (Figure 12).

The primary factors causing a decline in populations of yellow warblers are the destruction and alteration of riparian habitats and cowbird parasitism.

3.3.1.7 Mountain Yellow-legged Frog (*Rana muscosa*) Federal Endangered

The mountain yellow-legged frog is a federally listed endangered species (USFWS 2002c). Designated Critical Habitat does not extend into the Action Area, and no Recovery Plan has been published. This near endemic to California is distributed more or less continuously in the Sierra Nevada from the vicinity of La Porte (southern Plumas County) southward to Taylor and French Joe Meadows (southern Tulare County; Zweifel 1955). Additional populations of the frog have been documented in isolated clusters in the San Gabriel, San Bernardino, and San Jacinto mountains (Zweifel 1955), and an isolated outpost occurs in Pauma Creek flowing through Doane Meadow on Mount Palomar in northern San Diego County (Klauber 1929). Its known elevation range extends from approximately 4,500 feet AMSL (San Antonio Creek, Calaveras County; Zweifel 1955) to greater than 12,000 feet AMSL near Desolation Lake (Fresno County; Mullally and Cunningham 1956) in the Sierra Nevada. In southern California, its

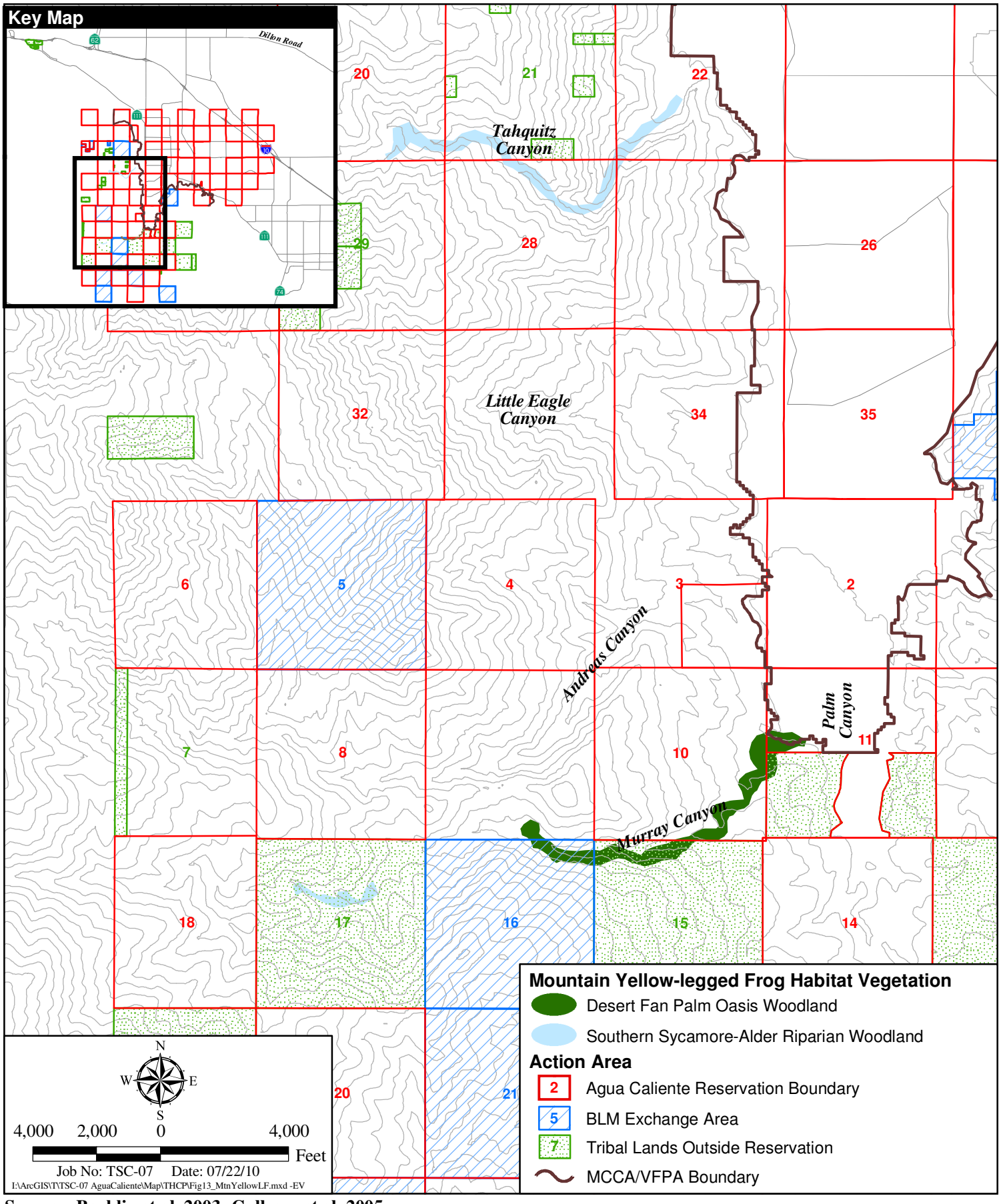
historical elevational range extended from 1,000 feet AMSL (Eaton Canyon, Los Angeles County) to greater than 7,500 feet AMSL near Bluff Lake (San Bernardino County; Zweifel 1955).

Mountain-yellow legged frogs were observed in two forks of Tahquitz Creek in 2009. These locations were approximately 4,000 and 13,000 feet west of the western Reservation boundary, respectively. Mountain yellow-legged frogs also are known to occur in four small tributaries of the upper reaches of the San Jacinto River system in the San Jacinto Mountains, four small streams in the San Gabriel Mountains, and one stream in the San Bernardino Mountains. Field surveys indicate that the entire remaining populations in these two mountain areas probably number less than 100 adult frogs. The nearest location other than Tahquitz Creek is in Dark Canyon, approximately five miles west of the Reservation (Backlin et al. 2001 and USFS 2002, as cited in USFWS 2002; USGS 2002a). The USFS's Angeles, San Bernardino, and Cleveland National forests manage lands containing all known locations of the mountain yellow-legged frog in southern California.

Figure 12 depicts all riparian areas in the Action Area with potential to support habitat for this amphibian species, totaling approximately 2,847 acres, as described above for the least Bell's vireo. A much more restricted amount of habitat, however, is believed to be currently suitable. The mountain yellow-legged frog historically was observed in Chino (1960), Tahquitz (1972), and Andreas (1979) canyons but has not recently been observed in the Plan Area (CDFG 2004a). Recent surveys of the Plan Area's canyons determined that suitable habitat was limited to lower and upper Tahquitz Canyon (Backlin et al. 2003), lower and upper Andreas Canyon, lower Chino Canyon (Gallegos et al. 2005), and Murray Canyon (Ervin and Merkel 2006) in the MCCA, totaling approximately 210 acres, including 136 acres on the Reservation, 56 acres of Tribal Land outside the Reservation, and 18 acres of BLM Exchange Areas (Figure 13).

The mountain yellow-legged frog inhabits ponds, dams, lakes, and streams at moderate to high elevations (Mullally and Cunningham 1956). It seems to be absent from the smallest creeks, probably because these have insufficient depth for adequate refuge and overwintering. It also appears to prefer open stream and lake margins that gently slope up to a depth of approximately two to three inches. The frog seems to be most successful where predatory fish are absent (Bradford 1989; Bradford et al. 1993). The coldest winter months are spent in hibernation, probably under water or in crevices in the bank. Mountain yellow-legged frogs emerge from overwintering sites in early spring, and breeding soon follows. Eggs are deposited in shallow water where the egg mass is attached to vegetation or the substrate.

Because the yellow-legged frog occurs in riparian habitat, further protection is afforded through the need to obtain Clean Water Act Section 404 permits prior to impacting habitats that are determined to be USACE jurisdictional. Additionally, many of the areas where appropriate habitat occurs in the Coachella Valley are located in steep canyons, limiting development pressure.



Sources: Backlin et al. 2003; Gallegos et al. 2005; Erwin and Merkel 2006

Mountain Yellow-legged Frog Habitat

AGUA CALIENTE THCP

Figure 13

3.3.1.8 Southern Yellow Bat (*Lasiurus ega [xanthinus]*) No Official Status

The southern yellow bat occurs in extreme southeastern California to southwestern Texas, and the northwestern portion of Mexico, including Baja (Burt and Grossenheider 1976). It roosts in trees (primarily palm trees) and appears to prefer the dead fronds of palms. 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 Coachella Valley, the bat is currently known to occur off the Reservation at the Coachella Valley Preserve, Dos Palmas Preserve/ACEC, and on the Applegarth Ranch in the Thermal area. They also were identified on the Reservation within Palm, Andreas, and Murray canyons using an ANABAT system, with significantly lower usage recorded at Murray Canyon than the other two canyons (Tierra Environmental Consultants 2003; Rahn 2006a).[5] In addition, the 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 proportion of the native palm oases in southeastern California. Figure 14 depicts the distribution of desert fan palm oasis woodlands within the Action Area where the southern yellow bat may occur. The modeled potential habitat totals approximately 1,176 acres, including, on the Reservation, approximately 467 acres in the MCCA and 12 acres in the VFPA; 390 acres of Tribal lands outside the Reservation in the MCCA; 148 acres in the BLM Exchange Areas in the MCCA; and 159 acres in the off-Reservation Target Acquisition Areas.

The southern yellow bat feeds on flying insects such as beetles and true bugs. Foraging was thought to occur over ponds in streams (Findley et al. 1975). Monitoring on the Reservation, however, indicates that bats typically spent the first part of the evening foraging and flying around the palm canyons, then departed in the late evening, presumably to forage in the valley and open habitat areas (Rahn 2006a). 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 some locations but decreased from summer to winter during 2005 monitoring on the Reservation. There is very little information available on the life history of this species.

Because the southern yellow bat roosts occur in riparian habitat (palm oases), some protection is afforded through the need to obtain Clean Water Act Section 404 permits prior to impacting habitats that are determined to be USACE jurisdictional. Additionally, many of the areas where appropriate habitat occurs in the Coachella Valley are located in steep canyons, limiting development pressure. Threats to this species include vandalism (burning of native palms) and pruning of urban palms (AGFD 1988). These bats are often found in palms during pruning activities (Hoffmeister 1986). Nearly all fires that would affect these bats in the Action Area would be human-caused fires.

[5]The ANABAT system converts the ultrasonic echolocation signals of bats into audible electronic signals that can be recorded and processed to assist in identification of the species.

3.3.1.9 Triple-ribbed Milk-vetch (*Astragalus tricarinatus*) Federal Endangered

The triple-ribbed milk-vetch is a federally listed endangered species (USFWS 1998b). It is an endemic species that is found in a narrow range from the northwestern portion of the Coachella Valley from the vicinity of Whitewater Canyon (the type locality), in Mission Creek Canyon across Highway 62 to Dry Morongo Wash and Big Morongo Canyon (Michael Brandman Associates 2001a). 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 USGS 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 (Barrows, pers. observ. 2003). Other locations where the species has been reported are Agua Alta Canyon, a branch of Martinez Canyon in the Santa Rosa Mountains, the Orocopia Mountains, Big Morongo Canyon, Dry Morongo Canyon, and Joshua Tree National Park. 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 by botanists. The Martinez Canyon location has led some to suggest that this species could occur in the rugged canyons of the Santa Rosa and San Jacinto mountains (CVAG 2003).

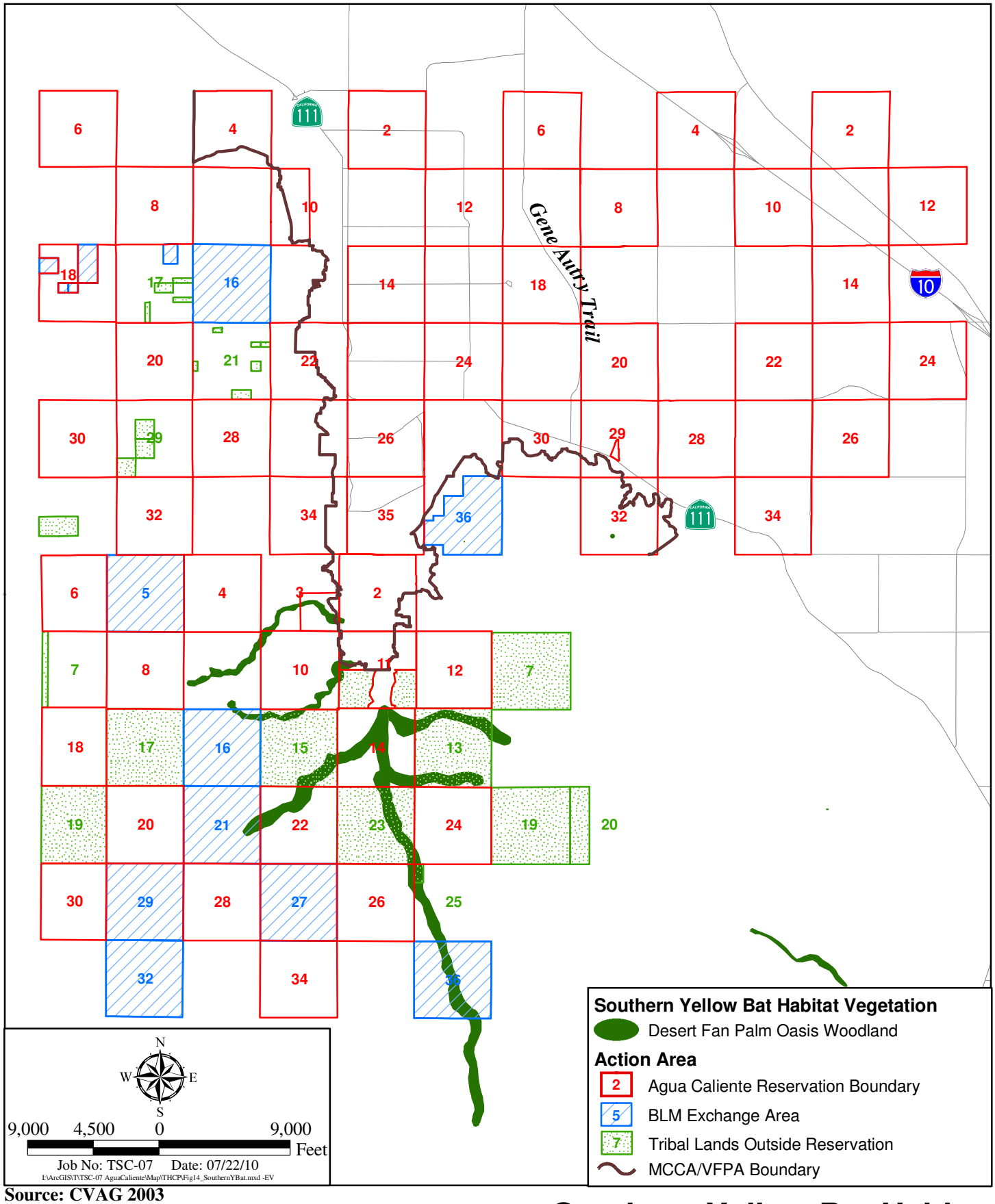
Modeling for the potential distribution of this species within the Coachella Valley does not indicate any potential habitat in the Plan Area or the BLM Exchange Areas (Figure 15). Despite this and the fact that there have been no sightings, this species could occur in the rugged Canyons of the San Jacinto and Santa Rosa mountains in the Plan Area. Approximately 1,105 acres of potential habitat occur within the off-Reservation Target Acquisition Areas.

Triple-ribbed milk-vetch is a perennial herb that blooms from February to May. Most aspects of the biology of this species are unknown including pollinators, germination requirements, longevity of seeds in the soil, and specific habitat requirements. Some research into aspects of the life history of this species will be carried out through a funding agreement under Section 6 of ESA between CDFG and UCR.

The known locations of this species occur where there are few human-caused threats. Most of the known locations (85 percent) 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, this species may be subject to crushing by vehicles, but most of the known locations receive very limited vehicle traffic.

3.3.1.10 Desert Tortoise (*Xerobates* or *Gopherus agassizii*) Federal Threatened

The desert tortoise is widely distributed through an exceptionally broad array of habitats that span 680 miles from northern Sinaloa State, Mexico, where it occupies deciduous forest, across the Sonoran

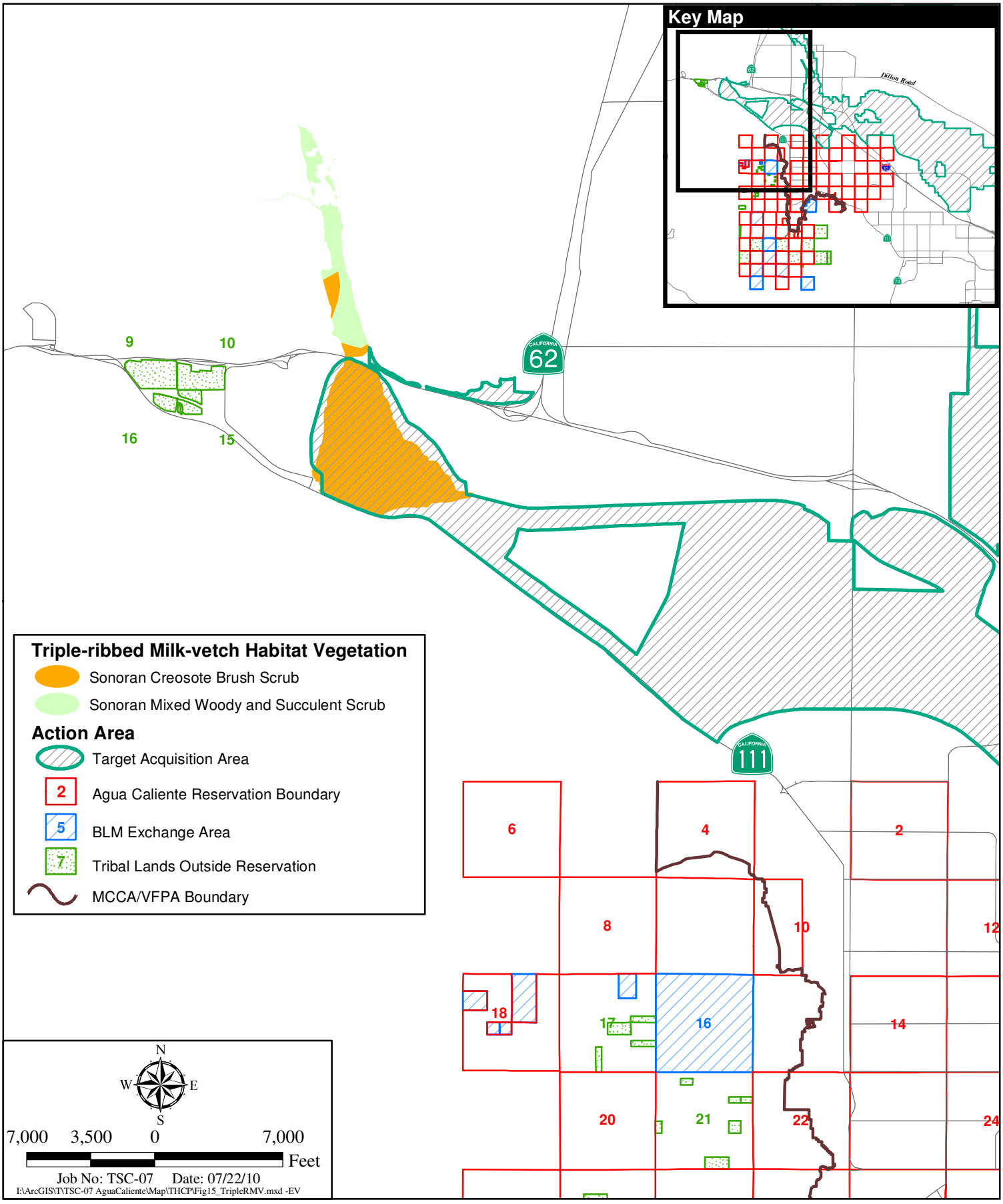


Source: CVAG 2003

Southern Yellow Bat Habitat

AGUA CALIENTE THCP

Figure 14



Source: CVAG 2003

Triple-ribbed Milk-vetch Habitat

AGUA CALIENTE THCP

Figure 15

(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 et al. 1994). Tortoises are found naturally along the northern, eastern, and western rims of the Coachella Valley in the foothills of the Little San Bernardino Mountains, the Painted and Whitewater Hills, 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. Recorded observations on the Reservation are limited to sightings in the vicinity of Chino and Little Eagle canyons (CVAG 2003).

The desert tortoise was formally listed by the USFWS as threatened in 1990. The USFWS has adopted a Recovery Plan and designated Critical Habitat for the species. Neither the Critical Habitat nor the designated Recovery Units, however, extend into the Plan Area.

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 desert tortoise densities (Wilson and Stager 1992). Desert tortoises frequently exhibit a contiguous 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 approximately 1 to 642 acres.

The Coachella Valley generally supports a low desert tortoise density because of the high use and development of the area. The desert tortoise is most generally found in association with the Sonoran creosote bush scrub plant community. Desert tortoises are primarily associated with flats and bajadas with soils ranging from sand to sandy-gravel but firm enough for the tortoise to construct burrows. Figure 16 depicts the area within the Action Area potentially supporting habitat for this species. Modeled habitat in the Action Area totals 20,849 acres, including on the Reservation approximately 8,312 acres in the MCCA and 1,402 acres in the VFPA; in Tribal Lands outside the Reservation, 3,405 acres in the MCCA and 144 acres in the VFPA; on the BLM Exchange Areas, 2,564 acres in the MCCA ; and 5,022 acres in the off-Reservation Target Acquisition Areas.

The desert tortoise is active from mid-March or April to November and is dormant in underground burrows during the winter months. Desert tortoises will congregate in winter dens during colder weather, spread out to nearby areas during moderate weather in the spring and fall, and retreat into short individual burrows or under shrubs during more extreme heat in summer. Desert tortoises typically feed on a wide variety of herbaceous plants, particularly grasses and annual flowering plants.

Coyotes (*Cania latrans*), bobcats (*Lynx rufus*), ravens (*Corvus corax sinuatus*), golden eagles (*Aquila chrysaetos*), and Gila monsters (*Heloderma suspectum*; which do not occur within the Reservation) are known predators of either eggs, juveniles, or adults (Barrow 1979; Luckenbach 1982; Barrett and Humphrey 1986), and ring-tailed cats (*Bassariscus astutus*), badgers (*Taxidea taxus*), skunks (*Mephitis*

occidentalis), kit foxes (*Vulpes velox*), domestic dogs, large hawks, owls, roadrunners (*Geococcyx californianus*), bullsnakes (*Pituophis melanoleucus*), and coachwhip snakes (*Masticophis flagellum*) are suspected predators (Ernst and Barbour 1972; Luckenbach 1982). The presence of a high density of local ravens has a detrimental effect on populations of desert tortoise through predation on young tortoises (Boarman 1993).

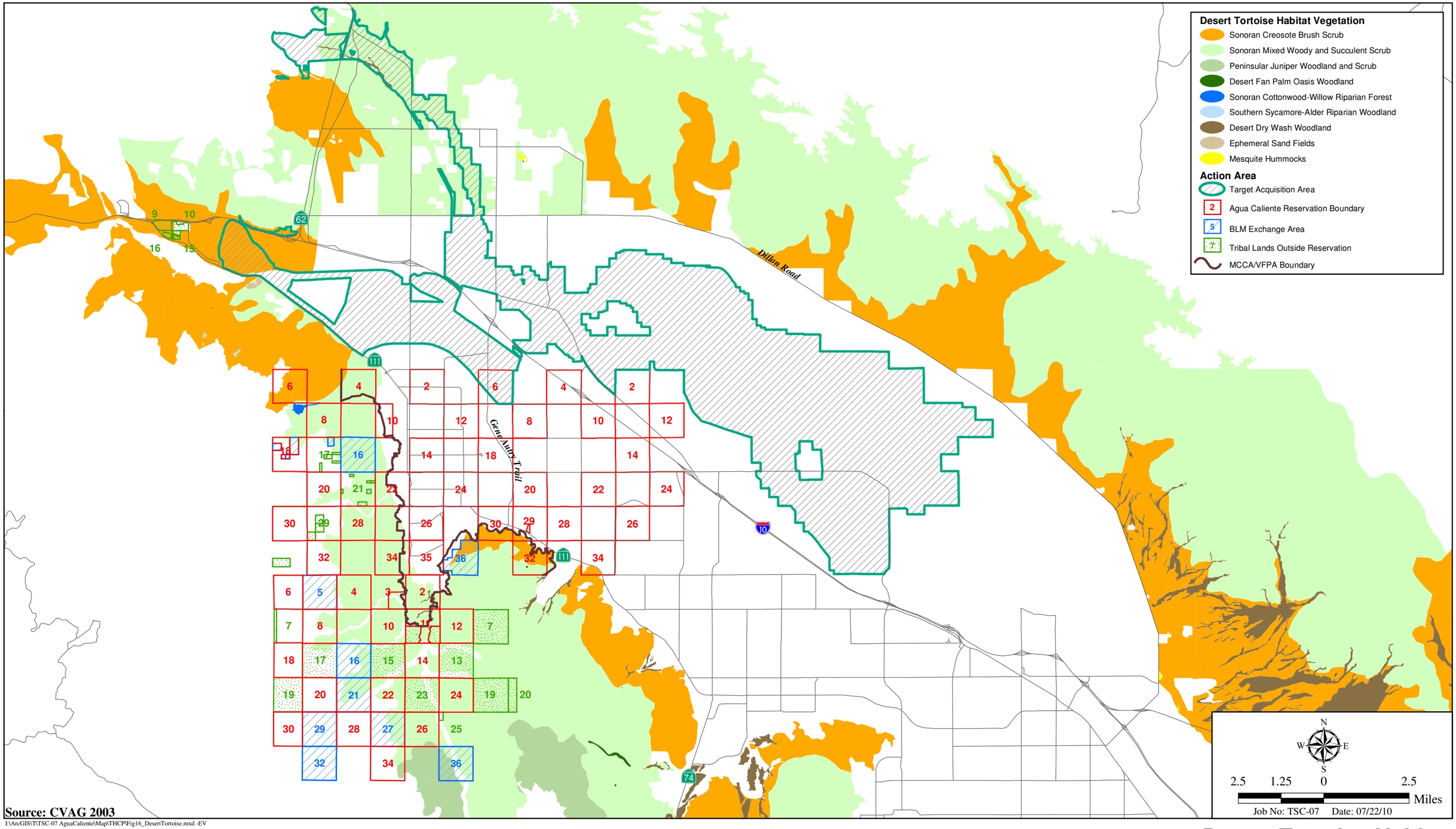
The desert tortoise is adversely impacted by urbanization and other human-related activities, including OHV use, overgrazing of domestic livestock, and construction of roads and utility corridors. Secondary contributions to degradation include the proliferation of exotic plant species and a higher frequency of anthropogenic fire. OHV use may contribute to declines of desert tortoise populations directly by crushing individuals (above or below ground) or by collapsing burrows. Vehicle activity also may destroy vegetation used by tortoises for food or cover, making habitat unsuitable for sustaining their populations.

Disease has contributed to declines of many desert tortoise populations. Wild and captive desert tortoises are afflicted with upper respiratory tract disease in many areas within the geographic range. Fire may be the biggest threat to the continued survival of tortoises in the western Coachella Valley. 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. 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.

This species is afforded significant protection in other parts of its range through efforts such as the Northern and Eastern Colorado Desert Coordinated Management Plan (BLM 2002) and Desert Tortoise Habitat Conservation Plan (Regional Environmental Consultants 1990) as well as conservation on the Desert, Cibola, Havasu, and Imperial National Wildlife Refuges (USFWS 1994).

3.3.1.11 Burrowing Owl (*Athene cunicularia*) Bird of Conservation Concern

The burrowing owl is a federal Bird of Conservation Concern. It has a broad distribution that includes open country throughout the midwestern and western U.S., Texas and southern Florida, parts of central Canada, and into Mexico and the drier regions of Central and South America. The burrowing owl is a gregarious owl that occupies a wide variety of open habitats, including most of the canyon bottoms and sandy habitats on the valley floor in the Coachella Valley. It can occur in the stabilized and partially stabilized sand fields found along the I-10 corridor in the northeastern portion of the Reservation as well as in the desert dry wash and Sonoran mixed woody and succulent scrub communities found on the canyon bottoms within Indian Canyons Heritage Park, Tahquitz Canyon, and Chino Canyon.



Source: CVAG 2003

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Desert Tortoise Habitat

AGUA CALIENTE THCP

Figure 16

On the Reservation, observations of this species have been recorded in the Whitewater River wash east of the Palm Springs Airport. It also has been observed in areas adjacent to existing development at the airport (CVAG 2003). Habitat types that may be suitable for burrowing owls in the Action Area include stabilized and partially stabilized sand fields, desert saltbush scrub, Sonoran creosote bush scrub and desert dry wash woodland. Based on the distribution of these habitat types, the Action Area supports a total of approximately 26,215 acres of potentially suitable habitat, including on the Reservation 1,152 acres in the MCCA and 3,131 acres in the VFPA; 144 acres of Tribal Lands outside the Reservation in the VFPA; in the BLM Exchange Areas, 214 acres in the MCCA ; and 21,574 acres in the off-Reservation Target Acquisition Areas (Figure 17).

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. Breeding occurs between early March and late August. Pairs may stay together during an entire year. Clutches average about five young. After the breeding season, secondary burrows may be used for cover and roost sites. During winter, attachment to a particular burrow is reduced even more. Burrowing owls typically form small colonies and fly low to the ground (seldom above 25 feet). They follow a crepuscular habit, being most active during the early morning and evening hours. Their diet is predominantly large insects and small rodents, but they will also take small birds, reptiles, amphibians, fish, scorpions, and other available prey. They are often observed perched on fence posts or utility wires. They typically live eight years or more.

The most significant threat to the continued persistence of the burrowing owl is destruction of habitat. Their ground-nesting habitat leaves them susceptible to predation by domestic cats and dogs. Individuals may be killed on roadways while foraging at night. In agricultural areas, levees and irrigation dikes where rodent burrows are present can provide a suitable nest site; however, in these areas, burrowing owls may be threatened by maintenance activities and by poisoning from pesticide use or rodent poisoning campaigns. OHV activity is a threat to the habitat of this species, as burrows can be crushed and nest sites disturbed.

Protected known locations of this species in the Coachella Valley include the Snow Creek area, the Coachella Valley Preserve, the Whitewater Floodplain Reserve, the Edom Hill/Willow Hole Reserve, the Mission Creek area west of Highway 62, and significant portions of the Indio and Mecca Hills (CVAG 2003).

3.3.1.12 Gray Vireo (*Vireo vicinior*) Bird of Conservation Concern

The gray vireo is a federal Bird of Conservation Concern. It is a migratory bird, breeding in the southwestern U.S. and Baja. The summer range of the gray vireo includes New Mexico, southern Nevada, southern Utah, southern Colorado, western Texas, Arizona, and southeastern California. In California, breeding gray vireos are known from the northeastern slopes of the San Bernardino

Mountains, the San Jacinto and Santa Rosa Mountains, and on the southern slopes of the Laguna Mountains. The vireo is also known from the mountains of the eastern Mojave Desert. Historically, the breeding distribution was much broader, with species being observed in Kern County, Joshua Tree National Park, portions of the San Gabriel Mountains, and in the desert slopes of San Bernardino, Riverside, and San Diego counties. The vireo was also known as a migrant in Whitewater Canyon. This species spends winters primarily south of the Mexican border and in southwestern Arizona.

The gray vireo usually occurs in semi-arid, shrub-covered foothills and mesas in pinyon-juniper, juniper, and chamise-redshank chaparral habitat. Suitable habitat typically occurs from 2,000 to 6,500 feet AMSL. The species is most often found in areas with sparse to moderate vegetative cover and small scattered trees. Although junipers are the dominant tree in gray vireo habitat, oaks are also common.

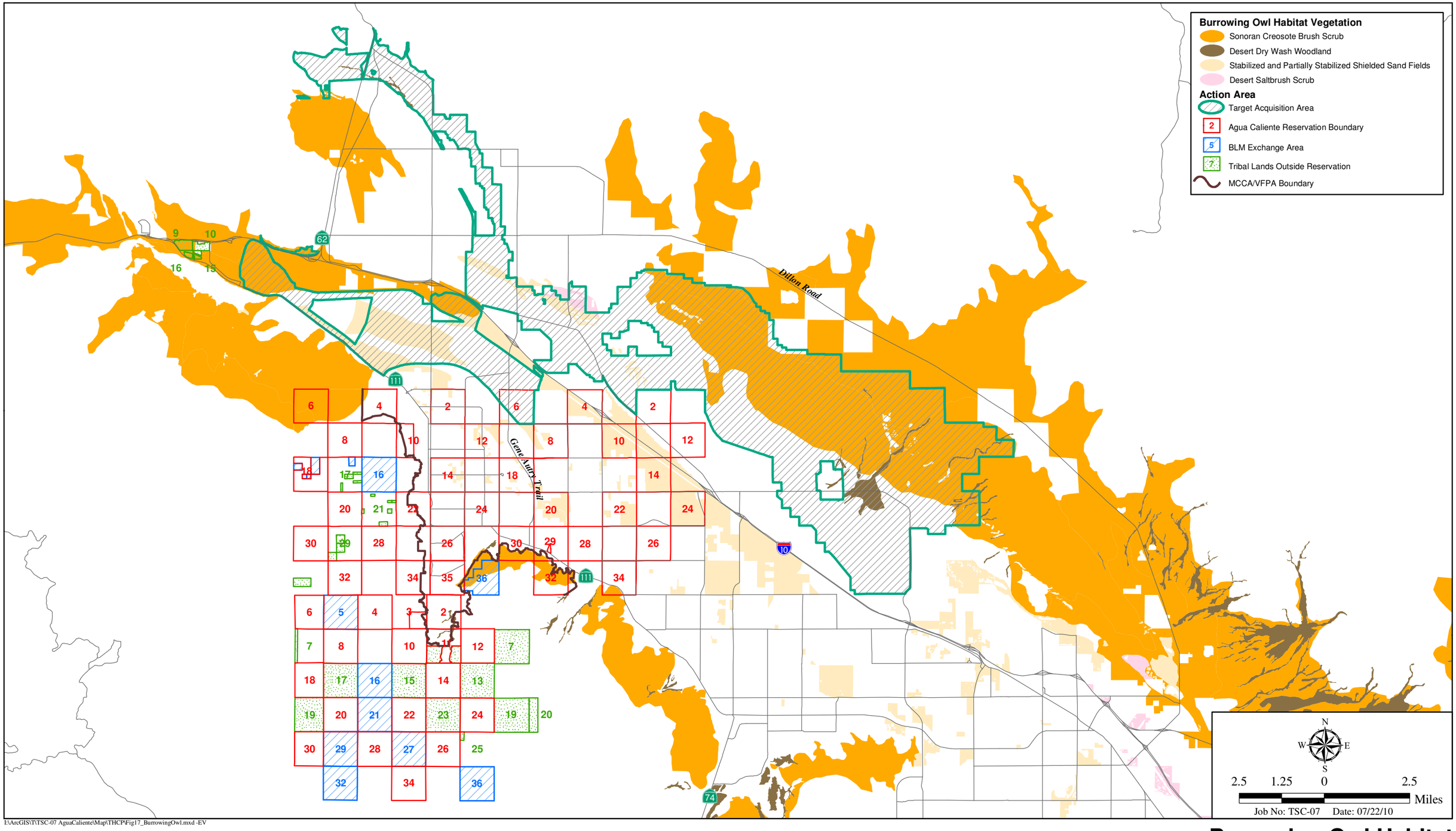
This species has the potential to occur in the higher elevations of the Action Area but has not been observed. The modeled potential habitat for this species extends over approximately 1,429 acres in the MCCA, including approximately 978 acres on the Reservation and 451 acres in the BLM Exchange Areas (Figure 18).

The cause of declines in gray vireo populations is not fully understood. A major factor in the decline of the species may be brood parasitism by the brown-headed cowbird, which occurs frequently near residential developments, golf courses, and agriculture. Another possible factor causing a decline in the species could be habitat changes to vegetation as a result of fire suppression activities.

Existing conserved habitat for this species includes public lands in the Santa Rosa and San Jacinto mountains, Joshua Tree National Park, Whitewater Canyon Conservation Area, and San Gorgonio Wilderness (CVAG 2003).

3.3.2 Covered Species Potentially Occurring on the Valley Floor

More than half of the Plan Area within the VFPA is urbanized and no longer available for native wildlife species. There are approximately 8,654 acres of urban development on the valley floor within the Reservation. For those undeveloped areas in the VFPA (approximately 6,647 acres), stabilized and partially stabilized shielded sand fields and Sonoran mixed woody and succulent scrub are the dominant plant communities. Significant areas of active sand fields exist within the Target Acquisition Areas. Following is a discussion of Covered Species known or with potential to occur in the VFPA in the Plan Area and off-Reservation Target Acquisition Areas.



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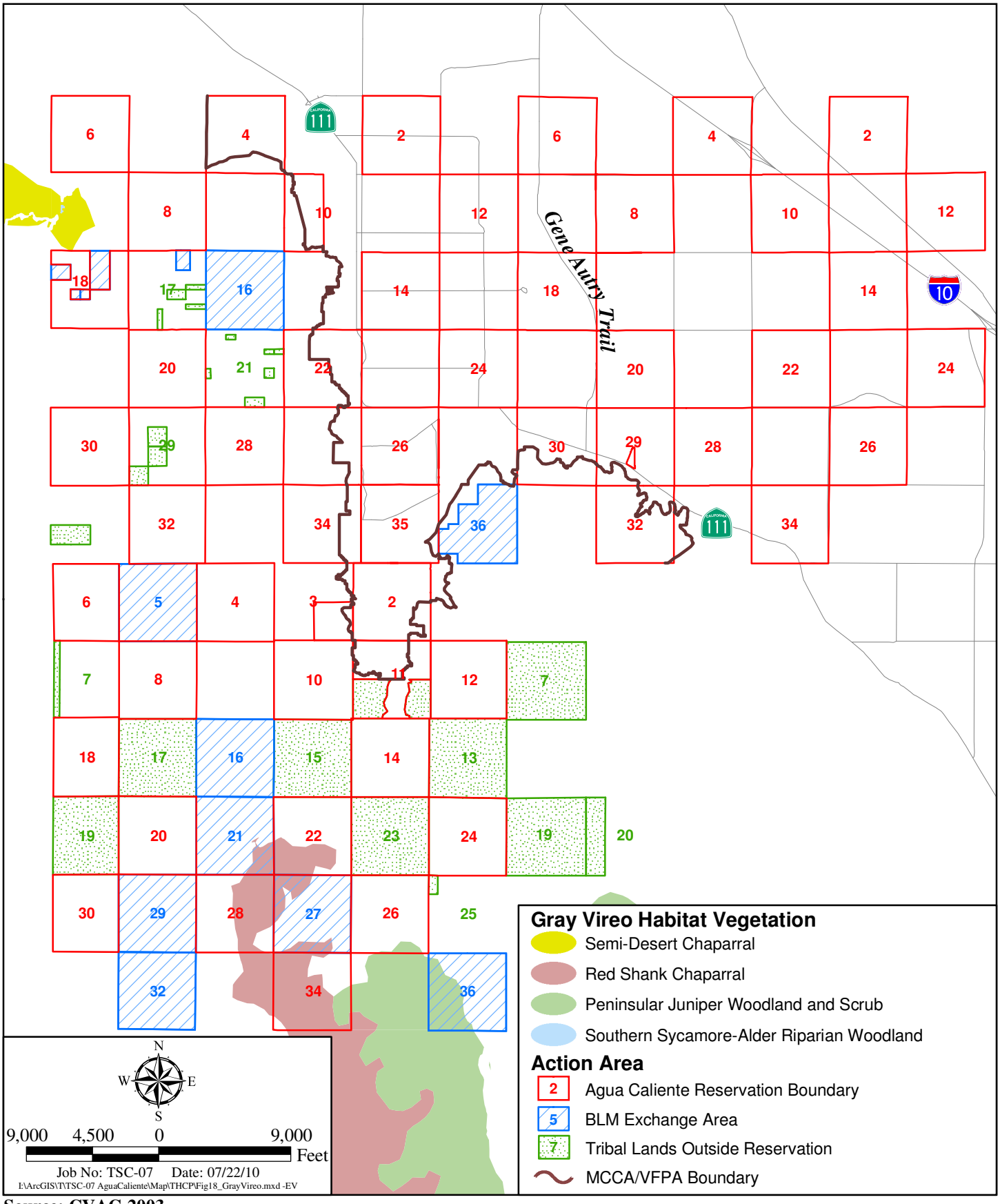
Burrowing Owl Habitat

AGUA CALIENTE THCP

Figure 17



Source: CVAG 2003

Gray Vireo Habitat

AGUA CALIENTE THCP

Figure 18

3.3.2.1 Coachella Valley Fringe-toed Lizard (*Uma inornata*) Federal Threatened

The Coachella Valley fringe-toed lizard was federally listed threatened, and a Recovery Plan was approved in 1993. This species 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 (wind-blown) sands to which it has developed morphological and behavioral adaptations (Heifetz 1941; Stebbins 1944; Norris 1958), and it occurs wherever there are large patches of the appropriate substrate (England and Nelson 1976; La Pré and Cornett 1981; Turner et al. 1980; England 1983; Barrows 1997).

The Coachella Valley fringe-toed lizard is a medium-sized lizard that averages between six and nine inches in total length. Adaptations to living in sand include the ability to "swim" through the sand: run across the sand surface at high speed, dive into the sand, and move short distances below the sand surface. This activity is facilitated by the small, rounded scales on the lizard's skin, which make the skin very smooth and reduce the friction of its body against the sand. Other adaptations for mobility in sand include the fringed toes for which the animal is given its common name. The toes have a row of enlarged scales (fringes) that the lizard uses to improve its traction when pushing against the sand as it moves. Other types of adaptations function to protect the lizard's body from abrasion and to keep sand particles out of body openings. These include the nasal passages that allow it to breathe the air between sand grains when fully encased in the sand. The nose is wedge shaped rather than blunt, which is thought to spread the sand as the lizard dives. There is also a flap of skin covering the ears, preventing sand grains from entering the ears during sand swimming.

Primary threats are loss or degradation of habitat and the processes that create and maintain that habitat. Habitat is lost when urban, agricultural, and other types of development replace suitable with unsuitable habitat. Habitat is degraded by OHV abuse, illegal dumping, invasion by exotic weeds, and the like. The processes that drive the aeolian sand system cannot be disrupted if the habitat is to remain. 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 this habitat, floodwaters must not be blocked or redirected from the sorting area. There also must be no barriers blocking the movement of wind and its sand load between the sorting area and the habitat. Barriers impound sand and cause shielding effects, which will eventually extend to the downwind end of the region because of the unidirectional sand movement pattern.

The Coachella Valley fringe-toed lizard has suffered serious decline due to extensive habitat loss. Edge effects also are related to urban development adjacent to habitat. Roads, feral pets, human activity/interaction (including collection), and the like increase mortality of fringe-toed lizards, especially around the perimeter of a habitat patch. The larger the perimeter relative to the total area (perimeter to area ratio), the more area affected by adjacent development.

The Coachella Valley fringe-toed lizard HCP established three preserves (the Thousand Palms Preserve, the Whitewater Floodplain Reserve, and the Edom Hill/Willow Hole Reserve) that protect nearly 20,000 acres of habitat and blowsand sources. As described in Chapter 2, these preserves are within the off-Reservation Target Acquisition Areas.

Figure 19 depicts the modeled distribution of the species in the Action Area, which includes approximately 3,391 acres in the VFPA and 11,647 acres in the off-Reservation Target Acquisition Areas, for a total of approximately 15,038 acres. Designated critical habitat for the species encompasses approximately 10,334 acres of the off-Reservation Target Acquisition Areas. The only recorded sighting and only likely location for this species on the Reservation is in the Section 6 Target Acquisition Area.

3.3.2.2 Coachella Giant Sand-treader Cricket (*Macrobaenetes valgum*) None

Coachella giant sand-treader cricket occurs exclusively in the Coachella Valley and is most abundant in the active sand 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. Perennial shrubs, including creosote bush, white bursage, honey mesquite, Mormon tea (*Ephedra trifurca*), desert willow (*Chilopsis linearis*), and sandpaper bush (*Petalonyx thurberi*) dominate their preferred habitat in windblown environments. Stabilized sand areas are avoided.

Figure 19 depicts the CVAG modeled distribution for this species on the valley floor. Modeled habitat includes approximately 3,391 acres in the VFPA on the Reservation and 11,647 acres in the off-Reservation Target Acquisition Areas, for a total of 15,038 acres in the Action Area. Core Habitat occurs within the off-Reservation Target Acquisition Areas. This species has not been the subject of extensive surveys in the Plan Area, and has not been recorded there.

The Coachella 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. The life history of these insects is not well known.

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, particularly where sand transport processes are disturbed. OHV activity is a threat to the habitat of this species, as shallow burrows can be crushed and the sand compacted. Any human activity that results in sand stabilization also is a concern. Non-native species, including Russian thistle (*Salsola tragus*) and Saharan mustard (*Brassica tournefortii*), can significantly stabilize active sand habitats.

Coachella Valley Fringe-toed Lizard and Coachella Giant Sand-treader Cricket Habitat Vegation

- Active Sand Fields
- Ephemeral Sand Fields
- Stabilized and Partially Stabilized Shielded Sand Fields
- Mesquite Hummocks

Action Area

- Target Acquisition Area
- 2 Agua Caliente Reservation Boundary
- 5 BLM Exchange Area
- 7 Tribal Lands Outside Reservation
- MCCA/VFPA Boundary

Dillon Road

Gene Autry Trail

N W E S

2 0 2 Miles

Job No: TSC-07 Date: 07/22/10

Source: CVAG 2003

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Coachella Valley Fringe-toed Lizard and Coachella Giant Sand-treader Cricket Habitat

AGUA CALIENTE THCP

Figure 19

This species also is being conserved through other conservation efforts elsewhere in the region. Specifically, the Coachella Valley Preserve, the Whitewater Floodplain Reserve, and the Edom Hill/Willow Hole Reserve, while not specifically designed to address this species, conserve nearly 20,000 acres of habitat and blowsand sources.

3.3.2.3 Flat-tailed Horned Lizard (*Phrynosoma mcalli*) Proposed Federal Threatened

The flat-tailed horned lizard is currently being considered for federally listing as threatened (USFWS 2010). The historic range of the flat-tailed horned lizard included suitable habitat in southeastern California, southwestern Arizona, northwestern Sonora, Mexico, and northeastern Baja. The Plan Area is near the northern- 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 and urban development and by the Salton Sea.

The flat-tailed horned lizard typically inhabits desert dry washes and desert flats (stabilized and partially stabilized sand fields) on the valley floor in the Coachella Valley, generally below approximately 800 feet AMSL (Figure 20). The only recorded observations on the Reservation are in Sections 14 and 24 (Township 4 South, Range 5 East). The modeled habitat for this species extends over approximately 15,574 acres of the Action Area, including within the Reservation, approximately 3 acres in the MCCA and 3,392 acres in the VFPA; and 12,182 acres in the off-Reservation Target Acquisition Areas. Most of the potential habitat for this species on the Reservation is found in the northeastern corner along the I-10 corridor.

This species prefers fine sand, into which it burrows to avoid extreme temperatures. This species also requires sparse vegetation coverage. It also occurs far from blowsand on concreted silt and gravel substrates (Beauchamp et al. 1998; Barrows, pers. comm. 2001; Muth and Fisher 1992). In their comparisons of habitat types, Turner et al. (1980) determined that 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 and white bursage.

Like related species, flat-tailed horned lizards are anteaters, or myrrnecophageous. Ants, especially harvester ants (*Pogonomyrmex* sp.), comprise about 98 percent of their diet. The flat-tailed horned lizard is relatively active for a desert lizard. A majority (over 50 percent) of the day is spent in some kind of activity, including feeding, digging burrows, and running. They eat ants they encounter while moving. They dig burrows to escape hot midday temperatures, and for winter hibernation. Most of the remaining activity involves attempting to locate food, suitable burrow sites, and mates. When approached by a potential predator, a flat-tailed horned lizard usually stops moving 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.

Threats to the species include increased mortality and loss of habitat. Threats to habitat within the Coachella Valley include agricultural and urban development, expansion of the Salton Sea and utility corridors, and OHV use. Eighty-four percent of the historic habitat has been lost to urban and agricultural development (Nicol, pers. comm. 2004). This estimate is conservative because much of the remaining habitat is now discontinuous and fragmented. Roads are known to increase desert reptiles' (including flat-tailed horned lizard) mortality dramatically 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.

This lizard is found in the Thousand Palms Preserve.

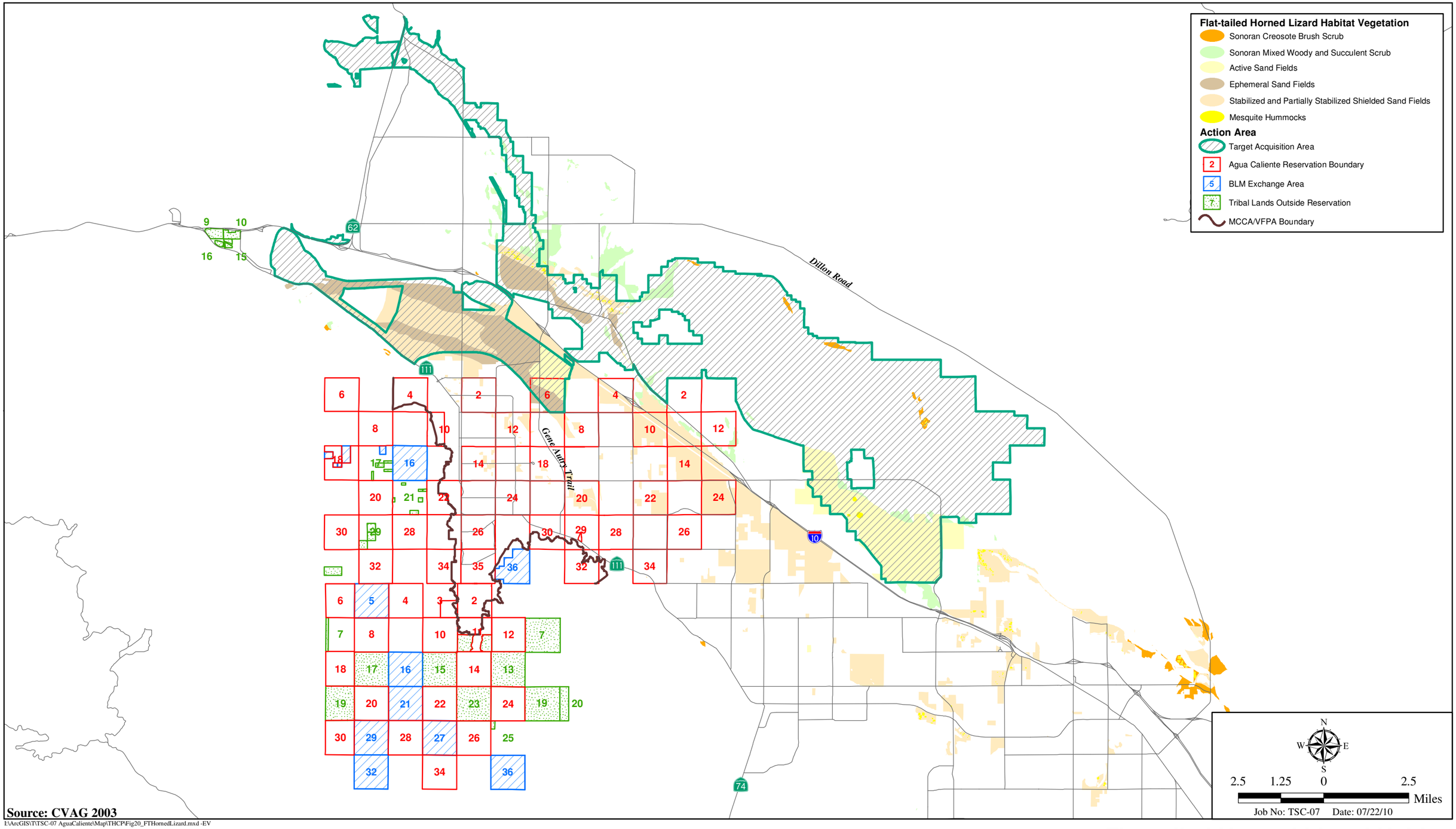
3.3.2.4 Palm Springs Pocket Mouse (*Perognathus longimembris bangsi*) None

The Palm Springs pocket mouse is found in sandy habitats on the valley floor of the Coachella Valley. 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). Generally, its habitat is described as having level to gently sloping topography, sparse to moderate vegetative cover, and loosely packed or sandy soils. Figure 21 depicts the CVAG modeled distribution for this species on the valley floor. The species was found broadly distributed in the Coachella Valley on slopes ranging from 0 to approximately 15 percent.

The Palm Springs pocket mouse has been observed in Sections 4, 6, 10, 12, 14 and 24 (Township 4 South, Range 5 East) on the Reservation. Core Habitat occurs in the off-Reservation Target Acquisition Areas. The modeled distribution extends over approximately 48,687 acres of the Action Area, including, on the Reservation, 352 acres in the MCCA and 6,165 acres in the VFPA; on Tribal Lands outside the Reservation, 5 acres in the MCCA and 144 acres in the VCFA; and 42,021 acres in the off-Reservation Target Acquisition Areas.

Threats to this species and its habitat within the Coachella Valley include agricultural and urban development, construction of roads, railroads, airports and other structures, OHV use, illegal trash dumping, and domestic animal predators. This species is generally associated with sandy soils; thus, long-term viability of populations will require the continued functioning of the sand source and transport systems that sustain the habitat.

Significant populations exist in the Snow Creek and Mission Creek areas as well as three existing preserves: Coachella Valley Preserve, Whitewater Floodplain Reserve, and Edom Hill/Willow Hole Reserve. Considerable unprotected habitat also occurs adjacent to the Edom Hill/Willow Hole Reserve.



Source: CVAG 2003

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Flat-tailed Horned Lizard Habitat

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Figure 20

Palm Springs Pocket Mouse Habitat Vegetation

- Sonoran Creosote Brush Scrub
- Sonoran Mixed Woody and Succulent Scrub
- Desert Dry Wash Woodland
- Active Sand Fields
- Ephemeral Sand Fields
- Stabilized and Partially Stabilized Shielded Sand Fields
- Desert Saltbrush Scrub
- Mesquite Hummocks

Action Area

- Target Acquisition Area
- Agua Caliente Reservation Boundary
- BLM Exchange Area
- Tribal Lands Outside Reservation
- MCCA/VFPA Boundary

Dillon Road

Gene Autry Trail

N W E S

2.5 1.25 0 2.5 Miles

Job No: TSC-07 Date: 07/22/10

Source: CVAG 2003

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Palm Springs Pocket Mouse Habitat

AGUA CALIENTE THCP

Figure 21

3.3.2.5 Palm Springs (Coachella Valley Round-tailed) Ground Squirrel (*Spermophilus tereticaudus* var. *coachellae*) Federal Candidate for Listing

The Palm Springs ground squirrel is a federal candidate for listing and is generally found throughout the Coachella Valley, including the Reservation. The current and historical distribution for the Palm Springs ground squirrel is from San Gorgonio Pass to the vicinity of the Salton Sea (Grinnel and Dixon 1918).

The Palm Springs ground squirrel is a subspecies of the round-tailed ground squirrel that occurs on the floor of the Coachella Valley in habitats associated with sandy substrates. It is typically associated with sand fields and dune formations, 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. They may also be found in areas where sandy substrates occur in Sonoran creosote bush scrub and desert saltbush or desert sink scrub that supports herbaceous growth. In addition to wind blown sand habitats, the squirrel may occur in areas of coarser sands associated with desert dry washes. They seem to prefer open areas with adequate visibility.

This squirrel occurs in sizable 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 Reserve. 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 sandy dunes at the Willow Hole-Edom Hill Reserve/ACEC, has been described as high quality for this species (Dodero 1995), and many individuals were observed there during surveys. From the Willow Hole-Edom Hill Reserve/ACEC, it can be found in sandy habitats within the off-Reservation Target Acquisition Areas to the east. It also is common on the sand dunes at the east end of the Indio Hills.

Recorded locations on the Reservation include the northeastern corner of the Reservation (Sections 4, 10, 13, 14, 20 and 22 of Township 4 South, Range 5 East; Michael Brandman Associates 2001b) and the Palm Springs Airport (CVAG 2003). Figure 22 depicts the CVAG modeled distribution for this species in the Coachella Valley. Potential habitat extends over approximately 30,839 acres of the Action Area, including, on the Reservation, approximately 129 acres in the MCCA and 5,301 acres in the VFPA; on Tribal Lands outside the Reservation, 9 acres in the MCCA, and on Tribal Lands outside the Reservation, 140 acres in the VFPA,, and 25,260 acres of the off-Reservation Target Acquisition Areas. Although the CVAG model includes extensive amounts of rocky and cobbly substrates, the Palm Springs ground squirrel is almost invariably associated with soft, deep sand accumulations amenable to burrowing, such as mesquite stands with pronounced hummocks.

Threats to the Palm Springs ground squirrel 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 OHVs and other surface disturbances that could crush their burrows. At the urban interface, impacts from domestic pets (i.e., 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 the Russian thistle and Saharan mustard may reduce habitat suitability.

3.3.2.6 Coachella Valley Jerusalem Cricket (*Stenopelmatus cahuilaensis*) No Official Status

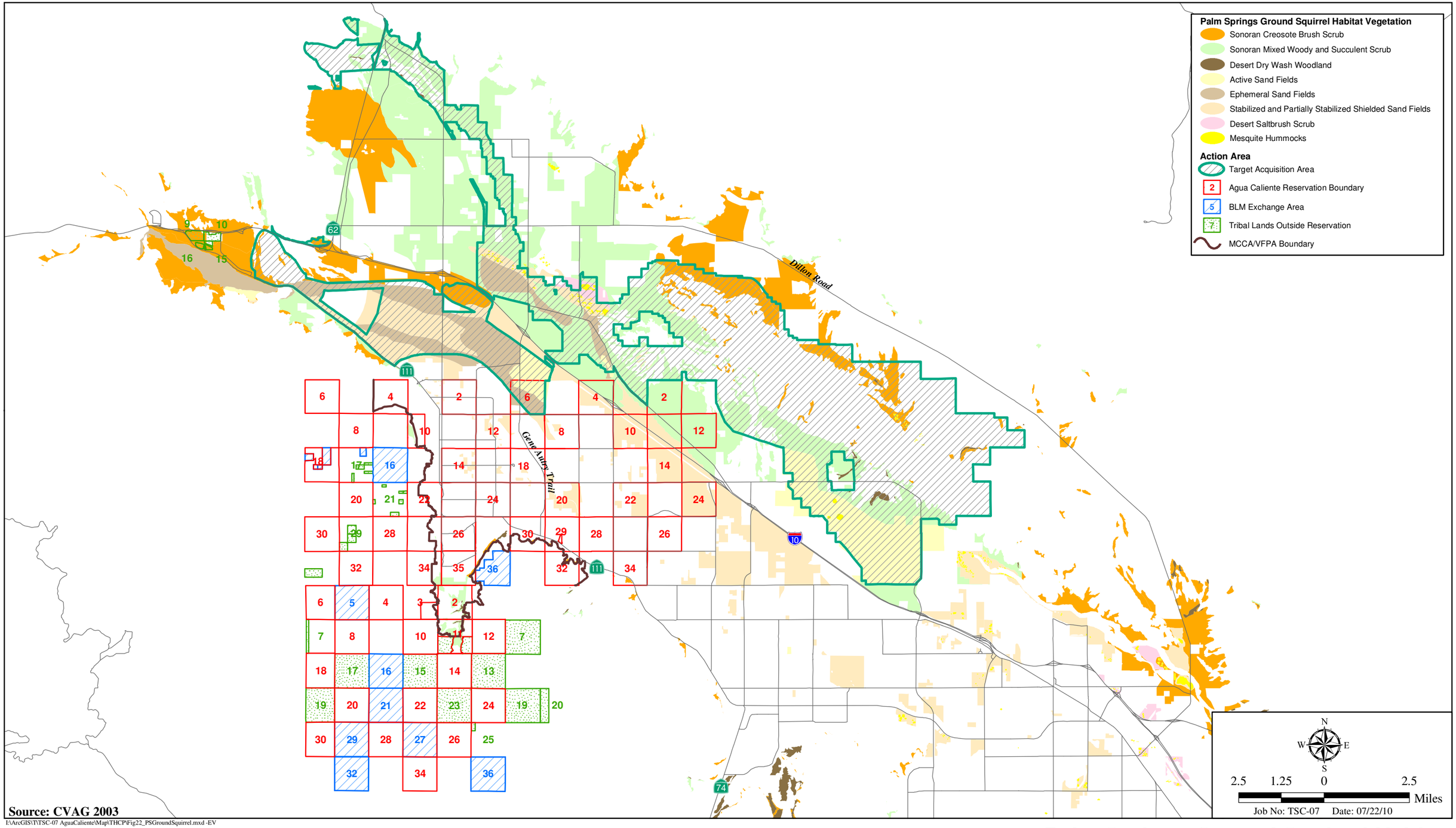
The Coachella Valley Jerusalem cricket inhabits windblown sand habitats on the floor of the Coachella Valley. It is known from the Snow Creek area east to Indian Avenue and within the remnants of sand dune habitat around the Palm Springs Airport. Although they normally occur in sandy to somewhat gravelly sandy soils, they do not necessarily require active blow sand habitat. This species is generally found in windblown active sandy areas with creosote bush, white bursage, Mormon tea, and sandpaper bush.

The Coachella Valley Jerusalem cricket requires high humidity and is most often encountered in the spring when the soil is damp after winter and spring rains. The species is 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. The Coachella Valley Jerusalem cricket has been found associated with the roots of members of the sunflower family, including *Ambrosia* sp. and *Encelia* sp. The species feed at night on roots, tubers, and detritus; they also have been occasionally observed feeding on dead animals and may be cannibalistic.

This species is apparently limited to sand dunes and fields at the west end of the Coachella Valley, where the temperature/moisture gradients are within their tolerance levels. Figure 23 depicts the CVAG modeled distribution for this species in the Coachella Valley. Potential habitat extends over 3,507 acres of the VFPA within the Reservation, 112 acres of Tribal Lands outside the Reservation in the VFPA, and 10,077 acres of the off-Reservation Target Acquisition Areas, for a total of approximately 13,696 acres.

The most significant threats to the Coachella Valley Jerusalem cricket are habitat fragmentation and OHV use within their habitat. OHVs 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 the species uses debris piles.

Known locations where the species has been observed include some of the lands owned by the BLM in the Windy Point area and on lands purchased by the BLM or by the Friends of the Desert Mountains along Snow Creek Road. This Jerusalem cricket has not been detected on the Coachella Valley Preserve despite trapping efforts in this area, and it has not been found in the vicinity of the Whitewater Floodplain Reserve.



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Palm Springs Ground Squirrel Habitat

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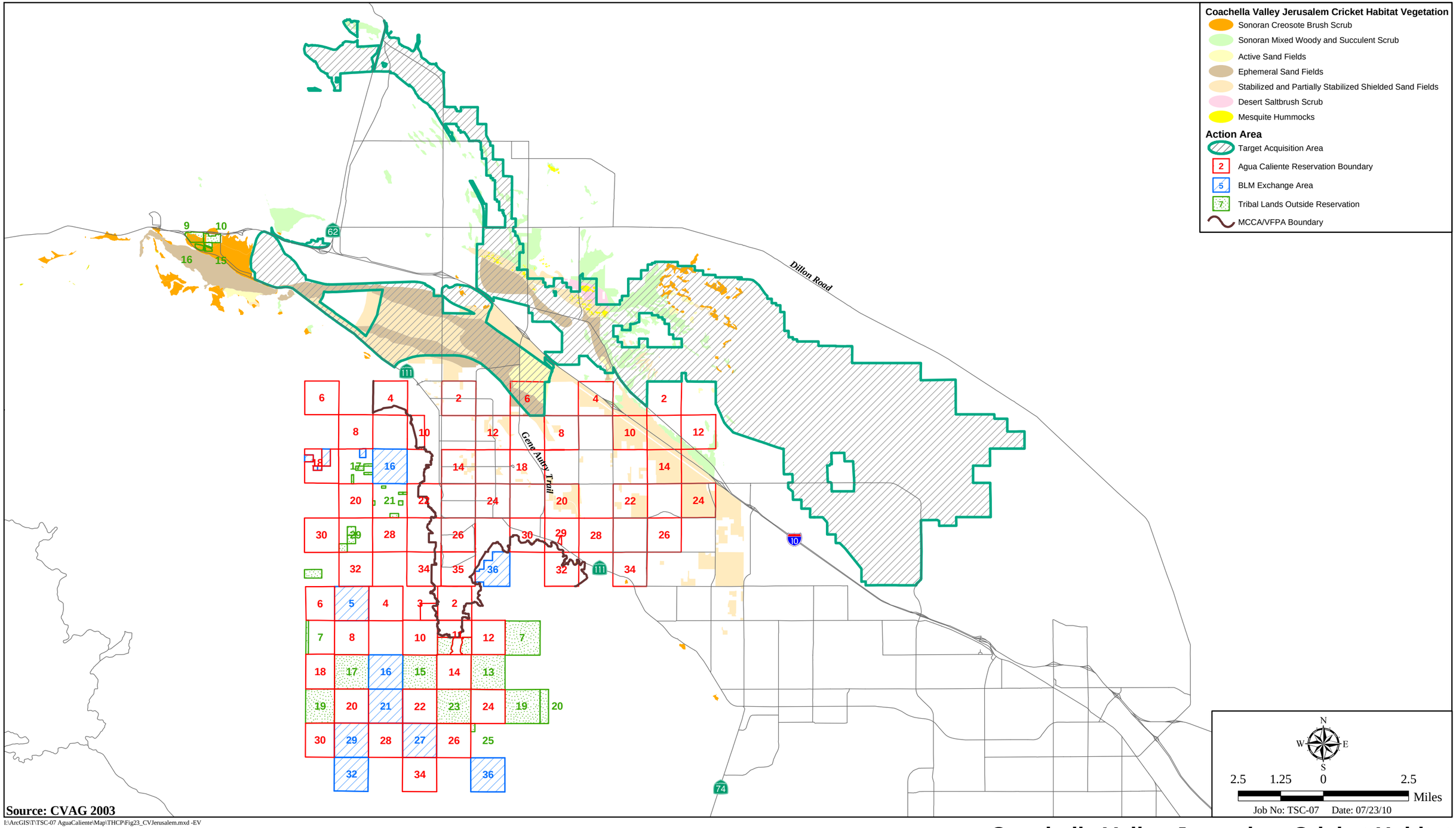
Figure 22



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Coachella Valley Jerusalem Cricket Habitat

AGUA CALIENTE THCP

Figure 23

3.3.2.7 Coachella Valley Milk-vetch (*Astragalus lentiginosus* var. *coachellae*) Federal Endangered

The Coachella Valley milk-vetch is a federally listed endangered species (USFWS 1998b). It is commonly found in sandy flats, washes, and other sand habitats along the I-10 corridor on the valley floor and is endemic to the Coachella Valley. This species has been found on sand dunes and sandy flats, along the disturbed margins of sandy washes, and in sandy soils along roadsides in areas formerly occupied by undisturbed sand dunes. Within the sand dunes and sand fields, this milk-vetch tends to occur in the coarser sands at the margins of dunes, not in the most active blowsand areas. It may also occur in sandy substrates associated with Sonoran creosote bush scrub. This species occurs at elevations from 180 to 1,100 feet AMSL and flowers from February to May.

Populations are known from the Snow Creek area (in the sandy areas on either side of Snow Creek Road east toward Windy Point and scattered along Tipton Road north of Highway 111). 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. 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.

Biological consultants hired by the Tribe surveyed potentially suitable habitat for Coachella Valley milk-vetch on the valley floor of the Reservation, in particular along the I-10 corridor. During surveys conducted in February and May 2001, populations were located that ranged in size from 1 individual plant to populations estimated to be 5,000 plants in size. Coachella Valley milk-vetch was found in 11 of the 20 sections surveyed. The heaviest concentrations of Coachella Valley milk-vetch were in the sand dunes just south of I-10 in Sections 10, 14, 22 and 24 (Township 4 South, Range 5 East). A few scattered plants were also found along the Whitewater River Wash in Sections 6 and 8 (Township 4 South, Range 5 East) and northeast of the Palm Springs Airport in Section 18 (Township 4 South, Range 5 East). It also has been observed in the off-Reservation Target Acquisition Areas.

Figure 24 depicts the CVAG modeled distribution for this species in Coachella Valley. Modeled habitat consists of approximately 23,188 acres in the Action Area, including within the Reservation 45 acres in the MCCA and 4,651 acres in the VFPA, 116 acres of Tribal Lands outside the Reservation in the VCFA, , and 18,376 acres in the off-Reservation Target Acquisition Areas.

This endangered plant species is a perennial or biennial. Flowers are produced from February to May and are pink to deep magenta in color. It is distinguished in part by strongly inflated, mottled pods which, when dried, fall to the ground and blow along the dunes. In years with appropriate climatic conditions, 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. Some initial studies on features of this species' life history are being funded under Section 6 of ESA.

The primary threat to the Coachella Valley milk-vetch 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 OHV use, trampling, and the introduction of non-native plants, including Saharan mustard and Russian thistle. Development of wind energy parks has impacted this species, although the plants can persist as long as disturbance to the species' sandy habitat is minimized.

This species is conserved on the Whitewater Floodplain Preserve, the Edom Hill/Willow Hole Reserve/ACEC, Snow Creek/Windy Point Conservation Area, and Thousand Palms.

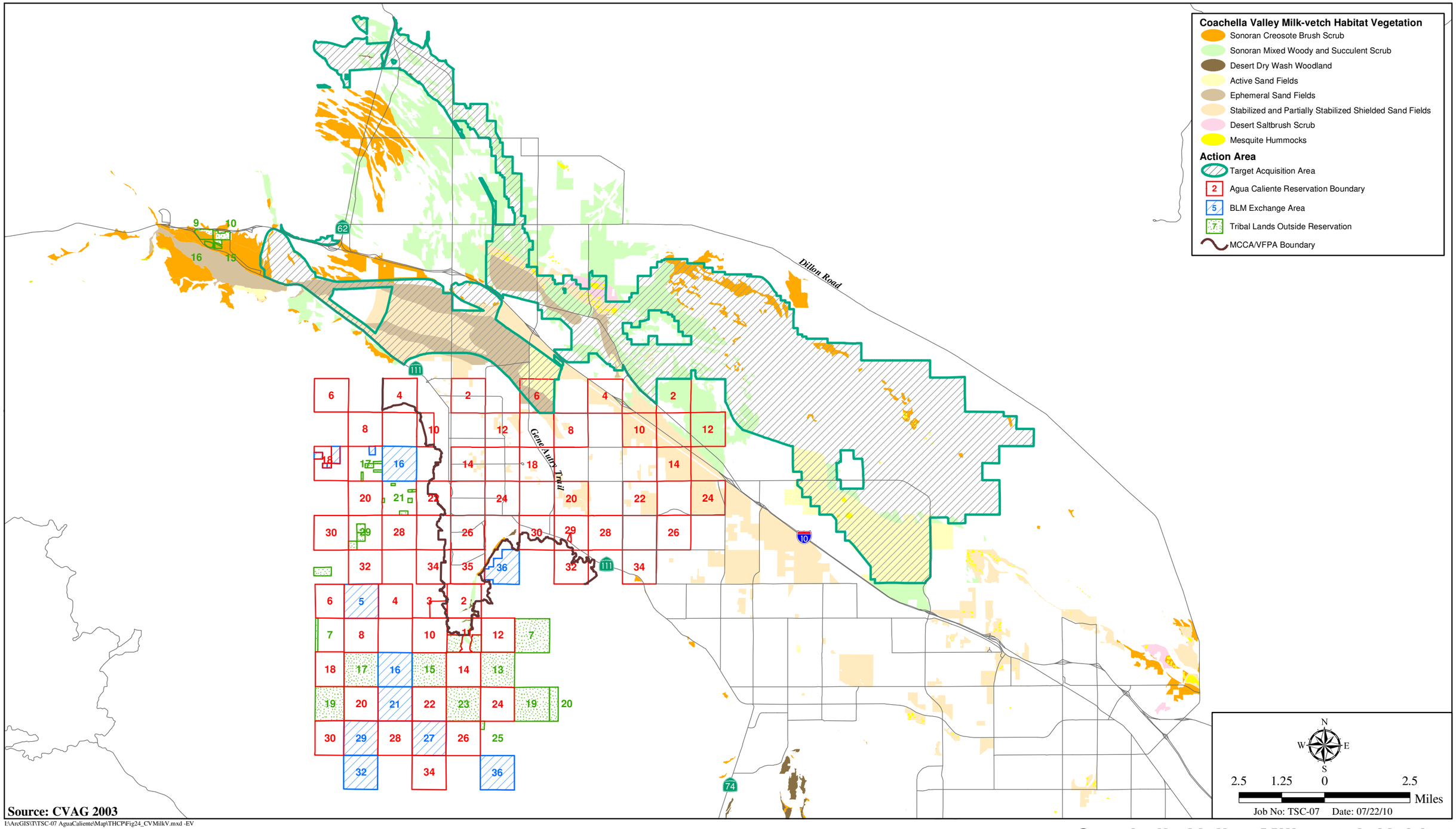
3.3.2.8 Le Conte's Thrasher (*Toxostoma lecontei*) Bird of Conservation Concern

The Le Conte's thrasher is a federal Bird of Conservation Concern. It occurs in a limited area in the southwestern portion of the U.S. and northwestern Mexico. Specifically, the species is known to occur in the San Joaquin Valley and the Mojave and Colorado deserts of California and Nevada into central and coastal Baja. The bird also has been known in the Sonoran Desert from southwestern Utah and western Arizona into western Sonora, Mexico. Despite its moderate distribution, the species is rare, only being observed in patches of this area.

The Le Conte's thrasher occurs in undisturbed, sparsely vegetated desert flats, dunes, alluvial fans, and hills, often in habitat where saltbush or cholla cactus (*Opuntia* sp.) is present. The species usually prefers open areas with sparse patches of ground cover and scattered but contiguous cover in the nearby vicinity. Habitat requirements also include an accumulation of leaf litter on the ground where arthropods, the bird's food source, are present. The presence of surface water in the immediate area does not seem to be a requirement of Le Conte's thrasher, although the species is often found in riparian areas.

Approximately 32,700 acres of modeled habitat for this species occur in the Action Area, including within the Reservation approximately 119 acres in the MCCA and 5,162 acres in the VFPA; 144 acres of Tribal Lands outside the Reservation in the VFPA; and 27,275 acres in the off-Reservation Target Acquisition Areas (Figure 25). This species has not been recorded on the Reservation but has been observed in the off-Reservation Target Acquisition Areas.

Loss of habitat is the primary factor limiting the population size of the Le Conte's thrasher. Urbanization and agriculture often occur in areas with habitat suitable to the bird. Other threats to the species may include fire, pesticides, predation of young by house cats, and collisions with cars.



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Coachella Valley Milk-vetch Habitat

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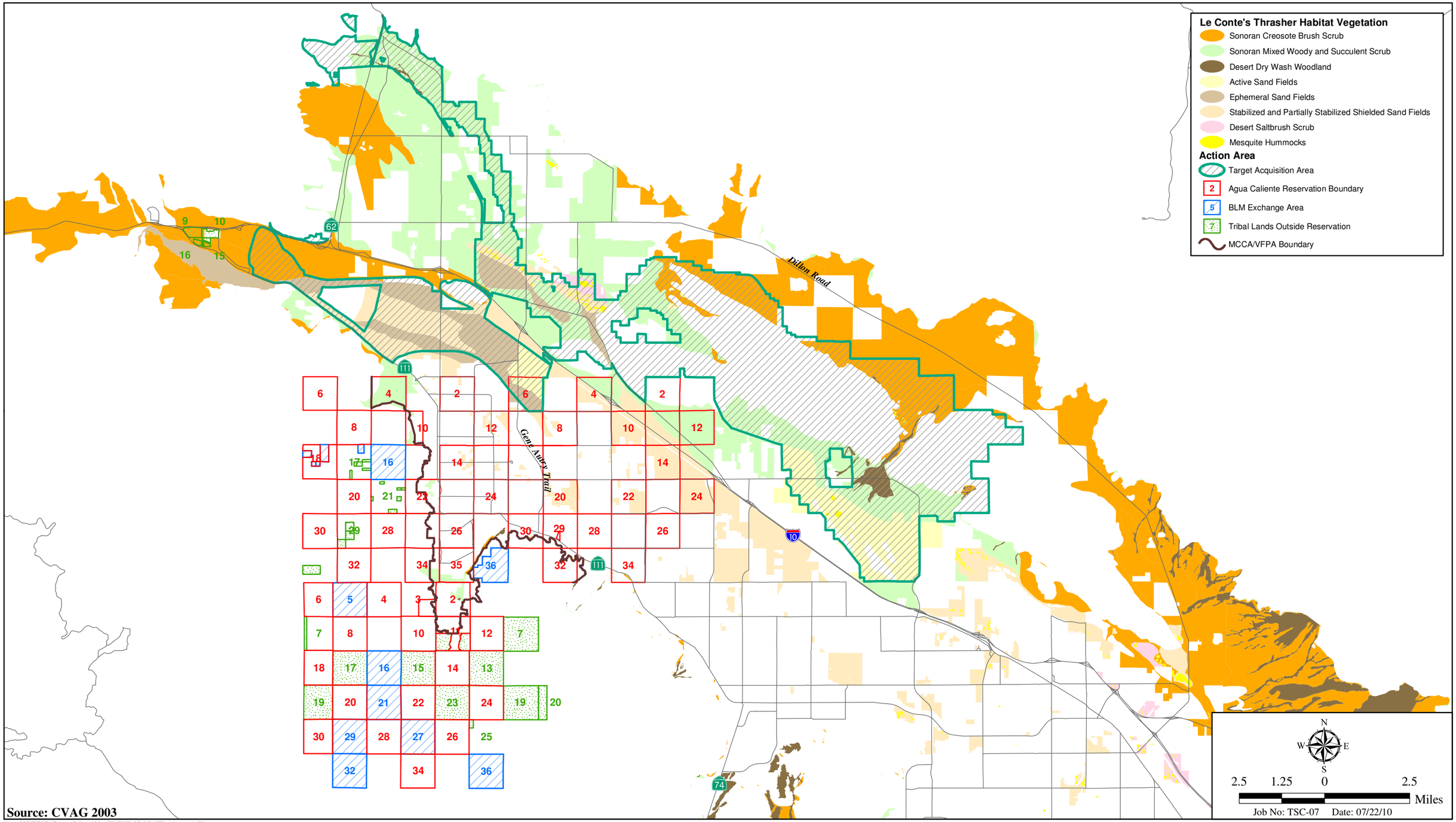
Figure 24



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Le Conte's Thrasher Habitat

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Figure 25

3.3.2.9 Crissal Thrasher (*Toxostoma crissale*) Bird of Conservation Concern

The crissal thrasher is a federal Bird of Conservation Concern. It occurs throughout the southwesternmost portion of the U.S. and northwestern Mexico. Its range in the U.S. includes southeastern California, southern Nevada, the southern portions of Arizona and New Mexico, and the westernmost portion of Texas.

The crissal thrasher is a ground-dwelling bird associated with desert environments. It occupies thickets of dense, shrubby vegetation that provide cover along streams and in washes, such as desert saltbush scrub, screwbean mesquite, ironwood, catclaw acacia, arrowweed willow, and mesquite hummocks. The bird is very secretive, spending much of its time in underbrush.

As a result of the species' reclusive behaviors, very little is known about its habitat requirements or population status; however, loss of habitat is certainly a factor affecting populations of the species. Although it was historically (1920) observed in Section 10 (Township 4 South, Range 4 East) of the Reservation, none of the modeled habitat for this species extends onto the Reservation (Figure 26). It potentially could occur near the base of the San Jacinto Mountains or on the valley floor east of I-10. Approximately 354 acres of potential habitat occur in the off-Reservation Target Acquisition Areas.

3.3.2.10 Little San Bernardino Mountains Gilia (*Linanthus maculatus*) None

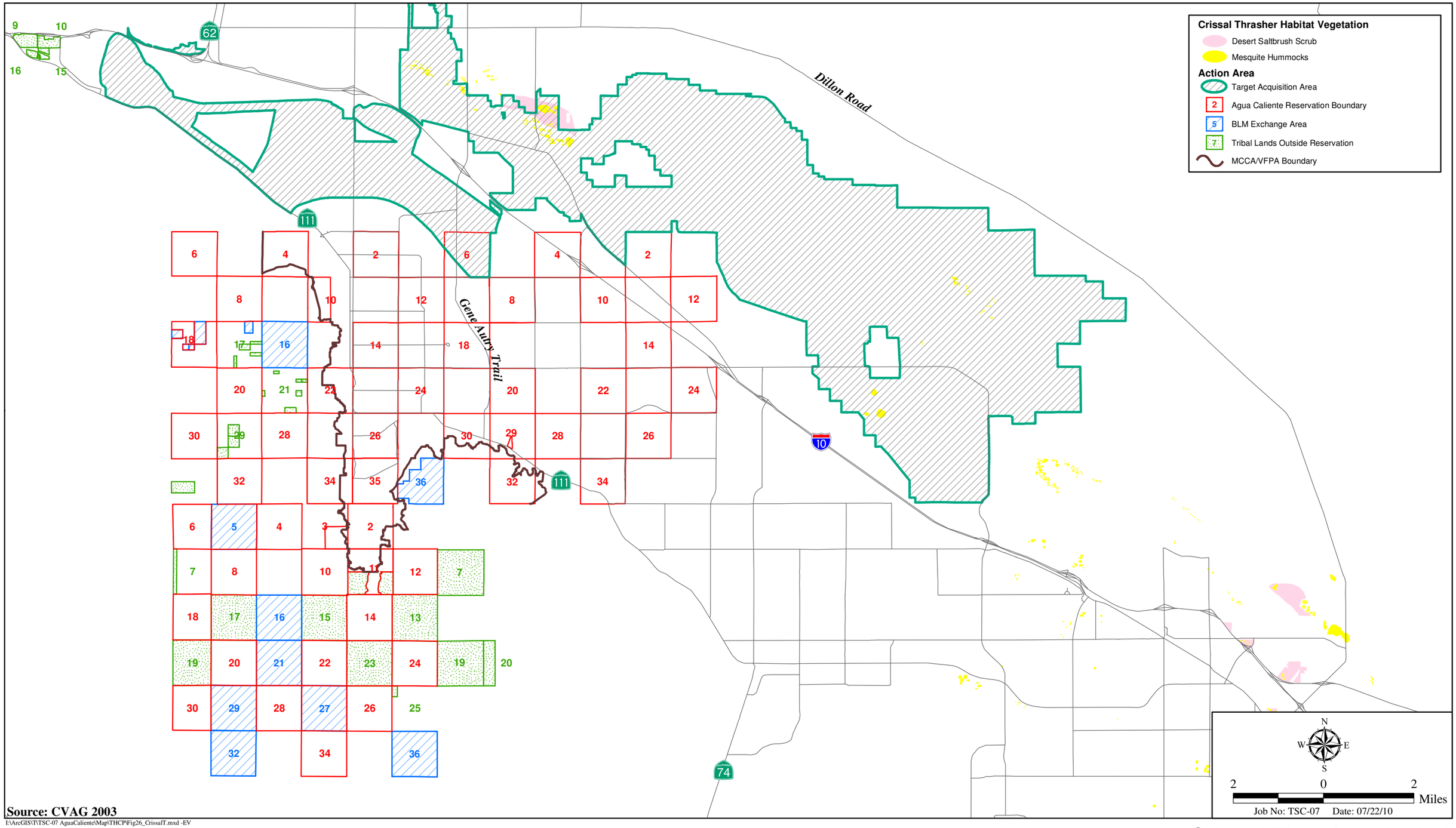
The Little San Bernardino Mountains gilia occurs in the vicinity of the Little San Bernardino Mountains and Mission Creek Canyon to Dry Morongo Wash and Big Morongo Canyon as well as the northwest portion of the Coachella Valley. It also occurs in Whitewater Canyon and from Whitewater to Palm Springs. Recently, an additional population has been discovered in Rattlesnake Canyon on the north side of the San Bernardino Mountains. Populations of this species also occur outside the Action Area along washes at the northern edge of Joshua Tree National Park in the vicinity of Joshua Tree, Yucca Valley, and Twentynine Palms. Additional populations of this species may occur in the 22-mile area between Rattlesnake Canyon and Yucca Valley, but data are lacking.

The Little San Bernardino Mountains gilia is found in loose, soft, sandy soils on low benches along washes, usually in areas where there is evidence of water flow. The plant seems to occur in areas where there is less competition and little shrub or tree cover in the immediate vicinity. The plant is associated with creosote bush scrub, but it avoids growing in the immediate vicinity of other plants. The gilia occurs between the elevations of 500 to 4,000 feet AMSL.

None of the modeled habitat for this species extends onto the Reservation (Figure 27); the species may, however, occur in the bajadas and alluvial fans in the northeastern portion of the Reservation where

habitat may be considered appropriate for this species. Approximately 2,449 acres of potential habitat occur within the off-Reservation Target Acquisition Areas.

The primary threat to this species is increased development near Desert Hot Springs and Highway 62, where the largest populations of the species exist. Only 6 percent of the known locations for Little San Bernardino Mountains gilia are protected in existing public or private conservation areas. Development spreading west from Desert Hot Springs could eliminate the most significant populations, and development pressures are also a concern in the Mission Creek drainage east of Highway 62 and in the Dry Morongo Wash area near Highway 62 and Indian Avenue. Another factor that may impact this species is flood control maintenance activities in the Whitewater Canyon and Mission Creek drainages. Additionally, OHV activity may also be a concern to the species, which occurs along the margins of washes that are often used by riders.



Source: CVAG 2003

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Crissal Thrasher Habitat

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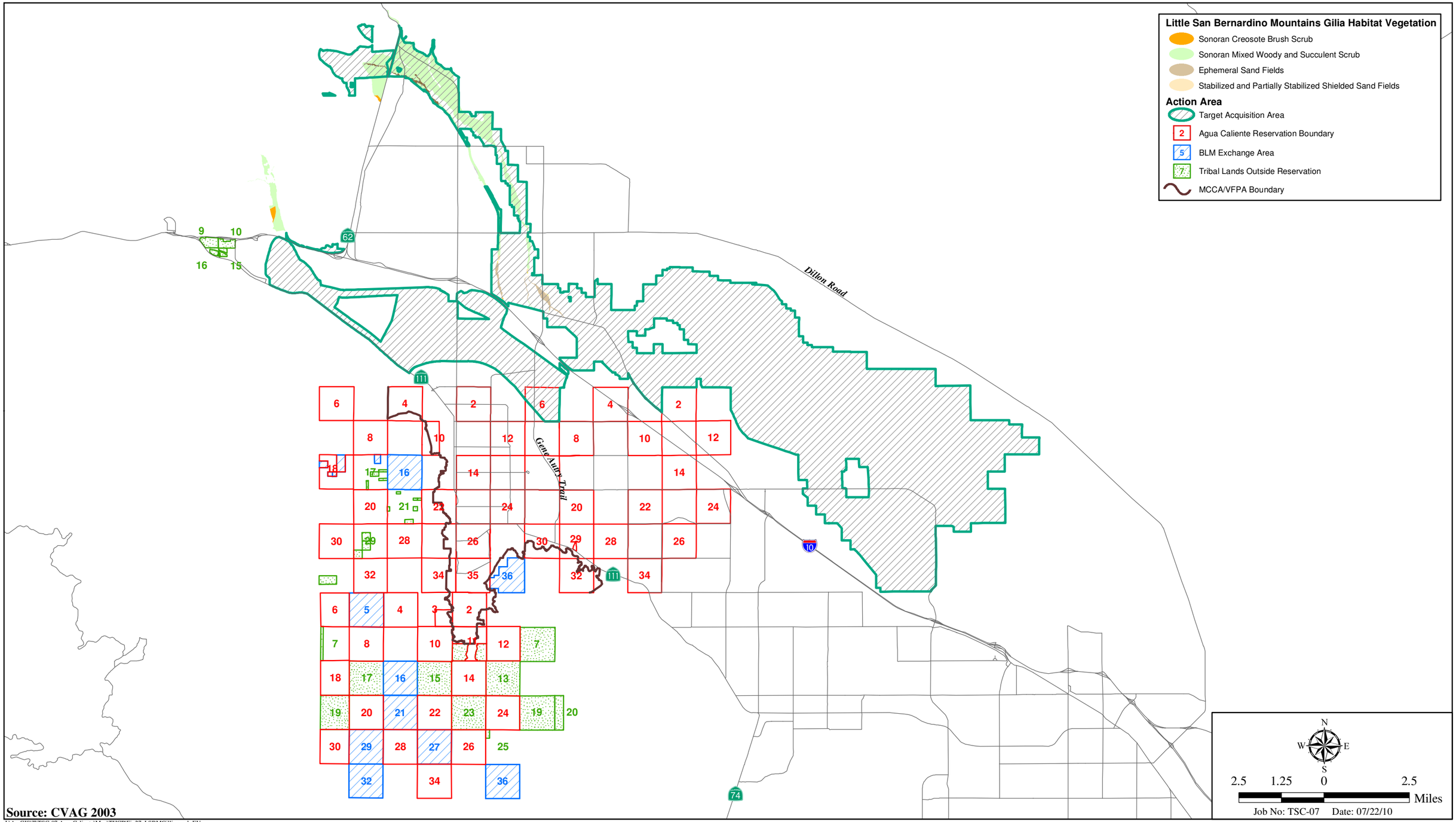
Figure 26



Source: CVAG 2003

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Little San Bernardino Mountains Gilia Habitat

AGUA CALIENTE THCP

Figure 27