4.5 BIOLOGICAL RESOURCES

This section addresses biological resources. The information included below is derived from field work and data collected by Monk & Associates between April 2003 and February 2006. The information collected by Monk & Associates was incorporated into a Natural Environmental Study (NES), upon which much of this section is based. The NES is available for public review at the Solano Transportation Authority (STA), One Harbor Center, Suite 130, Suisun City, CA 94585, during regular business hours.

Methodology

The methods used to identify biological resources in the study area included biological field surveys for general habitat characterization, special-plant status, and heritage tree status. Additional surveys were conducted for common wildlife species, special status wildlife species, and habitat assessment, including a wetland delineation. The California Natural Diversity Database (CNDDB) and the California Native Plant Society's (CNPS) Electronic Inventory were searched for historic and recent records of special-status species within the North Connector Project (Project) area. A species lists from the United States Fish and Wildlife Service (USFWS) including special-status species occurring in the region of the Project area was also utilized in conducting surveys.

EXISTING CONDITIONS

This section discusses natural communities of concern, specific plant species of concern, animal species of concern, and threatened and endangered animal species. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act (FESA) are discussed, and wetlands and other waters are also discussed, below.

Biological Communities and Wildlife Habitat within the Study Area

California Annual Grassland. California annual grassland habitats are characterized by dense to sparse cover of introduced Mediterranean grasses with flowering stems generally between 0.7 and 1.6 feet. A variety of native and non-native forbs (broad-leaved plants) are often found within the grassland community. Most of the species associated with this habitat germinate in the fall, with flowering and seed production occurring during the spring. These species are dormant during the summer. Annual grassland habitats are widespread throughout the valleys and foothills of California at elevations below 4,002 feet.

Annual grassland habitats within the study area primarily occur at the western end of the Project. The annual grasslands on the West End of the study area north of State Route 12 (SR12) are currently used for cattle grazing.

Freshwater Marsh (Cattail Wetland). Freshwater marsh habitats are characterized by dense cover of perennial, emergent monocots, often 13 to 16 feet tall, which form closed canopies. This wetland type occurs in quiet water areas that are either permanently flooded or inundated for extended periods of time. This wetland community is common

along the margins of lakes and ponds. A freshwater marsh, dominated by dense cover of cattails (*Typha latifolia*), is located around the ponds on the West End of the study area just north of SR12.

Mixed Riparian Woodland. Mixed riparian woodland is characterized by medium to tall broadleaf, winter deciduous trees that often form relatively closed canopies. Riparian communities develop along rivers and streams. Mixed riparian woodlands occur along the edges of low-gradient streams throughout the Central Valley, generally at elevations less than 492 feet. While this community was once widespread, much of the habitat has been lost due to flood control, agriculture, and urban expansion. Within the study area dense riparian habitat is associated with Suisun Creek, the two unnamed creeks on either side of Red Top Road, and on the West End of the study area north of SR12.

Riparian communities are important stopover areas for migratory warblers and other migratory passerine birds (perching birds) that need to feed and rest while on their long seasonal migrations.

Coast Live Oak Woodland. This community is characterized by medium-sized evergreen oaks with continuous or intermittent canopy. Live oak woodland typically occurs on north-facing slopes and in shaded ravines at elevations less than 3,281 feet. This community occurs throughout the outer Coast Ranges from Sonoma County south to Santa Barbara County. Coast live oak woodland is present on the West End of the study area on the north side of SR12.

The live oak woodland present within the study area provides valuable wildlife habitat. Hundreds of vertebrate species and thousands of invertebrate species are known to be associated with California's oak habitats. Oak trees produce a variety of wildlife food opportunities. Oak acorns, leaves, wood, roots, pollen, and sap are sustenance for a myriad of insects, birds, and mammals. These trees form the basis of an elaborate food web, with herbivores eating the oak products and carnivores eating the herbivores. It is expected that many other birds, mammals, and reptiles could be found within this community in the Project area at different times of the year.

Agricultural Areas. The eastern extent of the study area is located almost entirely within agricultural areas that include cultivated crops, vineyards, and orchards. Agricultural areas do not provide habitat for many resident wildlife species. The intense cultivation and manipulation of agricultural land, including pesticide and fertilizer applications, limits the number of species that can occupy or use this habitat.

Urban Mix. Developed and landscaped areas contain no natural plant communities. Developed areas include residential, commercial and industrial buildings, roadways, and parking lots.

Landscaped areas include vegetated areas that have been planted with horticultural species that are routinely maintained. Developed and landscaped areas occur in various places throughout the study area. Urban landscape communities consist of herbs, shrubs, and trees planted for landscapes in parks and around homes, businesses, and other structures.

Plant Species of Concern

A search of CDFG's Natural Diversity Database (CNDDB 2007) was conducted for special-status plant records within ten miles of the Project area. The search identified twenty-eight (28) special-status plants known to occur in the vicinity of the Project area, as shown in Figure 1 of Appendix E. This figure provides a graphical illustration of the closest known records for special-status species within 10 miles of the Project area. Appendix E also provides a list of special-status plant species known to occur in the vicinity of the Project area and their habitat requirements. Many of the plant species indentified during the CNDDB and CNPS database searches and in the USFWS letter may have historically occurred within the study area; however, suitable habitat within the study area no longer exists for these species and therefore these species will not be addressed.

The study area contains suitable habitat for seven plant species indentified during the CNDDB search, including alkali milk-vetch (*Astragalus tener* var. *tener*), brittlescale (*Atriplex depressa*), big-scale balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*), big tarplant (*Blepharizonia plumosa* ssp. *plumosa*), Diablo helianthella (*Helianthella castanea*), Pappose tarplant (*Centromadia parryi* ssp. *parryi*), and Contra Costa goldfields (*Lasthenia conjugens*). These species are discussed in detail below.

In addition, two uncommon plants are found on the West End of the study area: Biolettii daisy (*Erigeron biolettii*), a CNPS List 3 species, and long-petaled iris (*Iris longipetala*), a locally uncommon species, were observed. These species are also discussed below.

No state or federally-listed plants or CNPS List 1B plants were found within the study area during the surveys conducted in 2003 and 2004.

Alkali Milk-Vetch (Astragalus tener var tener). Alkali milk-vetch is a CNPS List 1B.2 species. It has no state or federal status. This annual herb is a member of the pea family. It is found in vernal pools with alkaline soils, and mesic grassland habitats with adobe clay soils where it blooms between March and June. Suitable habitat is present within the study area. This plant was not observed during appropriately-timed surveys conducted in 2003 and 2004. Consequently, the proposed Project will not result in impacts to this species.

Brittlescale (Atriplex depressa). Brittlescale is a CNPS List 1B.2 species. It has no state or federal status. This annual chenopod is found in chenopod scrub, meadows and seeps, playas, valley and foothill grassland habitats and vernal pools with alkaline or clay soils. It flowers between May and October. Suitable habitat is present within the study area. This plant was not observed during appropriately-timed surveys conducted in 2003 and 2004. Consequently, the proposed Project will not result in impacts to this species.

Big-Scale Balsamroot (Balsamorhiza macrolepis var macrolepis). Big-scale balsamroot is a CNPS List 1B.2 species. It has no state or federal status. This member of the sunflower family is found in chaparral, woodland, and grassland habitats, sometimes on serpentinite soil. This perennial herb flowers between March and June. Suitable habitat is present within the study area. This plant was not observed during appropriately-timed surveys conducted in 2003 and 2004. Consequently, the proposed Project will not result in impacts to this species.

Big Tarplant (Blepharizonia plumosa ssp. plumosa). Big tarplant is a CNPS List 1B.1 species. It has no state or federal status. This annual member of the sunflower family is found in grassland habitats at elevations between 50 and 505 meters. It flowers between July and October. This plant was not observed during appropriately-timed surveys conducted in 2003 and 2004. Consequently, the proposed Project will not result in impacts to this species.

Diablo Helianthella (Helianthella castanea). Diablo helianthella is a CNPS List 1B.2 species. It has no state or federal status. This member of the sunflower family is found in a variety of habitat types including broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and grassland. It is a perennial herb that blooms between April and June. This plant was not observed during appropriately-timed surveys conducted in 2003 and 2004. Consequently, the proposed Project will not result in impacts to this species.

Pappose Tarplant (Centromadia parryi ssp. parryi) is a CNPS List 1B.2 species. It has no state or federal status. This annual member of the sunflower family is found in chaparral, coastal prairie, meadows, seeps, marshes, and vernally mesic grassland, often in alkaline soils. It flowers between May and November. This plant was not observed during appropriately-timed surveys conducted in 2003 and 2004. Consequently, the proposed Project will not result in impacts to this species.
Contra Costa Goldfields (Lasthenia conjugens). Contra Costa goldfields is a federal listed endangered species and is a CNPS List 1B.1 species. It has no state status. This species is found in valley and foothill grasslands, vernal pools, and cismontane woodlands. Its microhabitats in these communities are swales, and low depressions in open grassy areas (elevations of 3-1500 feet). It flowers between March and June. This plant was not observed during appropriately-timed surveys conducted in 2003 and 2004. Consequently, the proposed Project will not result in impacts to this species.

Biolettii Daisy (Erigeron biolettii). Biolettii daisy is a CNPS List 3 species. It has no state or federal status. Biolettii daisy is a semi-woody, yellow flowered, perennial herb in the Sunflower Family (Asteraceae). Distinctive features of this species include discoid heads, purple-tipped, densely-glandular phyllaries in several series, and narrowly oblanceolate leaves. Biolettii daisy is found in mesic, rocky habitats (not necessarily stream sides) in North Coast woodlands, broadleaved upland forests and conifer forests in Humboldt, Mendocino, Marin, Napa, Solano and Sonoma counties (CNPS 2001). In spite of its wide distribution, it is rarely collected, and most existing collections are old. Biolettii daisy occurs on the West End of the study area and may be affected by the proposed Project, but impacts to this species are not considered significant because this species is not a State or federally listed plant.

Long-Petaled Iris (*Iris longipetala*). This species is widely distributed in moist areas of the annual grassland, generally found on the easternmost east-facing slope of the property. The Napa Chapter of the CNPS considers this iris locally uncommon in Napa and Solano counties. However, this species is not included as a special-status species in the latest CNPS Inventory (CNPS 2001). It does not have a special state or federal status, either. Long-petaled iris occurs on the West End of the study area and may be affected by the proposed Project, but impacts to this species are not considered significant because this species is not a State or federally listed plant.

Wildlife Species of Concern

Based on the CNDDB search (CNDDB 2007) and the USFWS list, 48 special status wildlife species are known to occur in the vicinity of the Project area. Figure 1 of Appendix E provides a graphical illustration of the closest known records for special-status species within 10 miles of the Project area. Appendix E provides a list of special-status wildlife species known to occur in the vicinity of the Project area and their habitat requirements, The USFWS' countywide list indicates that 86 special-status animal species (this includes fish and invertebrates) could occur in Solano County. The USFWS' countywide list overlaps with the CNDDB search. Also, it should be noted that the CNDDB list is based on records submitted to the CNDDB by biologists who have identified the special-status species in the area. The USFWS' County-wide list is based on distribution maps and habitat range maps of the special-status species, and is not necessarily based upon known records of the special-status species in question. Twenty-four (24) special-status species identified during the CNDDB search and/or on the USFWS list have potential to occur within the study area; these species are discussed below. All other special-status species known from the region would not be expected to occur within the study area due to lack of suitable habitat.

Vernal Pool Species

Two vernal pool invertebrates have potential to occur in the study area. These species are discussed below:

Vernal pool fairy shrimp (*Branchinecta lynchi*) was designated as threatened in its entire range on September 19, 1994 (Federal Register 59:48136-48153). Critical habitat for this species was originally designated on August 6, 2003 (Federal Register 68: 46683-46867), and the designation was revised on August 11, 2005. Critical habitat unit designations for individual listed fairy shrimp species were published on February 10, 2006 (Federal Register 71:7117).

The vernal pool fairy shrimp is a small aquatic crustacean that ranges in size from ½ to one inch long. Fairy shrimp feed on algae, bacteria, protozoa, rotifers and bits of detritus. The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. It tends to occur in smaller pools (less than 0.05-acre) that are most commonly found in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands. It has also been collected in large vernal pools (e.g. 25 acres). Vernal pool fairy shrimp should be collected from early December to early May (USFWS 1994).

The female drops eggs to the pool bottom or the eggs remain in the brood sac until the mother dies and sinks. When the pool dries out, so do the eggs (known as cysts when dry). They remain in the dry pool bed until rains and other environmental stimuli hatch them. Cysts can withstand heat, cold and prolonged desiccation. When the pools refill, some, but not all, of the cysts may hatch. The cyst bank in the soil may contain cysts from several years of breeding. Average time to maturity is only forty-one days. In warmer pools, it can be as little as eighteen (Eriksen and Belk 1999).

The vernal pool fairy shrimp is widespread but not abundant within its known range. Known populations extend from Shasta County through most of the length of the Central Valley to Tulare County. The ephemeral wetlands that support this network of

populations are remnants of what was formerly a pristine vernal pool ecosystem, which has been converted to primarily agricultural and urban uses.
The closest record for vernal pool fairy shrimp is located 4.8 miles northeast of the Project area (CNDDB Occurrence No. 331).

Two large stock ponds located in the West End of the Project area are deep, perennial water bodies. These features would not constitute habitat used by listed shrimp species. Although most unlikely, vernal pool fairy shrimp conceivably could occur in the shallow, seasonal wetland pool features on the flat portions of the West End of the Project area. The proposed Project would not impact any of the seasonal wetland pool features that provide suitable habitat conditions for special-status shrimp. The seasonal wetland pools are within 150 feet (47 meters) of the proposed road alignment. Consequently, if vernal pool invertebrate species occur in the study area, they would not be affected by the Project.

Vernal pool tadpole shrimp (*Lepidurus packardi*) was designated as threatened in its entire range on September 19, 1994 (Federal Register 59:48136-48153). Critical habitat for this species was originally designated on August 6, 2003 (Federal Register 68: 46683-46867), and the designation was revised August 11, 2005. Critical habitat units by individual fairy shrimp species were published on February 10, 2006 (Federal Register 71:7117). The Project area is located outside critical habitat (Unit 16) designated for this species in Merced County.

The vernal pool tadpole shrimp is a small crustacean whose adults reach approximately 2 inches in length. Vernal pool tadpole shrimp require seasonally aquatic habitats that are wet for at least 7 weeks and dry in summer. They occur in a variety of natural and artificial seasonally inundated habitats including vernal pools, seasonal wetlands, alkaline pools, clay flats, vernal swales, stockponds, railroad right-of-way pools, roadside ditches, and road rut pools resulting from vehicular activity. Occupied pools and wetlands typically have highly turbid waters or aquatic vegetation that may provide shelter from predators. They also have been observed in clear waters. Tadpole shrimp climb or scramble over objects, as well as plowing along or within bottom sediments. Their diet consists of organic debris and living organisms, such as fairy shrimp and other invertebrates.

The life history of the vernal pool tadpole shrimp is linked to the seasonal cycle of the vernal pool. After winter rainwater fills the pool, the population is reestablished from cysts that lie dormant in the dry pool sediments. Sexually mature adults have been observed in vernal pools three to four weeks after the pools had been filled. Some cysts hatch immediately and the others remain dormant in the soil to hatch during later rainy seasons.

The vernal pool tadpole shrimp is known from 19 populations in the Central Valley, ranging from east of Redding in Shasta County south to the San Luis National Wildlife Refuge in Merced County, from a small population near the Napa County airport, and from a single vernal pool complex on the San Francisco Bay National Wildlife Refuge in the City of Fremont, Alameda County. The ephemeral wetlands that support this network of populations are remnants of what was formerly a pristine vernal pool ecosystem, but which has been converted to mainly agricultural and urban uses. This highly disturbed remnant habitat is imperiled by a variety of human-caused activities, primarily urban

development, water supply and flood control projects, and agriculture. Rapid urbanization of the Central Valley of California currently poses the most severe threat to the continued existence of the listed vernal pool crustaceans. The closest record for vernal pool tadpole shrimp is located 6 miles northeast of the Project area (CNDDB Occurrence No. 158).

Two large stock ponds located in the West End of the Project area are deep, perennial water bodies. These features would not constitute habitat used by listed shrimp species. Although most unlikely, vernal pool tadpole shrimp conceivably could occur in the shallow, seasonal wetland pool features on the flat portions of the West End of the Project area. The proposed Project would not impact any of the seasonal wetland pool features that provide suitable habitat conditions for special-status shrimp. The seasonal wetland pools are within 150 feet (47 meters) of the proposed road alignment. Consequently, if vernal pool invertebrate species occur in the study area, they would not be affected by the Project.

Crustaceans

California Freshwater Shrimp (*Syncaris pacifica*), is a state and federal endangered species. This shrimp is known from only 11 streams in Napa, Sonoma, and Marin Counties. The 11 streams are East Austin, Salmon, Lagunitas, Big Austin, Sonoma, Huichica, Green Valley, Jonive, Walker, Yulupa, and Blucher. The freshwater shrimp inhabits quiet portions of tree-lined streams with underwater vegetation and undercut banks with exposed tree roots.

Decline in shrimp populations is attributed to degradation and loss of their habitat resulting from increased urbanization, overgrazing, agricultural development, dam construction, and water pollution. This shrimp is also threatened by the introduction of exotic predators, especially sunfish. Although this shrimp species has a very restricted range and is known from only 11 streams, potential habitat for this species occurs along Suisun Creek. The Project, as currently designed, would not result in direct impacts to Suisun Creek. Consequently, no likely direct impacts to California freshwater shrimp are anticipated.

Insects

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*). The valley elderberry longhorn beetle was designated as federally threatened in its entire range on August 8, 1980. 45 F.R. 52803-52807. Critical habitat was designated for this species at the same time.

The valley elderberry longhorn beetle is a medium-sized beetle, about 0.8 inches long. The forewings of the female are dark metallic green with red margins, whereas those of the male are primarily red with dark green spots. This beetle is associated with elderberry trees (*Sambucus* spp.) during its entire life cycle. Elderberry trees/shrubs are associated with riparian habitats which occur along rivers and streams. It appears that in order to serve as habitat, the shrubs must have stems that are 1.0 inch or greater in diameter at ground level. The adults eat the elderberry foliage until about June when they mate. The females lay eggs in crevices in the bark. Upon hatching the larvae then begin to tunnel into the tree where they will spend 1-2 years eating the interior wood

which is their sole food source. The adults emerge from pupation inside the wood of these trees in the spring as the tree begins to flower. The exit holes made by the emerging adults are distinctive, small, oval openings (Barr 1991). Often these holes are the only indication that the beetles occur in an area.

Valley elderberry longhorn beetle is reported to occur along the eastside of Green Valley Road, north and south of the intersection with Business Center Drive, which is in close proximity to the study area (City of Fairfield 2000). Surveys for this species were conducted by M&A biologists on May 17 and June 6, 2004, and February 22, 2006, to determine if this species is present within the study area. Several of the elderberry trees/shrubs present along Suisun Creek had appropriately-sized beetle exit holes indicating past use by valley elderberry longhorn beetle. While most of the exit holes were from previous years, fresh exit holes were found on an elderberry tree/shrub near the southern end of the study area along the creek. All of these holes indicate that habitat for valley elderberry longhorn beetle occurs within the Project area along Suisun Creek.

The extent of valley elderberry longhorn beetle habitat along Suisun Creek was determined in accordance with USFWS' *Conservation Guidelines for Valley Elderberry Longhorn Beetle* (USFWS 1999). All elderberry plants along Suisun Creek were mapped using a Trimble Pro-XR Global Positioning System (GPS) having sub-meter accuracy. In addition, all valley elderberry shrub/trees with individual stems or clusters of stems greater than one inch in diameter at ground level were tagged using numbered aluminum tree tags and then entered as a data point in the GPS file. Similarly, the "diameter size class" of the recorded stems was entered into the GPS file. Consequently, the proposed Project may result in impacts to this species. Mitigation measures detailed in this report will address potential impacts to this species.

Callippe Silverspot Butterfly (*Speyeria callippe callippe*), is a federally endangered species. It has no state status. This butterfly is found in native and non-native annual grassland habitats that support either its host and/or food plants. Female Callippe silverspots lay their eggs on the dry remains of Johnny jump-up (*Viola pedunculata*) plants or on the surrounding debris. Within about one week of hatching, the larvae eat their egg shells and then wander a short distance to spin a silk pad upon which they spend the summer and winter. Upon completion of their diapause the following spring, the larvae immediately seek out Johnny jump-ups on which to feed. In May, each larva forms a pupa. Adults emerge in about two weeks and live for approximately three weeks. The flight period of this butterfly ranges from mid-May to early-July, typically ending around July 4.[1] Adult nectar plants that this butterfly feeds on includes Italian thistle, milk thistle (*Silybum marianum*), bull thistle (*Cirsium vulgare*), California buckeye (*Aesculus californica*), and coyote mint (*Monardella villosa*). Ideal habitat conditions for this species are grasslands on hilltops (where mating occurs) that support larval food plants and/or nectar plants. However, all three of these habitat components need not be present in one area. Presence of the larval food plant (Johnny jump-up) may be enough for this butterfly to lay its eggs. Once the larvae metamorphose, adult butterflies may travel up to several miles to find suitable nectar plants.

The presence of Johnny jump-ups in the grasslands within the West End of the study area provides potential host plants for Callippe silverspot butterfly. Surveys for Johnny

[1] D. Arnold, Entomologist, personal communication with S. Lynch of M&A, Inc., 1998.

jump-up plants were conducted in March 2004. Two distinct populations of Johnny jump-up were identified in the West End of the study area. The Project as currently designed does not impact either population of host plant. Consequently, no direct impacts to Callippe silverspot butterfly, or the host plant, are anticipated.

Amphibians

California Tiger Salamander (*Ambystoma californiense*). On September 3, 2004 the Central California Distinct Population Segment (DPS) of California tiger salamander (CTS) was designated as threatened. The study area occurs within the region where populations of CTS are designated by the USFWS as the Central California DPS.

On August 10, 2004, the USFWS designated Critical Habitat for the Central California DPS. USFWS proposed 47 critical habitat units for the salamander, encompassing a total of 382,666 acres (154,859 hectares), in portions of 20 counties in Central California, including Alameda, Amador, Calaveras, Contra Costa, Fresno, Kern, Kings, Madera, Mariposa, Merced, Monterey, Sacramento, San Benito, San Joaquin, San Luis Obispo, Santa Clara, Solano, Stanislaus, Tulare, and Yolo Counties.

The CTS is also a California species of special concern. This title affords the CTS no legally mandated protection; however, pursuant to CEQA, this species must be considered in any Project that will undergo, or is currently undergoing CEQA review, and/or any Project that must obtain an environmental permit(s) from a public agency (e.g., the U.S. Army Corps of Engineers). 14 Cal. Code Regs. §15380, Under Section 41 of Title 14 of the California Code of Regulations, the CTS is a protected amphibian that may only be taken or possessed under a special permit issued by the California Department of Fish and Game (CDFG) .

The CTS occurs in grasslands and open oak woodland that provide suitable aestivation (i.e., summer retreats) and/or breeding habitats. The CTS spend the majority of their lives underground in California ground squirrel (*Spermophilus beechyi*) burrows, Botta's pocket gopher (*Thomomys bottae*) burrows, and other subterranean refuges. This salamander has also been found in areas with no apparent underground retreats. In these areas it may utilize cracks in the ground or may burrow into loose soil, or seek refuge in and under rotting logs or fallen branches. The CTS emerges from its aestivation sites for only a few nights each year during the rainy season to migrate to its breeding ponds, typically during a driving rainstorm. Seasonal wetlands, vernal pools, or artificial impoundments such as stock ponds that typically do not support fish, bullfrogs, red swamp crayfish, or signal crayfish provide suitable breeding habitat. Breeding ponds and streams typically hold water at least until the month of May to allow time for larvae to fully metamorphose. Since the tiger salamander may migrate up to 0.62-mile or more from its underground retreats to breeding ponds, unobstructed migration corridors are critical to this animal's survival. (Brode 1997; M&A unpublished data 1997).

The closest mapped critical habitat in the County is 17 miles east of the Project area in Central Valley habitats. The closest record for CTS in vernal pool habitats is located approximately 7 miles east of the study area. (CNDDB Occurrence No. 485). Since there is no mapped critical habitat within many miles of the Project site, and since there are no records for CTS in similar habitats as found within the study area in the County, CTS are unlikely to be present within the study area. However, a habitat assessment for CTS was prepared for the study area following the joint USFWS/CDFG protocol, *Interim*

Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander (October 2003). This guidance document provides two procedures to accurately assess the likelihood of CTS presence in the vicinity of a Project site, including: 1) an assessment of CTS locality records and potential CTS habitat in and around the study area; and 2) focused field surveys of breeding pools and their associated uplands to determine whether CTS are likely to be present. On April 26, 2004, a CTS site assessment report was submitted to CDFG and USFWS that requested authorization to conduct spring larval surveys for CTS in the ponds north of SR12 on the West End of the Project area. (M&A 2004a). On April 27, 2004, prior to the July 27, 2004 federal listing of the Central California DPS of the CTS, authorization was received from CDFG to conduct funnel trapping for CTS in these ponds. (Mr. Scott Wilson – Region 3). Funnel trapping and dip-netting yielded negative findings for CTS. On October 11, 2004 the CTS survey report was submitted to CDFG and USFWS (M&A 2004d). The assessment and survey demonstrates that CTS do not likely occur within the study area. On April 5th, 2006, the USFWS stated that "the Service has concurred with your determination that the Project does not provide habitat for the California tiger salamander." As such, no impacts are expected to occur to CTS from implementation of the Project.

California Red-Legged Frog (*Rana aurora draytonii*), is a federal listed threatened species and a California species of special concern. The study area is east of the Jameson Canyon-Lower Napa River core recovery area for California red-legged frog (USFWS 2002). The California red-legged frog is typically found in slow-flowing portions of perennial streams and in intermittent streams that maintain water in the summer months. This frog is also found in hillside seeps that maintain pool environments or saturated soils throughout the summer months (Monk & Associates, Inc. personal observations). Riparian vegetation such as willows and emergent vegetation such as cattails (*Typha* spp.) are preferred red-legged frog habitats, though not necessary for this species to be present. This frog is also found in ponds. Larval California red-legged frogs require 11-20 weeks of permanent water to reach metamorphosis (that is, to change from a tadpole into a frog).

Populations of California red-legged frog would be reduced or eliminated from aquatic habitats supporting non-native species such as bullfrogs, Centrarchid fish species (such as sunfish, blue gill, or large mouth bass), and signal and red swamp crayfish, all of which are known California red-legged frog predators. However, the presence of these non-native species does not preclude the presence of the California red-legged frog. (M&A unpublished data).

In April and May of 2003, biologists conducted surveys to evaluate the suitability of habitats for California red-legged frog in the other portions of the study area. The areas surveyed in April and May of 2003 included Suisun Creek and the West End of the Project area north of SR12. Areas surveyed also included Dan Wilson Creek. However, this creek is no longer part of the Project area and thus is not discussed further in this report. The habitat assessments completed for Suisun Creek and the West End of the Project area were submitted to the USFWS in a report dated June 23, 2003 (M&A 2003a). The report concluded there was suitable habitat for the California red-legged frog and that protocol surveys of Suisun Creek should commence. The report also documented that on May 27, 2003 biologists observed California red-legged frog in a drainage feature on the West End of the Project area. Accordingly, California red-legged frog are assumed to be present throughout the West End of the Project area, and

therefore no further surveys of this area were required. A juvenile California red-legged frog was also observed in the same drainage on March 17, 2004.

Written authorization was received from USFWS on August 19, 2003 to conduct protocol surveys in Suisun Creek. Biologists conducted the protocol surveys for California red-legged frog in Suisun Creek during August and September of 2003. No California red-legged frogs were observed during the protocol surveys. The protocol California red-legged frog survey report was submitted to the USFWS on September 29, 2003. In addition, in September 2004, M&A biologists conducted a protocol survey for this species along the creeks south of SR12, near Red Top Road (Jameson Creek), and no California red-legged frogs were observed in association with this intermittent creek. However, the report concluded that there may be marginal habitat for California red-legged frogs within the Jameson Creek at Red Top Road (M&A 2004c).

Other amphibian studies augmented information on the presence of California red-legged frogs in the study area. In May, 2004 funnel trapping for California tiger salamander larvae was being conducted in the stock ponds on the West End of the Project area. On May 6, 2004 numerous California red-legged frog larvae were found in the funnel traps in the large pond on the Mangels' property. No California red-legged frog larvae were found in the smaller pond on the Mangels' property. At that time, all the funnel traps were removed and the survey was discontinued.

California red-legged frog could be negatively affected by the proposed Project. Mitigation measures to compensate for impacts to this species are detailed below.

Fish

Chinook Salmon (*Oncorhynchus tshawytscha)*. The Sacramento-San Joaquin Chinook salmon of California is divided into four groups, or races: winter, spring, fall, and late-fall, based on the timing of the migration of spawning adults. The Sacramento River winter-run Chinook salmon was listed as federally threatened in 1989 and reclassified as endangered in 1994. This race of Chinook salmon was state listed as endangered in 1989. The Central Valley spring-run Chinook salmon was designated as federally threatened in all naturally spawned spring-run populations from the Sacramento and San Joaquin River mainstreams and their tributaries on December 29, 1999. This race of Chinook salmon is also a state-listed threatened species. The Central Valley fall/late fall-run Chinook salmon is a federal candidate species and a California species of special concern.

Suitable habitat for Chinook salmon is present in Suisun Creek, and NMFS has historical records of fall-run Chinook salmon in this creek. The study area includes "essential fish habitat" for fall-run Chinook salmon, as well as winter- and spring-run.[2] The Project, as currently designed, would not result in direct impacts to Suisun Creek; however riparian habitat would be removed. This may result in indirect impacts to this fish species. Impacts to riparian vegetation would be mitigated. Following construction of the clear span bridge, natural stream processes would carry on and therefore, the Project is not expected to have any continuing impacts or adverse affects to Chinook salmon.

[2] S. Boring, NMFS, pers. comm. with D. Waller, CH2M Hill, April 3, 2003

Steelhead Trout (*Oncorhynchus mykiss*). All naturally spawned populations of the Central Valley steelhead found in the Sacramento and San Joaquin Rivers and their tributaries were designated as federally threatened on June 17, 1998. The Central Valley steelhead does not have a state status.

Steelhead are the anadromous (that is, fish species born in the stream that migrate to the ocean for their adult phase) form of rainbow trout, a salmonid species native to western North America and the Pacific Coast of Asia. In North America, steelhead are found in Pacific Ocean drainages from southern California through Alaska. In California, known populations occur in coastal rivers and streams from Malibu Creek in Los Angeles County up to the Smith River near the Oregon border, and in the Sacramento River system. Steelhead were once abundant in coastal and Central Valley rivers and streams. A rough estimate of the total statewide steelhead population is 250,000 adults. This is less than half the population of 30 years ago. The major factor causing steelhead population decline is freshwater habitat loss and degradation. This has resulted from three main factors: inadequate stream flows, blocked access to historic spawning and rearing areas due to dams, and human activities that discharge sediment and debris into waterways.

Suitable habitat for steelhead is present in Suisun Creek, and the NMFS has records of steelhead in this creek.[3] The Project, as currently designed, would not result in direct impacts to Suisun Creek; however, riparian habitat would be removed. This may result in indirect impacts to this fish species. Impacts to riparian vegetation will be mitigated. Following construction of the clear span bridge, natural stream processes will carry on and therefore the Project is not expected to have any continuing impacts or adverse affects to steelhead.[4]

Reptiles

The **Pacific pond turtle (*Actinemys marmorata*)** is a California "species of special concern." The Pacific pond turtle is a habitat generalist, inhabiting a wide range of fresh and brackish, permanent and intermittent water bodies from sea level to about 4,500 feet above sea level (USFWS 1992). Typically, this species is found in ponds, marshes, ditches, streams, and rivers that have rocky or muddy bottoms. This turtle is most often found in aquatic environments with plant communities dominated by watercress, cattail, and other aquatic vegetation. It is a truly aquatic turtle that usually only leaves the aquatic site to reproduce and to overwinter. Recent field work has demonstrated that Pacific pond turtles may overwinter on land or in water, or may remain active in water during the winter season; this pattern may vary considerably with latitude, water temperature, and habitat type and remains poorly understood (Jennings and Hayes 1994).

The pond turtle also requires upland areas for burrowing habitat where it digs nests and buries its eggs. These nests can extend from 52 feet to 1,219 feet from watercourses (Jennings and Hayes 1992), however most pond turtles nest in uplands within 250 meters of water (Bury, unpublished). Upland nest sites are usually found in areas with sparse vegetation. Sunny, barren, and undisturbed (not disked) land provides optimal habitat, while shady riparian habitat and planted agricultural fields do not provide suitable habitat (op. cit.). Eggs are typically laid from March to August (Zeiner et. al. 1988), with most eggs

[3] G. Stern, NMFS, pers. comm. with H. Kingma, M&A, Inc., January 12, 2004
[4] Memorandum from NMFS dated January 18, 2007.

being laid in May and June. Hatchlings will stay in the nest until the following April (Bury, unpublished). Predators of juvenile pond turtles include the non-native bullfrog (*Rana catesbeiana*) and Centrarchid fish (sunfish). This turtle is most visible between April and July when it can be observed basking in the sun. In areas where the water is very warm during these months, however, it will bask in the warm water and will be more difficult to observe. It eats plants, insects, worms, fish and carrion (Stebbins 2003).

Pacific pond turtles are found in the ponds on the West End of the study area north of SR12. The Project would not result in impacts to aquatic habitat occupied by this species, however, potentially occupied upland burrowing habitat could be impacted by the Project (see prescribed mitigation measures below).

Birds

Swainson's Hawk (Buteo swainsonii) is a state listed threatened species pursuant to the California Endangered Species Act (CESA), Title 14, California Code of Regulations. While it has no special federal status, it is protected from direct take under the Federal Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711). Swainson's hawks, their nests, eggs, and young are also protected under California Fish and Game Code (§3503, §3503.5, §3513, and §3800).

Swainson's hawk inhabits open to semi-open areas at low to middle elevations in valleys, dry meadows, foothills, and level uplands (Kochert 1986). It nests almost exclusively in trees and will nest in almost any tree species that is at least 10 feet tall (Schmutz et. al. 1984). Swainson's hawks occasionally nest in shrubs, on telephone poles, and on the ground. In the Central Valley of California, the majority of Swainson's hawk nests and territories are associated with riparian systems and nests are commonly found in cottonwoods and oaks (Schlorff et. al. 1984). They have also been documented nesting in eucalyptus, black walnut, black locust (Robinia pseudoacacia), almond, Osage orange (Maclura pomifera), Arizona cypress (Cupressus arizonica) and pine (Pinus spp.) (CNDDB records).

Foraging habitats include alfalfa fields, fallow fields, beet, tomato, and other low-growing row or field crops, dry-land and irrigated pasture, and rice land when not flooded (CDFG 1994). The Swainson's hawk generally forages in open habitats with short vegetation containing small mammals, reptiles, birds, and insects. Its primary prey in the Central Valley is California meadow vole (Microtus californicus). Agricultural areas are often preferred over more natural grassland habitats due to larger prey populations. Areas within the West and East Ends could be foraging habitat for the Swainson's hawk.

The California Department of Fish and Game's Natural Diversity Database identified a record for nesting Swainson's hawk located less than five miles from the Project area (CNDDB Occurrence No. 1372). Since Swainson's hawks are known to nest less than 5 miles from the proposed Project area, implementation of the Project would be viewed by CDFG as an impact to the Swainson's hawk. Nest site disturbance which results in: (1) nest abandonment; (2) loss of young; (3) reduced health and vigor of eggs and/or nestlings (resulting in reduced survival rates), may ultimately result in the take (killing) of nestling or fledgling Swainson's hawks incidental to otherwise lawful activities. The taking of Swainson's hawks in this manner can be viewed by the CDFG as a violation of the Section 2080 of the Fish and Game Code. This interpretation of take has been judicially affirmed by the landmark appellate court decision pertaining to CESA (CDFG v. ACID, 8 CA App.4, 41554) (CDFG 1994).

Any disturbance around a Swainson's hawk nest that is not characteristic of the normal activities around the nest site that caused disruption of the nesting attempt would likely be regarded by CDFG as a violation of CESA. Typically, CDFG requires that any impact to a Swainson's hawk nest be permitted through a Fish and Game Section 2081 management authorization. If an active nest is found on or immediately adjacent to the Project area (which is generally considered to be within 300 feet of the Project area) "to avoid potential violation of Fish and Game Code 2080 (i.e., killing of listed species), Project-related disturbance at active Swainson's hawk nesting sites should be reduced or eliminated during critical phases of the nesting cycle (March 1- September 15 annually)" (CDFG 1994). If disturbance would occur to an actual active nest site (disturbance to the nest site or within 300 feet of the nest site), a Fish and Game Section 2081 management authorization shall be obtained as required by CDFG. Impacts to nesting Swainson's hawks would be considered a significant impact pursuant to CEQA. Preconstruction nesting surveys will be conducted before trees are impacted or removed within this portion of the study area. If Swainson's hawks are identified nesting within the study area, a buffer area would have to be established during the nesting season (see prescribed mitigation measures below). CDFG also recommends that impacts to foraging habitat be mitigated.

Cooper's Hawk (*Accipiter cooperi*), is a California species of special concern. This raptor is also protected under the Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712. Its nest, eggs, and young are also protected under California Fish and Game Code, §§ 3503, 3503.5, and 3800. The Cooper's hawk is a yearlong resident that typically nests in heavily-wooded areas along streams, rivers, or in close proximity to springs or seeps. There are also migratory Cooper's hawks that can be found locally in the fall and winter months. This species prefers to nest in tall canopies with an open under story, usually near openings. Cooper's hawks construct nests of sticks that may be reused in subsequent years near the trunks of large trees. In the region of the study area, Cooper's hawks nest from April through July. Prey consists primarily of avian species and to a lesser extent mammalian species. Prey is usually captured in flight.

The oak woodland found within the West End of the study area provides suitable nesting habitat for this species. Preconstruction nesting surveys will be conducted before trees are impacted or removed within this portion of the study area If Cooper's hawks are identified nesting within the study area, a buffer area would have to be established during the nesting season (see prescribed mitigation measures below)..

Golden Eagle (*Aquila chrysaetos*), is a California species of special concern. This raptor is also protected under the Eagle Protection Act, 16 U.S.C. §§ 668-668d, and the Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712. Its nest, eggs, and young are also protected under California Fish and Game Code §§ 3503, 3503.5, and 3800. Golden eagles are found breeding throughout western North America in remote, open habitats. Typical habitats in North America include savannah woodland habitats, grasslands, aspen parkland, high and low deserts, and in taiga and zone habitats. Golden eagles feed on fresh carrion or take live prey ranging in size from small rodents to as large as newborn fawns. More typical prey includes rabbits, hares, and waterfowl. Golden eagles build nests in large trees, often oaks or conifers, or on large vertical cliffs. On rare occasions nests are found on the ground, especially in expansive prairie habitats where cliffs and/or trees are scarce. Often this species will return each year to the same nest, stacking new sticks on the existing nest structure. Over time, nests can become piled so high with sticks that they topple over, leaving huge debris piles beneath trees or at the base of cliffs. Golden eagles nest from January until September, with peak nesting occurring in March through July.

Golden eagles likely forage over the grassland habitats found within the study area. This species is unlikely to nest within the study area due to limited potential nest sites and susceptibility to disturbance due to the close proximity of nearby roads and highways. However, preconstruction nesting surveys would be conducted before trees are impacted or removed within the study area. If golden eagles are identified nesting within the study area, a buffer area would have to be established during the nesting season (see prescribed mitigation measures below).

Short-Eared Owl (*Asio flammeus*), is a California species of special concern. It is also protected by the Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712, and its nest, eggs, and young are protected under California Fish and Game Code §§ 3503, 3503.5, and 3800. Short-eared owls often hunt over grasslands, lowland meadows and marsh habitats where they seek small mammal prey, particularly microtine rodents (e.g., California meadow vole, *Microtus californicus*). Tule patches or tall grasses are needed for nesting and for seclusion during the day. Nests consist of a slight depression on the ground or rarely in a burrow.

This species has potential to migrate through the study area and to forage on the site. The study area may provide potential seasonal foraging habitat for this species, however, suitable nesting habitat is absent within the study area. Preconstruction surveys for ground-nesting species will be conducted prior to any ground disturbance within the study area (see prescribed mitigation measures below).

Western Burrowing Owl (*Athene cunicularia hypugaea), is a California species of special concern. Its nest, eggs, and young are also protected under California Fish and Game Code §§ 3503, 3503.5, and 3800. The burrowing owl is also protected from direct take under the Migratory Bird Treaty Act,16 U.S.C. §§ 703-712. Burrowing owl habitat can be found in annual and perennial grasslands, characterized by low-growing vegetation. Typically, the burrowing owl utilizes rodent burrows, usually ground squirrel burrows, for nesting and cover. They may also on occasion dig their own burrows, or use manmade objects such as concrete culverts or riprap piles for cover. They exhibit high site fidelity, reusing burrows year after year. Occupancy of suitable burrowing owl habitat can be verified at a site by observation of a pair of burrowing owls during the spring and summer months or, alternatively, its molted feathers, cast pellets, prey

remains, eggshell fragments, or excrement (white wash) at or near a burrow. Burrowing owls typically are not observed in grasslands with tall vegetation or wooded areas because the vegetation obscures their ability to detect avian and terrestrial predators. Since burrowing owls spend the majority of their time sitting at the mouths of their burrows, grazed grasslands seem to be their preferred habitat because it allows them an unobstructed 360 degree view of their environment.

Burrowing owls were observed in the West End of the study area north of SR12 in November 2003 and March 2004. The West End of the study area provides suitable nesting habitat for the burrowing owl. Nesting surveys will be conducted in the spring of the year prior to construction. If burrowing owl is identified nesting on the site, mitigation as prescribed in section below will be implemented. If burrowing owl is not identified during the spring nesting surveys, preconstruction surveys would still be necessary 30 days prior to earth-moving activities to avoid impacting any owls that may have moved into the study area. Spring nesting surveys for burrowing owls will be conducted in accordance with the survey requirements detailed in the CDFG's October 17, 1995 *Staff Report on Burrowing Owl Mitigation* (see Mitigation measures described below).

White-Tailed Kite (*Elanus caeruleus*), is a fully protected under California Fish and Game Code § 3511. Fully protected birds may not be "taken" or possessed (i.e., kept in captivity) at any time. It is also protected under the Federal Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712. The white-tailed kite is typically found foraging in grassland, marsh, or cultivated fields where there are dense-topped trees or shrubs for nesting and perching. They nest in a wide variety of trees of moderate height and sometimes in tall bushes, such as coyote bush. Native trees that are used for nesting include live and deciduous oaks (*Quercus* spp.), willows (*Salix* spp.), cottonwoods (*Populus* spp.), sycamores (*Platanus* spp.), maples (*Acer* spp.), and Monterey cypress (*Cupressus macrocarpa*). Although the surrounding terrain may be semiarid, kites often reside near water sources, where prey is more abundant. The particular characteristics of the nesting site do not appear to be as important as its proximity to a suitable food source (Shuford 1993). Kites primarily hunt small mammals, with California meadow voles (*Microtus californicus*) accounting from between 50 to 100 percent of their diet.

This species is likely to forage over the study area and may nest within the study area. Preconstruction nesting surveys would be conducted before trees or shrubs are impacted or removed within the study area. If white-tailed kites are identified nesting within the study area, a buffer area would have to be established during the nesting season (see prescribed mitigation measures below).

Northern Harrier (*Circus cyaneus*), is a California species of special concern. This raptor is also protected under California Fish and Game Code § 3503.5, which protects nesting raptors and their eggs and young. The species is also protected under the Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712. Northern harriers build grass-lined nests on the ground within dense, low-lying vegetation in a variety of habitats, though they are typically found nesting in grassland or marsh habitats. They usually nest on level to near-level ground. This species is particularly vulnerable to ground predators while nesting and is subject to disturbance by agricultural practices.

The grassland community in the West End of the study area north of SR12 provides suitable foraging and nesting habitat for the northern harrier. A northern harrier was observed foraging over grassland habitat in this area. Preconstruction nesting surveys

will be conducted before earth-moving activities commence within the study area. If nesting northern harriers are found within the study area, a buffer will be established until the young have fledged (see prescribed mitigation measures below)

Loggerhead Shrike (*Lanius ludovicianus*), is a California species of special concern. Active nests, eggs, and young are also protected pursuant to § 3503 and § 3800 of the California Fish and Game Code and the Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712. This small, predaceous bird of open and often arid habitats prefers areas with scattered shrubs, trees, posts, fences, utility lines, and other acceptable perching locations. This shrike preys mostly upon large insects, but also takes small birds, mammals, amphibians, reptiles, fish, carrion, and various invertebrates. It typically constructs a stick nest on a stable branch in a densely foliated tree or shrub such as blackberry, rose (*Rosa* spp.) and willows (*Salix* spp). Site selection is apparently based on the degree of protective cover rather than on a particular plant species. Although nest height varies from 1.5 to 30 feet above ground, it is rarely less than 3 feet. The open grassland community in the West End of the study area provides suitable hunting ground for loggerhead shrikes, and the willows, oaks, and eucalyptus trees provide potentially suitable nesting habitat. A loggerhead shrike was observed in the West End of the study area in March 2004. Preconstruction nesting surveys will be conducted before trees are impacted or removed within the study area (see prescribed mitigation measures below).

Grasshopper Sparrow (***Ammodramus savannarum*),** Active nests, eggs, and young are protected pursuant to Fish and Game Code § 3503 and by the Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712. This often shy and elusive sparrow is typically found in dry, dense grasslands, especially those with a variety of grass and tall forb species. This sparrow feeds primarily upon insects, and also on grass and forb seeds. Typically, it builds a grass/forb nest at the base of a dense clump of grasses or forb vegetation. Grassland found in the West End of the study area may provide habitat for this species, however, grazing activities have reduced the densities of grass and forb vegetation, thereby limiting nesting opportunities. Thus, the grasshopper sparrow is unlikely to be affected by the Project. Regardless, preconstruction surveys for ground-nesting species will be conducted prior to any ground disturbance within the study area (see prescribed mitigation measures below).

Tricolored Blackbird (*Agelaius tricolor*), is a California species of special concern. Active nests, eggs, and young are also protected pursuant to Fish and Game Code § 3503. A gregarious species, the tricolored blackbird is typically found near fresh water, particularly near marsh habitat. Nesting colonies are typically found in stands of cattail and bulrush (*Scirpus* spp.), although they are also known to utilize blackberry patches and thistle clumps (*Cirsium* spp. and *Cynara* spp.) adjacent to water. Flooded lands, margins of ponds, and grassy fields in summer and winter provide typical foraging habitat for this species.

This species may occur within the West End of the study area. Potential nesting habitat occurs in the dense cattails around the ponds in the West End of the study area north of SR12, approximately 400 feet from the proposed North Connector. Nesting season surveys would be necessary to determine if this species could be impacted by the Project. While no impacts to nesting habitat will result from the Project, construction during the nesting period could result in disturbance to this species (see prescribed mitigation measures below).

Mammals

Pallid Bat (*Antrozous pallidus*), is a California species of special concern, but has no federal status. This bat is a locally common species of low elevations in California, occurring throughout the state except for in the high Sierra Nevada from Shasta to Kern Counties, and the northwestern corner of the state from Del Norte and western Siskiyou Counties to northern Mendocino County. It occurs in a wide variety of habitats and is most common in open, dry habitats with rocky areas for roosting. Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings; these roosts must protect bats from high temperatures. Night roosts may be in more open sites such as porches and open buildings. A social bat, it roosts in groups of 20 or more.

There is a record for this species located 8.3 miles northwest of the Project area (CNDDB Occurrence No 223). Suitable roosting habitat for this bat occurs on cliffs in the West End of the study area north of SR12, although these cliffs would not be impacted by the Project. In general, trees in the area of impact do not provide suitable roosting or nesting cavities. Regardless, preconstruction surveys will be conducted before trees or potential roost structures are impacted or removed within the study area (see prescribed mitigation measures below).

Hoary Bat (*Lasiurus cinereus*) is a California species of special concern. It has no federal status. This bat is generally found in wooded areas with access to open areas for foraging. This species of bat feeds on moths and beetles. In winter, this bat roosts on the vertical trunks of trees. This species is found in California in the winter, and migrates north in the summer (Jameson 2004).

There is a record for this species located 2.2 miles southwest of the Project area (CNDDB Occurrence No 122). While this species is unlikely to roost within the proposed Project area, preconstruction surveys would have to be conducted to ensure that direct take of this species would not occur (see prescribed mitigation measures below).

Western Red Bat (*Lasiurus blossevillii*) is a California species of special concern. It has no federal status. This bat species is commonly referred to as "tree bats" because they roost only in tree foliage. This species is generally found in riparian areas where they roost in trees, such as cottonwoods, oaks, sycamores, and walnuts.

There is a record for this species located 9 miles southeast of the Project area (CNDDB Occurrence No 69). While this species is unlikely to roost within the proposed Project area, preconstruction surveys would have to be conducted to ensure that direct take of this species would not occur (see prescribed mitigation measures below).

American Badger (*Taxidea taxus*) is a California species of special concern, found in a variety of habitats, especially in open habitats such as oak-savannah and grasslands. In the region, this animal is uncommon. When present, this animal would be expected to prey upon Botta's pocket gopher, California ground squirrel, and several species of mice common in the area. Except during breeding, badgers are typically highly solitary and have vast home ranges. Because this animal is shy and nocturnal, biologists usually detect its presence by indirect evidence such as characteristic diggings or by road kills.

There is a record for this species located 7.8 miles northwest of the Project area (CNDDB Occurrence No 203). The grasslands on the Mangels property provide suitable foraging and denning habitat for the American badger. While this species has not been detected during wildlife surveys conducted for the Project, owing to this species' vast home range size and generally sparse occurrences, this species may occur on the Project site. Preconstruction surveys would have to be conducted to ensure that direct take of this species would not occur (see prescribed mitigation measures below).

REGULATORY SETTING

Federal and State Requirements

Wetlands and Other Waters

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (CWA), 33 U.S.C. § 1344, is the primary law regulating wetlands and waters. The CWA regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (ACOE) with oversight by the United States Environmental Protection Agency (USEPA).

At the state level, non-federal wetlands and waters are regulated primarily by the CDFG and the Regional Water Quality Control Boards (RWQCB). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission [BCDC]) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a Project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the Project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the ACOE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act, Cal. Water Code, Div. 7, § 13000 et seq., to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the Federal Clean Water Act. For further discussion, please see Section 4.10, *Water Quality and Storm Runoff*.

Waters of the United States and State located on the East End include Suisan Creek. The Project proposes a bridge over Suisan Creek, however, the bridge will clear span the creek, therefore avoiding significant impacts to waters of the United States and State located. Waters of the United States and State located on the West End include Jameson Creek, unnamed tributaries and drainages and seasonal wetlands. These waters of the United States and State may be impacted by the proposed Project.

Animal Species

Many state and federal laws regulate impacts to wildlife. The USFWS, the National Marine Fisheries Service (NMFS) and the CDFG are responsible for implementing these laws. Federal laws and regulations pertaining to wildlife include the following:

- Federal Endangered Species Act (FESA) of 1973
- National Environmental Policy Act, 42 U.S.C. § 4321 et seq.
- Migratory Bird Treaty Act, 16 U.S.C. § 703 et seq.
- Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661-667e.

State laws and regulations pertaining to wildlife include the following:

- California Endangered Species Act (CESA) (Fish and Game Code §2050)
- California Environmental Quality Act, Cal. Pub. Res. Code, §§ 2100-21177.
- California Fish and Game Code, §§ 1601 – 1603.
- California Fish and Game Code, § 4150, § 4152.

Plant Species

The USFWS and The CDFG share regulatory responsibility for the protection of special-status plant species. Special-status species are selected for protection because they are rare and/or subject to population and habitat declines. Special-status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under FESA, 16 U.S.C. § 1531 et seq.; 50 C.F.R. Part 402, and/or the California Endangered Species Act (CESA), Cal Fish & G. Code § 2050 et seq. Projects are also subject to the Native Plant Protection Act, Cal. Fish & G. Code, §§ 1900-1913, and CEQA, Cal. Pub. Res. Code, §§ 2100-21177.

City of Fairfield – Heritage Tree Ordinance

The City of Fairfield (City) zoning ordinance states that it is necessary for the public health and welfare to conserve tree resources by protecting significant trees from unnecessary destruction or removal, encouraging the replacement of trees lost to disease, natural hazards, or human intervention. City of Fairfield Zoning Ordinance § 25.36.1. Native Oaks (*Quercus* sp), Bay Laurel (*Umbellularia californica*), Madrone (*Arbutus menziesii*), and Buckeye (*Aesculus californica*), located on private property and exceeding 6 inches in caliper or diameter at breast height (breast height is measured at a point located 4-1/2 feet above the existing ground level of the tree), are protected under city ordinance. City of Fairfield Zoning Ordinance § 25.36.2. Removal of trees qualifying under the ordinance requires a tree removal permit and shall require mitigation as condition of approval for the permit. City of Fairfield Zoning Ordinance § 25.36.5.

Solano Multi-Species Habitat Conservation Plan

As discussed in section 4.1, Land Use and Agricultural Resources, the Solano Multi-species Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) is being developed by the Solano County Water Agency (SCWA) to support the issuance of a Section 10(a)1(B) "incidental take permit" under the Federal Endangered Species Act (FESA) as part of a Biological Opinion between the USFWS and Bureau of Reclamation issued in 1999. A total of 71 species are currently proposed to be covered under the HCP. According to the Draft HCP, the West End of Project site falls within Zone 1, which represents the Urban Zone. The East End falls within Zone 2, which represents areas affected by SCWA, Irrigation Districts, and Reclamation District Boundaries. However, this HCP is in draft form only and has not been adopted as of January 2008; therefore, it does not apply to the Project. No other known HCPs exist in the Project area.

BIOLOGICAL RESOURCES IMPACT ASSESSMENT

Significance Criteria

California Environmental Quality Act

Appendix G of the CEQA Guidelines identifies environmental issues to be considered when determining whether the Project could have a significant effect on the environment.

The Project would result in significant impacts if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Impacts Not Discussed Further

Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Plan, or other approved local, regional, or state habitat conservation plan. The Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Plan, or other approved local, regional, or state habitat conservation plan. As discussed above and in section 4.1, Land Use and Agricultural Resources, the Solano Multi-species Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) is being developed by the Solano County Water Agency (SCWA) to support the issuance of a Section 10(a)1(B) "incidental take permit" under the federal Endangered Species Act (ESA) as part of a Biological Opinion between the USFWS and Bureau of Reclamation issued in 1999. However, the HCP is in draft form and has not been officially adopted; therefore, it does not apply to the Project.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Less than Significant Impacts

No less than significant impacts related to biological resources were identified for this Project.

Significant and Potentially Significant Impacts and Mitigation Measures

4.5-1: The Project could potentially impact the habitat of the Pallid Bat, Western Red Bat, and Hoary Bat, state species of special concern. This is considered a potentially significant adverse impact.

The pallid bat, western red bat, and the hoary bat are California species of special concern. These bats may utilize trees or other potential roost structures found within the study area. Impacts to occupied roost trees or structures would be considered potentially adverse.

> **Mitigation Measure 4.5-1**: Preconstruction surveys shall be conducted before trees or potential roost structures are impacted or removed within the entire study area. A qualified biologist shall conduct this survey. If no bats are found during the survey, tree removal and structure demolition work shall be conducted within one month of the survey. If a maternity colony is observed during the surveys, no eviction/exclusion should be allowed during the maternity season (typically between April 15 and July 30). If a non-reproductive group of bats are found within a building or roost tree, they should be evicted by a qualified biologist and excluded from the roost site prior to work activities during the suitable time frame

for bat eviction/exclusion (i.e., February 20th to April 14th and July 30th to October 15th).

Significance After Mitigation: Less than significant.

4.5-2: The Project would have a substantial adverse effect to the California Red Legged Frog and its habitat. The California Red Legged Frog is a federally listed threatened species and a California species of concern. This is considered a significant adverse impact.

The California red-legged frog is a federally listed threatened species and a California species of special concern. Protocol-level surveys were conducted for California red-legged frogs along Dan Wilson Creek and Suisun Creek. No California red-legged frogs were observed during the diurnal or nocturnal surveys along either creek. In May 2003, one California red-legged frog adult was observed in the West End of the study area north of SR12 at the edge of a plunge pool in one of the unnamed drainages. A juvenile California red-legged frog was observed in the same drainage in March 2004. California red-legged frog larvae were also identified in the Mangels pond.

Construction of the Project in the West End could result in direct impacts to California red-legged frogs and/or its habitat. The proposed roadway alignment through the West End of the Project area cannot be adjusted due to site topography and other engineering constraints. Consequently, occupied and potentially occupied California red-legged frog habitat would be impacted by the Project.

The California red-legged frog has been observed on at least two occasions in a drainage feature at the West End of the Project. While the drainage known to support California red-legged frogs would not be filled by the Project, 0.59-acre of other drainage features, seasonal wetlands and seeps within the West End of the Project area that may also provide habitat for California red-legged frogs would be impacted by the proposed roadway and associated grading activities. Finally, this frog is known to occur in the large stock pond at the West End of the Project area. This pond would not be directly affected, although uplands surrounding occupied habitat would be impacted by the Project. It is estimated that 17.7 acres of upland habitat that provides dispersal habitat for California red-legged frogs would be impacted by the proposed roadway and associated grading activities.

Impacts to California red-legged frog, larvae, or occupied habitat are considered an adverse effect.

Mitigation Measure 4.5-2:

In accordance with guidance received from USFWS, the Project shall mitigate for impacts to California red-legged frog habitat by creating a breeding pond for this species that would provide a greater than 2:1 ratio (replacement: impacted) of mitigation acreage (see Figure 3-4 for the approximate location of the red-legged frog breeding pond).[5] The proposed location of the new breeding site is to the

[5] The pond would be designed to not exceed 25 feet in depth and 15 acre-feet of capacity, or 6 feet in depth and 50 acre-feet of capacity. Therefore, it would not fall within the jurisdiction of the State Department of Water Resources (Division of Safety of Dams). Based on these design

north and east of the new roadway alignment. In addition, a total of 35.4 acres of upland around this breeding pond shall also be preserved by a conservation easement or a deed restriction. This provides for 2:1 mitigation (preserved to impacted) for impacts to upland migration/dispersal habitat. The conservation easement shall usurp all development rights. The mitigation property would be owned in fee by the existing land owner, Solano County, or a qualified conservation organization. Allowable uses within this open space preserve shall be limited to maintenance of the pond. No further development, establishment of utilities, or any construction of any kind shall be allowed within the dedicated open space preserve. It is anticipated that final mitigation requirements, including the size of the breeding pond and the amount of upland dispersal habitat to be preserved will be determined in consultation with the USFWS.

Significance After Mitigation: Less than significant.

4.5-3: The Project may impact the habitat of the Pacific Pond Turtle, a state species of special concern. This is considered a potentially significant adverse impact.

The Pacific pond turtle is a California species of special concern. Pacific pond turtles are found in the ponds located in the West End of the study area north of SR12. The Project would not result in direct impacts to the pond turtle's aquatic habitat; however, potentially occupied upland burrow sites may be impacted. Therefore, impacts to this species are considered potentially adverse.

Mitigation Measure 4.5-3: Mitigation Measure 4.5-2 includes preservation of 35.4 acres of upland habitat. Preservation of this habitat would be considered adequate mitigation for potential impacts to the Pacific Pond Turtle, and would reduce any impacts to a less-than-significant level.

Significance after Mitigation: Less than significant.

4.5-4: The Project would have an adverse effect to the habitat of the Valley Elderberry Longhorn Beetle, a federally listed threatened species. This is considered a significant adverse impact.

The elderberry trees/shrubs along Suisun Creek provide potential habitat for valley elderberry longhorn beetle. This beetle is a federally listed threatened species. Several of the elderberry trees/shrubs present along Suisun Creek had appropriately-sized beetle exit holes indicating past use by valley elderberry longhorn beetle. A total of 12 elderberry plants would be affected, which include 37 stems greater than 1 inch but less than 3 inches, and 6 stems greater than 3 inches but less than 5 inches. Removal or damage to elderberry trees/shrubs supporting valley elderberry longhorn beetles is considered an adverse impact.

Two potential mitigation options are presented below. Implementation of one or the other would reduce biological impacts related to the Valley Elderberry Longhorn Beetle

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parameters and the topography of the area, the maximum size of the pond is estimated to be 1.5 acres.
http://damsafety.water.ca.gov/jurisdictionalchrt3.cfm

to a less-than-significant level. Selection of the mitigation measure required by the USFWS shall be determined as part of the Section 7 consultation.

Mitigation Measure 4.5-4a: Suitable habitat shall be avoided and preserved to the extent feasible. Complete avoidance, resulting in no adverse effects, shall be assumed outside the 100-foot buffer that shall be established from the edge of the proposed bridge alignment over Suisun Creek and the preserved elderberry plants. Protection measures detailed in the USFWS' Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS 1999) shall be implemented. All preserved plants shall be fenced off and these areas shall be designated as avoidance areas that shall be protected from disturbance during construction of the bridge. In addition, restoration and maintenance measures detailed in the USFWS' Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS 1999) shall be implemented to restore any damage done to the 100-foot buffer area during construction. These areas shall be re-vegetated and appropriate erosion control measures shall be installed.

All elderberry plants with one or more stems measuring 1.0 inch or more in diameter that would be removed by the Project shall be transplanted. Based on field surveys, it is anticipated that a total of 12 elderberry plants would be affected by the Project and would be transplanted and an additional 55 elderberry seedlings and/or cuttings shall be planted to mitigate for the number of stems (and their associated size classes) that would be impacted by the bridge construction. Prior to construction the area should be surveyed to determine the actual final number of plants that will be affected and transplanted, including calculation of the number of seedlings required. The elderberry plants and cuttings shall be transplanted to a conservation area along Suisun Creek. A biological monitor shall be present during all transplanting activities. Transplanting shall occur when plants are dormant (November through mid-February). Cuttings shall be taken when shoots are just beginning to newly sprout. The conservation area along Suisun Creek where the elderberry plants would be relocated, would receive protected status within the County. Dedication of the conservation area shall occur prior to any ground disturbing activities, including grading.

Monitoring of the conservation area shall be conducted for ten consecutive years. A minimum survival rate of 60 percent of the elderberry plants/cuttings and 60 percent of the native riparian plantings is required throughout the monitoring period. If survival rates fall below 60 percent, replacement plants shall be installed within one year of discovery to bring the number of plants back to the original number of plantings. The USFWS may evaluate the site if there is severe damage to the plants due to circumstances beyond the applicant's control, such as flooding, fire, or vandalism. Monitoring of the site shall conform to USFWS and CDFG requirements and be submitted to those agencies by December 31 of each year.

or

Mitigation Measure 4.5-4b: Alternately, the STA may purchase credits in a USFWS-approved mitigation bank that provides habitat for the Valley Elderberry Longhorn Beetle. Final compensation requirements and mitigation ratios would be determined through consultation with USFWS. Purchase of mitigation credits shall occur prior to any ground disturbing activities, including grading. Two mitigation

banks in the County that provide Valley Elderberry Longhorn Beetle habitat include the French Camp Conservation Bank (Sacramento, CA) and the River Ranch Conservation Bank (Rocklin, CA).

Significance After Mitigation: Less than significant.

4.5-5: The bridge proposed by the Project could potentially affect Steelhead trout habitat. This is considered a potentially significant adverse impact.

NMFS has records of steelhead in Suisun Creek. The Project, as currently designed, would not result in direct impacts to Suisun Creek. A clear span bridge design is proposed over Suisun Creek to minimize impacts to steelhead and steelhead habitat; however, riparian habitat would be removed to construct the new bridge. This may result in indirect impacts to this fish species. Impacts to this species are regarded as potentially significant.

Mitigation Measure 4.5-5*:* To minimize potential impacts to steelhead, riparian tree removal and bridge construction shall be conducted between June 15th and October 15th, when steelhead are not expected to be in this reach of Suisun Creek.

During a pre-Project meeting with NMFS on March 18, 2004, various mitigation options were discussed to compensate for this potential impact to steelhead and its habitat. Riparian trees removed for this Project shall be replaced at a ratio of 3:1 (three trees of the same species will be replanted for every tree removed). Riparian planting shall be conducted along Suisun Creek. A creek re-vegetation and enhancement plan has been prepared for this Project to address impacts to riparian trees. Mitigation for impacts to native trees is discussed later in this section.

In addition, Best Management Practices (BMPs) shall be employed during construction to minimize and/or prevent water quality impacts to Suisun Creek.

Significance After Mitigation: Less than significant.

4.5-6: The Project would have an adverse effect on Waters of the United States and State, or federally protected waters. This is considered a significant adverse impact.

The Project alignment in the West End of the Project area would impact 0.64-acre of waters of the United States and State. This acreage includes impacts to 642 linear feet (196 meters) (approximately 0.07-acre) of "other waters." In addition, 0.57-acre of seasonal wetlands would be filled to construct new roadway in the West End. Impacts to these waters would be considered an adverse biological impact.

Mitigation Measure 4.5-6: Various mitigation strategies will be employed to compensate for impacts to seasonal wetlands and other waters. Impacts to 0.57-acre of seasonal wetland habitat that will be impacted at the West End will be mitigated at a greater than 2:1 ratio by creating a 1.5-acre breeding pond for California red-legged frog that will provide seasonal wetland habitat. Additional impacts to waters of the U.S./State will be mitigated through creek enhancement

and preservation of existing wetlands and creek corridors in the project vicinity. A proposed riparian mitigation area has been identified along Suisun Valley Creek (see Figure 3-2). The riparian mitigation area will be confirmed prior to the beginning of construction.

Significance After Mitigation: Less than significant.

4.5-7: The Project could potentially result in impacts to nesting raptor species. This is considered a potentially significant adverse impact.

A red-tailed hawk (*Buteo jamaicensis*) was observed displaying territorial behavior over a eucalyptus tree located in the West End of the study area north of SR12. If tree removal or ground disturbance is proposed between March 1st and September 1st nesting raptors, such as Cooper's hawk, golden eagle, western burrowing owl, short-eared owl, white-tailed kite, and northern harrier could be impacted. Birds and their nests are protected under California Fish and Game Code §§ 3503 and 3503.5, and the Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712. Impacts to nesting raptors, their eggs, and/or young are regarded as potentially adverse/significant biological impact.

Mitigation Measure 4.5-7a: In order to avoid impacts to nesting raptors, a nesting survey shall be conducted 15 days prior to commencing with construction work including any tree pruning, tree removal, staging, ground disturbing or construction activities, if this work would commence between March 1 and September 1. Surveys should be conducted a minimum of three (3) separate days during the 15 days prior to the commencement of work activities. The raptor nesting surveys shall include examination of all trees within 1,000 feet of the entire proposed construction corridor, not just trees slated for removal.

If nesting raptors are identified during the surveys, the dripline of the nest tree or shrub must be fenced with orange construction fencing and a 500-foot radius around the nest tree must be staked with bright orange lath or other suitable staking. If the nest site is on an adjacent property, the portion of the buffer that occurs on the Project site shall be fenced with orange construction fencing. This 500-foot buffer may be reduced in size if a qualified raptor biologist determines through monitoring that the nesting raptors are acclimated to people and disturbance, and otherwise would not be adversely affected by construction activities. At a minimum, however, the non-disturbance buffer shall be a radius of 200 feet around the nest tree or shrub. When construction buffers are reduced from the 500-foot radius, a qualified raptor biologist shall monitor distress levels of the nesting birds for one week after Project disturbance occurs. If at any time the nesting raptors show levels of distress that could cause nest failure or abandonment, the raptor biologist shall have the right to re-implement the full 500-foot buffer. Instances when the buffer could be reduced in size would be if the raptors were well acclimated to disturbance and/or if there were physical barriers between the nest site and the construction Project that would reduce disturbance to the nesting raptors.

No construction or earth-moving activity should occur within the non-disturbance buffer until it is determined by a qualified raptor biologist that the young have fledged (that is, left the nest) and have attained sufficient flight skills to avoid Project construction zones. This typically occurs by August 1st. This date may be

earlier than August 1st, or later, and would have to be determined by a qualified raptor biologist. Once the raptors have completed the nesting cycle, that is the young have reached independence of the nest, no further regard for the nest site shall be required. No other compensatory mitigation is required.

Mitigation Measure 4.5-7b:

Ground Nesting Raptors
A nesting survey shall be conducted for ground nesting raptors, such as western burrowing owl, short-eared owl and northern harrier. The ground nesting raptor survey should be conducted in accordance with the survey requirements detailed in the California Department of Fish and Game's (CDFG) October 17, 1995 Staff Report on Burrowing Owl Mitigation. Surveys shall be conducted in both breeding season (April 15-July 15) and non-breeding season (December-January) to assess use of the Project area by this species.

If northern harriers or short-eared owls are identified nesting within the Project area, mitigation measures detailed above for nesting raptors should be implemented. If burrowing owls are found within the Project area during the non-breeding season (September 1 through January 31), impacts to burrowing owls will be avoided by establishing a fenced 160-foot buffer between the nest site(s) (i.e., the active burrow(s)) and any earth-moving activity or other disturbance within the Project area. If occupied burrows are found within 160 feet of the proposed Project area during the non-breeding season, and may be impacted, passive relocation measures will be implemented according to the Burrowing Owl Consortium Guidelines. If western burrowing owls must be passively relocated from the roadway alignment to remove them from harms way, these activities shall be approved by CDFG in advance. Passive relocation shall not commence before September 30th and shall be completed prior to February 1st.

If burrowing owls are detected on the site during the breeding season (peak of the breeding season is April 15 through July 15), and appear to be engaged in nesting behavior, a fenced 250-foot buffer would be required between the nest site(s) (i.e. the active burrows(s)) and any earth-moving activity or other disturbance within the Project area. This 250-foot buffer could be removed once it is determined by a qualified raptor biologist that that young have fledged (that is, left the nest). Typically, the young fledge by August 31st. This date may be earlier than August 31st, or later, and would have to be determined by a qualified raptor biologist.

Finally, if burrowing owls were found occupying burrows in the Project area, a qualified raptor biologist shall delineate the extent of burrowing owl habitat on the site. To mitigate impacts to burrowing owls, STA shall implement mitigation measures required by the CDFG which provide that six and a half acres (6.5 acres) of replacement habitat be set-aside (i.e., protected in perpetuity) for every occupied burrow, pair of burrowing owls, or unpaired resident bird. Such a set-aside will off-set permanent impacts to burrowing owl habitat. For example, if two pairs of burrowing owls are found occupying burrows on the study area, 13 acres of mitigation land must be acquired. Additionally, if one pair and one resident bird are identified, 13 acres of mitigation land must be acquired. The protected lands shall be adjacent to occupied burrowing owl habitat and at a

location acceptable to CDFG. Land identified to off-set impacts to burrowing owls must be protected in perpetuity either by a conservation easement or via fee title acquisition. CDFG will likely require that a detailed mitigation and monitoring plan be developed for the burrowing owl mitigation area. This plan shall be prepared by the Project biologist and will be subject to CDFG approval. Mitigation lands will be protected in perpetuity and the applicant will provide an endowment fund for the long-term management of the burrowing owl mitigation lands.

In lieu of this mitigation measure, with approval from CDFG, credit commensurate with the mitigation acreage requirements set forth above shall be purchased from a qualified burrowing owl mitigation bank in Solano County.

Significance After Mitigation: Less than significant.

4.5-8: The Project could result in impacts to Passerine (common) and Special-Status Nesting Birds. This is considered a potentially significant adverse impact.

If tree removal or ground disturbance is proposed between the months of March 1 and September 1, nesting passerine birds, and special-status birds such as grasshopper sparrow, loggerhead shrike, and tricolored blackbirds could be impacted. Birds and their nests are protected under California Fish and Game Code§§ 3503, 3503.5 and the Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712. Impacts to nesting birds, their eggs, and/or young are regarded as potentially adverse.

Mitigation Measure 4.5-8: In order to avoid impacts to common nesting birds and special-status birds, a nesting survey shall be conducted 15 days prior to commencing with construction work if this work would commence between March 1st and September 1st. Nesting surveys shall be conducted throughout the entire construction corridor 15 days prior to construction of the Project.

If special-status birds are identified nesting within the Project area, a 100-foot non-disturbance radius around the nest must be fenced. Only the portion of the buffer that occurs on the Project site shall be fenced. No construction or earth-moving activity shall occur within this 100-foot staked buffer until it is determined by a qualified ornithologist that the young have fledged (that is, left the nest) and have attained sufficient flight skills to avoid Project construction zones. This typically occurs by July 1st. This date may be earlier or later, and would have to be determined by a qualified ornithologist. Similarly, the qualified ornithologist could modify the size of the buffer based upon site conditions and the bird's apparent acclimation to human activities.

If common passerine birds such as American robins, scrub jays, and northern mockingbird are identified nesting in any tree or shrub proposed for removal, tree removal shall be postponed until it is determined by a qualified ornithologist that the young have fledged and have attained sufficient flight skills to leave the Project site. Typically, most passerine birds can be expected to complete nesting by July 1st, with young attaining sufficient flight skills by this date that are sufficient for young to avoid Project construction zones. Unless otherwise prescribed for

special-status bird species, upon completion of nesting no further protection or mitigation measures would be warranted for nesting birds.

Significance After Mitigation: Less than significant.

4.5-9: The Project could result in impacts to Swainson's hawk. This is considered a potentially significant adverse impact.

The Project area is located within 5 miles of a known Swainson's hawk nest (CNDDB Occurrence No. 1372) and is therefore considered by CDFG to be within the "defined foraging area" for this species (CDFG 1994). The trees within the Project area provide suitable nesting habitat for this species. The grasslands and agricultural fields provide suitable foraging habitat for this species. As a result, the Project could directly impact foraging habitat for this species by permanently removing habitat for roadway construction. This impact is considered potentially significant.

Mitigation Measure 4.5-9: CDFG has prepared guidelines for conducting surveys for Swainson's hawk entitled: *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (CDFG 2000). The following mitigation measure provides a summary of these survey requests. The survey recommendations were developed by the Swainson's Hawk Technical Advisory Committee (TAC) to maximize the potential for locating nesting Swainson's hawks, and thus reduce the potential for nest failures as a result of Project activities and/or disturbances. To meet the CDFG's recommendations for mitigation and protection of Swainson's hawks in this guideline, surveys shall be conducted for a half-mile radius around all Project activities and shall be completed for at least the two survey periods immediately prior to a Project's initiation, in accordance with CDFG's guidelines, which provide specific recommendations regarding the number of surveys based on the Project is scheduled to begin and the time of year the surveys are conducted.

If Swainson's hawks are found to be nesting on or in the immediate vicinity of the Project area in the future when the proposed Project is implemented, consultation with CDFG and mitigation compensation shall be required. At that time, the necessity of acquiring a Fish and Game Section 2081 management authorization should be determined. CDFG has prepared a *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California* (CDFG 1994) (hereinafter the Mitigation Guidelines) that prescribes avoidance and mitigation guidelines for impacts to Swainson's hawk nesting and foraging habitats. The Mitigation Guidelines require applicants to replace any impacted Swainson's hawk nesting and/or foraging habitat with other suitable Swainson's hawk nesting/foraging habitat. If Swainson's hawks are found to be nesting on or within the area of influence of the Project (within 1,000 feet of the Project), impacts to nesting Swainson's hawks would be regarded as significant and adverse, and mitigation compensation would be required. If Swainson's hawk are found to be nesting on or in the immediate vicinity of the Project area, STA shall set aside land as mitigation in a 1:1 ratio for all disturbed habitat within the Project area.

If Swainson's hawks are not found to be nesting in the immediate vicinity of the Project site immediately prior to a Project's initiation, STA shall mitigate for

impacts to foraging habitat within 5 miles of a known Swainson's hawk nest. Since the Project site is within 5 miles of at least one active nest tree (in 2007), STA will set aside 0.75 acre of habitat in perpetuity for every acre of foraging habitat impacted by the Project. If an active Swainson's hawk nest is found within 5 to 10 miles of the Project, STA shall set aside .5 acre in perpetuity for every acre of foraging habitat impacted by the Project.

The CDFG Mitigation Guidelines states that acceptable mitigation to offset impacts to Swainson's hawk foraging habitat can be met by Fee Title acquisition of Swainson's hawk habitat, or by acquisition of the right to record a conservation easement over lands that can be managed for this hawk species (hereinafter Habitat Management Lands). If STA acquires land through Fee Title, the land would have to be donated to a suitable conservation organization for management. In addition to providing Habitat Management Lands, STA would be assessed a management fee for the long-term management of the Habitat Management Lands by a suitable conservation organization. In lieu of these mitigation measures, with approval from CDFG, STA may purchase mitigation credits commensurate with the acreage of impacts to foraging and/or nesting habitat at a CDFG approved Swainson's hawk mitigation bank.

Significance After Mitigation: Less than significant.

4.5-10: The Project could result in impacts to American Badger, a California species of special concern. This is considered a potentially significant adverse impact.

The Project site supports suitable foraging and denning habitat for the American Badger, a California species of special concern. While not known to inhabit the Project site now, this wide ranging species could move onto the Project site in the future.

Mitigation Measure 4.5-10: A preconstruction survey shall be conducted for the American badger within the sphere of influence of the proposed Project, within 7 days prior to grading of the Project. Surveys shall be conducted by a wildlife biologist with experience identifying badger burrows. Survey methods would include conducting parallel transects through the grassland community looking for badger burrows. Any badger burrow identified should be staked in the field and mapped on Project site maps.

If active badger burrows are identified within the sphere of influence of the proposed Project, they should be avoided. If avoidance is not feasible, a biologist should determine if the burrow is being used for breeding. If young are determined to be present, the burrow should be avoided until young vacate the burrow. If the burrow is simply being used as refugia by the badger, as approved by CDFG, a one way eviction door will be installed to remove the badger from its burrow. If it digs back into the burrow, as approved by CDFG, live traps should be established at the burrow entrances to trap and remove badgers from the area of impact.

Significance After Mitigation: Less than significant.

4.5-11: The Project could potentially conflict with local policies and ordinances pertaining to tree preservation. This is considered a potentially significant adverse impact.

The Project could potentially result in the removal of native California trees and Heritage trees, as defined in the Fairfield City Code (Chapter 25, Section 25.36 through 25.38). There is no Solano County Heritage Tree Ordinance, and trees within Solano County are not subject to formal protection or preservation; however, impacts to riparian trees will be mitigated pursuant to CDFG and RWQCB requirements.

Tree and riparian habitat removal would be required at the following Project locations: the proposed road crossing over Suisun Creek would result in removal of riparian habitat, and the proposed road widening at Red Top Road south of Highway 12 would result in the removal of riparian habitat along two unnamed creeks. Removal of California native trees (such as native oaks, buckeye, bay laurel, and madrone) that are greater than 6 inches DBH, or heritage trees, would be considered an adverse biological impact.

Implementation of the following mitigation measure would reduce potential impacts to protected trees to a less-than-significant level.

> **Mitigation Measure 4.5-11:** A formal tree survey shall be conducted once Project design has been finalized to determine the final number of heritage trees and California native trees (with a DBH greater than 6 inches) that would be removed or modified by the Project within City limits and within riparian habitats. Each species of tree impacted by the Project shall be replaced at a ratio of 3:1 (i.e., 3 trees of the same species will be replaced for every tree impacted). Replanting of native trees shall occur within the study area in areas where native trees would naturally occur, and in areas that can support more trees. Trees shall be provided with water on a bi-monthly basis (during the summer) through means of a water truck for a period of at least three years, or as needed. Monitoring of tree survival shall be conducted for five consecutive years. Annual monitoring reports shall be submitted to STA.

Significance After Mitigation: Less than significant.