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Federal or State Endangered and Threatened Species

Bay Checkerspot Butterfly (*Euphydryas editha bayensis*). Federal Listing Status: Threatened; State Listing Status: None. The life cycle of the Bay checkerspot butterfly is closely tied to the biology of its primary larval host plant, the dwarf plantain. Secondary host plants, purple owl's-clover and exserted paintbrush (*Castilleja exserta*), also are important sources of food for both larvae and adults (Black and Vaughn 2005). Populations of the Bay checkerspot butterfly are restricted to areas with shallow serpentine-derived or similar soils that have substantial populations of dwarf plantain, which are highly fragmented and isolated (USFWS 2008a).

The Bay checkerspot butterfly formerly ranged around San Francisco Bay, from Twin Peaks and San Bruno Mountain in San Francisco east to Contra Costa County, and south to Santa Clara County (USFWS 1998b). However, the current known range has been reduced to Santa Clara County, where patches of the species' habitat are still present (USFWS 2008a), and to San Mateo County, where it was extirpated but where reintroduction has recently been attempted. The Bay checkerspot butterfly was listed as threatened in September 1987 (USFWS 1987), and critical habitat was finalized in September 2008 (USFWS 2008a). Nine of this species' critical habitat units occur within or adjacent to the Project Area.

The distribution of the Bay checkerspot butterfly in and near the Project Area is fairly well represented by critical habitat, which was designated for the species by the USFWS in 2008 (USFWS 2008a); this distribution and designated critical habitat are shown in Figure 3.3-5. The species and its habitat are known to be present along Coyote Ridge within the Metcalf and Kirby critical habitat units, in the Santa Teresa Hills within the Santa Teresa Hills critical habitat unit, on the northern half of Tulare Hill within the Tulare Hill critical habitat unit, on the northernmost of the two subunits of the Kalana Hills critical habitat unit on the west side of Coyote Valley, west of Calero Reservoir in the Calero Reservoir critical habitat unit, adjacent to Hale Avenue in the Hale critical habitat unit, in the western foothills of the Santa Clara Valley in the San Martin critical habitat unit, and in small patches of grassland just west of Coyote Reservoir in the Bear Ranch critical habitat unit (USFWS 2008a, ICF Jones & Stokes 2010). All of these areas contain serpentine grasslands that provide sufficient populations of host plant species. Given the intensive nature of research that has been conducted on this species, it is unlikely to occur in areas that are not currently known.

Relative to Proposed Project work sites, the Bay checkerspot butterfly is known or expected to occur in the following locations, based on designated critical habitat:

- along the Coyote Canal, from the vicinity of the U.S. Highway 101 crossing of Coyote Creek (north of Morgan Hill) northwest to the point at which the canal crosses westward under U.S. Highway 101; in two limited areas just south of Bailey Avenue; and in a relatively limited area between Field Sports County Park and U.S. Highway 101 north of Bailey Avenue—in these areas, Bay checkerspot is likely to occur very infrequently (e.g., only in or following years of high population size), if at all, given that these sites are located so low at the toe of the slope of Coyote Ridge;

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- along the Coyote Canal Extension just northwest of Field Sports County Park—again, Bay checkerspot is likely to occur very infrequently (e.g., only in or following years of high population size), if at all, in this location because it is located so low at the toe of the slope of Coyote Ridge;
- along upper Silver Creek, near Yerba Buena Road, Proposed Project activities are projected in a few very limited areas that are designated as Bay checkerspot critical habitat but that likely do not support the species, given the riparian nature of the habitat present;
- along Coyote Alamitos Canal along the northwestern edge of Tulare Hill, some potential exists for Bay checkerspot to occur along the canal, especially in years of high population size;
- along Coyote Alamitos Canal along the northern edge of the Santa Teresa Hills, a very low probability of occurrence of the butterfly exists in this area because of unsuitability of habitat; critical habitat actually ends just upslope from the canal in most of this area; and
- along Almaden Calero Canal in the San Vicente area west of Calero Reservoir, some potential exists for Bay checkerspot to occur along the canal.

The following designated Bay checkerspot butterfly critical habitat units occur in the Project Area: Metcalf (Unit 5), Tulare Hill (Unit 6), Santa Teresa Hills (Unit 7), Calero Reservoir (Unit 8), Kalana Hills (Unit 9), Hale (Unit 10), Bear Ranch (Unit 11), San Martin (Unit 12), and Kirby (Unit 13)

Green Sturgeon (*Acipenser medirostris*). Federal Listing Status: Threatened; State Listing Status: Species of Special Concern. The NMFS listed the southern Distinct Population Segment (DPS) of the green sturgeon as threatened on April 7, 2006 (NMFS 2006). Critical habitat for the southern DPS was designated on October 9, 2009 (NMFS 2009). All tidally influenced areas of San Francisco Bay in the Project Area, up to the elevation of mean higher high water have been designated as critical habitat. The range of the green sturgeon extends from Ensenada, Mexico, to the Bering Sea; the species occurs in coastal waters from the San Francisco Bay to Canada.

Green sturgeon occur widely in accessible estuarine habitat and, in summer and fall, the species is found in estuaries not associated with known spawning activity and where no records exist of their occurrence farther up the river system. Spawning within the southern DPS occurs predominantly in the upper Sacramento River. (Adams et al. 2007)

Green sturgeon juveniles are found throughout the Sacramento/San Joaquin River delta and portions of San Francisco Bay. Although little is known about the distribution and abundance of green sturgeon in South San Francisco Bay, the species appears to be relatively rare in the South Bay. The CDFG conducts monthly monitoring of fish assemblages at numerous sites in the San Francisco, San Pablo, and Suisun bays, using otter trawls and midwater trawls, of which 13 sites are in South San Francisco Bay. Between 1980 and 2006, 69 green sturgeon were captured in the San Francisco Estuary; however, only four green sturgeon were collected in the South Bay during this time, two at a main channel site near the Bay Bridge and two at a shoal site north of the San Mateo Bridge (R. Baxter, CDFG,

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unpublished data). According to NMFS (2009), a sport fishing group reported catches of two green sturgeon in Central San Francisco Bay, three in South-Central San Francisco Bay, and four in South San Francisco Bay in 2006.

No evidence exists that the southern green sturgeon has ever spawned in any creeks in the Project Area or anywhere else in the South Bay. Based on this species' preferences for streams having strong flow over large cobbles in deep pools, it is unlikely that South Bay tributaries historically provided suitable spawning habitat, and such habitat is certainly absent now. If the species occurs in lower portions of sloughs in the Project Area, it is not expected to swim far upstream because no spawning habitat exists to which such fish would be migrating. Thus, the species is likely to occur in the Project Area only irregularly and in low numbers because of the very limited abundance of the species in the vicinity. Furthermore, few encounters are expected because of the limited extent of SMP Update activities proposed in tidal habitats.

Longfin Smelt (*Spirinchus thaleichthys*). Federal Listing Status: Proposed Endangered; State Listing Status: Threatened. This southernmost population of longfin smelt is found as far north as Prince William Sound, Alaska, and occurs in the San Francisco Bay. The longfin smelt was declared a threatened species under the CESA in March 2009, and has been petitioned for listing as endangered under the FESA (USFWS 2008b). Suisun and San Pablo bays, where salinity generally ranges from 2 to 20 parts per thousand, support the most abundant populations of non-breeding longfin smelt in the Bay area. Spawning occurs in fresh water in the upper end of the San Francisco Bay and in the Sacramento-San Joaquin Delta (Wernette 2000). Longfin smelt occur in the South Bay year-round, as pre-spawning adults and yearling juveniles (Wernette 2000), and the species has been collected in the Alviso area and in Alviso Slough (EDAW 2007). In 2010, this species also was collected within the Island Ponds (Hobbs 2011), located between Coyote Slough and Mud Slough, breached in June 2006 for tidal marsh restoration. However, this species is not known to spawn in the Project Area, and the species is likely to occur in the Project Area infrequently and in low numbers because of the very limited abundance of the species in the vicinity. Furthermore, few encounters are expected because of the limited extent of Project activities proposed in tidal habitats.

Central California Coast Steelhead (*Oncorhynchus mykiss*). Federal Listing Status: Threatened; State Listing Status: None. The steelhead is an anadromous form of rainbow trout that migrates upstream from the ocean to spawn in late fall or early winter, when flows are sufficient to allow it to reach suitable habitat in far upstream areas. In the Project Area, adults typically migrate to spawning areas from late December through early April, and both adults and smolts migrate downstream from February through May. Steelhead typically spawn in gravel substrates located in clear, cool, perennial sections of relatively undisturbed streams, with dense canopy cover that provides shade, woody debris, and organic matter. Steelhead usually cannot survive long in pools or streams with water temperatures above 70 °F; however, they can use warmer habitats if adequate food is available. Steelhead populations have declined because of degradation of spawning and rearing habitat, introduction of barriers to upstream migration, over-harvesting by recreational fisheries, and reduction in winter flows because of damming and spring flows caused by water diversion.

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The NMFS has categorized steelhead into DPS. The Central California Coast DPS consists of all runs from the Russian River in Sonoma County south to Aptos Creek in Santa Cruz County, including all steelhead spawning in streams that flow into the San Francisco Bay. In 1998, the NMFS published a final rule to list the Central California Coast DPS as threatened under the FESA (NMFS 1998). Critical habitat for this DPS was designated on September 2, 2005 (NMFS 2005). In the Project Area, designated critical habitat includes accessible reaches of Upper Penitencia, Coyote, Stevens, San Francisquito, and Los Trancos creeks, as well as the Arroyo Aguague and the Guadalupe River upstream nearly to its confluence with Los Gatos Creek (Figure 3.3-6).

Steelhead historically have occurred more abundantly in streams throughout the Project Area, but it now is relatively rare because of urbanization, the presence of barriers to movement, and loss of spawning and rearing habitat (Leidy et al. 2005). In the Project Area, Central California Coast steelhead is known to occur in, and suitable spawning habitat is present in, Coyote Creek, Upper Penitencia Creek, Los Gatos Creek, Alamitos Creek, Calero Creek, Guadalupe Creek, Stevens Creek, San Francisquito Creek, and the Guadalupe River (Figure 3.3-6) (Leidy et al. 2005, NMFS 2005). This species also may be present in Calero Creek, though it does not appear to be present in Ross Creek (Leidy et al. 2005). Steelhead is absent from Lower Penitencia Creek, Calabazas Creek, the portion of Saratoga Creek that intersects the Project Area, San Tomas Aquino Creek, Thompson Creek, Canoas Creek, and Berryessa Creek, and it is unlikely to be present in Lower Silver Creek (Leidy et al. 2005). Steelhead potentially can spawn in virtually any reach of streams in the Project Area that offer suitable spawning habitat and lack downstream barriers to dispersal, and it likely occurs in all accessible portions of streams in the Project Area during migration between the ocean and upstream spawning and rearing areas. Tidal channels in brackish marshes, such as sloughs in the Alviso area, may provide habitat for juveniles during the process of smoltification (i.e., physiological adaptation to the saltwater environment). Table I-1 presents the upper limits of Central California Coast steelhead distribution within creeks in the Project Area.

Table I-1. Central California Coast Steelhead Distribution in the Project Area

Creek/River	Upper Limit of Steelhead Distribution
Alamitos Creek	Almaden Dam
Arroyo Calero	Calero Dam
Arroyo Aguague	Falls upstream from confluence with Upper Penitencia Creek
Coyote Creek	Leroy Anderson Dam/Anderson Lake
Guadalupe River	Guadalupe Dam
Los Gatos Creek	Camden Avenue Drop Structure
Los Trancos Creek	Approximately 0.4 mile north of headwaters
San Francisquito Creek	Searsville Dam
Stevens Creek	Stevens Creek Dam
Upper Penitencia Creek	Cherry Flat Dam (Cherry Flat Reservoir)

Source: CalFish 2010

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South-Central California Coast Steelhead (*Oncorhynchus mykiss*). Federal Listing Status: Threatened; State Listing Status: None. The South-Central California Coast steelhead includes all steelhead spawning from the Pajaro River south to (but not including) the Santa Maria River. In 1997, NMFS published a final rule to list the South-Central California Coast DPS of steelhead as threatened under the FESA. Critical habitat for this DPS was designated on September 2, 2005 (NMFS 2005). In the Project Area, designated critical habitat includes accessible reaches of Pacheco, Cedar, Llagas, Uvas/Carnadero, Tar, Bodfish, Little Arthur, and Pescadero creeks, as well as the Pajaro River.

In the Project Area, South-Central California Coast steelhead is known to occur in the Pajaro River watershed, including the streams listed in Table I-2 (Figure 3.3-6). The majority of South-Central California Coast steelhead in the Project Area apparently breeds in Uvas Creek. Steelhead likely occurs in all accessible portions of these streams during migration between the ocean and upstream spawning and rearing areas. Steelhead is able to access Llagas Creek, although it is likely unable to reach suitable spawning habitat because of low flows in the lower reaches. Table I-2 presents the upper limits of South-Central California Coast steelhead distribution within creeks in the Project Area.

Table I-2. South-Central California Coast Steelhead Distribution in the Project Area

Creek/River	Upper Limit of Steelhead Distribution
Bodfish Creek	Bodfish Creek Falls
Cedar Creek	Approx. 3 miles north of Cedar Creek Boulder Falls #2
Little Arthur Creek	Cement Dam (near Redwood Retreat Road crossing)
Llagas Creek	Chesbro Reservoir Dam
Pacheco Creek	North Fork Dam
Pajaro River	Steelhead occur in all portions of the creek within Santa Clara County
Pescadero Creek	Creek source
South Fork Pacheco Creek	South Fork Pacheco Creek Boulder Falls
Tar Creek	Southern end of Castro Valley approximately 1.8 river miles from source
Uvas/Carnadero Creek	Uvas Dam

Source: CalFish 2010

California Tiger Salamander (*Ambystoma californiense*). Federal Listing Status: Threatened (Central Population); State Listing Status: Endangered. The California tiger salamander's preferred breeding habitat consists of temporary (minimum of 3-4 months), ponded environments (e.g., vernal pool, ephemeral pool, or human-made ponds) surrounded by uplands that support small mammal burrows. California tiger salamander also will utilize permanent ponds provided aquatic, vertebrate predators are not present. Such ponds provide breeding and larval habitat, while burrows of small mammals such as California ground squirrels and valley pocket gophers in upland habitats provide refugia for juveniles and adults during the dry season.

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The range of the California tiger salamander is restricted to the Central Valley and the South Coast Range of California from Butte County south to Santa Barbara County. Tiger salamander has disappeared from a significant portion of its range because of habitat loss from agriculture and urbanization and the introduction of non-native aquatic predators. The California tiger salamander was listed as threatened in August 2004 (USFWS 2004a), and critical habitat was designated in August 2005 (USFWS 2005b). Designated critical habitat in the Project Area includes Unit 3 east of Calaveras Reservoir; Unit 5 northeast of Cherry Flat Reservoir; Unit 6 along Mt. Hamilton Road; Unit 7 near the northwestern end of Anderson Reservoir; Unit 8 located around Calero Reservoir; Unit 9 southwest of Coyote Reservoir; Units 10a and 10b west/southwest of San Martin; Unit 11 at the southern end of Henry Coe State Park; and Unit 12 along Highway 152 east of Gilroy (Figure 3.3-10). The California tiger salamander is considered a covered species by the draft Habitat Plan (ICF Jones & Stokes 2010).

In 1999, H. T. Harvey & Associates (1999c) prepared a report and maps documenting the known occurrences of the California tiger salamander in Santa Clara County and predicting the expected distribution of the species based on known occurrences, habitat suitability, and available information on survey effort within areas where the species had not been recorded. In preparing the analysis for the DSEIR, H. T. Harvey & Associates updated the mapping of the species' expected distribution, based on additional occurrences, additional information regarding this species' movements (e.g., indicating the long-distance dispersal capabilities of the species), and changes in land use (such as new development) since 1999. The expected distribution of the species in Santa Clara County, based on this analysis, is shown in Figure 3.3-10.

Historically, the California tiger salamander likely occurred in a number of locations in the Project Area. However, relatively few populations are still extant because filling or draining of ponds and development of upland habitat have restricted suitable habitat conditions to a few undeveloped areas. The species has been largely extirpated from the valley floor. As shown in Figure 3.3-10, California tiger salamander is absent from the majority of the urbanized valley floor in the northern part of the Project Area. The lone exception is a single population that is extant near Communications Hill in south San Jose. California tiger salamander also is considered extirpated from the majority of the valley floor south of the urban San Jose area, where intensive agricultural and urban development have eliminated breeding populations. Breeding sites are known at the edges of Coyote Valley (e.g., south of Bailey Avenue and west of Santa Teresa Boulevard), where ponds are located close to relatively undisturbed grasslands at the bases of the foothills. To account for the potential occurrence of California tiger salamander at similar locations elsewhere, the mapping that produced Figure 3.3-10 was done conservatively, including areas that maintained some relatively undisturbed grassland or pasture at the edges of the valley floor in the areas where the species was considered extant, even if no records of tiger salamander existed from those areas. However, tiger salamander was considered extirpated from intensively cultivated areas and areas of extensive development, especially areas lacking ponds or seasonal wetlands.

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California tiger salamander is not known or expected to breed in streams such as those in the Project Area. If the species attempted to breed in such streams or even in SCVWD's canals, flow would wash the eggs downstream, and successful breeding is not expected to occur in this lotic environment. As a result, California tiger salamander is expected to occur in Proposed Project work sites solely during upland dispersal or, possibly, within upland refugia such as small mammal burrows. Specific locations where Proposed Project activities would occur within the area where the California tiger salamander is considered extant are depicted in Figure 3.3-10 and discussed in detail in the effects analysis below.

Currently, extant populations in the Project Area are now limited primarily to areas with seasonal pools and stock ponds around the periphery of the Project Area, particularly in the less heavily developed areas and areas that have not been heavily cultivated.

Critical habitat for the California tiger salamander was designated by the USFWS in 2005 (USFWS 2005b). The following designated California tiger salamander critical habitat units occur in or near the Project Area (Figure 3.3-10): Unit 3 east of Calaveras Reservoir, Unit 5 northeast of Cherry Flat Reservoir, Unit 6 along Mt. Hamilton Road, Unit 7 near the northwestern end of Anderson Reservoir, Unit 8 located around Calero Reservoir; Unit 9 southwest of Coyote Reservoir; Units 10a and 10b west/southwest of San Martin; Unit 11 at the southern end of Henry Coe State Park, and Unit 12 along Highway 152 east of Gilroy.

California Red-legged Frog (*Rana draytonii*). Federal Listing Status: Threatened; State Listing Status: Species of Special Concern. The California red-legged frog inhabits perennial freshwater pools, streams, and ponds throughout the Central California Coast Range and isolated portions of the western slope of the Sierra Nevada (Fellers 2005). Its preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters (Fellers 2005), as well as shallow benches to act as nurseries for juveniles (Jennings and Hayes 1994). Non-breeding frogs may be found adjacent to streams and ponds in grasslands and woodlands, and may travel up to 2 miles from their breeding locations across a variety of upland habitats (Bulger and Scott 2003, Fellers and Kleeman 2007).

The historic distribution of the California red-legged frog extended from the city of Redding in the Central Valley and Point Reyes National Seashore along the coast, south to Baja California, Mexico. The species' current distribution includes isolated locations in the Sierra Nevada and the San Francisco Bay area, and along the central coast (USFWS 2002). The California red-legged frog was listed as threatened in June 1996 (USFWS 1996), based largely on a significant range reduction and continued threats to surviving populations (Miller 1994). Critical habitat was most recently designated in March 2010 (USFWS 2010b). Designated critical habitat in the Project Area includes portions of Units STC-1 and STC-2. These critical habitat units occur primarily east of (and outside) the Project Area, but portions are located in the Project Area near the northwestern end of Anderson Reservoir, along Highway 152 east of Gilroy, and elsewhere along the foothills of the Diablo Range.

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In 1997, H. T. Harvey & Associates (1997) prepared a report and maps documenting the known occurrences of the California red-legged frog in Santa Clara County and predicting the expected distribution of the species based on known occurrences, habitat suitability, and available information on survey effort in areas where the species had not been recorded. In preparing the analysis for this DSEIR, H. T. Harvey & Associates updated the mapping of the species' expected distribution based on additional occurrences and changes in land use (such as new development) since 1999. The expected distribution of the species within Santa Clara County, based on this analysis, is shown in Figure 3.3-13.

The California red-legged frog presumably used to occur in pools and streams throughout the Project Area, but it was extirpated from the majority of the Project Area because of development, alteration of hydrology of its aquatic habitats, and introduction of non-native predators such as non-native fish and bullfrogs (Figure 3.3-13) (H. T. Harvey & Associates 1997). California red-legged frog is entirely absent from the urbanized valley floor in the northern part of the Project Area. California red-legged frog also is considered extirpated from the majority of the valley floor south of the urban San Jose area, where intensive agricultural and urban development have eliminated breeding populations. Since 2004, SCVWD biologists have conducted pre-activity surveys for California red-legged frog along hundreds of miles of stream for SMP projects and capital projects in accordance with SCVWD's BMPs, and have never found a California red-legged frog within the area where the species is considered extirpated (Figure 3.3-13). Table 3.3-3 lists the locations of those surveys. Those survey results, coupled with the negative results of surveys by H. T. Harvey & Associates biologists on portions of the valley floor (including Coyote Valley) and the lack of any recent CNDDB records from those areas, support the mapping in Figure 3.3-13.

A few breeding sites are known from the edges of the foothills, such as near Kirby Canyon Landfill (east of U.S. Highway 101). To account for the potential occurrence of the species in such areas, the mapping that produced Figure 3.3-13 was done conservatively, and red-legged frog was considered potentially extant in any areas that maintained some relatively undisturbed natural habitat at the edges of the valley floor, even if no records of the species existed from those areas.

Any extant breeding population of red-legged frog likely is limited to the periphery of the Project Area. California red-legged frog also has been recorded in the upper reaches of several streams that flow into the Project Area, such as Saratoga, Calabazas, Guadalupe, and Upper Penitencia creeks. California red-legged frog from populations in streams located upstream from the Project Area may potentially disperse or be washed short distances down some of these streams, although it is not expected to occur on the valley floor.

California red-legged frog potentially could breed in streams where SMP Update activities are projected. However, this species is known from very few locations below the reservoirs along the major SCVWD-maintained streams, and the abundance of non-native fish predators along these streams reaches likely limits the viability of red-legged frog breeding populations along them. Although California red-legged frog potentially could occur along a number of stream reaches where SMP Update activities are projected (as discussed in greater detail in the effects analysis below), the probability of breeding populations being

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located within areas of projected activities and the number of individuals that may be present in Proposed Project work sites are low.

In Proposed Project work sites where California red-legged frog does occur, it is expected to make the greatest use of the aquatic channels and the riparian habitat immediately adjacent to the channel. It may forage or take refuge anywhere in the riparian habitats along these channels, but in areas with managed levees, use of drier, more open areas is expected to occur only during dispersal.

Critical habitat for the California red-legged frog was most recently designated by the USFWS in 2010 (USFWS 2010b). The following designated California red-legged frog critical habitat units occur in and near the Project Area (Figure 3.3-13): STC-1 and STC-2. These critical habitat units occur primarily east of (and outside) the Project Area, but portions are located within its boundaries near the northwestern end of Anderson Reservoir, along Highway 152 east of Gilroy, and elsewhere along the foothills of the Diablo Range.

San Francisco Garter Snake (*Thamnophis sirtalis tetrataenia*). Federal Listing Status: Endangered; State Listing Status: Endangered. The San Francisco garter snake was one of the first reptiles to be listed under the FESA by the USFWS in 1967. The San Francisco garter snake also was listed under the CESA in 1971, and it is a fully protected species under the California Fish and Game Code. San Francisco garter snake remains threatened by continued habitat loss and degradation, as well as by illegal collecting by reptile fanciers. The San Francisco garter snake is a medium-sized (18–48 inches total length) snake with a wide dorsal stripe of greenish-yellow edged with black, bordered on each side by a broad red stripe followed by a black one, a belly that is a bright greenish-blue (often turquoise) and the top of the head is red. San Francisco garter snake has been observed in a number of aquatic and terrestrial habitats throughout its historic range, such as ponds, pools in or next to streams, streams, lakes, and reservoirs. The presence of adjacent upland areas with abundant small mammal burrows also is important as hibernation sites for snakes during the winter. The species prefers a dense cover of vegetation, such as willows, bulrushes, cattails, and tules. Adults mate during the spring and fall, and young are usually born alive during late July to early August. San Francisco garter snake depends on frogs, particularly the threatened California red-legged frog, for food.

Garter snakes in the northwestern part of the Project Area (i.e., in the Palo Alto/Stanford area) fall within the intergrade zone between the San Francisco garter snake and the red-sided garter snake (*Thamnophis sirtalis infernalis*). This intergrade zone is located on the eastern flank of the Santa Cruz Mountains, extending approximately 12 miles from the vicinity of Boronda Lake in Palo Alto (Foothills Park) to Upper Crystal Springs Reservoir (Barry 1994, Fox 1951), with populations to the south of this zone (i.e., the majority of the Project Area) representing the red-sided garter snake and populations to the north representing the San Francisco garter snake. The intergrade populations do not belong exclusively to either subspecies; thus, no true San Francisco garter snake occurs in the Project Area.

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Bank Swallow (*Riparia riparia*). Federal Listing Status: None; State Listing Status: Threatened (Nesting). In the western hemisphere, the bank swallow is a neotropical migrant with a wide distribution, breeding locally in coastal and interior California as far south as Monterey County (Garrison et al. 1987, Roberson and Tenney 1993). Bank swallows are colonial nesters, excavating nesting burrows in vertical banks of streams, rivers, and ocean coasts. Nest sites in central California typically are composed of soft soils, with banks averaging at least 10 feet high and 0.25 mile long (Garrison et al. 1987). The historical range of the bank swallow in California has been dramatically reduced by streambed alterations, which have resulted in a widespread loss of nesting habitat. The nesting season for bank swallow begins in April and continues through July, when the species departs for its wintering grounds in Mexico and Central America.

The only record of bank swallows breeding in Santa Clara County is from the Pajaro River, and this colony has not been active in decades (Bousman 2007i). No suitable nesting habitat is present in the Project Area, and the species is not expected to breed here. Bank swallows occur in the Project Area only as rare transients.

California Condor (*Gymnogyps californianus*). Federal Listing Status: Endangered; State Listing Status: Endangered. The California condor was listed as endangered by the USFWS in 1967 (USFWS 1967) and by California in 1971. Critical habitat was designated for this species in 1976 (USFWS 1976); but no portion of the Project Area is within designated critical habitat. Historically, the condor ranged from Baja California to British Columbia, and likely foraged throughout the Project Area. However, the condor was extirpated from its entire range, and in 1987, the last remaining wild birds were captured and kept in zoos as part of a comprehensive captive breeding program. Intensive recovery efforts have produced a managed population, currently numbering approximately 150 free-flying birds, which range along the central and southern Coast Ranges from Monterey Bay in the north to Los Angeles County in the south; and across the Transverse Ranges and up the western slope of the southern Sierra Nevada. (Snyder and Schmitt 2002)

California condors seek out caves in steep, isolated cliffs or cavities in mature redwood trees for nesting, and forage over grasslands, open woodlands, and along coastal beaches. Consistent air movements that support the extended soaring flight utilized by the condor are a critical component of suitable habitat. Condors nest between February and November, laying one egg every other year. Medium- to large-bodied carcasses appear to be the preferred food source for condors, but smaller carcasses are readily consumed as well. (Snyder and Schmitt 2002)

The persistence of re-established condor populations is threatened primarily by lead contamination from spent ammunition, although habitat loss and collision with utility lines and towers also are important threats. (Meretsky et al. 2000, Cade 2007)

No breeding habitat for this species is present in the Project Area. California condors have been reintroduced into the wild at Pinnacles National Monument in San Benito County and on the Big Sur coast in Monterey County. Individuals from these reintroduction efforts occasionally wander into Santa Clara County; five such birds were observed at the summit of Mt. Hamilton, east of San Jose and well above the 1,000-foot elevation contour that

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delineates the upper limits of the Project Area, in mid-June 2011. However, no records are known in or near the Project Area, and at most, condors are expected to occur as infrequent visitors that overfly portions of the Project Area. Nevertheless, reintroduced birds potentially could expand their movements and eventually occur more regularly in or near the Project Area, most likely in the southern part of the area (but only as non-breeders).

Bald Eagle (*Haliaeetus leucocephalus*). Federal Listing Status: None; State Listing Status: Endangered, Fully Protected. Bald eagle populations exhibited precipitous declines in the early part of the twentieth century, primarily as a result of pesticide poisoning that severely affected reproductive rates. DDT was the most debilitating of these chemicals, and ever since its use was banned in the United States in 1972, eagle populations have recovered rapidly. (Buehler 2000) The bald eagle was removed from the federal endangered species list in 2008 (USFWS 2008c) but remains listed as both endangered and fully protected by California (CDFG 2008b).

Currently, bald eagles are found throughout North America, along waterways and coasts (Buehler 2000). In California, bald eagle populations remain low, although their numbers are increasing steadily (Peeters and Peeters 2005). Bald eagles can be found nesting in a number of locations in the Sierra Nevada range and southern California, and they nest in a few scattered locations in central California as well (Buehler 2000, CDFG 2008b).

Ideal habitat for bald eagles is comprised of remote, forested landscape with old-growth or mature trees and easy access to an extensive and diverse prey base. Bald eagles forage in fresh and salt water where their prey species (fish) are abundant and diverse. They build nests in tall, sturdy trees at sites that are in relatively close proximity to aquatic foraging areas and isolated from human activities. The eagle breeding season extends from January through August. (Buehler 2000)

Bald eagles are only known to nest in Santa Clara County in four locations—in a gray pine at Coyote Reservoir, at the eastern edge of the Project Area where a pair nested in 2010; in a gray pine at Anderson Reservoir, also at the eastern edge of the Project Area, where a pair nested successfully in 2010 and may have nested in prior years; on an electrical transmission tower near Calaveras Reservoir, just outside the Project Area; and at San Felipe Lake along Highway 152, where a pair was sited nesting in 2011 (Bousman 2007e). Small numbers also occur as non-breeding visitors, typically at reservoirs on either side of the Santa Clara Valley but occasionally in Coyote Valley as well.

Swainson's Hawk (*Buteo swainsoni*). Federal Listing Status: None; State Listing Status: Threatened. Swainson's hawk was listed as threatened by California in 1983 because of population declines likely precipitated by significant losses of riparian habitat and conversion of open foraging habitats to developed lands (England et al. 1997, Woodbridge 1998). Swainson's hawks are distributed throughout western North America during the breeding season, but in California they are primarily limited to the Central Valley and the southeastern Great Basin region (Woodbridge 1998). Swainson's hawks in California are strongly associated with riparian habitats, although they also are found in oak woodlands and other open habitats (Smallwood 1995, England et al. 1997, Woodbridge 1998). Prime breeding habitat for Swainson's hawk encompasses riparian draws or clumps of trees

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surrounded by open grassland or oak savannah for foraging (England et al. 1997, Woodbridge 1998). They build sturdy stick nests in low willows, box elders, oaks, or other trees, breeding from early March though July (England et al. 1997). Swainson's hawks are neotropical migratory birds, flying south after the breeding season to spend their winter months on the Pampas of Argentina (England et al. 1997, Canavelli et al. 2003). Stresses on winter populations, including pesticide poisoning, on the winter grounds have contributed to declines in North American breeding populations.

Swainson's hawks apparently nested in small numbers in Santa Clara County historically, and an 1894 nest record exists from the Berryessa area (in eastern San Jose) (Bousman 2007g). Currently, this species is known to occur in the Project Area only as a very infrequent transient during migration. Although young, not long out of the nest have been recorded on several occasions in the Santa Clara Valley in recent years (Santa Clara County Bird Data, unpublished), more concrete evidence of nesting has not been documented, and this species is not currently known to breed in the Project Area.

California Clapper Rail (*Rallus longirostris obsoletus*). Federal Listing Status: Endangered; State Listing Status: Endangered and Fully Protected. The California clapper rail is a secretive marsh bird that is currently endemic to marshes of the San Francisco Bay. It formerly bred at several other locations, including Humboldt Bay (Humboldt County), Elkhorn Slough (Monterey County), and Morro Bay (San Luis Obispo County), but is now extirpated from all sites outside of the San Francisco Bay (Harding-Smith 1993). California clapper rails nest in salt and brackish marshes along the edge of the Bay, and are most abundant in extensive salt marshes and brackish marshes, dominated by Pacific cordgrass, pickleweed, and marsh gumplant, (*Grindelia stricta*) and that contain complex networks of tidal channels (Harvey 1980). Shrubby areas adjacent to or within these marshes also are important for predator avoidance at high tides.

Since the mid-1800s, about 90 percent of the San Francisco Bay's marshlands have been eliminated through filling, diking, or conversion to salt evaporation ponds (Goals Project 1999). As a result, the California clapper rail lost most of its former habitat, and its population declined severely. The subspecies was listed as endangered by the USFWS in 1970 (USFWS 1970) and by California in 1971. The USFWS approved a joint recovery plan of the salt marsh harvest mouse and the California clapper rail in 1984 (USFWS 1984), and its updated *Tidal Marsh Species Recovery Plan* is currently under development. Critical habitat has not been proposed for the California clapper rail.

California clapper rails breed from February through August within the salt marsh habitat along the lowermost, tidal reaches of creeks that flow into the South Bay. The species does not occur in muted tidal or diked salt marshes. However, they have been documented in brackish marshes in the South Bay. Surveys conducted during the 1990 breeding season (H. T. Harvey & Associates 1990b) and winter season (H. T. Harvey & Associates 1990a) found a number of California clapper rails occupying salt/brackish transitional marshes and several brackish, alkali bulrush-dominated marshes. In addition, California clapper rails were found in nearly pure stands of alkali bulrush along Guadalupe Slough in 1990 and 1991 (H. T. Harvey & Associates 1990a; H. T. Harvey & Associates 1990b; H. T. Harvey & Associates 1991).

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Surveys by H. T. Harvey & Associates and others since the early 1990s, as well as observation by birders (including H. T. Harvey staff), have documented clapper rails in a number of areas near the Project Area, including lower San Francisquito Creek; the Palo Alto Baylands; Hook's Isle; the mouth of Charleston Slough; lower Permanent and Stevens creeks; Guadalupe Slough (primarily from its confluence with Moffett Channel downstream); Alviso Slough; a number of locations along Coyote Slough, extending upstream through South Coyote Slough; and in the Warm Springs marshes. Although site-specific surveys have not been conducted in all suitable habitats for clapper rails in the South Bay, this species is likely to occur in tidal salt marsh habitats in a number of additional areas as well (Figure 3.3-20).

Occasional non-breeding individuals also may wander upstream along tidal sloughs from their typical salt marsh habitats into tidal brackish/freshwater marsh habitats. Such individuals have been recorded in the Project Area along upper Alviso Slough near the Gold Street Bridge and in the non-tidal freshwater marsh/ponds between Calabazas and San Tomas Aquino Creeks north of SR 237 (H. T. Harvey & Associates, unpublished data), but only during the non-breeding season.

California Black Rail (*Laterallus jamaicensis coturniculus*). Federal Listing Status: None; State Listing Status: Threatened, Fully Protected. The California black rail is a small rail that inhabits a variety of marsh types. California black rail is most abundant in extensive tidal marshes with some freshwater input (Evens et al. 1991). They nest primarily in pickleweed-dominated marshes with patches or borders of bulrushes, often near the mouths of creeks. The black rail builds nests in tall grasses or marsh vegetation during spring, and lays about six eggs. Nests are usually constructed of pickleweed and are placed directly on the ground or slightly above ground in vegetation. The black rail feeds on terrestrial insects, aquatic invertebrates, and possibly seeds (Trulio and Evens 2000).

The California black rail reportedly bred in the Alviso area in the early 1900s (Wheelock 1916), but currently it is not known to breed in the South Bay. Black rails breed primarily in marshes in north San Francisco Bay (i.e., San Pablo Bay and Suisun Bay). Following breeding, some black rails disperse into the South Bay during the non-breeding season; however, their abundance is unknown. They are likely present in small numbers at scattered locations in the South Bay during the non-breeding season (e.g., unconfirmed reports exist from the Alviso Marina during high winter tides).

The absence (or scarcity) of breeding black rails in the South Bay is presumably a result of habitat loss. Tidal marsh habitat has been lost, but perhaps more important to winter survival is loss of high-tide refugia habitat. Upland transition habitat, both on natural levees within marshes and on landward edges of marshes, has been lost as a result of fill for development, and reductions in marsh size and resulting reductions in natural levees along higher-order channels. Predation by egrets, herons, gulls, and harriers has been observed in these marshes during winter high tides, as black rails are forced into the open by rising water. The importance of this predation on a population level, especially in light of impacts to high tide refugia, is unknown, but it may be a significant factor in the extirpation of breeding populations of the species from the South Bay.

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Western Snowy Plover (*Charadrius alexandrinus nivosus*). Federal Listing Status: Threatened; State Listing Status: Species of Special Concern. The snowy plover is a small shorebird that occurs on almost every continent. On the Pacific coast, snowy plovers nest on sandy beaches and salt panne habitat from Washington to Baja Mexico. Because they nest during the summer, primarily on beaches in a temperate climate, snowy plovers are susceptible to nest disturbance and other negative interactions with humans. Much of their nesting habitat, particularly in southern California, has been lost to development and high human use. In addition, introduced predators, especially the non-native red fox, have had dramatic effects on snowy plover nesting success (Neuman et al. 2004). In response to severe population declines, the USFWS listed the Pacific coast population of the western snowy plover as threatened in 1993. Critical habitat was designated for this population in 1999 (USFWS 1999b), and a revised recovery plan was released in 2007 (USFWS 2007). None of the breeding sites within the San Francisco Bay are considered critical habitat.

In the South San Francisco Bay, snowy plovers nest on low, barren to sparsely vegetated saline managed pond levees and islands, at pond edges, and on salt panne areas of dry ponds (Page et al. 2000), and preferentially use light-colored substrates such as salt flats (Feeney and Maffei 1991, Marriott 2003). Nesting areas are located near water, where prey (usually brine flies and other insects) are abundant. In some areas, snowy plovers nest within dry saline managed ponds; in other areas where ponds typically hold water through the summer, nests are located primarily on levees.

In the South Bay, the highest numbers of nesting snowy plovers occur in portions of Alameda and San Mateo counties, outside the Project Area. Until recently, the area in Santa Clara County that consistently supported the highest numbers of nesting snowy plovers was Pond A8, located between Alviso and Guadalupe sloughs, just west of the town of Alviso (Ryan and Parkin 1998, Strong 2004). However, that pond has been flooded as part of Phase 1 of the South Bay Salt Ponds Restoration Project, and its managed depth will no longer allow for the exposure of salt panne and island habitat suitable for plover nesting. Similarly, Pond A6 (located between the mouths of Alviso and Guadalupe sloughs) previously supported low numbers of nesting snowy plovers, but it was recently breached as part of the South Bay Salt Ponds Restoration Project, and thus no longer provides suitable breeding habitat.

The areas that have supported nesting snowy plovers in recent years and still provide suitable conditions for nesting are portions of New Chicago Marsh, providing salt panne habitat, and an impoundment between pond A12 and New Chicago Marsh. During the 2009 breeding season, seven western snowy plover nests were located in the Alviso complex, including one snowy plover nest in Pond A8, one in the impoundment, and five nests in New Chicago Marsh (SFBBO 2009). Snowy plovers also nested in the late 1990s in Pond A3N, on the southwest side of the mouth of Guadalupe Slough (S. Rottenborn, pers. obs.). To provide nesting habitat for snowy plovers and other pond-associated waterbirds, given the modifications that have been made to former nesting areas in Ponds A6 and A8, the Refuge has been maintaining low water levels in Pond A12 (immediately north/northwest of the Alviso Marina) to provide salt flats and islands, and plovers are likely to nest in this pond. Figure 3.3-20 depicts locations in the vicinity of the Project Area where suitable nesting habitat for snowy plover may occur. In all of these potential breeding locations, nesting may

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occur on extensive salt flats or islands. The large flood protection levees with extensive vegetation on their banks, such as the ones lining sloughs within the Project Area, are not used by snowy plover for nesting.

Although snowy plovers in the South Bay do show seasonal variations in distribution and abundance, they are observed infrequently, away from nesting areas in Santa Clara County, primarily because nesting areas provide the most suitable foraging habitat for the species year-round. Snowy plovers are expected to forage a bit more widely than the nesting areas indicated in Figure 3.3-20, and it is possible that non-breeding individuals may occasionally forage in the San Jose-Santa Clara Water Pollution Control Plant sludge ponds, or possibly at the Coyote Creek Reach 1A waterbird pond, both of which would be very close to Proposed Project work sites. However, they are expected to do so infrequently and in low numbers, if at all.

No SMP Update activities are projected to occur in or very close to areas that support nesting snowy plovers. However, this species can select breeding areas opportunistically, and it is possible that changes in habitat from 2012–2022 could result in use of new areas by breeding plovers. For example, if management of ponds adjacent to Proposed Project work sites (such as Pond A4 between Moffett Channel and Guadalupe Slough, or Pond A18 adjacent to South Coyote Slough) changed so that these ponds became suitable for nesting, plovers may nest in them. Likewise, if proposed activities such as vegetation management or management of animal conflicts needed to occur in non-projected areas, such as segments of Alviso Slough along Pond A12, then SMP Update activities could occur adjacent to snowy plover nesting and foraging habitat.

Final critical habitat for the western snowy plover was designated on September 29, 2005 (USFWS 2005c). No designated critical habitat for this species is located in or adjacent to the Project Area. On March 22, 2011, the USFWS proposed a new critical habitat designation that would include additional critical habitat. Under this proposed rule, the closest area of proposed critical habitat to the Project Area would be located in the northeastern portions of Ponds A22 and A23, located in the Warm Springs area of Fremont, approximately 0.75 mile north of the Project Area.

California Least Tern (*Sterna antillarum brownii*). Federal Listing Status: Endangered; State Listing Status: Endangered, Fully Protected. California least tern nests in California during the breeding season, from April to September (Rigney and Granholm 1990, Baron and Takegawa 1994). Its nesting habitat consists of shallow depressions in sand or small gravel along large tracts of undisturbed beaches (Baron and Takegawa 1994, Marschalek 2008). The loss of available, high-quality nesting habitat for least terns resulted in a reduction in population size to only 600 known breeding pairs (Baron and Takegawa 1994). In response to severe population declines, the USFWS listed the California least tern as endangered in 1970 (USFWS 1970), and California listed the species as both endangered and fully protected in 1971. No critical habitat has been designated for this species.

Habitat requirements for the California least tern typically consist of quiet, extensive beaches or tidal flats close to an abundance of small fish (Baron and Takegawa 1994, Rigney and Granholm 1990). In San Francisco Bay, this species' largest colony is located on an old

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airport runway at the former Alameda Naval Air Station, although small numbers nest on islands and salt pannes in former saline managed ponds in a few areas.

California least terns do not breed in or adjacent to the Project Area. However, the South Bay is an important post-breeding staging area, and California least terns forage in late summer and early fall in saline-managed ponds within and adjacent to the Alviso area. Both adult and juvenile least terns roost on saline-managed pond levees (both outboard levees and interior levees between ponds) and boardwalks, and forage both in the saline-managed ponds and over the open waters of the Bay. In recent years, the post-breeding (late summer/fall) staging area for least terns in the South Bay has been in the complex of saline-managed ponds immediately north of Moffett Field (Ponds AB1, A2E, and AB2). This site is used predictably for roosting and foraging by both adult and juvenile least terns in July and August each year, with typical counts of 20 to 100 birds. Least terns also have been recorded at a number of ponds in the Project Area, including A5, A7, A9, A10, A11, and A14. (Hurt, pers. comm., 2004; Krause, pers. comm., 2005)

Least Bell's Vireo (*Vireo bellii pusillus*). Federal Listing Status: Endangered; State Listing Status: Endangered. The least Bell's vireo is a small neotropical migratory songbird that is sparsely distributed along waterways in southern California and northern Baja California, Mexico (Brown 1993). The least Bell's vireo was historically distributed throughout much of California, including the Central Valley (Franzreb et al. 1994, Kus 2002). However, extensive habitat destruction and declines in nest survival caused by heavy parasitism by the brown-headed cowbird (*Molothrus ater*) resulted in severe population declines, and the species' range decreased to a few small remnant populations in riparian drainages in the eight counties south of Santa Barbara, with the greatest abundance of the vireos occurring in San Diego County (Franzreb et al. 1994, Kus 2002). The least Bell's vireo was listed as endangered by California in 1980, and by the USFWS in 1986 (USFWS 1986). No critical habitat for this species occurs in Santa Clara County (USFWS 1994).

The least Bell's vireo is a riparian-obligate breeder (Kus 1998), nesting in dense thickets of willows and other low bushes along perennial or ephemeral streams (Franzreb et al. 1994, Kus 2002). Prime least Bell's vireo habitat can be described as a wide (greater than 825 feet) riparian corridor (Kus 2002) with dense shrub growth extending vertically from 2 to 10 feet (Brown 1993), few trees greater than 3 inches in diameter at breast height in the canopy, and an open canopy (Sharp and Kus 2006). Upland vegetation adjacent to riparian habitats frequently is used for foraging, and sometimes nesting, by least Bell's vireo (USFWS 1998c). Least Bell's vireo arrives on its breeding grounds in mid-March, and its nesting season extends from early April through July (Brown 1993). The species exhibits high breeding site fidelity, returning to the same territory, and even nesting in the same shrub, over multiple years (Kus 2002).

The coastal range of this species (i.e., west of the Central Valley) once extended north through the Salinas River valley, but apparently ended in extreme southern Santa Clara County, where the only record before 1997 was a nest collected at Sargent along the Pajaro River (on the Santa Clara/San Benito County line near the current location of U.S. Highway 101) in 1932 (Unglish 1937).

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By 1930, declines were widespread, mostly because of parasitism by brown-headed cowbirds. The least Bell's vireo was thought to be extirpated from northern California by 1970. Isolated and infrequent sightings of singing males in northern and central California have suggested that the species may eventually recolonize historic habitat in northern California. In 1972, and again in 1982, lone singing males were found in riparian habitat in Pinnacles State Park, in San Benito County (Roberson 2002). In 1983, three singing males were found on the Salinas River in southern Monterey County, and a female was observed building a nest.

In the past two decades, populations of least Bell's vireos have begun to rebound because of intensive recovery efforts (Kus 2002, USFWS 2006). However, the species is still not known to have recolonized former breeding areas in southern Monterey County, and only three records have been made from Santa Clara County since 1932. Beginning in 1997, SCVWD has conducted least Bell's vireo surveys almost annually along lower Llagas Creek, and occasionally along sections of Uvas Creek, during the breeding season (Padley 2010, H. T. Harvey & Associates 2010c). A pair was detected in April and May 1997, and two singing males were reported on May 17, 2001 (Rottenborn 2007d); both of these records were from lower Llagas Creek between Highway 152 and the confluence with the Pajaro River, just east of Gilroy. A single male was heard singing along Coyote Creek near the Coyote Creek Golf Course on June 20, 2006 (H. T. Harvey & Associates, unpublished). This individual was sought but not relocated subsequently, and it is not likely to have bred in the vicinity. No other recent records of the least Bell's vireo exist in Santa Clara County.

Least Bell's vireo numbers may increase in number and distribution as its core populations increase, but it is unlikely to ever be more than a rare and very locally occurring breeder along South County streams. In the Project Area, least Bell's vireo is expected to breed only along streams in the Pajaro Basin, and even then only sporadically and in low numbers. Portions of lower Llagas Creek (downstream from Highway 152), the Pajaro River (from Llagas Creek downstream), and lower Uvas/Carnadeo Creek (downstream from Hecker Pass Road) provide suitable habitat for the species, and SMP Update activities are projected in these areas. However, protocol-level surveys for the species were conducted along Uvas Creek between Hecker Pass Road and Santa Teresa Boulevard in 2006 (H. T. Harvey & Associates, unpublished data), and along portions of Uvas/Carnadero Creek, the Pajaro River, Tar Creek, and other waterways along U.S. Highway 101 south of Gilroy in 2007 (H. T. Harvey & Associates 2011), with negative results. Combined with the results of SCVWD's recent surveys along lower Llagas Creek, these negative survey results suggest that this species likely is absent from the county in most years. Potential habitat for the species also is present in the Project Area along lower Pacheco Creek, although no SMP Update activities are projected in that area.

Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*). Federal Listing Status: Endangered; State Listing Status: Endangered, Fully Protected. The salt marsh harvest mouse is found only in saline wetlands of the San Francisco Bay and its tributaries. The southern subspecies *raviventris* is restricted to an area along both sides of San Francisco Bay, from San Mateo County and Alameda County south to Santa Clara County. Although its primary habitat consists of pickleweed-dominated areas in the upper regions of tidal marshes, the salt marsh harvest mouse also is found in diked and muted tidal marshes

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dominated by pickleweed, and recently it has been found in dense vegetation within brackish marshes in the South Bay, specifically tri-corner bulrush marshes that are mature and have a thick, well-developed layer of thatch (H. T. Harvey & Associates 2006, 2010a). The salt marsh harvest mouse occurs with the closely related, ubiquitous, and abundant western harvest mouse (*Reithrodontomys megalotis*) at the upper edges of marshes and in marginal areas. Both animals occur in pickleweed, but the salt marsh harvest mouse replaces the western harvest mouse in denser areas of pickleweed.

The salt marsh harvest mouse has declined substantially in recent decades. This decline has been primarily caused by the diking and filling of marshes, subsidence, and changes in salinity brought about by increasing volumes of fresh water discharge into the Bay. In response to habitat loss and population declines, the salt marsh harvest mouse was listed as endangered by the USFWS in 1970 (USFWS 1970) and by California in 1971. Critical habitat has not been designated for this species.

In the Project Area, salt marsh harvest mouse is known from a variety of locations in the South Bay, especially from the tidal salt marshes of the Bay, levees, and from a series of diked salt marshes (H. T. Harvey & Associates 2010a). Potential salt marsh harvest mouse habitat in the Project Area, mapped based on the assessment by H. T. Harvey & Associates, is depicted in Figure 3.3-22.

San Joaquin Kit Fox (*Vulpes macrotis mutica*). Federal Listing Status: Endangered; State Listing Status: Threatened. The San Joaquin kit fox is the largest subspecies of the kit fox, the smallest canid species in North America. The San Joaquin kit fox was listed as endangered by the USFWS in 1967 and by California in 1971. Loss of habitat from urban, agricultural, and industrial development are the principal factors in the decline of the San Joaquin kit fox. Subpopulations of the San Joaquin kit fox appear to be increasingly isolated from one another because of development within its range (USFWS 1998a). Critical habitat has not been designated for this species.

The San Joaquin kit fox is primarily nocturnal and typically occurs in annual grassland or mixed shrub/grassland habitats throughout low, rolling hills and in the valleys. It requires underground dens for temperature regulation, shelter, reproduction, and predator avoidance. Kit foxes commonly modify and use dens constructed by other animals and human-made structures (USFWS 1998a). Dens are usually located on loose-textured soils on slopes less than 40 degrees, but San Joaquin kit fox den characteristics vary across the fox's geographic range, including the number of openings, shape, and slope of the ground on which they occur (USFWS 1998a). Kit foxes change dens frequently, often using numerous dens each year.

San Joaquin kit foxes were infrequently sighted in San Benito County and southern Santa Clara County in the early 1970s. Morrell (1975) reported four sightings before 1972, and seven sightings between 1972 and 1975 in this region. These reports included nine sightings in San Benito County near Hollister and two sightings in Santa Clara County between Pacheco Pass and San Felipe Lake.

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Since 1975, two reports of kit foxes have been made in Santa Clara County. Two adults were reported near Coyote (Weslar 1987), and one adult was reported near Bell's Station in an outlying portion of Henry Coe State Park in 2002 (CNDDB 2011). The Coyote report was not documented adequately to confirm that this species, which can be easily confused with other foxes or especially with young coyotes, was actually present. As a result, no firm records of the kit fox exist from the Project Area. Subsequent extensive surveys throughout the area have failed to detect any kit foxes, and kit foxes are now generally acknowledged to be extremely rare in Santa Clara County and found only in areas proximal to access from Central Valley population centers (e.g., near Highway 152 in the southeastern corner of the county). The species' preferred habitat, extensive low-lying grasslands with minimal topography, is not present in the Project Area. If San Joaquin kit foxes occur in the Project Area, they are expected to occur only in the southeastern portion along Pacheco Creek and the uppermost Pajaro River. Kit fox may occur here during dispersal between areas of known breeding activity outside the Project Area (i.e., the Central Valley to the east and San Benito County to the south).

California Species of Special Concern

Central Valley Fall-run Chinook Salmon (*Oncorhynchus tshawytscha*). Federal Listing Status: None; State Listing Status: Species of Special Concern. Like the steelhead, the Chinook salmon is an anadromous salmonid. Populations of Pacific salmon have been categorized into Evolutionarily Significant Units (ESUs) by the NMFS; an ESU represents a population of Pacific salmon that is reproductively isolated from other conspecific populations and is recognized as a distinct evolutionary component of the species (Waples 1991). The Central Valley Fall-run ESU represents a population of Chinook salmon that migrate from the ocean to spawning streams in late fall and begin spawning in beds of coarse river gravels between October and December. Populations of fall-run Chinook salmon have suffered the effects of over-fishing by commercial fisheries, degradation of spawning and rearing habitat, added barriers to upstream migration, and reductions in winter flows because of damming. Approximately 40–50 percent of its spawning and rearing habitats in Central Valley streams have been lost or degraded. Chinook salmon generally spawn in cool waters that provide incubation temperatures no warmer than 55°F. Compared to steelhead, Chinook salmon are more likely to spawn in coarse gravels located lower in the watershed.

Chinook salmon historically did not spawn in streams flowing into South San Francisco Bay. Since the mid-1980s, however, small numbers of fall-run Chinook salmon have been found in several such streams, including Coyote Creek, Los Gatos Creek, and the Guadalupe River in the Project Area (Leidy et al. 2003). However, genetic analysis, timing of spawning, and the detection of coded wire-tagged hatchery fish in the Project Area suggest that these fish are derived from Central Valley fall-run stock (Garcia-Rossi and Hedgecock 2002), possibly hatchery releases. Conditions for successful spawning in the Project Area are marginal because these fish spawn during fall, when streamflow is at its lowest. Because these fish are not native to the South Bay and are apparently derived, at least in part, from hatchery stock, the NMFS does not consider the Chinook occurring in the South Bay to be a special-status species.

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Monterey Roach (*Lavia symmetricus*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The Monterey roach is a small minnow found primarily in small and intermittent tributaries in the San Lorenzo River, Pajaro River, and Salinas River watersheds. The Monterey roach forages primarily on algae, but juveniles often eat small invertebrates as an important part of their diet. Roaches can withstand extreme conditions found in late summer pools, such as high temperatures up to 95 °F and low oxygen levels down to 1 ppm. The Monterey roach is known to occur in Llagas and Uvas Creeks, and it likely is present in other Project Area creeks within the Pajaro River Basin.

Foothill Yellow-legged Frog (*Rana boylii*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The foothill yellow-legged frog is a stream-breeding frog, historically found in most Pacific drainages from the Coast Ranges to the western Sierra Nevada and San Gabriel mountain foothills (Jennings and Hayes 1994, CaliforniaHerps.com 2010). Currently, the foothill yellow-legged frog may occupy only 55 percent of its historical range (CaliforniaHerps.com 2010). The main reason for the reduction in the species' range apparently is the alteration of stream hydrology because of the presence of dams (Jennings and Hayes 1994, Wheeler et al. 2006).

Ideal habitat for the foothill yellow-legged frog consists of streams with riffles and cobble-sized rocks, with slow water flow (Jennings and Hayes 1994). The breeding ecology of the foothill yellow-legged frog requires consistently slow-moving flows, as well as the presence of upland areas surrounding the breeding locations for use as non-breeding habitat.

In 1999, H. T. Harvey & Associates (1999b) prepared a report and maps that documented the known occurrences of the foothill yellow-legged frog in Santa Clara County and predicted the expected distribution of the species, based on known occurrences, habitat suitability, and available information on survey effort within areas where the species had not been recorded. In preparing the analysis for this DSEIR, H. T. Harvey & Associates updated the mapping of the species' expected distribution, based on additional occurrences and changes in land use (such as new development) since 1999. The expected distribution of the species within Santa Clara County, based on this analysis, is shown in Figure 3.3-18. No recent records of foothill yellow-legged frog exists from the Santa Clara Valley floor, and although it still occurs in foothill streams in the Project Area, it is now presumed extirpated from the majority of the Project Area (Figure 3.3-18) (H. T. Harvey & Associates 1999b). At the edges of the Project Area, foothill yellow-legged frog is known to occur in Guadalupe Creek downstream from Guadalupe Reservoir, in Llagas Creek south of Calero Reservoir, and along Rincon Creek (CNDDB 2011). The species also occurs (or formerly occurred) in Upper Penitencia Creek in Alum Rock Park in the Project Area and at other South Bay locations outside the Project Area (H. T. Harvey & Associates 1999b).

Western Pond Turtle (*Actinemys marmorata*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The western pond turtle occurs in ponds, streams, and other wetland habitats in the Pacific slope drainages of California and northern Baja California, Mexico (Bury and Germano 2008). The central California population historically was present in most drainages on the Pacific slope (Jennings and Hayes 1994), but streambed alterations and other sources of habitat destruction, exacerbated by frequent drought events, have caused substantial population declines

throughout most of the species' range (Stebbins 2003). Ponds or slack-water pools with suitable basking sites (such as logs) are an important habitat component for this species, and western pond turtles do not occur commonly along high-gradient streams. Females lay eggs in upland habitats, in clay or silty soils in unshaded (often south-facing) areas up to 0.25 mile from aquatic habitat (Jennings and Hayes 1994). Juveniles feed and grow in shallow aquatic habitats (often creeks) with emergent vegetation and ample invertebrate prey. Nesting habitat typically is found within 600 feet of aquatic habitat (Jennings and Hayes 1994), but if no suitable nesting habitat can be found close by, adults may travel overland considerable distances to nest. Threats to the western pond turtle include impacts to nesting habitat from agricultural and grazing activities, human development of habitat, and increased predation pressure from native and non-native predators as a result of human-induced landscape changes.

Western pond turtles have been recorded recently along a number of streams and rivers, and within a number of ponds and lakes, throughout much of the Project Area away from northern, tidal stream reaches (Figure 3.3-19) (H. T. Harvey & Associates 1999a, CNDDB 2011, unpublished SCVWD data). All perennial creeks, many intermittent creeks, and most ponds that are not completely isolated by development have some potential to support this species. However, the cumulative stressors of urbanization, including release of non-native turtles, predation and harassment by pets and non-native mammals, capture by humans, degradation of water quality, loss of upland nesting habitat because of development, and the construction of barriers between creeks and nesting areas have reduced western pond turtle populations, and few areas exist where the species can be considered common. In particular, the scarcity of suitable expanses of nesting habitat makes the maintenance of viable populations unlikely along reaches of many creeks in the Project Area. Large numbers of different-aged individuals, suggesting the presence of successfully breeding turtles, have been observed in ponds near Coyote Ranch in the northern part of Coyote Valley, since the 1990s (S. Rottenborn, pers. obs.), but observations of such healthy breeding populations are relatively scarce in the Project Area. The most recent observations in the Project Area were small numbers of primarily older individuals, suggesting low productivity and/or survival of western pond turtles in most of the Project Area.

California Horned Lizard (*Phrynosoma blainvillii*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The California horned lizard is a California endemic that is distributed along the coast from Contra Costa County in the north to San Diego County in the south, as well as in patches throughout the Central Valley. The breeding season for California horned lizards extends from April to August, after which individuals disperse to overwintering habitats where they hibernate from November through March. California horned lizards occupy a variety of open habitats characterized by sandy, loosely textured soils, such as chaparral, coastal scrub, annual grassland, and clearings in riparian woodlands. (Jennings and Hayes 1994)

Horned lizards are most strongly associated with loose soils free of plant debris, and with the presence of native harvester ants (*Pogonomyrmex barbatus*), which comprise a primary part of their diet. California horned lizard populations have declined significantly because of loss of habitat and the influx of invasive invertebrate species. (Fisher et al. 2002) The

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introduction of Argentine ants (*Linepithema humile*) has displaced the harvester ant in California, reducing the range of the California horned lizard.

Suitable loose-textured soils are relatively scarce, and Argentine ants are relatively common and widespread in the Project Area; therefore, the potential for California horned lizards to occur in the majority of the Project Area is extremely low. Additionally, pressure from domestic cat predation limits the populations of California horned lizards near urban areas. A single, recent record of the species exists in the Project Area, from Calero Reservoir (N. Merrill, pers. obs.) and some potential exists for the California horned lizard to occur in the Santa Teresa Hills, where the soils are more loosely textured. Locations of occurrence in the Project Area are shown in Figure 3.3-19. Potential habitat for this species also is in the vicinity of Alum Rock Park and possibly elsewhere, where suitable substrate and prey are present near the margins of the Project Area.

Black Skimmer (*Rynchops niger*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting Colony). The black skimmer's unique physiology, with its lower mandible longer than its upper mandible, allows this species to fly over the surface of the water, "skimming" for small fish. Nesting habitat for black skimmer occurs primarily on the coasts of the southeastern United States, the Gulf of California, and from the Pacific Coast of Baja, California, north to San Diego. In California, black skimmer is considered a species of special concern only when nesting.

Black skimmers were first detected nesting in California in 1972. Since that time, their populations in California have increased considerably, to approximately 1,200 pairs in 1995 (Collins and Garrett 1996). The black skimmer was considered a rare non-breeding visitor to the San Francisco Bay area until the mid-1990s. In 1994, one pair of black skimmers was documented nesting at saline-managed Pond AB2 in Santa Clara County, and a second pair nested at Hayward Regional Shoreline in Alameda County (Layne et al. 1996). Since 1994, black skimmers have occurred in the South Bay every year, nesting at several additional sites (Strong 2004). In the San Francisco Bay area, black skimmers typically nest among Forster's terns (*Sterna forsteri*), on small dredge-spoil islands (including both bare islands and vegetated islands, sometimes heavily vegetated with pickleweed) in saline-managed ponds. Exact nesting locations vary from year to year.

Since 1994, skimmer populations in the South Bay have slowly but steadily increased, although the extent to which this increase has resulted from local reproduction versus immigration from the increasing southern California population is unknown. In the Project Area, skimmers have bred at ponds AB1, AB2, A1, A2W, A7, A8, and A16, and Pond A12 and other managed ponds in Alviso may provide breeding and foraging habitat (Bousman 2007f). Although the species may forage in sloughs in the Project Area, black skimmer is likely to occur infrequently in areas that would be affected by the SMP Update.

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Northern Harrier (*Circus cyaneus*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). The northern harrier nests in marshes and grasslands, usually those with tall vegetation and moisture sufficient to inhibit accessibility of nest sites to predators. This species forages, primarily on small mammals and birds, in a variety of open grassland, ruderal, and agricultural habitats.

Northern harrier breeds in small numbers in more extensive patches of tidal marsh habitat close to San Francisco Bay, including marshes along the lower, tidal reaches of SCVWD-maintained streams. It is possible that this species nests in tall, dense, ruderal vegetation and grassland in San Jose/Santa Clara WPCP buffer lands (i.e., the formerly cultivated grassland/ruderal habitat surrounding the WPCP, bounded by SR 2376, Zanker Road, and Los Esteros Road in Alviso) or in diked/tidal marsh habitat in Alviso. Some potential also exists for harriers to nest in fallow fields in Coyote Valley, and along lower Llagas Creek, Carnadero Creek, and the Pajaro River. However, nest accessibility to predators limits the potential for, and likely the success of, the species' nesting in the Project Area. Northern harrier forages in a variety of open habitats, especially during the non-breeding season, and the species is fairly widespread as a forager in grasslands, extensive wetlands, and agricultural areas in the Project Area during migration and winter. In some years, when vole populations are particularly high, high densities of harrier can be found in some areas (De Anza College Wildlife Corridor Steward Team 2009).

Long-eared Owl (*Asio otus*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). The long-eared owl is an uncommon, year-long resident throughout much of California. It frequents dense riparian and live oak thickets near meadow edges, and nearby woodland and forest habitats, but also may be found in dense conifer stands at higher elevations. This species forages over open areas, where it hunts for rodents and small birds. It breeds from valley foothill hardwood up to ponderosa pine habitats from early March to late July. This species is considered a California species of special concern only when breeding.

No known nesting locations exist for the long-eared owl in the Project Area (Noble 2007), and the species likely occurs here only as a rare and irregular non-breeding visitor. However, the species has been recorded nesting just outside the Project Area in Ed Levin County Park, west of Calaveras Reservoir in 2001 (Noble 2007). Thus, because the long-eared owl is known to nest in a variety of wooded habitat types, it is possible that a few pairs occur in riparian, oak woodland, or mixed evergreen forest in the Project Area.

Short-eared Owl (*Asio flammeus*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). Short-eared owl occurs in open habitats such as grasslands, wet meadows, and marshes. It requires tall, herbaceous vegetation for nesting or daytime refuge. Short-eared owl once bred much more widely in California, including the San Francisco Bay area. However, the species now occurs primarily as a migrant and winter visitor, and it is a rare and local breeder in the South Bay. The most recent nesting record in the South Bay was of three pairs, producing four fledglings at Bair Island in 1994 (Yee et al. 1994). Breeding-season records in the Project Area include a pair at the Palo Alto Baylands in 1966 (Chase and Chandik 1966) and two nests in the Palo Alto Flood Control Basin in 1972 (Gill 1977). A low probability exists that this species currently breeds in the Project

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Area, or that it would breed in the Project Area other than in the Palo Alto Flood Control Basin. During winter, the species is more widespread, although in low numbers, foraging in extensive marshes, grasslands, and agricultural areas.

Burrowing Owl (*Athene cunicularia*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The burrowing owl is a small, terrestrial owl of the open country. This species prefers annual and perennial grasslands, typically with sparse or nonexistent tree or shrub canopies. In California, burrowing owls are found in close association with California ground squirrels; owls use the abandoned burrows of ground squirrels for shelter and nesting. The nesting season, as recognized by the CDFG (1995), runs from February 1 through August 31. After nesting is completed, adult owls may remain in their nesting burrows or in nearby burrows, or they may migrate (Rosenberg et al. 2007); young birds disperse across the landscape from 0.1 mile to 35 miles from their natal burrows (Rosier et al. 2006). Burrowing owl populations have declined substantially in the San Francisco Bay area in recent years, with declines estimated at 4-6 percent annually (DeSante et al. in press, in Rosenberg et al. 2007).

Burrowing owl occurs year-round in the Santa Clara Valley (Trulio 2007), and is commonly present in open, agricultural, or grassland areas with active ground squirrel burrows. Burrowing owl also exhibits strong site fidelity, and may return to a nesting site and attempt to nest even after the site has been developed. In the Project Area, particular concentrations of burrowing owls occur at the WPCP and its buffer lands, at the Santa Clara Valley Transportation Authority's Cerone operating division in the Alviso area, and at the San Jose International Airport and on undeveloped parcels east of U.S. Highway 101 near the airport. However, this species is increasingly disappearing from "infill" locations on the urban valley floor. Burrowing owl was present in the Coyote Valley and Evergreen areas in the 1990s, but it has been infrequently recorded in either area in recent years. It still occasionally is recorded in Coyote Valley and in grasslands at higher elevations, such as on Coyote Ridge, but it seems to occur in such areas primarily during the non-breeding season. SCVWD performed surveys at 41 project sites throughout Santa Clara County in summer 1998, but the District detected no burrowing owls at any of these sites, nor in potential habitats adjacent to the project sites (SCVWD 1998).

In 2007 and 2008, a habitat assessment, burrow mapping study, and standardized breeding-season, protocol surveys for the burrowing owl were conducted along sections of multiple SCVWD-managed waterways in Palo Alto, Mountain View, Sunnyvale, Santa Clara, San Jose, Alviso, Milpitas, and Gilroy (EDAW 2008). These surveys identified active breeding and overwintering burrowing owls at a few locations in or adjacent to the Project Area (Figure 3.3-21), and potential habitat for burrowing owl was determined to be present along a number of creeks in the Project Area (EDAW 2008). However, no burrowing owl was recorded using SCVWD facilities, such as levees, during either of the two surveys, and SCVWD levees did not appear to provide important burrowing owl nesting or roosting habitat (i.e., used regularly or by a sizeable proportion of the South Bay population).

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Vaux's Swift (*Chaetura vauxi*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). The Vaux's swift is distributed throughout the Pacific Northwest, in close association with coniferous forests (Bull and Collins 2007). In California, the range of this small neotropical migratory bird is concurrent with the range of the coast redwood, which extends along the coast from Del Norte County in the north to Monterey County in the south (Hunter 2008). Vaux's swifts also can be found in smaller numbers in other coniferous forest types across northern California and along the western slope of the Sierra Nevada (Hunter 2008). Vaux's swifts nest both in small colonies and as single pairs, occupying cavities in redwoods and other trees (Hunter and Mazurek 2003). They will use both basal cavities and holes near the tops of trees, and once they have discovered a suitable tree, they will return to reuse the site in subsequent years (Hunter and Mazurek 2003). Swifts also occasionally use artificial cavities such as chimneys (Hunter 2008). They forage on flying insects in the air above a variety of habitats and can often be seen far from the nearest suitable breeding habitat (Hunter 2008). Swifts begin breeding in early May and continue until mid-August, when most individuals migrate to southern Mexico and Central America, although small numbers overwinter as far north as central California (Bull and Collins 2007). Loss of nest and roost sites, particularly in old-growth and other mature forests, is a primary threat to this declining species (Hunter 2008).

In the South Bay, Vaux's swifts breed primarily in snags in the forests of the Santa Cruz Mountains (Rottenborn 2007d); suitable nest trees are absent from the Project Area. However, this species also breeds in residential chimneys in the foothills of the Santa Cruz Mountains and has most commonly been observed foraging over suburban areas having chimneys suitable for nesting, such as Los Gatos, Los Altos, Los Altos Hills, Cupertino, and Campbell (Rottenborn 2007d). Thus, it likely breeds more commonly than currently recorded (though still in small numbers) in residential areas in the western part of the Project Area. Vaux's swifts are aerial foragers that forage in low numbers throughout the Project Area during migration.

Olive-sided Flycatcher (*Contopus cooperi*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). In northern California, the olive-sided flycatcher is distributed along the Coast Ranges and the Sierra Nevada (Altman and Sallabanks 2000, Widdowson 2008). Olive-sided flycatchers are associated with coniferous forest habitats and breed in mature forests with open canopies, along forest edges in more densely vegetated areas, in recently burned forest habitats, and in selectively harvested landscapes (Altman and Sallabanks 2000, Robertson and Hutto 2007). Olive-sided flycatchers nest in tall trees, building an open-cup nest away from the main trunk in the middle to upper reaches of the tree (Widdowson 2008). This species makes one of the longest annual migrations of any songbird, from the Andes Mountains of South America to boreal breeding grounds in the United States and Canada. Individuals exhibit high site fidelity and arrive at their breeding territories beginning in mid-May, remaining until late July. Populations of olive-sided flycatchers are experiencing steady and steep declines throughout the range of the species, likely because of conversion of forested habitat to non-forested landscapes, and to the loss of habitat on wintering grounds (Altman and Sallabanks 2000, Widdowson 2008).

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This species breeds widely in the Santa Cruz Mountains, and more sparingly in the Diablo Range, but it does not breed on the Santa Clara Valley floor. Likely, few pairs nest at sites below 1,000 feet in elevation, but confirmed breeding has occurred at elevations as low as 400 feet (Bousman 2007c). It is known to nest along Upper Penitencia Creek in Alum Rock Park, and occasionally around Calero Reservoir, in the Project Area (Bousman 2007c).

Loggerhead Shrike (*Lanius ludovicianus*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). The loggerhead shrike is a predatory songbird associated with open habitats interspersed with shrubs, trees, poles, fences, or other perches from which it can hunt. Nests are built in densely foliated shrubs or trees, often containing thorns, which offer protection from predators and on which prey items are impaled. The breeding season for loggerhead shrikes may begin as early as mid-February and lasts through July. (Yosef 1996)

Nationwide, loggerhead shrike populations have declined significantly over the last 20 years. Loggerhead shrikes are still fairly common in parts of the San Francisco Bay area, but urbanization has reduced available habitat, and local populations likely are declining. Loss and degradation of breeding habitat as well as possible negative impacts of pesticides are considered to be the major contributors to the population declines exhibited by this species. (Cade and Woods 1997, Humple 2008)

Loggerhead shrike breeds in a number of locations in the Project Area, where open grassland, ruderal, or agricultural habitat with scattered brush, chaparral, or trees that provide perches and nesting sites occurs (Bousman 2007k). This species occurs slightly more widely (i.e., in smaller patches of open areas providing foraging habitat) during the non-breeding season.

Yellow Warbler (*Dendroica petechia*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). The yellow warbler is a widespread neotropical migrant that inhabits wet deciduous forests throughout North America (Lowther et al. 1999). In California, yellow warbler occupies wooded riparian habitats along the coast, on both eastern and western slopes of the Sierra Nevada up to approximately 1,700 feet, and throughout the northern portion of the state (Heath 2008). Its range has remained relatively stable over time, but populations have declined substantially in many localities because of habitat loss (Cain et al. 2003, Heath 2008) and expansion of the brood-parasitic, brown-headed cowbird.. As a result, breeding yellow warbler has been largely extirpated from the Santa Clara Valley (Heath 2008). Ideal breeding habitat for yellow warbler consists of riparian corridors with dense, shrubby understory and open canopy (Lowther et al. 1999, Cain et al. 2003, Heath 2008). Yellow warbler breeds from early May through early August, and constructs open-cup nests in upright forks of shrubs or trees in dense willow thickets or other dense vegetation (Lowther et al. 1999).

Yellow warblers are uncommon breeders in the Project Area because of loss of riparian habitat, invasion by non-native plants, development along riparian corridors, and the abundance of the brown-headed cowbird in the San Jose area. However, small numbers of yellow warblers still breed in remnant riparian areas within Santa Clara County (Bousman 2007j). Suitable breeding habitat consists of riparian corridors, often with an overstory of

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mature cottonwoods and sycamores, a midstory of box elder and willow, and a substantial shrub understory (Bousman 2007j). Riparian areas with reduced understory because of grazing or disturbance generally are not used by this species, and riparian corridors lacking open ruderal or herbaceous vegetation along the edges of the corridors or with development up to the corridor edge often are avoided as well. This species breeds in very low numbers along the lower reaches of South Bay streams, being somewhat more common in the upper reaches of the cottonwood/willow-dominated zone. In the South County, the species has been recorded breeding in riparian habitat along Llagas, Uvas/Carnadero, and Pacheco Creeks, as well as the Pajaro River. However, bi-weekly bird surveys along lower Llagas Creek from Highway 152 downstream to the Pajaro River in 2010 did not detect any breeding evidence, and none were observed after late June (H. T. Harvey & Associates 2010c). These results suggest the possibility that South County populations continue to decline. Yellow warblers are an abundant migrant throughout the Valley during the spring and fall.

San Francisco Common Yellowthroat (*Geothlypis trichas sinuosa*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The San Francisco common yellowthroat inhabits emergent vegetation and breeds in fresh and brackish marshes and moist floodplain vegetation around the San Francisco Bay. Common yellowthroat uses small and isolated patches of habitat as long as groundwater is close enough to the surface to encourage the establishment of dense stands of rushes, cattails, willows, and other emergent vegetation (Nur et al. 1997, Gardali and Evens 2008). Ideal habitat, however has extensive, thick riparian, marsh, or herbaceous floodplain vegetation in perpetually moist areas, where populations of brown-headed cowbirds are low (Menges 1998). San Francisco common yellowthroat breeds primarily in fresh and brackish marshes, although it nests in salt marsh habitats that support tall vegetation (Guzy and Ritchison 1999). This subspecies builds open-cup nests, low in the vegetation, and nests from mid-March through late July (Guzy and Ritchison 1999, Gardali and Evens 2008).

The San Francisco common yellowthroat is one of the approximately 12 subspecies of common yellowthroat recognized in North America, two of which occur in the Project Area. Because subspecies cannot be reliably distinguished in the field, determination of the presence of San Francisco common yellowthroat can be achieved only by locating breeding birds in the breeding range known for this subspecies.

In the South Bay, the San Francisco common yellowthroat is a fairly common breeder in fresh and brackish marshes in the northern part of the Project Area. It is known to breed near the edge of the South Bay as well as in herbaceous riparian habitat and ruderal floodplain habitat along streams entering the Bay, such as lower Coyote Creek and the Guadalupe River (Bousman 2007m). Common yellowthroats breeding along the edge of the Bay and in riparian and wetland habitats away from the Bay from the Milpitas/northern San Jose/Santa Clara/Los Gatos area northward are considered San Francisco common yellowthroats, while those breeding from southern San Jose southward are of the more widespread subspecies *arizela*. The demarcation between the two subspecies apparently occurs somewhere in the mid-San Jose area (Grinnell and Miller 1944), and although those breeding in the southern part of the Project Area are certainly *arizela*, yellowthroats

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breeding in such areas as along Silver Creek near Lake Cunningham could be either subspecies, or could be intergrades.

Yellow-breasted Chat (*Icteria virens*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). The yellow-breasted chat is a neotropical migrant that breeds throughout eastern North America and patchily throughout the west (Eckerle and Thompson 2001). Chats nest in the understory of early-successional riparian corridors and other riparian habitats with dense foliage in the understory and an open canopy (Ricketts and Ritchison 2000, Comrack 2008). Chats prefer large patches of nesting habitat (Burhans and Thomson 1999) and are more likely to fledge young in patches with very dense foliage cover and sparse canopy cover (Ricketts and Ritchison 2000). They also require some taller trees for song perches (Ricketts and Kus 2000). Thus, optimal chat habitat is characterized by large patches of riparian vegetation with a thick shrubby understory, and a few taller trees but little overall canopy cover. Chats arrive at their breeding grounds as early as mid-April, and breed through August, after which they migrate to southern Mexico and Central America for the winter (Eckerle and Thompson 2001).

Yellow-breasted chat historically has nested in riparian habitats in the Santa Clara Valley, although no evidence shows that it was ever common here. Now, the species is an extremely rare breeder because of loss of suitable breeding habitat and the presence of brown-headed cowbirds (Bousman 2007b). In recent years, chats have been recorded in the largest numbers and most regularly along lower Llagas Creek, from the vicinity of the South County Regional Wastewater Authority Plant downstream to the Pajaro River (Padley 2010, H. T. Harvey & Associates 2010c). Elsewhere, nesting has been confirmed recently in the Project Area only along Coyote Creek upstream from U.S. Highway 101 near Hellyer Park, where a family group was seen in 1995 (S. Rottenborn, pers. obs.). However, a singing male along Coyote Creek near Coyote Ranch, at the northern end of the Coyote Valley, in 2008 (De Anza College Wildlife Corridor Stewardship Team, unpublished data) may have attempted breeding, and the species may breed in small numbers elsewhere on the valley floor (e.g., along lower Uvas/Carnadero Creek, the Pajaro River, and possibly elsewhere), in willow-dominated riparian habitats.

Alameda Song Sparrow (*Melospiza melodia pusillula*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The Alameda song sparrow is one of three subspecies of song sparrow that breed only in salt marsh habitats in the San Francisco Bay area (Chan and Spautz 2008). Prime habitat for Alameda song sparrow consists of large areas of tidally influenced salt marsh, dominated by cordgrass and gumplant and intersected by tidal sloughs, offering dense vegetative cover and singing perches. Although the *pusillula* subspecies (the "species" of special concern) is occasionally found in brackish marshes dominated by bulrushes, it is apparently very sedentary and is not known to disperse upstream into freshwater habitats (Basham and Mewaldt 1987). Although the range of the Alameda song sparrow has remained relatively unchanged over time, populations have been reduced substantially and are continually threatened by the loss and fragmentation of salt marshes around the Bay (Nur et al. 1997, Chan and Spautz 2008).

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Song sparrow nests as early as March, but peak nesting activity probably occurs in May and June. Salt marsh-breeding song sparrow in the Bay area (including *pusillula*) is known to breed about 2 weeks earlier than *gouldii* (Johnston 1954; Johnston 1956). This early breeding by *pusillula* is apparently an adaptation to breeding in a tidal environment, as high tides in late spring and early summer may destroy large numbers of nests.

This subspecies' primary habitat is fully tidal salt marsh, which is present in the Project Area along the South Bay (Figure 3.3-20). Song sparrow breeds along the lengths of tidal sloughs, and the demarcation along these sloughs between this subspecies and the more common, widespread subspecies *gouldii* that nests widely in freshwater habitats in the South Bay is unknown (Rottenborn 2007c).

Grasshopper Sparrow (*Ammodramus savannarum*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). In California, the distribution of breeding grasshopper sparrows includes the Coast Ranges, the northern Central Valley, and areas west of the southeastern deserts (Lyon 2000, Unitt 2008). The species always has been sparsely distributed in California, and its abundance has declined over the past half-century, likely in relation to conversion of native grassland habitats to agricultural and developed lands (Sutter and Ritchison 2005, Unitt 2008). Grasshopper sparrow breeds in open, short grasslands with scattered clumps of shrubby vegetation, constructing domed ground nests with grasses in patches of dense vegetation (Vickery 1996, Sutter and Ritchison 2005, Unitt 2008). Prime grasshopper sparrow breeding habitat features very large, unfragmented areas of grassland with patches of bare ground, and clumps of shrubby vegetation surrounded by denser grass cover for singing perches and nest sites (Vickery 1996, Lyon 2000, Sutter and Ritchison 2005). Grasshopper sparrow breeds from mid-March to August in California, after which it migrates to wintering grounds that are presumed to be in Mexico and Central America (Vickery 1996, Unitt 2008).

In the Project Area, breeding grasshopper sparrow occurs in the foothills of the Santa Cruz Mountains, from Calaveras Reservoir southeast to the hills above Pacheco Creek, and in the southeast portion of the Project Area where the hills drop down to the Pajaro River Valley (Heller 2007). The species may occur somewhat more widely during migration, but it is seldom seen in the South Bay outside the breeding season.

Bryant's Savannah Sparrow (*Passerculus sandwichensis alaudinus*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The Bryant's savannah sparrow is one of four subspecies of savannah sparrow that breeds in California. The *alaudinus* subspecies occurs primarily along coastal and bay shore areas, from Humboldt Bay to Morro Bay, and is found year-round in low-elevation, tidally influenced habitat, specifically pickleweed-dominated salt marshes, and in adjacent grasslands and ruderal areas. In South San Francisco Bay, levee tops with short vegetative growth and levee banks with high pickleweed are the preferred nesting habitat of this sparrow (Fitton 2008).

Bryant's savannah sparrows breed in the Project Area primarily in short pickleweed-dominated portions of diked/muted tidal salt marsh habitat, and in adjacent ruderal habitat, in the South San Francisco Bay area. Breeding also has been confirmed in expanses of short grassland in inland/upland areas on the west side of the Coyote Valley and in the

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Santa Cruz Mountain foothills, just north of the Pajaro River Valley (Rottenborn 2007b). During the non-breeding season, *alaudinus* and other savannah sparrow subspecies may forage in open areas throughout the Project Area.

Tricolored Blackbird (*Agelaius tricolor*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting Colony). Tricolored blackbirds are found primarily in the Central Valley and in central and southern coastal areas of California. This species is considered a California species of special concern (at its nesting colonies) because of concerns over the loss of wetland habitats in the state. The tricolored blackbird is highly colonial in its nesting habits and forms dense breeding colonies that, in some parts of the Central Valley, may consist of up to tens of thousands of pairs. This species typically nests in tall, dense stands of cattails or tules, but it also nests in blackberry, wild rose bushes, and tall herbs. Nesting colonies usually are located near fresh water. Tricolored blackbirds form large, often multi-species flocks during the non-breeding period and range more widely than during the breeding season.

In the Project Area, the species is patchily distributed in the Santa Clara Valley; its distribution reflecting the patchy nature of its breeding habitat (Rottenborn 2007a). Because nesting habitat for this species is short-lived and is often created by disturbance, colonies generally are not present at a given location for more than a few years. Additionally, because tricolored blackbirds are itinerant nesters, and because their nesting habitat is ephemeral, it is possible for this species to colonize or recolonize an area as suitable breeding habitat becomes available. As a result, undocumented colonies of tricolored blackbirds may appear in the Project Area, if new areas of emergent vegetation are established (e.g., because of wetland restoration or in stormwater detention basins or other ponds that are newly constructed or modified) in areas surrounded by extensive open foraging habitat.

Salt Marsh Wandering Shrew (*Sorex vagrans halicoetes*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The salt marsh wandering shrew occurs primarily in medium-high, wet tidal marsh (6 to 8 feet above mean sea level) with abundant driftwood and other debris for cover (Shellhammer 2000). This species also has been recorded in diked marsh habitat. Within these habitats, individuals typically prefer patches of tall pickleweed, in which they build nests. Salt marsh wandering shrew breeds and gives birth during the spring; however, very little is known about the natural history of this species.

The salt marsh wandering shrew historically was more widely distributed in the San Francisco Bay, but it is currently confined to salt marshes in the South Bay (Findley 1955). Salt marsh wandering shrew occasionally is captured during salt marsh harvest mouse trapping studies, but the difficulty in identifying it to species has precluded a better understanding of its current distribution in the South Bay. The shrew was formerly recorded from marshes of San Pablo and San Francisco Bays in Alameda, Contra Costa, San Francisco, San Mateo, and Santa Clara counties, but captures in recent decades have been very infrequent in these areas.

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The fully tidal salt marshes in the South Bay provide high-quality habitat for the species, and salt marsh wandering shrew likely is present in these areas. The species also has been recorded in New Chicago Marsh, which contains muted tidal/diked salt marsh. Therefore, it may occur in pickleweed-dominated tidal, muted tidal, or diked salt marshes within the northern part of the Project Area, such as along the lower reaches of streams entering the Bay (Figure 3.3-22).

Pallid Bat (*Antrozous pallidus*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The pallid bat is a light brown or sandy-colored, long-eared, moderate-sized bat that occurs throughout California, with the exception of the northwest corner of the state and the high Sierra Nevada (Zeiner et al. 1990b). Pallid bats are most commonly found in oak savannah and in open dry habitats with rocky areas, trees, buildings, or bridge structures that are used for roosting (Zeiner et al. 1990b, Ferguson and Azerrad 2004). Coastal colonies commonly roost in deep crevices in rocky outcroppings, in buildings, under bridges, and in the crevices, hollows, and exfoliating bark of trees. Night roosts often occur in open buildings, porches, garages, highway bridges, and mines. Colonies can range in size from a few individuals to over a hundred (Barbour and Davis 1969), and they usually consist of at least 20 individuals (Wilson and Ruff 1999). Pallid bats typically winter in canyon bottoms and riparian areas. After mating during the late fall and winter, females leave to form maternity colonies, often on ridge tops or other warmer locales (Johnston et al. 2006). Pallid bat roosts are very susceptible to human disturbance, and urban development has been cited as the most significant factor contributing to their regional decline (Miner and Stokes 2005).

Pallid bat likely was present throughout the Project Area historically, but it is slowly being extirpated from the area because of anthropogenic disturbance and habitat loss. In the Project Area, a maternity colony is present along Cochrane Road near Anderson Dam in Morgan Hill (Dave Johnston, pers. obs.). In addition, maternity colonies are present in east San Jose at a drainage south of Berryessa Creek close to Old Piedmont Road and on Chaboya Court at the end of Quimby Road; at the Highway 152 bridge over Uvas Creek west of Gilroy; and near Day Road northwest of Gilroy (Dave Johnston, pers. obs.). Individuals from these maternity roosts may forage in the Project Area, in open areas located within several miles of these roost locations. Pallid bats are known to forage along Alamitos Creek and Metcalf Road, but the locations of breeding colonies for these individuals are unknown. Potential breeding habitat is present in barns or old oak trees in a number of other areas, primarily in less developed portions of the Project Area.

Townsend's Big-eared Bat (*Corynorhinus townsendii*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The Townsend's big-eared bat is a colonial species, and females aggregate in the spring at maternity colonies to begin their breeding season, which may extend through the end of August. Females give birth to one young, and females and young show a high fidelity to both their group and their specific roost site (Pearson et al. 1952). Although the Townsend's big-eared bat is usually a cave dwelling species, many colonies are found in anthropogenic structures, such as the attics of buildings or old abandoned mines. Known roost sites in California include limestone caves, lava tubes, mine tunnels, buildings, and other structures (Williams 1986). This species also roosts in deep crevices of redwood trees. Radio tracking studies suggest that movement

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from a colonial roost during the maternity season is confined to the area within 9 miles of the roost (Pierson and Rainey 1998). This species is easily disturbed while roosting in buildings, and females are known to abandon their young when disturbed (Humphrey and Kunz 1976). Townsend's big-eared bats feed primarily on moths and other soft-bodied insects (Kunz and Martin 1982).

Townsend's big-eared bats have been found roosting at San Cristobal mine at Almaden Quicksilver County Park and just outside the Project Area on UTC property, east of Coyote Ridge near Metcalf Road (Dave Johnston pers. obs.). Additional roosts of Townsend's big-eared bats may be present in other areas, especially where mines are present (such as the Guadalupe Mines and possibly on southern Coyote Ridge), and it is possible that large trees or abandoned buildings in relatively undisturbed areas are used as well. No populations of Townsend's big-eared bats are currently known to occur on the Santa Clara Valley floor, and this species is not expected to breed in developed portions of the Project Area. Individual Townsend's big-eared bats may occasionally wander through any portion of the Project Area, where they may roost in cavities or structures and forage in a variety of habitats, although they are expected to occur only as occasional non-breeding foragers.

Western Red Bat (*Lasiurus blossevillii*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The western red bat is a locally common bat in coastal California and the Central Valley, and its range extends from Shasta County to Baja California, Mexico (Zeiner et al. 1990b). Western red bats are strongly associated with intact cottonwood and sycamore valley riparian habitats in low elevations (Pierson et al. 2006), and the loss of such habitats throughout the species' range threatens the persistence of the western red bat (Western Bat Working Group 2005). Both day and night roosts usually are located in the foliage of trees; red bats in the Central Valley show a preference for large trees and extensive, intact riparian habitat (Pierson et al. 2006). Day roosts often are located along the edges of riparian areas, near streams, grasslands, and even urban areas (Western Bat Working Group 2005). During the breeding season, western red bats establish individual tree roosts and occasionally small maternity colonies in riparian habitats (Zeiner et al. 1990b). Little is known about the habitat use of western red bats during the non-breeding season (Pierson et al. 2006). The red bat uses echolocation to capture insects in mid-flight, and requires habitat mosaics or edges that provide close access to foraging sites as well as cover for roosting (Zeiner et al. 1990b).

The Central Valley is assumed to be the primary breeding location of western red bat populations in California, and the species likely occurs in the San Francisco Bay Area only during winter and migration (Pierson et al. 2006). Western red bats are expected to be regular migrants and winter residents in the Project Area, but they are not known or expected to breed here. Individual male and female bats may occur as occasional migrants during the fall and spring or as foragers during the winter, and non-breeding individual males may occur during the summer. No breeding females occur in the Project Area during the summer. Western red bats may roost in the foliage in trees virtually anywhere throughout the Project Area, but are expected to roost primarily in wooded riparian areas.

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San Francisco Dusky-footed Woodrat (*Neotoma fuscipes annectens*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The San Francisco dusky-footed woodrat occurs in a variety of woodland and scrub habitats throughout the South Bay and the adjacent Central Coast Range, south to the Pajaro River in Monterey County (Hall 1981, Zeiner et al. 1990b). Woodrats prefer riparian and oak woodland forests with dense understory cover, or thick chaparral habitat (Lee and Tietje 2005). Although woodrats are locally common in many areas, habitat conversion and increased urbanization, as well as increasing populations of introduced predators, such as domestic cats, pose substantial threats to this subspecies (H. T. Harvey & Associates 2008). Dusky-footed woodrats build large, complex nests of sticks and other woody debris, which may be maintained by a series of occupants for several years (Carraway and Verts 1991). Woodrats also are very adept at making use of human-made structures, and can nest in electrical boxes, pipes, wooden pallets, and even portable storage containers. Woodrat nest densities increase with canopy density and with the presence of poison oak (Carraway and Verts 1991). Although the San Francisco dusky-footed woodrat is described as a generalist omnivore, individuals may specialize on local plants that are available for forage (Haynie et al. 2007). The breeding season for dusky-footed woodrat begins in February and sometimes continues through September, with females bearing a single brood of one to four young per year (Carraway and Verts 1991).

Because dusky-footed woodrats are extremely sensitive to non-native predators, their distribution in the mostly-urban Project Area is limited. Currently, with the exception of records along the northern portion of Coyote Creek and along the edges of the valley, San Francisco dusky-footed woodrats do not occur on the Santa Clara Valley floor (H. T. Harvey & Associates 2010c). They likely also have been extirpated in the southern portion of the county, in the Gilroy and Morgan Hill areas where the valley floor is developed (H. T. Harvey & Associates 2010c). Where low, open valleys are less developed (e.g., Coyote Valley and along Little Arthur Creek), woodrat populations appear to remain intact. In the Project Area, Coyote Creek likely supports extant populations of the San Francisco dusky-footed woodrat.

American Badger (*Taxidea taxus*). Federal Listing Status: None; State Listing Status: Species of Special Concern. American badger is a stocky, burrowing mammal that occurs in grassland habitats throughout the western United States. Badgers can have large territories, up to 21,000 acres in size, with territory size varying by sex and by season. They are strong diggers and feed primarily on other burrowing mammals, such as ground squirrels. In central California, American badgers typically occur in annual grasslands, oak woodland savannas, semi-arid shrub/scrublands, and any habitats with stable ground squirrel populations or other fossorial rodents (i.e., ground squirrels, gophers, kangaroo rats, and chipmunks [Zeiner et al. 1990b]). They occur to a lesser extent in agricultural areas, where intensive cultivation inhibits den establishment and reduces prey abundance. Badgers are primarily nocturnal, although they are often active during the day. They breed during late summer, and females give birth to a litter of young the following spring.

Badgers are known to occur in the Project Area primarily in foothill grasslands. In addition, road-killed animals have been detected in recent years by H. T. Harvey & Associates biologists along Monterey Highway near Tulare Hill and north of Morgan Hill; along Bailey Avenue (in Coyote Valley) at U.S. Highway 101 and west of Monterey Highway; along

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McKean Road near Calero Reservoir; and along U.S. Highway 101 from Metcalf Road south to Bailey Road, in San Martin, and near the Pajaro River. These records indicate that badgers occur on the valley floor as well, most likely during dispersal events.

State Fully Protected Species

American Peregrine Falcon (*Falco peregrinus anatum*). Federal Listing Status: None; State Listing Status: Fully Protected. The American peregrine falcon occurs throughout much of the world and is known as one of the fastest flying birds of prey. Peregrine falcons prey almost entirely on birds, which they kill while in flight. These falcons nest on ledges and caves on steep cliffs, as well as on human-made structures such as buildings, bridges, and electrical transmission towers. In California, they are known to nest along the entire coastline, the northern Coast, and the Cascade Ranges and Sierra Nevada.

A severe decline in populations of the widespread North American subspecies *anatum* began in the late 1940s. This decline was attributed to the accumulation of DDE, a metabolite of the organochlorine pesticide DDT, in aquatic food chains. When concentrated in the bodies of predatory birds such as the peregrine falcon, this contaminant led to reproductive effects, such as the thinning of eggshells. The American peregrine falcon was listed as endangered by the USFWS in 1970 (USFWS 1970) and by California in 1971. Recovery efforts included the banning of DDT in North America and captive breeding programs to help bolster populations. The USFWS removed the American peregrine falcon from the endangered species list in 1999 (USFWS 1999a), and although California still lists the species as endangered, delisting under the CESA also has been proposed (California Fish and Game Commission 2007).

The only locations within the Project Area where peregrine falcons have been detected breeding are on San Jose City Hall, where successful nesting has occurred each year since 2007 (Santa Cruz Predatory Bird Research Group 2010), and in old raven and hawk nests on electrical transmission towers within managed ponds in the Mountain View/Alviso area. Although no suitable cliff habitats are present in the Project Area, buildings and transmission towers provide potentially suitable nest sites. Because of the recent increases in this species' populations in California, this species' distribution and abundance as a breeder in the Project Area possibly will expand during the span of the Proposed Project. Small numbers of peregrine falcons regularly forage in bayside areas, in Coyote Valley, and in the Pajaro River valley, particularly during the non-breeding season, and they are occasional foragers at other locations throughout the Project Area.

Golden Eagle (*Aquila chrysaetos*). Federal Listing Status: None; State Listing Status: Fully Protected. In California, the golden eagle is an uncommon permanent resident and migrant throughout the state. The species' breeding range within California excludes only the Central Valley, the immediate coast in the far north, and the southeastern corner of the state (Zeiner et al. 1990a). Recent declines of golden eagle populations have occurred in several western states in North America, including California, primarily because of loss of habitat and mortalities resulting from human activities (Kochert et al. 2002, Good et al. 2007). Further declines in eagle populations are expected to occur as long as habitat loss and anthropogenic landscape alteration continue (Good et al. 2007).

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Golden eagle breeds in a range of open habitats, including desert scrub, foothill cismontane woodlands, and annual or perennial grasslands (Zeiner et al. 1990a, Kochert et al. 2002). Golden eagle nesting habitat is characterized by large, remote patches of grassland or open woodland; a hilly topography that generates lift; an abundance of small mammal prey; and tall structures that serve as nest platforms and hunting perches (Kochert et al. 2002). Once a breeding pair establishes a territory, they may build a number of nests in tall structures such as tall trees or snags, cliffs, or utility towers (Zeiner et al. 1990a, Kochert et al. 2002), only one of which is used in any given year (Kochert et al. 2002). The eagle breeding season begins in late January and continues through August (CDFG 2008a). Following the nesting period, adult eagles usually remain in or near their breeding territory (Zeiner et al. 1990a). Young birds in California tend to be sedentary, remaining in or near their parental home ranges (Kochert et al. 2002).

In the South Bay, golden eagle breeds widely in the Diablo Range, and less commonly in the Santa Cruz Mountains (Bousman 2007l), primarily outside the Project Area; however, valley floor areas adjacent to the foothills may be used (e.g., Coyote Valley and southern Santa Clara Valley), and grasslands along the San Francisco Bay margin, where perches are available, may be used for foraging. Nesting pairs within the Project Area are expected to occur primarily in the foothills of the Diablo Range and Santa Cruz Mountains. Nesting on the valley floor occurs more rarely, although a pair has nested on an electrical tower below Calero Reservoir for a number of years, and another pair has nested in a residential backyard in western Morgan Hill (S. Rottenborn, pers. obs.).

White-tailed Kite (*Elanus leucurus*). Federal Listing Status: None; State Listing Status: Fully Protected. In California, white-tailed kites can be found in the Central Valley and along the coast, in grasslands, agricultural fields, cismontane woodlands, and other open habitats (Zeiner et al. 1990a, Dunk 1995, Erichsen et al. 1996). White-tailed kites are year-round residents of the state, establishing breeding territories that encompass open areas with healthy prey populations, and snags, shrubs, trees, or other nesting substrates (Dunk 1995). Non-breeding birds typically remain in the same area over the winter, although some movements do occur (Zeiner 1990a). The presence of white-tailed kites is closely tied to the presence of prey species, particularly voles, and prey base may be the most important factor in determining habitat quality for white-tailed kites (Dunk and Cooper 1994, Skonieczny and Dunk 1997). Although the species recovered after population declines during the early twentieth century, its populations may be exhibiting new declines as a result of recent increases in habitat loss and disturbance (Dunk 1995, Erichsen et al. 1996).

White-tailed kites are fairly common residents in less developed portions of the Project Area that contain extensive open grassland, ruderal, or agricultural habitats. They breed across the northern edge of Santa Clara County, from the foothills of the Santa Cruz Mountains near Palo Alto, through the open areas edging the South Bay, and into the foothills of the Diablo Range east of Milpitas (Mammoser 2007). The species also occurs at scattered locations southward along the western edge of the Diablo Range bordering the Santa Clara Valley (Mammoser 2007). From the Santa Teresa Hills south to the Pajaro River, white-tailed kites breed throughout the foothills of the Santa Cruz Mountains and in a few areas of the valley floor (Mammoser 2007).

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Ringtail (*Bassariscus astutus*). Federal Listing Status: None; State Listing Status: Fully Protected. The ringtail is distributed throughout much of California, occurring in forests and shrubland, often in close association with rocky areas or riparian habitats. This species nests in rock recesses, hollow trees, logs, snags, abandoned burrows, or woodrat nests; young are usually born between May and June (Walker et al. 1968).

The status of this species in Santa Clara County is not well known. Although this species' strictly nocturnal habits may be at least partially responsible for the lack of information on its distribution in the Project Area, it is likely very rare because of the lack of sightings and the scarcity of roadkill records (e.g., compared to the nocturnal American badger, which is much more frequently detected by roadkill).However, ringtails have been recorded near Lexington Reservoir and near Little Arthur Creek west of Gilroy (D. Johnston, pers. comm.), and near the confluence of Carnadero Creek and the Pajaro River, and it is likely that ringtails are present in small numbers in less developed, wooded areas elsewhere at the edges of the Project Area.

Other Special-Status Species

Mimic Tryonia (*Tryonia imitator*). Federal Listing Status: None; State Listing Status: None. Also known as the California brackish water snail, this species inhabits coastal lagoons, estuaries, and salt marshes from Sonoma County south to San Diego County (CNDDB 2011). It is found in permanently submerged areas in a variety of sediment types and is able to withstand a wide range of salinities. This species has been recorded in two locations in Santa Clara County, both in the Project Area in Alviso (CNDDB 2011); one of these occurrences was from a salt evaporation pond on the east side of the Alviso Slough mouth, but the details of the other occurrence were not listed by the CNDDB. The mimic tryonia potentially may occur in tidal sloughs elsewhere in the Project Area as well.

Hom's Micro-blind Harvestman (*Microcina homi*). Federal Listing Status: None; State Listing Status: None. The Hom's micro-blind harvestman is a member of the family *Phalangodidae*, arachnids that are characterized by simple paired claws on their terminal segments. Harvestman typically has unusually long and thin legs in relation to its small, oval-shaped body.

Hom's micro-blind harvestman is endemic to the San Francisco Bay Area and highly restricted in its range. It has been observed or collected during fall and winter rains at eight sites in Santa Clara County (USFWS 1998b). With one exception, the species has been found underneath rocks with moist surfaces, on deep serpentine soil with fairly gentle slopes, often near running water (USFWS 1998b). However, in Santa Teresa Park, the species was found under Franciscan sandstone (USFWS 1998b). In the Project Area, it has been observed in the Santa Teresa Hills, the Morgan Hill area, north of U.S. Highway 101 on Metcalf Road, and near Silver Creek Road (CNDDB 2011). It potentially may occur in other locations in the Project Area as well, especially on serpentine-dominated areas with shallow soils and rock outcrops.

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Jung's Micro-blind Harvestman (*Microcina jungi*). Federal Listing Status: None; State Listing Status: None. The Jung's micro-blind harvestman also is a member of the family Phalangodidae. Jung's micro-blind harvestman is known only from one rocky serpentine grassland location, 0.9 mile south of the junction of Silver Creek and San Felipe roads near San Jose. It potentially may occur in other locations in the Project Area as well, especially on serpentine-dominated areas with shallow soils and rock outcrops.

Opler's Longhorn Moth (*Adela oplerella*). Federal Listing Status: None; State Listing Status: None. Opler's longhorn moth is a small, dark brown, hairy moth with a wingspan of approximately 0.35 to 0.55 inches. Adults almost always are found within a few yards of their host plant, California creamcups. Within this constraint, they are fairly commonly found on potential nectar plants, such as goldfields (*Lasthernia* sp.), tidy tips (*Layia* sp.), and Linanthus (*Linanthus* sp.), although the importance of nectar, if any, for survival and reproduction is unknown (USFWS 1998b). Individuals complete the active portion of their life cycle in a single season, the winter–spring wet season. At any one population, the flight season may last only 2 or 3 weeks (USFWS 1998b). Adults fly, mate, and female's lay their eggs generally from mid-March to late April, although the exact timing varies from year to year, depending on the weather (USFWS 1998b). Females insert their eggs directly into the unopened flowers of California creamcups. Survival through the dry season is accomplished by prepupal larvae or pupae in larval cases (USFWS 1998b). Available data indicates that Opler's longhorn moths are not strong fliers, with one study recapturing 95 percent of marked and recaptured moths within 164 feet of their initial release point (USFWS 1998b).

Habitat for the Opler's longhorn moth includes shallow, serpentine-derived or similar soils that support the moth's host plant, as well as potential nectar sources for adults. However, the presence of a population on non-serpentine soils in Santa Cruz County suggests that this species is not a serpentine obligate (USFWS 1998b). Historically, the Opler's longhorn moth's range is believed to have included serpentine and possibly non-serpentine grassland from most of the greater San Francisco Bay area counties. More recently, the species has been recorded from 14 sites, extending along the west side of San Francisco Bay from 5 miles southeast of Nicasio in Marin County south to the Scott's Valley area of Santa Cruz County, and also from the Oakland Hills area on the inner Coast Ranges (USFWS 1998b). Nine populations of Opler's longhorn moth have been recorded in Santa Clara County, all in the Project Area (USFWS 1998b). The species is known from serpentine habitat along Coyote Ridge, the Kalana Hills, the Hale property northwest of Morgan Hill, Tulare Hill southeast of San Jose, Silver Creek Hills in upper Hellyer Canyon, east of the Hayes Valley near San Martin, Santa Teresa County Park west of Calero Reservoir, and just north of Gavilan College south of Gilroy (USFWS 1998b, CNDDB 2011). It potentially may occur in other locations in the Project Area as well, especially on serpentine-dominated grasslands.

Pacific Lamprey (*Lampetra tridentata*). Federal Listing Status: None; State Listing Status: None. The Pacific lamprey is a member of the family *Petrornyzontidae*, a group of eel-like fish that do not possess jaws or paired fins. This species' range extends from Hokkaido, in northern Japan, across the Pacific Ocean to Alaska, and south along the coast to Baja California, Mexico (USFWS 2004b). Lampreys are born in fresh water, and larvae (or ammocoetes) hatch and drift downstream where they act as filter feeders for 2 to 7 years (USFWS 2004b). Ammocoetes gradually mature to the adult phase, and in streams that run

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to the ocean, adults migrate to saltwater habitat (USFWS 2004b). Adults are parasitic and feed on marine fish for 1–3 years before returning to fresh water (USFWS 2004b). The species' fidelity to natal streams is unknown, but adults may spend several years in streams before spawning (USFWS 2004b). Spawning habitat consists of gravel-bottomed streams at the upstream end of riffle habitat, typically also upstream of suitable ammocoete habitat (USFWS 2004b). Adults construct nests and deposit eggs between March and July (USFWS 2004b). Threats to this species include degraded water quality, construction of artificial barriers that prevent migration of anadromous populations to and from breeding habitat, harvest by fishing, predation by non-native species, and habitat loss (USFWS 2004b).

Historically, the Pacific lamprey may have been present in streams throughout the Project Area (Leidy 2007). It is currently known to occur in the Project Area in the Guadalupe River and Guadalupe, Alamitos, Calero, Los Gatos, Coyote, and Upper Penitencia Creeks, and may be locally common in these areas (Leidy 2007, SCVWD fish sampling and relocation data 2002-2009). As with other anadromous fishes, the Pacific lamprey may be present in all accessible areas of streams in the Project Area during migration to breeding areas, as well as during the latter portion of the adult phase of their lives, when they return to freshwater streams.

Pacific Harbor Seal *(Phoca vitulina richardsi*). Federal Listing Status: None; State Listing Status: None. Pacific harbor seals occur along the Pacific coast of North America, from Alaska south to Baja California, Mexico. In the San Francisco Bay, harbor seals haul out at sites that typically consist of mudflats located far from areas used regularly by humans, and near deeper water where the seals forage. Haul-out sites are used for resting and pupping (giving birth); pupping typically occurs during spring, with a peak in April (Fancher and Alcorn 1982). Harbor seals forage in nearshore marine habitats on a variety of fishes and invertebrates. The major harbor seal dietary components in the South Bay include yellowfin goby (*Acanthogobius flavimanus*), staghorn sculpin (*Leptocottus armatus*), and white croaker (*Genyonemus lineatus*) (Kopec and Harvey 1995).

During the spring, female harbor seals nurse pups for about 28 days, during which time they are susceptible to being separated from their young as a result of human disturbance. Disturbance can lead to separation of pups from nursing mothers, can add physiological stress to adults, and can lead to long-term abandonment of historic haul-out sites (Lidicker and Ainley 2000). The NMFS (the agency that oversees the protection of marine mammals) recommends a 100-yard disturbance-free buffer around harbor seals. Although it is not listed by California as a species of special concern or covered by the draft Habitat Plan (ICF Jones & Stokes 2010), Pacific harbor seal is protected under the federal Marine Mammal Protection Act.

Any undisturbed intertidal habitat that is accessible to the open Bay potentially may be used by harbor seals (Lidicker and Ainley 2000). A known, primary haul-out site for harbor seals in the South Bay is present just north of the Project Area at Mowry Slough in Fremont. Additional haul-out sites and foraging habitat for harbor seals are present in the intertidal habitat and mud flats elsewhere in the vicinity of the Project Area, and harbor seals are known to forage in tidal reaches of a number of the streams entering the Bay in the Project Area.