APPENDIX 6

BIOLOGICAL RESOURCES

6.1 INTRODUCTION

This appendix presents detailed descriptions of the habitats and species that exist or may be encountered in the Proposed Project area. The appendix is organized as follows:

- Section 6.2: Vegetation Types
- Section 6.3: Special-Status Plant Species Observed in the Western Corridor
- Section 6.4: Special-Status Plant Species with Potential to Occur in the Study Area
- Section 6.5: Special-Status Wildlife Species Observed in the Study Area
- Section 6.6: Special-Status Wildlife Species with Potential to Occur in the Study Area

6.2 VEGETATION TYPES

6.2.1 Alkaline Areas

The accumulation of salt deposits in some drainage areas produces growing conditions suitable only for a unique group of species. There are two unique alkali communities identified in the Proposed Western Corridor, which occupy approximately 28 acres or 0.19 percent of the project area.

Iodine Bush Scrub. This community is characterized by iodine bush (*Allenrolfea occidentalis*) as the dominant species, with alkali heath (*Frankenia grandifolia* var. *campestris*) and various saltbush species *(Atriplex patula, A. fruticulosa,* and *A. parishii)* as associates in this shrub-dominated community. The Salt Springs drainage, located on the north side of Los Banos Reservoir in Segment 2 near MP 5.5, is the only example of this community observed in the project area. Another similar area, not accessible during field studies, occurs in the northerly drainage of Peidra Azul Creek near MP 11, and may also support elements of this vegetation community.

Alkali Playa. The playa community is another alkali plant association. It is dominated by salt grass meadows *(Distichlis spicata* var. *stricta)* in some areas, with a more diverse association in others. The Salt Creek drainage south of Los Banos Reservoir in Segment 2 near MP 8.5 is an example of the simplest grassland type associated with this community. Additional salt grass populations occur in Segment 5 in the Cantua Creek drainage near MP 56 and in the Arroyo Hondo drainage between MP 51 and 52 (see Figure C.3-2a and Figure C.3-2d).

A more complex example of the alkali playa community is found in Segment 4, at the Little Panoche Reservoir, near MP 22.5, although the physical features of the environment do not actually form a playa. Here salt bush, alkali heath, and pickleweed *(Salicornia subterminalis)* form a shrub-dominated community with a meadow-like understory in the lowlands upstream of the impoundment, and along the channel downstream of the inlet structure. Common plant associates in these areas include bladderpod *(Isomeris arborea),* Baltic rush *(Juncus balticus),* and annual grasses.

6.2.2 Grasslands

This most extensive vegetation type in the project area consists of annual and perennial grasslands, which occupy over 11,300 acres, or 75 percent of the 15,000-acre Western Corridor. The introduced annual grasses cover most of the area, with remnant patches of the native perennial grasses, which used to be more extensive in isolated locations.

Cismontane Non-Native Grassland. This community is the most frequently occurring vegetation type along the Western Corridor, throughout Segments 1-6. These grasses provide most of the forage available to range animals and resident wildlife, and include introduced species that arrived with the Spanish colonization (Heady, 1977) and have since replaced most of the native grasses and forbs. Dominant species include red brome *(Bromus rubens),* soft chess *(Bromus mollis),* wild oats *(Avena fatua),* and ripgut brome *(Bromus diandrus*). Annual forbs are also present, with displays of wildflowers occurring during the spring. Common herbaceous species include filaree *(Erodium* sp.*),* western larkspur *(Delphinium hesperium),* mustard *(Brassica campestris),* common fiddleneck *(Amsinckia intermedia),* medick *(Medicago hispida),* owls clover *(Orthocarpus purpurascens),* and various clovers *(Loyus* spp.*)* and Lupines *(Lupinus* spp.*)*.

Cismontane Native Bunchgrass. Examples of the Upland Native Bunchgrass community are infrequently found in the foothills. There is a needlegrass (*Stipa pulchra*) population on a steep slope above the previously described Salt Springs alkali communities, north of Los Banos Reservoir near MP 5.2. Pine bluegrass *(Poa scabrella)* and foothill needlegrass (*Stipa cernua*) populations occur in Segment 5 in the Ciervo Hills near MP 48.5, and the Big Blue Hills, between MP 61.0 and 64.0. Grazing pressure and the high seed production of annual grasses (competition) restrict the ability of the native species to recolonize their former range (see Figure C.3-2a).

6.2.3 Wetlands

Surface water is abundant enough to form wetland communities at several locations in the project area. Two types of marsh observed plant associations are described below. These areas are significant for wildlife, as they provide the few perennial water sources for regional wildlife, along with their own unique assemblage of plants and animals in an otherwise arid environment. These areas comprise approximately 12 acres or 0.08 percent of the project area.

Dominant plant species in these habitats are indicative of wetlands as defined by the U.S. Fish and Wildlife Service (Cowardin, 1977). The species noted below are either listed as wetland obligates (always found in wetlands) or facultative species (usually found in wetlands with 66 to 99 percent frequency), as described by Reed (1986).

Valley Freshwater Marsh. Soil types and low annual rainfall in the study area limit freshwater marsh to only a few locations along the Western Corridor, including:

- Along Billie Wright Road in Segment 2 near MP 2.0
- The edges of Los Banos Creek Reservoir near MP 5.5
- Los Banos Creek below the dam

- Along former gravel pits of Panoche Creek in Segment 5 near MP 35.5
- At scattered sites along Ortigalita Creek in Segment 2 near MP 13.0
- In the margins of various stock ponds.

Freshwater marshes are dominated by bulrush *(Scirpus californicus)*, toad rush *(Juncus bufonius)*, and cattail *(Typhus latifolia)*, with other herbaceous species, such as duckweed *(Lemna gibba)*, western buttercup *(Ranuculus occidentalis)*, and common large monkey flower *(Mimulus guttatus)*, in or adjacent to the water (see Figures C.3-2a and -2b).

Cismontane Alkali Marsh. A marsh community, represented by salt grass, redscale *(Atriplex rosea)*, and common spikeweed *(Hemizonia pungens* ssp. *maritima)*, can be found in areas with standing water where salts accumulate in the surface soils. This community often intergrades with Alkali Playa, depending on the amount of standing water and salinity distribution. In some of the ephemeral creeks, pools may exhibit either freshwater or alkali tolerant species. The reservoir at Little Panoche Creek in Segment 4 near MP 22.5, and portions of Ortigalita (MP 13.0) and Piedra Azul (MP 11.0) Creeks in Segment 2, provide examples of this community (see Figure C.3-2b).

6.2.4 Riparian Communities

Most streams in the study area are ephemeral, with routine surface flow only during the winter and spring of most years. Consequently, extensive riparian vegetation is quite limited and occupies only about 151 acres or one percent of the Western Corridor project area. The few examples of riparian community development are noted below.

Central Coast Riparian Woodlands. The incidence of large trees and an associated herbaceous understory is restricted in the Western Corridor to:

- The drainages of Cantua Creek in Segment 5, near MP 56.0
- In Segments 2 and 3 along Ortigalita Creek, between MP 11.0 and 17.0
- Along the banks of the Los Banos Reservoir in Segment 2 near MP 5.5.

Extensive riparian woodland can be found outside the corridor, in the upper portion of Los Banos Creek at MP 5.2. The site of postponed Los Banos Grandes Reservoir contains mature Fremont cottonwoods *(Populus fremontii)* and one of two identified sites of extensive California sycamore *(Platanus racemosa)* woodlands in California (Holland, 1986).

Cottonwoods along Cantua Creek form a nearly continuous strip of mature trees for approximately three miles in an area otherwise devoid of large woody vegetation. In contrast, the Ortigalita sites support only scattered stands of generally small cottonwoods, with occasional blue elderberries *(Sambucus mexicana)* and willows *(Salix* spp.*)*. There are no other significant stands of trees in the study area, though oak woodlands and some junipers occur at higher elevations, along the western boundary of the corridor (see Figures C.3-2a and –2d).

Alluvial and Riparian Scrub. Stands of shrubs, which are not associated with riparian trees or marsh communities, are classified as riparian scrub. This community type can be found along the following drainages:

- Ortigalita Creek in Segments 2 and 3 between MP 11.0 and 17.0
- Panoche Creek in Segment 5 at MP 35.5
- Little Panoche Creek in Segment 4 near MP 22.5.

Typical plants in this association include various species of salt bush, mule fat *(Baccharis viminea)*, and tamarisk *(Tamarix* sp.) (see Figures C.3-2a and C.3–2b).

6.2.5 Scrub

The vegetation in the Western Corridor study area becomes a mixture of scrubland and grassland in the southern half of the project area, as the terrain increases in relief and the elevation rises more sharply. This community occupies approximately 155 acres or 1 percent of the project area.

The brush-dominated hills bordering the western San Joaquin Valley support relatively few perennials and only one native shrub – common salt bush *(Atriplex polycarpa)*. A few other shrubs also appear, including Russian thistle *(Salsola kali* var. *tenuifolia)*, sagebrush *(Artemisia californica)*, and California buckwheat *(Eriogonum fasciculatum* var. *foliosum)*. The vegetation may be dense to sparse, depending on soil and moisture conditions. Annual grassland species form the understory in this mosaic. The northern and western exposures of the hills tend to support the most robust display of scrub vegetation (see Figures C.3-2a through –2c).

6.2.6 Barrens

Steeper slopes in the southern portion of the study area support a sparse vegetation cover due to unstable surface soils and rapid runoff or infiltration of infrequent rainfall. Serpentine outcrops in the Big Blue Hills and shale barrens at various sites in the Tumey Hills and Monocline Ridge area support a distinctive plant community. This community occupies approximately 12 acres or 0.08 percent of the Western Corridor.

Serpentine Barrens. Serpentine exposures in the Big Blue Hills, between MP 61.0 and 64.0, are characterized by decomposed soils with few rock outcrops. In these areas, the reddish or greenish serpentine rock usually weathers into infertile soils that are high in magnesium and poor in phosphates, potassium, and calcium, and are often too thin to hold moisture. The unique mineral chemistry of these areas limits the types of plants to those tolerant of these soils. Species found here include slender buckwheat *(Eriogonum gracile)*, soap plant *(Chlorogalum pomeridianum)*, bluedicks *(Brodiaea laxa*), and yellow yarrow *(Eriophyllum confertiflorum)* (see Figures C.3-2c and –2d).

Shale Barrens. White shale slopes that support a sparse group of plants, including desert trumpet *(Eriogonum inflatum)*, showy fiddle-neck *(Azusinckia intermedia* var. *eastwoodii)*, California buckwheat, caterpillar phacelia *(Phacelia cicutaria*), bush monkey-flower *(Mimulus auranticus)*, and desert dandelion *(Malacothrix californica)*, occur at several locations along Segment 5 (see Figures C.3-2c and –2d), including:

- The Cantua Creek drainage near MP 56.0
- Monocline Ridge between MP 44.0 and 48.0
- Tumey Hills adjacent to MP 35.0 to 36.0.

6.2.7 Agricultural Lands

Cultivated fields are common throughout much of the southern half of the Western Corridor. Plowing, seeding of vegetable and cotton crops, herbicide application, and other farming practices prevent the establishment of any significant native vegetation that would provide habitat for wildlife species. Second only to grasslands, this community occupies approximately 3,367 acres or 22 percent of the Western Corridor project area.

6.3 SPECIAL-STATUS PLANT SPECIES OBSERVED IN THE WESTERN CORRIDOR

Following are descriptions of the special status plants observed during surveys in the Western Corridor. The following paragraphs also describe the locations in which each plant was observed.

Forked Fiddleneck. Forked fiddleneck is a Federal species of concern and is included on the CNPS List 4 – species not generally considered threatened or endangered, but of limited distribution (Skinner and Pavlik, 1994). It is found in the western San Joaquin Valley and interior South Coast Ranges from San Benito County to Kern County (Hickman, 1993) and occurs in oak woodland and annual grassland habitats, on loose, shaly slopes, from 160 to 4,600 feet elevation (Hickman, 1993; Skinner and Pavlik, 1994). In the annual grasslands, on north-facing slopes within the study area, the species occurs in association with red brome, pine bluegrass (*Poa secunda*), devil's lettuce (*Amsinckia tessellata*), common phacelia (*Phacelia distans*), uropappus (*Uropappus lindleyi*), big tarweed (*Blepharizonia laxa*), and protruding buckwheat (*Eriogonum nudum* var. *indictum*). Forked fiddleneck was encountered in the Ciervo Hills in Segment 5, between MP 47.0 and MP 49.5, and between MP 52.0 and MP 54.5 (see Figure C-3.2c and –2d).

Crownscale. Crownscale has no Federal or State listing status, but is included on the CNPS List 4 (Skinner and Pavlik, 1994). It occurs in saltbush scrub or annual grassland habitats with alkaline soils, generally below 750 feet elevation (Hickman, 1993; Skinner and Pavlik 1994), in association with spinescale (*Atriplex spinifera*), saltgrass (*Distichlis spicata*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), foxtail barley (*Hordeum murinum* ssp. *leporinum*), Italian ryegrass (*Lolium multiflorum*), alkali heath (*Frankenia salina*), common spikeweed (*Centromadia pungens*), alkali mallow (*Malvella leprosa*), recurved larkspur (*Delphinium recurvatum*), and other annual Atriplex species.

Crownscale was encountered in the study area on low terraces associated with intermittent streams, in soils with high levels of salt or alkali — usually on the margins of alkali scalds (barren areas with a surface crust of salts) in Segment 5, between MP 50.0 and MP 51.0, and between MP 66.0 and MP 67.0. In these areas, it is associated with ball saltbush, red brome, red-stemmed filaree (*Erodium cicutarium*), Kellogg's tarweed (*Deinandra kelloggii*), recurved larkspur, and rupturewort (*Herniaria hirsuta*) (see Figure C-3.2c and –2d).

Lost Hills Crownscale. Lost Hills crownscale is a Federal species of concern and the CNPS considers it to be rare, threatened, or endangered in California and elsewhere (CNPS List 1B; Skinner and Pavlik, 1994). The species occurs in California in the inner South Coast Ranges, from Merced County

to Kern County, up to 1,100 feet elevation, on gypsum-rich clay barrens, often in association with spinescale, red brome, small fescue (*Vulpia microstachya*), hollisteria (*Hollisteria lanata*), and annual buckwheat (CNDDB, 2001). Lost Hills crownscale intergrades morphologically with crownscale, and Welsh (2000) has proposed to treat it as a variety (*Atriplex coronata* var. *vallicola*), rather than distinct species.

Lost Hills crownscale was observed in the Tumey Hills, Ciervo Hills, and Monocline Ridge, at numerous locations in Segment 5 between MP 37.0 and MP 56.5. It was found growing on gypsum-rich clay barrens, with spinescale, poverty weed (*Monolepis nuttalliana*), hydra stick-leaf (*Mentzelia afffinis*), desert pincushion (*Chaenactis fremontii*), Great Valley phacelia (*Phacelia ciliata*), Crum's monolopia (*Monolopia stricta*), red brome, woolly plantain (*Plantago ovata*), Mediterranean grass (*Schismus barbatus*), slender-stemmed buckwheat (*Eriogonum gracillimum*), and Fort Mohave buckwheat (*Eriogonum ordii*).

Recurved Larkspur. Recurved larkspur is a Federal species of concern and is also on the CNPS List 1B (rare, threatened, or endangered in California and elsewhere [Skinner and Pavlik, 1994]). It is found in and around the San Joaquin and Sacramento Valleys in Alameda, Contra Costa, Colusa, Fresno, Kings, Kern, Merced, San Luis Obispo, Solano, and Tulare Counties — from 100 to 2,000 feet elevation (Hickman, 1993; Skinner and Pavlik, 1994). It generally occurs in annual grasslands, or in association with saltbush scrub or valley sink scrub, on sandy or clay alkaline soils, and is commonly associated with allscale, red brome, common spikeweed, California goldfields (*Lasthenia californica*), bush seepweed (*Suaeda moquinii*), interior goldenbush (*Isocoma acradenia*), alkali sacaton (*Sporobolus airoides*), and alkali heath (CNDDB, 2001) (see Figures C.3-2c through C.3-2e).

In the Western Corridor, recurved larkspur was found on the lower terraces associated with an intermittent stream — in soils with high levels of salt or alkali — in Segment 5, between MP 44.5 and MP 45.1, and between MP 66.0 and MP 67.0. At these sites, it occurs in association with allscale, red brome, common fiddleneck (*Amsinckia menziesii* var. *intermedia*), red-stemmed filaree, alkali peppergrass (*Lepidium dictyotum*), snake's-head (*Malacothrix coulteri*), and blow-wives (*Achyrachaena mollis*).

Gypsum-Loving Larkspur. Gypsum-loving larkspur has no Federal or State listing status, but is included on CNPS List 4 (Skinner and Pavlik, 1994). It occurs in the foothills bordering the western edge and southern end of the San Joaquin Valley (Lewis and Epling, 1954). Populations generally occur in annual grasslands, on north- or east-facing slopes, on soils rich in gypsum (see Figures C.3-2a through C.3-2e).

This species was encountered at many locations (almost always on north- or east-facing slopes) along the proposed alignment within Segments 2, 3, 4, and 5, between MP 3.9 and MP 28.6 and MP 45.4 and MP 65.5. At these locations, it was found in association with red brome, ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), foxtail barley, slender wild oat (*Avena barbata*), pine bluegrass, red-stemmed filaree, Kellogg's tarweed, tomcat clover (*Trifolium willdenovii*), Menzies'

fiddleneck (*Amsinckia menziesii* var. *menziesii*), chaparral fairyfan (*Clarkia affinis*), pale-yellow mariposa (*Calochortus clavatus* ssp. *pallidus*), big tarweed, and spinescale.

Protruding Buckwheat. Protruding buckwheat has no Federal or State listing status, but is included on CNPS List 4 (Skinner and Pavlik, 1994). It occurs in the inner South Coast Ranges, from Merced County to Kern County, on barren slopes in chaparral, saltbush scrub, and oak woodland habitats — typically on clay soils or serpentinite — at 500 to 2,600 feet elevation (Hickman, 1993; Skinner and Pavlik, 1994).

In the Western Corridor, protruding buckwheat was found in Segment 5 in the Ciervo Hills, between MP 46.0 and 49.5, on gypsum-rich clay barrens, in association with red brome, ripgut brome, red-stemmed filaree, angle-stemmed buckwheat (*Eriogonum angulosum*), pinpoint clover (*Trifolium gracilentum*), Indian clover (*Trifolium albopurpureum*), and forked fiddleneck (see Figures C.3-2c and C.3-2d).

Cottony Buckwheat. Cottony buckwheat is a Federal species of concern and is included on CNPS List 4 (Skinner and Pavlik, 1994). It occurs in the inner South Coast Ranges, the southwest San Joaquin Valley, and the southern Sierra Nevada foothills — from Fresno County to Kern County — at 300 to 1,500 feet elevation on clay soils in saltbush scrub or annual grasslands (Hickman, 1993; Skinner and Pavlik, 1994).

Cottony buckwheat was found on clay barrens in the study area, in association with chia (*Salvia columbariae*), poverty weed, woolly plantain, red brome, Kellogg's tarweed, hollisteria, red-stemmed filaree, woolly fishhooks (*Ancistrocarphus filagineus*), and wild celery (*Apiastrum angustifolium*). It was observed during 2001 field surveys in:

- Segment 4 in the Panoche Hills near MP 25.7
- Segment 5 in the Tumay Hills near MP 39.0
- In the Ciervo Hills, near MP 53.5 and MP 55.5.

Idria Buckwheat. Idria buckwheat has no Federal or State listing status, but is included on CNPS List 4 (Skinner and Pavlik, 1994). It occurs in annual grassland on semi-siliceous, diatomaceous shale in the interior South Coast Ranges of Merced, Fresno, and San Benito Counties, at 1,300 to 2,300 feet elevation (Hickman, 1993; Skinner and Pavlik, 1994). Idria buckwheat was only found at one location within Segment 4, in the Panoche Hills near MP 26.3.

San Benito Poppy. San Benito poppy has no Federal or State listing status, but is included on CNPS List 4 (Skinner and Pavlik, 1994). It occurs in grassy openings in chaparral and oak woodland in the inner South Coast Ranges, including Fresno, San Benito, Monterey, and San Luis Obispo Counties, at 1,600 to 4,900 feet elevation (Hickman, 1993; Skinner and Pavlik, 1994). In the Western Corridor, San Benito poppy was only found at one location in Segment 5 in the Ciervo Hills near MP 49.8.

6.4 SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

The following plants were not observed in the study area during surveys, but they have the potential to occur there based on their characteristics.

San Benito Thornmint. San Benito thornmint (*Acanthomintha obovata* ssp. *obovata*) is a Federal species of concern and is included on CNPS List 4 (Skinner and Pavlik, 1994). It occurs in the interior South Coast Ranges of Fresno, San Benito, Monterey, and San Luis Obispo Counties (Hickman, 1993) in open areas in chaparral and annual grassland, on heavy clay or alkali soils or on serpentinite, between 1,300 and 5,000 feet elevation (Skinner and Pavlik, 1994).

San Benito thornmint was not observed in the study area, although potential habitat is present. Only a few collections have been made in western Fresno County, and most of the known populations in the vicinity of the study area are at higher elevations in San Benito County (CalFlora, 2001). However, San Benito thornmint has been reported in the Ciervo Hills, approximately 10 miles west of the study area (CNDDB, 2001).

Oval-Leaved Snapdragon. Oval-leaved snapdragon (*Antirrhinum ovatum*) has no Federal or State listing status, but is included on CNPS List 4. It occurs in the southern San Joaquin Valley and in the interior South Coast Ranges, from San Benito to Ventura County (Hickman, 1993; Skinner and Pavlik, 1994). It grows in heavy, adobe clay soils on gentle, open slopes; in chaparral, oak woodland, pinyon-juniper woodland, and annual grassland; between 650 and 3,300 feet elevation (Hickman, 1993; Skinner and Pavlik, 1994).

Oval-leaved snapdragon is very unlikely to occur in the study area and there are no records of the species from Merced or Fresno Counties. Most known occurrences are in San Luis Obispo County (CalFlora, 2001). Oval-leaved snapdragon is extremely difficult to survey for because it appears only in certain years (Skinner and Pavlik, 1994) and the environmental cues that determine a favorable year have not yet been determined.

Salinas Milkvetch. Salinas milkvetch (*Astragalus macrodon*) has no Federal or State listing status, but is included on CNPS List 4 (Skinner and Pavlik, 1994). It occurs in the central South Coast Ranges from San Benito County to Kern County, on eroded pale shale or sandstone, or on serpentine alluvium, in openings in chaparral, oak woodlands, and annual grassland (between 950 and 3,100 feet elevation) (Hickman, 1993; Skinner and Pavlik, 1994).

Salinas milkvetch was not observed in the study area and there are no records from Merced or Fresno Counties. All known species occurrences have been west of the study area in the central portion of the South Coast Ranges (CalFlora, 2001). Because Salinas milkvetch would have been evident and identifiable at the time of the survey, it is presumed to be absent from the study area.

Heartscale. Heartscale (*Atriplex cordulata*) is a Federal species of concern and is on the CNPS List 1B. Heartscale occurs along the central trough of the Central Valley, from Butte to Kern County, and

typically grows in alkali grasslands on saline/alkaline soils, in and around slickspot areas[1]. It is commonly associated with saltgrass, low barley (*Hordeum depressum*), Mediterranean barley, common spikeweed, alkali heath, alkali weed (*Cressa truxillensis*), and bush seepweed (CNDDB, 2001). Heartscale often co-occurs with other annual *Atriplex* species, including crownscale, brittlescale (*Atriplex parishii* var. *depressa*), San Joaquin brittlescale (*Atriplex parishii* var. *subtilis*), and lesser saltscale (*Atriplex minuscula*).

Heartscale was not found in the study area and there are no records of the species from western Merced or Fresno Counties. All of the known occurrences in the San Joaquin Valley are in the basin areas of the central portion of the valley (CNDDB, 2001). Because heartscale would have been evident and identifiable at the time of the survey, it is presumed to be absent from the study area.

San Joaquin Spearscale. San Joaquin spearscale (*Atriplex joaquiniana*) is a Federal species of concern and is on the List 1B. It occurs in the Sacramento and northern San Joaquin Valley and at scattered locations in the valleys of the interior Coast Ranges below 1,000 feet elevation. It ranges from Glenn to San Benito County, although historical records from as far south as Tulare County are known (Skinner and Pavlik, 1994). San Joaquin spearscale grows in grasslands or chenopod scrub on clay soils with high saline or alkali levels and is commonly associated with saltgrass, alkali heath, common spikeweed, and several species of barley, peppergrass, and *Atriplex*.

San Joaquin spearscale is unlikely to occur in the study area. The nearest known occurrences are near Los Banos (in central Merced County) and near Hollister (in San Benito County; CNDDB, 2001). Suitable habitat is present in the study area where recurved larkspur and crownscale were observed. Because San Joaquin spearscale would have been evident and identifiable at the time of the survey, it is likely absent from the study area.

Brewer's Clarkia. Brewer's clarkia (*Clarkia breweri*) has no Federal or State listing status, but is included on the CNPS List 4 (Skinner and Pavlik, 1994). It occurs in the Mount Hamilton Ranges and in the northern interior South Coast Ranges, from Alameda to San Benito County. It grows in open, grassy areas in chaparral and oak woodland, often on soil derived from serpentinite, below 3,300 feet elevation (Hickman, 1993; Skinner and Pavlik, 1994).

Brewer's clarkia was not observed in the study area and the nearest occurrence is several miles west of the project alignment in Piedra Azul Canyon, on the east slope of Ortigalita Ridge (CalFlora, 2001). The species normally blooms between June and September, and therefore may not have been evident during the April 2001 field surveys.

Small-Flowered Morning Glory. Small-flowered morning glory (*Convolvulus simulans*) has no Federal or State listing status, but is a CNPS List 4 species (Skinner and Pavlik, 1994). It is widespread, but uncommon, occurring in central Western California from Contra Costa to Kern County and in southwestern California from Los Angeles to San Diego County, including several Channel Islands

[1] Shallow, somewhat circular depressions 1 to 4 meters in diameter. The surface soil in these depressions is slick when wet because of alkalinity or high exchangeable sodium. Vegetation is usually sparse and sometimes absent in the center.

(Hickman, 1993; Skinner and Pavlik, 1994). It grows in grasslands and in grassy openings in chaparral, on wet clay or in serpentinite springs, between 100 and 2,300 feet elevation (Hickman, 1993; Skinner and Pavlik, 1994).

The small-flowered morning glory was not observed in the study area, but is potentially present. It has been collected in the Tumey Hills, approximately 3-4 miles west of MP 40 (CalFlora, 2001). No plants were evident during a pre-survey reconnaissance of this population. The plant may not have been evident in the study area at the time of the survey due to low 2000-2001 rainfall.

Hispid Bird's-Beak. Hispid bird's-beak (*Cordylanthus mollis* ssp. *hispidus*) is a Federal species of concern and is on the CNPS List 1B. It occurs in alkali meadow and alkali sink scrub habitats, below 30 feet elevation in the central and southern Central Valley, primarily in Merced County, but with scattered occurrences in Alameda, Kern, and Placer Counties (Hickman, 1993; CNDDB, 2001). Where it occurs, it is often associated with iodine bush, saltgrass, and other halophytic species (CNDDB, 2001).

This species was not observed in the study area and is very unlikely to occur here. There are no records from western Merced or Fresno Counties, and all known occurrences in the San Joaquin Valley are in the basin areas of the central portion of the valley (CNDDB, 2001). Potential habitat is present along the study area where recurved larkspur and crownscale were observed but as a consequence of the low 2000-2001 rainfall, hispid bird's-beak may not have been evident and identifiable at the time of the survey.

Palmate Bird's-Beak. Palmate bird's-beak (*Cordylanthus palmatus*) is Federally listed as endangered (51 FR 23765, July 1, 1986) and was State-listed as endangered in May 1984. It is also considered rare and endangered in California and elsewhere by CNPS (List 1B; Skinner and Pavlik, 1994). It occurs at scattered locations in the Central Valley, from Colusa to Fresno County, and in Alameda County in the Livermore Valley (Hickman, 1993; CNDDB, 2001). It grows on alkaline clay soils in grassland and alkali sink scrub habitats, below 500 feet elevation in association with iodine bush, bush seepweed, saltgrass, alkali heath, common spikeweed, and other halophytic species.

Palmate bird's-beak was not observed in the study area and is very unlikely to occur here. There are no records from western Merced or Fresno Counties, and all known occurrences in the San Joaquin Valley are in the basin areas of the central portion of the valley (CNDDB, 2001). Potential habitat is present along the study area where recurved larkspur and crownscale were observed. Palmate bird's-beak is a hemiparasite, parasitizing the roots of saltgrass, which was found in the study area in Segments 2 and 5; it has the potential to occur within the study area.

Stink Bells. Stink bells (*Fritillaria agrestis*) is a Federal species of concern and is included on CNPS List 4 (Skinner and Pavlik, 1994). It is uncommon, but has a wide distribution, ranging from the North Coast Ranges to the southern Sacramento Valley and northern San Joaquin Valley, through the South Coast Ranges to Santa Barbara County (Hickman, 1993; Skinner and Pavlik, 1994). It occurs in grasslands and grassy openings in chaparral, oak woodland, and pinyon-juniper woodland; typically on clay soils, but sometimes on serpentinite; and below 5,000 feet elevation (Skinner and Pavlik, 1994).

Stink bells were not observed in the study area and there are no records from the study area. The nearest occurrences are in the Coast Ranges west of Coalinga (CalFlora, 2001). Grasslands in the study area are potential habitat for this species, but because the species typically blooms during March and early April, it may not have been evident by the time the 2001 field surveys were conducted.

Hall's Tarweed. Hall's tarweed (*Deinandra halliana*) has no Federal or State listing status, but is on the CNPS List 1B. It occurs in the central interior South Coast Ranges at scattered locations in Fresno, San Benito, Monterey, and San Luis Obispo Counties (Hickman, 1993; Skinner and Pavlik, 1994) on clay soils in grasslands and in grassy openings in chenopod scrub and oak woodland, from 900 to 3,200 feet elevation (Skinner and Pavlik, 1994).

This species was not observed in the study area, but has been reported from the Ciervo Hills between Arroyo Hondo and Cantua Creek, approximately 7-8 miles west of MP 54.0 (CNDDB, 2001), where conditions are similar to the clay barrens of the Tumey and Ciervo Hills portions of the study area. Hall's tarweed is usually evident only during unusually wet years (Skinner and Pavlik, 1994) and lack of evidence of this species in the study area in 2001 could be a consequence of relatively low 2000-2001 rainfall.

Hoover's Eriastrum. Hoover's eriastrum (*Eriastrum hooveri*) is Federally listed as threatened (55 FR 29370, July 19, 1990), but the U.S. Fish and Wildlife Service (USFWS) has recently proposed to delist this species (66 FR 13474, March 6, 2001). Although there is no State listing for this species, it is considered a plant of limited distribution by the CNPS (List 4; Skinner and Pavlik, 1994). It is found between 165 and 3,000 feet in the Temblor Range and adjacent San Joaquin Valley (CNDDB, 2001), from Fresno, Kings, Kern, Santa Barbara, San Benito, San Luis Obisbo, and Tulare Counties (Skinner and Pavlik, 1994). It occurs in a wide variety of plant communities, including pinyon-juniper woodland, chenopod scrub, and valley and foothill grassland (Hickman, 1993). It grows on sandstone outcrops and shalebanks in the Temblor Range (Twisselmann, 1967), and on mound tops in sparsely vegetated alkaline alluvium fans below 500 feet (CNDDB, 2001). The ideal habitat for this species consists of stabilized silty to sandy soils, low cover of competing herbaceous vegetation, and the presence of cryptogamic crust (a layer of moss, lichen, and algae). However, Hoover's eriastrum also has been found on loamy soils with dense vegetation and no cryptogamic crust (USFWS, 1997). Associated plants include allscale, spinescale, iodine bush, bush seepweed, matchweed (*Gutierrezia californica*), and red brome (Natural Diversity Data Base, 2001; UUSFWS, 1998).

Hoover's eriastrum was not observed in the study area, but potential habitat is found along the flood plains of a number of the streams traversing the study area. This is another species that may only be evident during unusually wet years. Consequently, although no Hoover's eriastrum was found during the 2001 field survey, it may be a consequence of the low 2000-2001 rainfall.

Jepson's Woolly Sunflower. Jepson's woolly sunflower (*Eriophyllum jepsonii*) has no Federal or State listing status, but is included on CNPS' List 4 (Skinner and Pavlik, 1994). It occurs at scattered locations in the South Coast Ranges from Contra Costa County to Ventura County in chaparral, coastal

scrub, and oak woodland, from 650 to 3,400 feet elevation (Hickman, 1993; Skinner and Pavlik, 1994).

Very little coastal scrub habitat is present in the study area, and no Jepson's woolly sunflower was observed during 2001 spring surveys. The nearest occurrence is several miles west of the project alignment, in Piedra Azul Canyon — on the east slope of Ortigalita Ridge (CalFlora, 2001). Though Jepson's woolly sunflower should have been evident and identifiable at the time of the survey, it is still possible that they occur in the study area.

Pale-Yellow Layia. Pale-yellow layia (*Layia heterotricha*) is a Federal species of concern and is on the CNPS List 1B. It occurs in grasslands and in open grassy areas within oak woodland and pinyon-juniper woodland, on alkali or clay soils, from 950 to 5,250 feet elevation in the western San Joaquin Valley and in the adjacent mountains of the South Coast Range, Transverse Ranges, and Tehachapi Mountians — from Fresno County to Ventura County (Hickman, 1993; Skinner and Pavlik, 1994). It is commonly found in association with single-leaf pinyon, interior goldenbush, and pine bluegrass (CNDDB, 2001).

Suitable habitat for pale-yellow layia is present in the study area, and the species has a moderate probability of occurring there. Two occurrences are reported in the vicinity of the study area – one along Cantua Creek, approximately three to four miles west of the study area, and one in the Coalinga Oil Fields, approximately four miles west of the study area. This is another species that is usually evident during unusually wet years and, consequently it may not have been observed during 2001 field surveys as a consequence of the low 2000-2001 rainfall.

Munz' Tidy-Tips. Munz' tidy-tips (*Layia munzii*) has no Federal or State listing status, but is also on the CNPS List 1B. It occurs in grasslands and alkali sink scrub on alkali clay soils, from 500 to 2,300 feet elevation, in the southern San Joaquin Valley from Fresno County to Kern County, and on the Carrizo Plain, San Luis Obispo County (Skinner and Pavlik, 1994). It commonly occurs in association with spinescale and annual grassland species (CNDDB, 2001) (see Figure C.3-2a). .

Munz' tidy-tips was not observed in the study area and there are no records of the species from western Merced or Fresno Counties (CalFlora, 2001). Suitable habitat may be present along the study area where recurved larkspur and crownscale were observed, however, it is unlikely to occur in the study area.

Panoche Peppergrass. Panoche peppergrass (*Lepidium jaredii* ssp. *album*) is a Federal species of concern and is on the CNPS List 1B. It occurs in the interior South Coast Ranges of Fresno, San Benito, and San Luis Obispo Counties in grasslands on alluvial fans and along washes and on gypsum-rich clay barrens, from 600 feet to 900 feet elevation (Skinner and Pavlik, 1994; CNDDB, 2001).

Panoche peppergrass has been reported from Little Panoche Wash, Arroyo Honda, and at three locations in the Ciervo Hills – between six and ten miles west of the project alignment, where it crosses Cantua Creek (CNDDB, 2001). Suitable habitat is present along the study area in the Tumey Hills and in the Ciervo Hills. This is another species that may only be evident during unusually wet years and

therefore may not have been observed during 2001 field surveys as a consequence of the low 2000-2001 rainfall.

Benitoa. Benitoa (*Lessingia occidentalis*) has no Federal or State listing status, but is included on CNPS List 4 (Skinner and Pavlik, 1994). It occurs in the interior South Coast Ranges in Fresno and Monterey Counties between Coalinga and Parkfield and in San Benito County, near Idria (Hickman, 1993) on serpentinite or clay soils in grasslands and open grassy areas in chaparral, oak woodland, and coastal scrub between 1,475 and 2,800 feet elevation (Skinner and Pavlik, 1994).

Benitoa is unlikely to occur in the study area, but has been reported from the Ciervo Hills, approximately 10 miles west of the study area (CNDDB, 2001). Although there is potential habitat for this species in the study area, most known populations occur at higher elevations.

Showy Madia. Showy madia (*Madia radiata*) has no Federal or State listing status, but is on the List 1B. It occurs in the eastern San Francisco Bay Area, the western San Joaquin Valley, and the South Coast Ranges, from Contra Costa County to Santa Barbara County on adobe clay soils in grasslands and in open, grassy areas in oak woodland and chenopod scrub, from 75 to 3,000 feet elevation (Hickman, 1993; Skinner and Pavlik, 1994).

Showy madia has been reported from Big Panoche Creek, Arroyo Honda, and the Ciervo Hills – approximately six miles west of the study area at Cantua Creek. Suitable habitat is present along the study area in the Tumey Hills and in the Ciervo Hills, but this is another species that may only be evident during unusually wet years and may not have been observed during 2001 field surveys due to the low 2000-2001 rainfall.

Hall's Bush-Mallow. Hall's bush-mallow (*Malacothamnus hallii*) has no Federal or State listing status, but is on the CNPS List 1B. It occurs in chaparral and coastal scrub, from 40 to 2,500 feet elevation in the south San Francisco Bay Area and in the northern interior South Coast Ranges (Skinner and Pavlik, 1994).

Very little coastal scrub habitat is present in the study area. The nearest species occurrence is several miles west of the Los Banos Substation, near Pacheco Pass (CNDDB, 2001). Hall's bush mallow is a perennial shrub and would have been evident and identifiable at the time of the survey. Therefore, it is presumed to be absent from the study area.

San Joaquin Woolly-Threads. San Joaquin woolly-threads (*Monolopia congdonii*) is Federally listed as endangered (55 FR 29370, July 19, 1990). There is no State listing for this species, but it is on the CNPS List 1B. It is presently known from Fresno, Kern, Santa Barbara, San Benito, and San Luis Obispo Counties (Skinner and Pavlik, 1994) and is typically found in silty-loamy soils or in wind-modified light soil or sand dunes, in chenopod scrub, and in valley and foothill grassland — from 300 to 2,300 feet (Hickman, 1993; Skinner and Pavlik, 1994; Twisselmann, 1967). San Joaquin woolly-threads may bloom only in years of heavy rainfall (Twisselmann, 1967). It is commonly associated with allscale, desert tea, Mediterranean grass, and red brome (CNDDB, 2001).

San Joaquin woolly-threads occurs in sandy soils in the vicinity of the study area. Although it was not observed during the 2001 field surveys, it may not have been evident as a consequence of the low 2000-2001 rainfall.

Slender Nemacladus. Slender nemacladus (*Nemacladus gracilis*) has no Federal or State listing status, but is included on the CNPS List 4 (Skinner and Pavlik, 1994). It occurs in sandy or gravelly soils in grasslands and oak woodlands, from 400 to 6,250 feet in scattered locations in the southern South Coast Ranges, the Tehachapi Mountains, the Western Transverse Ranges, and the western Mohave Desert (Hickman, 1993).

Slender nemacladus was not observed in the study area, but has been recorded from west of the study area, on Ortigalita Peak and on the Arburua Ranch (CalFlora, 2001).

Arburua Ranch Jewelflower. Arburua Ranch jewelflower (*Streptanthus insignis* ssp. *lyonii*) is a Federal species of concern and is on the CNPS List 1B. It is endemic to Merced County and occurs in coastal scrub dominated by California buckwheat, from 750 to 2,800 feet elevation (Skinner and Pavlik, 1994).

Arburua Ranch jewelflower was not observed and very little coastal scrub habitat is present in the study area. The nearest occurrence is several miles west of the study area on or near Ortigalita Ridge (CNDDB, 2001).

Caper-Fruited Tropidocarpum. Caper-fruited tropidocarpum (*Tropidocarpum capparideum*) is a Federal species of concern, but the CNPS places the species on its List 1A – plants that are believed to be extinct (Skinner and Pavlik, 1994). It was primarily known from the Mount Diablo foothills, although it was reported from a few other scattered locations. Little is known about caper-fruited tropidocarpum, but it is believed to have occurred in alkali grasslands (CNDDB, 2001).

Caper-fruited tropidocarpum was not observed in the study area and would be highly unlikely to occur there. Although potential habitat occurs at locations where recurved larkspur and crownscale were observed, the study area is well outside the species' previous range.

6.5 SPECIAL-STATUS WILDLIFE SPECIES OBSERVED IN THE STUDY AREA

Table C.3-6 in Section C.3 lists the special status wildlife species recorded or with moderate to high potential to occur in the study area. Based on literature search and field surveys, six special status species of mammal, six bird species, three amphibian species, and three reptile species were either observed or have the potential to occur within the Proposed Western Corridor study area. Detailed descriptions of these species are provided below.

Loggerhead Shrike. The loggerhead shrike is designated as a California Species of Special Concern by the CDFG. It is a widespread breeding species in North America, occurring from the southern Canadian provinces, south across most of the United States, and into Mexico (American Ornithologists' Union, 1983). It is a resident species throughout the lowlands and foothills of California (Grinnell and

Miller, 1944) in grasslands, agricultural lands, open shrublands, and open woodlands (Bent, 1950) and nests in low trees, dense shrubs, and vines. It feeds on insects, small reptiles, and small mammals.

Loggerhead shrike populations have declined over much of the United States, especially in the central and eastern United States (Fraser and Luukkonen, 1986). In the western United States, populations have declined more slowly and currently appear to be stable (Fraser and Luukkonen, 1986). The conversion of grassland and open brush fields to agriculture and the increasing trend of farming larger fields, called "clean farming," have eliminated the hedgerows that supported the prey base and perch sites for the species. Pesticide contamination also may have reduced the breeding success of this species by reducing eggshell thickness (Fraser and Luukkonen, 1986).

Numerous individual loggerhead shrikes and several pairs displaying territorial behavior were observed in riparian areas within the study area near MP 36.75 and MP 48.7 in Segment 5. No nests were observed during field surveys; however, the ruderal and annual grasslands present along the study area provide moderate- to high-quality foraging and breeding opportunities for the species.

California Horned Lark. The California horned lark is designated as a California Species of Special Concern. It is one of eight subspecies that breeds in California and is resident along large portions of the Coastal Ranges and the San Joaquin Valley, from Humboldt County south to Baja California (Behle, 1942). Populations have declined in certain portions of their range because of habitat loss to urban and agricultural development. Declines in coastal breeding populations as a result of commercial and residential development are of particular concern (Rorabaugh pers. comm.).

The California horned lark nests in dry grasslands and rangelands with low, sparse cover, and feeds on the seeds of grains, forbs, and grasses and on small insects (Bent 1950). The annual grasslands within the study area provides high-quality nesting habitat for this subspecies, and numerous adult California horned larks were observed in Segment 2 between MP 8.5 and MP 10.0, and in Segment 5 between MP 48.5 and MP 49.5, as well as between MP 57.0 and MP 57.5.

Tricolored Blackbird. The tricolored blackbird is designated as both a Federal and California Species of Special Concern. It is a permanent resident of the Central Valley, from Butte through Kern County, and is found in scattered locations throughout the state. Populations sizes of this species have declined throughout their range because of loss of wetland breeding habitat, nest disturbance, aerial spraying of pesticides and herbicides, and mortality from poisoned grain (Beedy et al., 1991).

The tricolored blackbird nests in dense wetland vegetation and blackberry thickets, and forages in grasslands and agricultural fields as far as four miles from its nesting colonies (Beedy et al. 1991). Approximately 100 tricolored blackbirds were observed foraging in annual grasslands near the drainage between MP 4.0 and 4.5 in Segment 2 of the Proposed Western Corridor. No evidence of nesting was observed and no suitable nesting habitat is present in the study area.

Western Burrowing Owl. The western burrowing owl is both a Federal and California Species of Special Concern. Once a common, permanent resident throughout much of California, population declines were noticeable by the 1940s and have continued to the present (Grinnell and Miller, 1944;

Remsen, 1978). Ground squirrel control measures and the conversion of grasslands to agriculture and other uses are the primary factors responsible for the species' decline (Zarn, 1974).

The burrowing owl prefers open, dry, and nearly level grassland habitats, where it feeds on insects, small mammals, and reptiles (Zeiner et al., 1990). It occupies burrows, typically abandoned ground squirrel and jackrabbit burrows and often can be found on roadside embankments, on levees, and along irrigation canals. The breeding season usually extends from late-February through August. This species is more diurnal than most owls and can often be observed during the day standing outside the entrance to its burrow.

Nearly all the habitat along the proposed alignment is suitable for nesting burrowing owls. Western burrowing owls were one of the most frequently encountered special status wildlife species, with a total of four adults and 10 active burrows identified along the western alignment between MP 14.6 and MP 17.8 in Segment 3 and between MP 52.6 and MP 70 along Segment 5.

Golden Eagle. The golden eagle is a California Species of Special Concern. It is sparsely distributed throughout most of California, occupying primarily mountain and desert habitats. Approximately 500 breeding pairs were estimated to nest in California in 1985 (CDFG, 1985).

The golden eagle constructs its nests on cliff ledges, high rocky outcrops, or in large trees. Grassland, oak savanna, and open woodland and chaparral provide suitable habitat for golden eagle foraging for rabbits and squirrels. No nesting golden eagles or large stick nests were located along the proposed alignment during the 2001 field surveys. One adult bird and one juvenile bird were, however, seen soaring within the study area during field investigations, however, the specific location of this observation was not reported. Suitable foraging habitat for this species occurs along most of the study area.

Northern Harrier. The northern harrier is a California Species of Special Concern. It historically bred throughout California, except in deserts, woodlands, and forested mountains. The breeding range of the northern harrier includes most of the Central Valley, Sacramento-San Joaquin Delta, Suisun Marsh, and portions of the San Francisco Bay (Zeiner et al., 1990).

North American populations of northern harrier have declined during the 20th century, with the major causes being the extensive draining of wetlands, implementation of monoculture farming, and reforestation of open farmlands (MacWhirter and Bildstein, 1996). The northern harrier uses tall grasses and forbs in wetlands and field borders for cover (Zeiner et al., 1990). It roosts on the ground in shrubby vegetation, often near the marsh edge (Brown and Amadon, 1968). The species' breeding season is between April and September, with peak activity in June and July. The northern harrier feeds mainly on voles and other small mammals, birds, small reptiles, crustaceans, and insects.

Several northern harriers were observed foraging in ruderal grassland within Segment 5 near MP 32.3 and MP 66.5; however, no nests or nesting activity was observed.

San Joaquin Antelope Squirrel. The San Joaquin antelope squirrel is listed as threatened in California and designated as a Federal Species of Concern. The species' historical range included the western and southern portions of the Tulare Basin; San Joaquin Valley, in Kern County to near Tipton (Tulare County); the upper Cuyama Valley; and the Carrizo and Elkhorn Plains (Williams and Kilburn, 1992). Grinnell and Dixon (1918) noted that this species was unevenly distributed and occurred in abundance in only a few localities (William and Kilburn, 1992). Today, only the Carrizo and Elkhorn Plains and western Kern County, around Elk Hills, support significant populations of San Joaquin antelope squirrels. Smaller populations also inhabit marginal habitat in the foothills of the western edge of the San Joaquin Valley (CDFG, 1992).

San Joaquin antelope squirrel population declines are due to approximately 80 percent of the species' original geographic range being converted to agriculture, and no prime habitat remains within the San Joaquin Valley (CDFG, 1992). The San Joaquin antelope squirrel inhabits dry grasslands with sandy loam soils, widely spaced alkali scrub vegetation, and dry washes. Hawbecker (1953) reported that this species does not occur in areas where the annual rainfall exceeds 9 inches (Jones & Stokes Associates, 1998).

One San Joaquin antelope squirrel was observed in the entrance to a burrow within Segment 5 near MP 52.5. Potential habitat is present throughout the study area.

Blunt-Nosed Leopard Lizard. The blunt-nosed leopard lizard is listed as endangered under both the California and Federal Endangered Species Acts (ESAs). It was historically found throughout the San Joaquin Valley and adjacent foothills, from San Joaquin to eastern San Luis Obispo County (CDFG, 1992). The lizards currently occupy scattered areas of undeveloped habitat on the San Joaquin Valley floor and in the eastern foothills of the Coast Range (CDFG, 1992).

Population declines are attributable to the elimination of almost all suitable habitats in the San Joaquin Valley by agricultural conversion and urbanization (CDFG, 1992). The use of agricultural pest control programs; intensive grazing; and petroleum and mineral extraction have also contributed to the decline in blunt-nosed leopard lizard populations (Jones & Stokes Associates, 1998).

Blunt-nosed leopard lizards are found in sparsely vegetated plains, alkali flats, grasslands, low foothills, canyon floors, and large washes (CDFG, 1988). They prefer areas with sandy soils and scattered vegetation, and are usually absent from thickly vegetated habitats (Jones & Stokes Associates, 1998). Their breeding season is from late April through May (Zeiner et al., 1988); and breeding females can be easily identified by the orange or reddish spots on their sides (CDFG, 1992). They feed on a variety of insects, as well as other small lizards, and can even be cannibalistic (Zeiner et al., 1988). Their diet can vary, depending on the availability of prey (Jones & Stokes Associates, 1998).

Two juvenile blunt-nosed leopard lizards were observed within Segment 5 near MP 33.0 and MP 59.6. Potential habitat of varying quality for the blunt-nosed leopard lizard is present throughout the much of the proposed alignment. Portions of the proposed corridor that overlap potential blunt-nosed leopard lizard habitat include:

- MP 15 to MP 20 in Segment 3
- MP 20.5 to MP 24.0 in Segment 4
- MP 29.0 to 33.0, MP 38.0 to 46.0
- MP 58.0 to 59.0 in Segment 5.

6.6 SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

San Joaquin Kit Fox. The San Joaquin kit fox is listed as threatened under the California ESA and as endangered under the Federal ESA. Although the precise historical range of the San Joaquin kit fox is unknown, it is believed to have once ranged from Contra Costa and San Joaquin Counties in the north to Kern County in the south. In addition, kit foxes were found in three counties outside this originally defined historical range: Monterey, Santa Clara, and Santa Barbara (Orloff et al., 1986).

The San Joaquin kit fox population has declined primarily as a result of habitat loss to agricultural, urban, industrial, and mineral development in the San Joaquin Valley (USFWS, 1983). Most of the range defined in 1975 still supports kit foxes (CDFG, 1989), although populations are declining (CDFG, 1988) and those in the northern portion of the species' range are small and isolated (USFWS, 1983).

Today, kit foxes occur in seasonal wetland, alkali desert scrub, grassland, and valley foothill hardwood habitats (USFWS, 1983). They usually inhabit areas with loose-textured (friable) soils, suitable for den excavation (USFWS, 1983). Where soils make digging difficult, the foxes frequently use and modify burrows built by other animals (Orloff et al., 1986). Structures such as culverts, abandoned pipelines, and well casings also may be used as den sites (USFWS, 1983).

Kit foxes are primarily nocturnal and carnivorous. Major prey includes kangaroo rats, black-tailed hares, desert cottontails, deer mice, and California ground squirrels. Although kangaroo rats are a dominant prey item in the San Joaquin Valley (USFWS, 1983), California ground squirrels are the most important prey item in other portions of the kit fox's range (Balestreri, 1981; Hall, 1983; O'Farrell et al., 1987; Clifton, 1989). Kit foxes apparently do not require drinking water (Egoscue, 1956; Morrell, 1972).

No sightings of San Joaquin kit fox or their specific sign were recorded during the field surveys. Potential dens for San Joaquin kit fox and/or American badger were, however, located within the study area, though the specific locations of these potential dens were not reported. Most of the potential dens identified as kit fox or badger (as defined by USFWS guidelines) had larger openings (from 6 to 10 inches in diameter) than the average ground squirrel burrows present within the study area. Many of these potential kit fox or badger burrows showed evidence of recent excavation activity.

American Badger. The American badger is designated in California as a Species of Special Concern. The species historically ranged throughout much of the state, except in humid coastal forests. Badgers were once numerous in the Central Valley; however populations now occur in low numbers in the surrounding peripheral parts of the valley and in the adjacent lowlands of eastern Monterey, San Benito, and San Luis Obispo Counties (Williams, 1986).

Badgers currently occupy a variety of habitats, including grasslands and savannas. The principal requirements seem to be significant food supply; friable soils; and relatively open, uncultivated ground (Williams, 1986). No sightings of American badger were recorded during the field surveys, however, potential badger dens were located during field surveys along the corridor.

Giant Kangaroo Rat. The giant kangaroo rat is listed as endangered under both the California and Federal ESAs. The historic distribution of the giant kangaroo rat included the foothills of the western San Joaquin Valley, from the base of the Tehachapi Mountains in the south to just south of Los Banos (Merced County) in the north; the Carrizo and Elkhorn Plains; and the Cuyama Valley. The species is scattered among six major geographic regions (Williams et al., 1997):

- The Panoche Region in western Fresno and eastern San Benito Counties
- The Kettleman Hills in Kings County
- San Juan Creek Valley in San Luis Obispo County
- Lokern, Elk Hills, and other areas in western Kern County
- The Carrizo Plain Natural Area in eastern San Luis Obispo County
- The Cuyama Valley in Santa Barbara and San Luis Obispo Counties.

Continuing loss of habitat to agriculture and other land-modifying actions is the primary reason for the decline in giant kangaroo rat populations. Intensive livestock grazing and the use of rodenticides may also contribute to the continued decline of this species (Williams, 1980).

Giant kangaroo rats require sparsely vegetated grasslands with good drainage, fine sandy-loam soils, and a gentle slope (CDFG, 1992). Populations are limited to areas with less than six inches of rain and are generally found at elevations of less than 3,000 feet (Williams, 1992). The species feeds almost exclusively on the seeds of annual plants, such as bromes and filarees. Individuals harvest, stack, and dry the grasses and forbs near the entrance to their burrows (CDFG, 1992).

Although no individuals were observed directly, possible giant kangaroo rat tracks and burrows were observed throughout Segment 5 at a number of locations between MP 38.0 and MP 68.5. Potential habitat of varying quality occurs along portions of Segment 5 near MPs 40.5, 40.9, 51.1, and 62.7.

Short-Nosed Kangaroo Rat. The short-nosed kangaroo rat is a California Species of Special Concern. Its historic distribution is not well known, but it is believed that they once occupied arid grassland and shrubland associations along the western half of the San Joaquin Valley floor and the hills on the western edge of from about Los Banos, Merced County, south to the foothills of the Tehachapi Range. This historic range extended east and north, inland, above the edge of the Valley floor to Poso Creek, north of Bakersfield. Short-nosed kangaroo rats also occurred in the Carrizo Plain and in the upper Cuyama Valley (Grinnell, 1920; Boolootian, 1954; Hoffman, 1974; Hall, 1981; Williams and Kilburn, 1992; Williams et al., 1993; Hafner, 1979; Williams, 1985). Their current range includes the southwestern San Joaquin valley, west of the California Aqueduct, at elevations up to 1,800 feet. Population declines are largely due to extensive agricultural development. In some areas, use of rodenticides to control California ground squirrels may have contributed to population declines (Williams and Kilburn, 1992).

Short-nosed kangaroo rats are a permanent resident of alkali desert scrub habitat and herbaceous habitats with scattered shrubs (Zeiner et al., 1990). They generally are found in areas with light, friable soils, such as the sandy bottoms and banks of arroyos and other sandy areas (Williams and Tordoff, 1988). Short-nosed kangaroo rats forage on open ground and under shrubs, eating mainly seeds of annual forbs and grasses. Food items are collected and stored temporarily in cheek pouches, and some is later cached in small holes dug into the sides of burrows (Zeiner et al., 1990).

Possible short-nosed kangaroo rat sign was observed within Segment 6 between MP 70.0 and MP70.5, and potential habitat occurs along the Western Corridor from the Merced and Fresno County line south to the Gates Substation.

Yuma Myotis. The mammal Yuma myotis (*Myotis yumanensis*) is a bat that is a Federal Species of Concern. Its range extends across western North America from British Columbia to central Mexico, and from the West Coast to as far east as Idaho and west Texas. It is widespread in California, except within the Mojave and Colorado Desert regions (Zeiner et al., 1990). The species is threatened by human disturbance of maternity colonies in caves and buildings. It may also be affected by closure of abandoned mines. Some riparian management practices may also be detrimental and result in the loss of roost sites (Western Bat Working Group, 1998; Arizona Game and Fish Department 1993).

The Yuma myotis is found in a wide variety of habitats, ranging from sea level to 11,000 feet, but is uncommon to rare above 8,000 feet (Zeiner et al., 1990). Optimum habitats include cliffs and rocky walls near desert scrub, pinyon-juniper woodlands, and other open woodlands and forests. The bat roosts in narrow crevices in rock outcrops, bridges, buildings and, occasionally, in mines (Hoffmeister, 1986). Like many bat species, it is closely tied to an open water source for foraging and drinking (Zeiner et al., 1990) and tends to be found near permanent watercourses such as rivers, streams, creeks, or ponds (Arizona Game and Fish Department, 1997).

The Yuma myotis feeds largely on emergent aquatic insects, such as mayflies, caddisflies, and midges (Hoffmeiste, 1986), but may also take moths, leafhoppers, June beetles, ground beetles, muscid flies, and craneflies. It forages directly over the surface of quiet open water and above adjacent vegetation (Easterla and Whitaker, 1972).

Potential habitat for Yuma myotis was observed within the study area at an abandoned mine (specific site not stated in 1986 Draft EIS/EIR).

California Tiger Salamander. The California tiger salamander is a candidate for Federal listing as threatened or endangered and is a California Species of Special Concern. Historically, the species occurred in grassland habitats throughout much of the state, but subsequent conversion to agricultural and urban uses has reduced the species' range and size of breeding populations (Stebbins, 1985). Residential development in the salamander's range has fragmented vernal pool complexes and reduced habitat suitability for the species (Gustafson, 1992). The introduction of the bullfrog and non-native fishes (i.e., *Gambusia* sp.), which prey on salamander larvae and often eliminate larval populations from breeding sites, also has contributed to population declines (Jennings and Hayes, 1994).

Currently, the California tiger salamander occurs in the Central Valley and Sierra Nevada foothills, from Yolo County south to Tulare County, and in the coastal valleys and foothills from Sonoma County south to Santa Barbara County (Zeiner et al., 1988). Isolated populations exist at Gray Lodge Wildlife Area in Butte County (Jennings et al., 1994) and at Grass Lake in Siskiyou County (Zeiner et al., 1988). The species inhabit valley and foothill grasslands and open woodlands, usually within 1.0 mile of water (Jennings and Hayes, 1994). They breed in reservoirs, ponds, vernal pools, small lakes, and slow-flowing streams that do not support predatory fish (Stebbins, 1972; Zeiner et al., 1988). They require ground burrows for cover during the nonbreeding season and during migration to and from aquatic breeding sites (Zeiner et al., 1988). They also use shrink-swell cracks in the ground, boards and planks, and logs for cover (Holland et al., 1990). Adult salamanders migrate from upland habitats to aquatic breeding sites during the first major rainfall events of fall and early winter, and return to upland habitats after breeding. Juveniles disperse from aquatic breeding sites to upland habitats after metamorphosis. California tiger salamanders may not reproduce during years of low rainfall (Jennings and Hayes, 1994).

Potential habitat for California tiger salamanders was associated with stock ponds and pool areas in drainages in Segment 2 near MP 4.3 and Segment 5 at MPs 57.3, 64.1, and 65.1.

California Red-Legged Frog. The California red-legged frog is listed as threatened under the Federal ESA and has been designated in California as a Fully-Protected Species. Historically, the red-legged frog was common from Redding south to Baja California, in the lower elevations of the Sierra Nevada and Coast Ranges. The species has sustained a 70 percent reduction in its geographic range in California as a result of several factors acting singly or in combination (Jennings et al., 1992). Habitat loss and alteration, overexploitation, and introduction of exotic predators were significant factors in the California red-legged frog's decline in the early to mid 1900s. It is estimated that California red-legged frogs were extirpated from the Central Valley floor before 1960. Remaining aggregations (assemblages of one or more individuals, not necessarily a viable population) of California red-legged frogs in the Sierran foothills became fragmented and were later eliminated by reservoir construction, continued expansion of exotic predators, grazing, and prolonged drought. Within the Central Valley hydrographic basin, only 14 drainages on the Coast Ranges slope of the San Joaquin Valley and one drainage in the Sierran foothills are actually known to support or may support California red-legged frogs, compared to over 60 historic locality records for this basin (a 77 percent reduction).

The current range of this species is much reduced from its historic distribution, and most remaining populations are found in central California along the coast from Marin County south to Ventura County, though several populations have been identified in the Sierra Nevada foothills. The USFWS has proposed 31 red-legged frog Critical Habitat Units (CHU) along California's coast and in the northern Sierra Nevada (see Figure Ap.6-1); this corridor is in CHU 15.

Within its range, the red-legged frog breeds in lowland streams and wetlands, including livestock ponds. Red-legged frogs also may be found in upland habitats near breeding areas and along intermittent drainages connecting wetlands.

Figure Ap.6-1

Critical Habitat for the California Red-Legged Frog

[See link on webpage]

The decline of the red-legged frog is attributable to a variety of factors. During the late 1800s to mid-1900s, the species' distribution was substantially reduced by the conversion of wetland habitat to agricultural uses in the Central Valley and elsewhere. Large-scale commercial harvest for food during this period probably also had some detrimental effect (Jennings and Hayes, 1994). Continued recent declines are attributed to the ongoing loss of wetland and stream habitat (especially from dam construction and water management activities) and the introduction of non-native predators and competitors, including bullfrogs (*Rana catesbeiana*), crayfish (*Procambarus clarki*), and mosquito fish (*Gambusia* spp.), which feed on the frog larvae (Jennings and Hayes, 1994).

Red-legged frogs require coldwater pond habitats, including pools, streams, and ponds, with emergent and submergent vegetation (Storer, 1925; Stebbins, 1972). Habitats with the highest densities of frogs are deepwater pools (at least 2.5 feet deep) with dense stands of overhanging willows (*Salix* sp.) and a fringe of tules (*Scirpus* sp.) or cattails (*Typha* sp.) (Hayes and Jennings, 1988; Jennings, 1988; Jennings and Hayes, 1994). Juvenile frogs seem to favor open, shallow aquatic habitats with dense submergent vegetation. Although red-legged frogs can inhabit either ephemeral or permanent streams or ponds, populations probably cannot be maintained in ephemeral streams in which all surface water disappears (Jennings and Hayes, 1994).

The diet of red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food item for juveniles and adults. Vertebrates, such as Pacific tree frogs (*Pseudacris [Hyla] regilla*) and California deer mice (*Peromyscus californicus*), represented more than half of the prey mass eaten by larger frogs. Juvenile frogs have been active diurnally and nocturnally, whereas adult frogs were largely nocturnal. Feeding activity probably occurs along the shoreline and on the surface of the water (Hayes and Tennant, 1985).

Potential red-legged frog habitat was associated with stock ponds and pool areas in drainages in Segment 2 near MP 4.3 and Segment 5 at MPs 57.3, 64.1, and 65.1. The nearest CNDDB records for the red-legged frog are approximately three miles west of the proposed corridor near Carrisalito Flats.

Foothill Yellow-Legged Frog. The foothill yellow-legged frog is both a Federal and California Species of Concern. It occurs in the Coast Ranges, from the Oregon border south to the Transverse Mountains in Los Angeles County, west of the Cascade crest in most of northern California, and in the Sierra Nevada foothills south to Kern County, from sea level to 6,000 feet (Stebbins, 1985).

Foothill yellow-legged frogs occupy rocky streams in valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow types of habitat. They are rarely found far from water and will often dive into water to take refuge under rocks or sediment when disturbed (Zeiner et al., 1988). Potential foothill yellow-legged frog habitat at MP 36.7, in Segment 5, consisted of a single, low-flow drainage with cobble/boulder substrate. Although no foothill yellow-legged frogs were observed in the western alignment area, CNDDB records also indicate a single occurrence directly adjacent to the project area near MP 6.1.

San Joaquin Whipsnake. The San Joaquin whipsnake is a California Species of Special Concern. It is endemic to dry, open areas (e.g. grassland and saltbush scrub [Jennings and Hayes, 1994]) in the western San Joaquin Valley. Its current distribution coincides with its historic distribution – from Colusa County, south along the west side of the San Joaquin Valley to the Grapevine in Kern County and west to the inner South Coast Ranges. An isolated population has been identified in the Sutter Buttes (Jennings and Hayes, 1994). San Joaquin whipsnake populations have declined throughout much of their historical range due to loss of habitat associated with agricultural and urban development.

The San Joaquin whipsnake, like other *M. flagellum* subspecies, maintains a higher active body temperature than many other snakes. It will not emerge from its burrow until temperatures reach 28º C; therefore, it does not emerge from the burrow until late in the season (April/May) and late in the day. This snake uses mammal burrows for refuge and for nesting sites. Mating occurs in May. The San Joaquin whipsnake feeds on lizards, small birds, and small mammals and may eat carrion (Jennings and Hayes, 1994).

No San Joaquin whipsnakes were observed during the field surveys. However, there is a single CNDDB record within 1,000 feet of the survey area near MP 15.0, and potential habitat is present within the study area.

Southwestern Pond Turtle. The southwestern pond turtle is a Federal and California Species of Special Concern. Historically, this pond turtle occurred in most Pacific slope drainages, from Washington south through California to Baja California (Stebbins, 1985; Jennings and Hayes, 1994). Jennings and Hayes (1994) report that the species is endangered from the Salinas River south, coastally, and from the Mokelumne River south (inland) in the San Joaquin hydrographic basin.

Southwestern pond turtle populations have declined in California for a number of reasons. Historically, these turtles were heavily exploited for food in parts of the species' range. Habitat alteration from changes in land and water use and from abusive grazing practices, have negatively affected the species range and population sizes. These circumstances have been exacerbated by periods of drought (Holland, 1991). Predation on juvenile turtles by introduced bullfrogs (Moyle 1973, Holland 1991, Jennings and Hayes 1994) and introduced fish (Holland, 1991; Jennings and Hayes, 1994) likely have also extracted a significant toll on turtle populations. In addition, southwestern pond turtle populations in the west that have been examined show an age (size) structure increasingly biased toward adults, which indicates little or no recruitment is occurring (Holland, 1991; Jennings and Hayes, 1994).

The western pond turtle is an aquatic species that leaves aquatic habitats only to reproduce, aestivate and, in some cases, to overwinter. Along the central and southern coast of California, western pond turtles may be active year-round (Holland, 1985 and 1991; Zeiner et al., 1988). Its preferred habitat includes ponds, lakes, and low-gradient streams with basking sites such as logs, rocks, or dense aquatic vegetation mats.

Potential habitat for southwestern pond turtles (consisting of stock ponds and pool areas in drainages) occurs in Segment 2 near MP 4.3 and Segment 5 at MPs 57.3, 64.1, and 65.1. However, there were no direct observations of southwestern pond turtles within the proposed corridor.

[References for information in this Appendix may be found at the end of Section C.3, Biological Resources.]