

2.3 Biological Environment

The project area generally includes the project construction footprint and a 20-foot buffer around the project footprint to accommodate construction activities and staging. The 56.39-acre study area for biological resources includes the project area, seasonal wetlands within 250 feet of the construction footprint, and elderberry shrubs within 100 feet of the construction footprint. Where seasonal wetlands extend beyond the 250-foot boundary, the entire wetland is included in the study area.

The project area encompasses approximately 2 miles along I-80, the existing eastbound truck scales that will be removed, and the site of the new truck scales. Areas of highway widening, ramp construction, and creek crossings are included. Land use in the study area is primarily roadway with adjacent development and agriculture, with a high level of historical and ongoing disturbance.

2.3.1 Natural Communities

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. 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 are discussed below in the Threatened and Endangered Species section (section 2.3.5). Wetlands and other waters are also discussed below in section 2.3.2.

The study area supports six natural communities of special concern: riparian woodland, valley oak woodland, seasonal wetland, perennial wetland drainage, seasonal drainage, and perennial drainage (Figure 2.3-1). Only riparian woodland and valley oak woodland are discussed in this section. The wetland communities and drainages are discussed in section 2.3.2 (“Wetlands and Other Waters”). Other parts of the study area support other woodland (planted trees), orchard, ruderal (weedy) grasslands, row crops, landscaped areas, or developed areas.

Riparian Woodland

Regulatory Setting

Riparian communities are considered sensitive locally, regionally, and statewide because of their habitat value and decline in extent. The Solano County Water Agency (SCWA) habitat conservation plan (HCP) concludes that the riparian corridor along Suisun Valley Creek is important because it provides connectivity between the Inner Coast Ranges and Suisun Marsh (Solano County Water Agency 2007). The California Department of Fish and Game (DFG) has adopted a no-net-loss policy for riparian habitat values, and the streambed alteration agreement (SAA) would include mitigation requirements for a loss of riparian vegetation. The U.S. Fish and

Wildlife Service (USFWS) mitigation policy identifies California's riparian habitats in Resource Category 2, for which no net loss of existing habitat value is recommended (46 FR 7644).

Affected Environment

A total of 1.71 acres of riparian woodland is in the study area. Riparian woodland occurs along both banks of Suisun Creek. A row of mature live oak and valley oak trees grows along the I-80 roadway for several hundred feet to the west and east of Suisun Creek. This row of trees forms a continuous band of vegetation with the riparian habitat adjacent to the creek and is shown on Figure 2.3-1 as riparian habitat. Plant species that characterize riparian woodland in the study area include valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), willows (*Salix* sp.), white alder (*Alnus rhombifolia*), California buckeye (*Aesculus californica*), California bay (*Umbellularia californica*), and Himalayan blackberry (*Rubus armeniacus [discolor]*). Adjacent to the south side of the study area at Suisun Creek, riparian woodland also supports elderberry shrubs (*Sambucus mexicana*). Herbaceous groundcover consists of nonnative grasses, sedge species (*Carex* sp.), and mugwort (*Artemisia douglasiana*), and the shrub understory includes poison oak (*Toxicodendron diversilobum*), California wild grape (*Vitis californica*), and other species.

Riparian woodland habitat along Suisun Creek provides a wildlife movement corridor up and downstream for fish, amphibians, reptiles, birds, and mammals on a seasonal basis. However, its biological value is reduced because of fragmentation by I-80 and nearby development.

Environmental Consequences

Impact NC-1: Effect on Riparian Woodland

Construction of the project would result in a permanent loss of approximately 0.71 acre of riparian woodland along Suisun Creek (see Figure 2.3-1). The permanent effect area would include riparian trees, as well as woody understory plants, such as young trees, coyote brush (*Baccharis pilularis*), Himalayan blackberry, and elderberry adjacent to Suisun Creek.

Approximately 1.0 acre of riparian woodland vegetation would be disturbed temporarily for the construction of the Suisun Creek bridge. This effect would include the probable removal of additional trees and understory vegetation in the project footprint. Indirect effects on riparian woodland vegetation could occur from adjacent construction activity. Riparian vegetation adjacent to the construction area would not be removed for construction, but it could sustain damage from equipment. Implementation of the avoidance and minimization measures (Measures NC-1a through NC-1d) would protect trees and avoid indirect adverse effects.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of riparian habitat. The loss or disturbance of riparian woodland vegetation would be considered adverse because it provides a variety of important ecological functions and values. However, implementation of Measure NC-1e would ensure that this is not an adverse effect.

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FIGURE 2.3-1

Biological Resources
I-80 Eastbound Cordelia Truck Scales
Relocation Project
Solano County, California

Legend

- | | |
|------------------------------|----------------------------|
| Permanent Impact | Perennial Drainage |
| Utility Pole Relocation | Riparian Woodland |
| Temporary Impact | Row Crops |
| Underground Utilities | Ruderal |
| Developed/graded | Seasonal Wetland |
| Landscaped | Valley Oak Woodland |
| Orchard | Native Tree |
| Other Woodland | Elderberry Shrub |
| Drainage or Irrigation Ditch | Perennial Wetland Drainage |

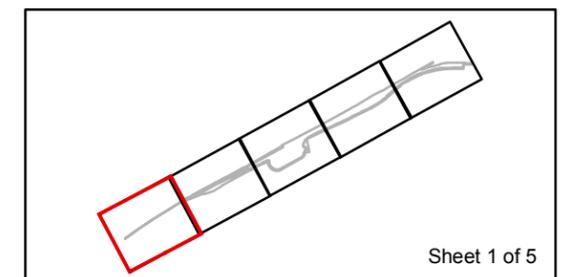
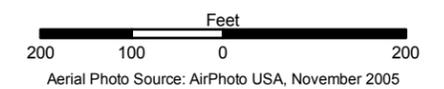


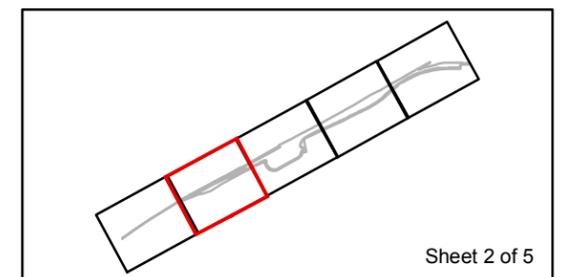
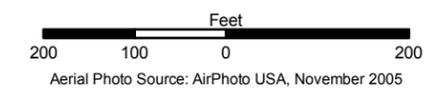
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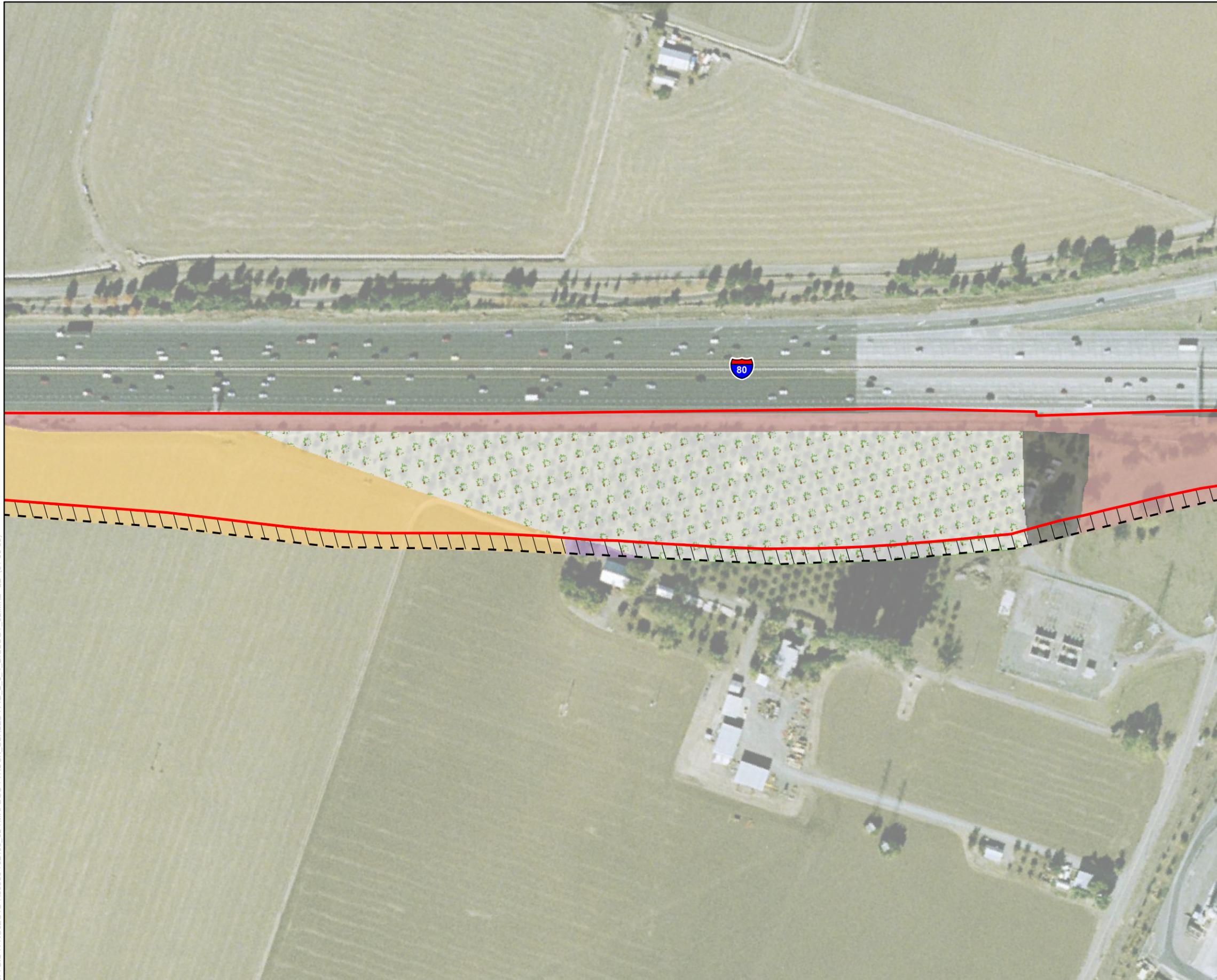


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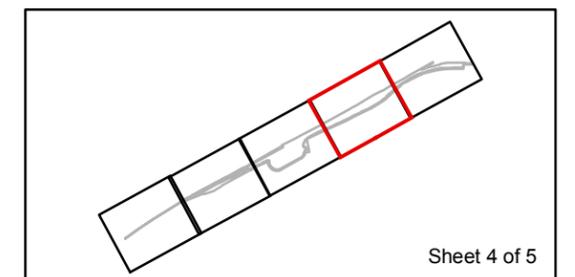
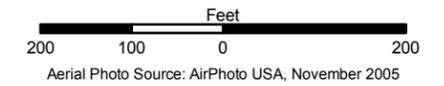
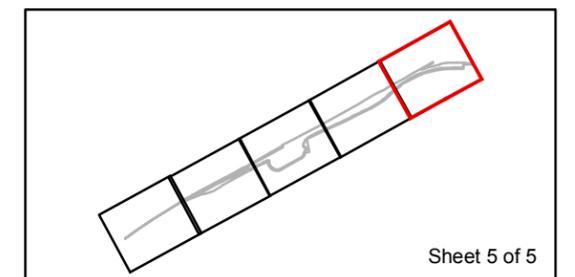
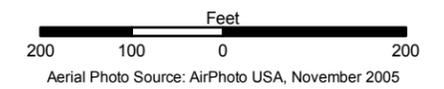
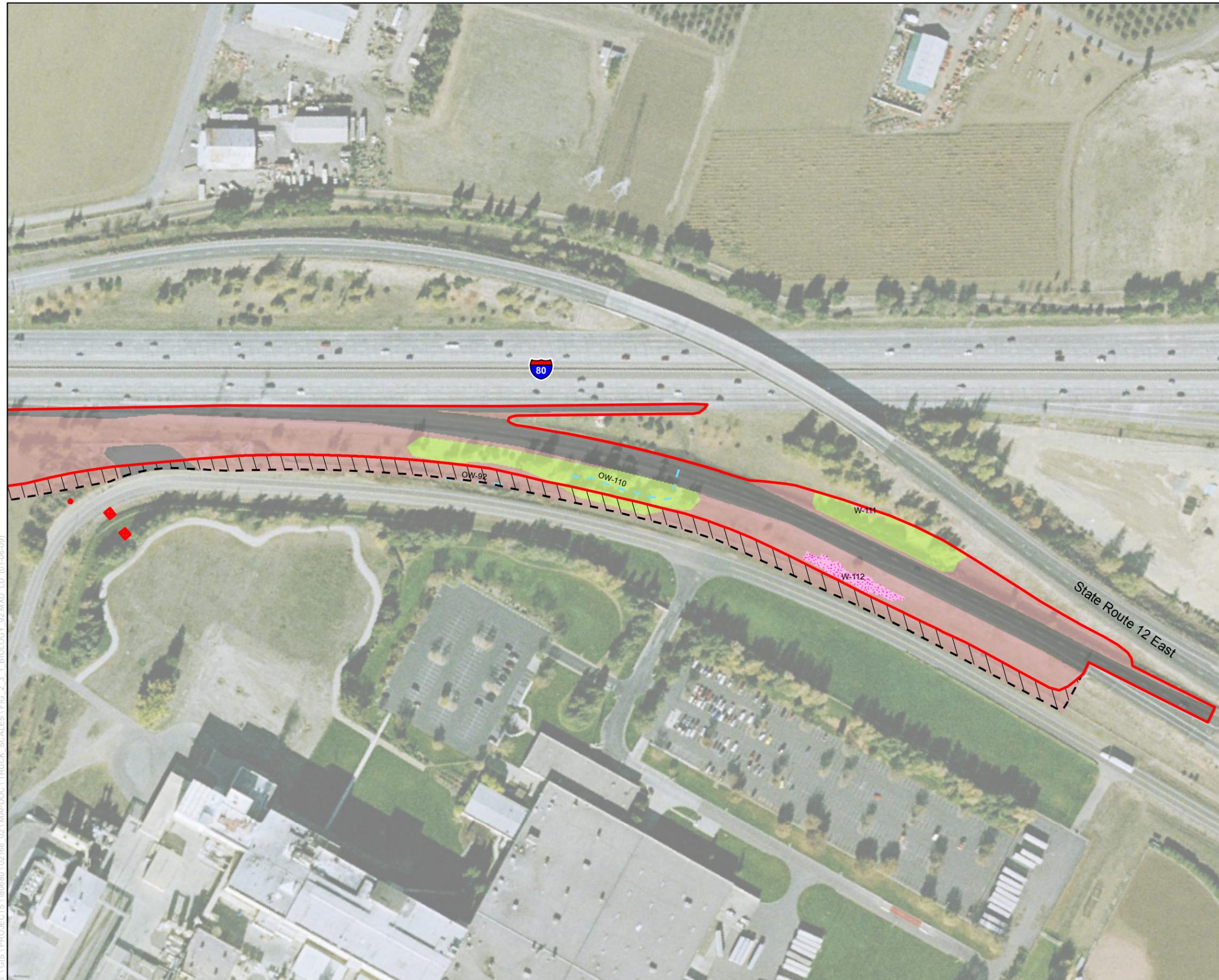


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Avoidance, Minimization, and/or Mitigation Measures

Implementation of the following avoidance and minimization measures would ensure that the proposed project would minimize effects on riparian habitat within and adjacent to the study area.

Measure NC-1a: Install Construction Barrier Fencing around the Construction Area to Protect Sensitive Biological Resources Outside of the Construction Area

Orange construction barrier fencing will be installed to identify environmentally sensitive areas (ESAs). A qualified biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans. The area that generally would be required for construction, including staging and access, is shown in Figure 2.3-1. Pockets of this area that are to be avoided during construction should be fenced off to avoid disturbance. Sensitive biological resources that occur adjacent to the construction area include sensitive natural communities; native trees to be retained; special-status wildlife habitats for valley elderberry longhorn beetle (VELB) (*Desmocerus californicus dimorphus*), California red-legged frog (CRLF) (*Rana aurora draytonii*) and northwestern pond turtle (western pond turtle) (*Actinemys marmorata*) (Suisun Creek); and nests of special-status birds.

Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated and will be maintained throughout the construction period.

Temporary fences around the ESAs will be installed as one of the first orders of work. Temporary fences will be furnished, constructed, maintained, and removed as shown on the plans, as specified in the special provisions, and as directed by the project engineer. The fencing will be commercial-quality woven polypropylene, orange in color, and at least four feet high (Tensor Polygrid or equivalent). The fencing will be tightly strung on posts set at maximum intervals of 10 feet.

Measure NC-1b: Conduct Environmental Awareness Training for Construction Employees

A USFWS-approved biologist will be retained to develop and conduct environmental awareness training for construction employees on the importance of on-site biological resources, including sensitive natural communities; native trees to be retained; special-status wildlife habitats for VELB, CRLF, and western pond turtles (Suisun Creek); nests of special-status birds; and avoidance of invasive plant introduction and spread. The environmental awareness program will be provided to all construction personnel to brief them on the life history of special-status species in or adjacent to the project area, the need to avoid adverse effects on sensitive biological resources, any terms and conditions required by state and federal agencies, and the penalties for not complying with biological mitigation requirements. If new construction personnel are added to the project, the contractor's superintendent will ensure that the personnel receive the mandatory training before starting work. An environmental awareness handout, describing and

illustrating sensitive resources that will be avoided during project construction and identifying all relevant permit conditions, will be provided to each person.

Measure NC-1c: Retain a Biological Monitor to Conduct Daily Visits during Construction around Suisun Creek

A biologist will be retained to conduct daily construction monitoring in and adjacent to all sensitive habitats when construction is taking place near sensitive habitat areas. The monitor, as part of the overall monitoring duties, will inspect the fencing along the creek and drainages in the construction area that support riparian vegetation, surrounding native trees and woodlands, and special-status wildlife habitats. The biological monitor will assist the construction crew as needed to comply with all project implementation restrictions and guidelines. The biological monitor also will be responsible for ensuring that the contractor maintains the staked and flagged perimeters of the construction area and staging areas adjacent to sensitive biological resources.

Measure NC-1d: Avoid and Minimize Potential Indirect Disturbance of Riparian Communities

To the extent possible, potential indirect disturbance of riparian communities will be avoided and minimized by implementing the following measures.

- The potential for long-term loss of riparian vegetation will be minimized by trimming vegetation rather than removing entire shrubs. Shrubs that need to be trimmed will be cut at least 1 foot above ground level to leave the root systems intact and allow for more rapid regeneration. Cutting will be limited to the minimum area necessary within the construction zone. To protect nesting birds, the project proponent will not allow pruning or removal of woody riparian vegetation between February 15 and September 1 without preconstruction surveys.
- A certified arborist will be retained to oversee any necessary pruning of riparian trees.
- The areas that undergo vegetative pruning will be inspected immediately before construction, immediately after construction, and 1 year after construction to determine the amount of existing species cover, cover that has been removed, and cover that resprouts. If, after 1 year, these areas have not resprouted sufficiently to return to the pre-project level, the project proponent will replant the areas with the same species (native species) to reestablish the vegetation cover.

Work in riparian areas will be conducted between June 15 and October 15, and disturbed areas will be stabilized with erosion control measures and replanted as described in Measure NC-1e.

Measure NC-1e: Compensate for Temporary and Permanent Loss of Riparian Vegetation

Temporary construction-related loss of riparian vegetation will be compensated by replanting the temporarily disturbed area with the native species removed. Replanting will occur immediately after completion of the construction activities and no later than October 15 to minimize erosion, creek sedimentation, and adverse effects on fish.

The temporary loss of riparian vegetation will be compensated through the preparation of a mitigation planting plan, including a species list and number of each species, planting locations, and maintenance requirements. Plantings will consist of cuttings taken from local plants, or plants grown from local material obtained within the American Canyon watershed.

Planted species will be based on those removed from the project area and will include valley oak, interior live oak, willows, white alder, California buckeye, California bay, and Himalayan blackberry. Native understory species, such as sedge species, mugwort, California wild rose, poison oak, California wild grape, or other suitable species will be planted. Plantings will be monitored annually for three years or as required in the project permits.

If 75 percent of the plants survive at the end of the monitoring period, the revegetation will be considered successful. If the survival criterion is not met at the end of the monitoring period, planting and monitoring will be repeated after mortality causes have been identified and corrected.

Permanent loss of riparian vegetation will be compensated. Potential mitigation areas are available at Solano Community College; the Solano Land Trust's Lynch Canyon Open Space, which is northwest of I-80 in American Canyon; and the King Ranch Open Space, which is west of I-680 in the American Canyon area (Wickham pers. comm.)

Valley Oak Woodland

Regulatory Setting

The City of Fairfield Tree Conservation ordinance (FCC 25.36) protects native trees, including native oaks (*Quercus* spp.), bay laurel (*Umbellularia californica*), madrone (*Arbutus menziesii*), and California buckeye (*Aesculus californica*), that are greater than 6 inches in diameter at breast height (dbh). Removal of these trees requires a permit and on-site or off-site replacement for the removed trees on an inch-for-inch basis. Most of the study area is outside the Fairfield city limit line, and no native trees occur in that area. Native trees in the remainder of the project area are not protected under the ordinance. The DFG would recommend avoidance, minimization, and compensatory mitigation for the loss of native oak trees and oak woodland habitat. The loss or disturbance of oak woodland vegetation is considered adverse because this vegetation is declining and provides important wildlife habitat and other ecological functions and values.

Affected Environment

The west end of the study area extends into 0.03 acre of a valley oak woodland. This community is dominated by valley oak trees, although the overstory also contains coast live oak and blue oak (*Quercus douglasii*). The understory is open and grassy understory with blue wildrye (*Elymus glaucus*) and poison oak. Within the small portion of valley oak woodland that is in the study area, the overstory includes a coast live oak and a valley oak.

The piece of valley oak woodland in the study area provides some wildlife habitat value but it is too small and isolated to provide a movement corridor for wildlife species.

Environmental Consequences

The valley oak woodland vegetation community is not protected under any applicable federal statute. Impacts on this resource are discussed per CEQA requirements in Chapter 3.

2.3.2 Wetlands and Other Waters

The information presented here is taken from the *Preliminary Delineation of Waters of the United States for the Interstate 80 Eastbound Cordelia Truck Scales Relocation Project* (ICF Jones & Stokes 2008i) and the *I-80 Eastbound Cordelia Truck Scales Project Natural Environment Study* (ICF Jones & Stokes 2008h). The wetland delineation was submitted to the U.S. Army Corps of Engineers (USACE) in August 2008. A field verification of the preliminary delineation was conducted with Andrea Meier of the USACE San Francisco District on January 7, 2009, and final verification of the revised map is pending. This section addresses waters of the United States, which are under the jurisdiction of the USACE, as well as wetland and drainage features that are outside of USACE jurisdiction (nonjurisdictional features) and are regulated only as waters of the state. Impacts on nonjurisdictional features are discussed per CEQA requirements in Chapter 3.

Jurisdictional wetlands and other waters (waters of the U.S.) in the study area include a perennial wetland drainage (Dan Wilson Creek) and a perennial drainage (Suisun Creek). Non-jurisdictional features (waters of the state) in the study area include two seasonal wetlands, an irrigation ditch (Raines Drain), and roadside ditches. Raines Drain connects to navigable waters in Cordelia Slough and is, therefore, considered jurisdictional by the USACE and subject to regulation under CWA Section 404. A summary of the effects on waters of the state and waters of the United States is provided in Table 2.3-1 below.

Table 2.3-1. Effects on Waters of the State and Waters of the United States

Water of the State/ Water of the U.S.	Type	Permanent Effect (acres)	Temporary Effect (acres)
Water of the State (CEQA-only impact)	Seasonal wetland	0.13	0
Water of the U.S.	Perennial wetland drainage	0	0
Water of the U.S.	Perennial drainage	0	0
Water of the U.S.	Seasonal drainage	0.02	0.06
Water of the State (CEQA-only impact)	Seasonal drainage	0.10	0.08

Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (CWA) (33 USC 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 USACE with oversight by the Environmental Protection Agency (EPA).

The Executive Order for the Protection of Wetlands (E.O. 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this EO states that a federal agency, such as the FHWA, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the DFG and the Regional Water Quality Control Boards (RWQCBs). Sections 1600–1607 of the 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 the DFG before beginning construction. If the DFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Program will be required. DFG 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 USACE may or may not be included in the area covered by an SAA obtained from the DFG.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the CWA. Please see the Water Quality Section for details.

Seasonal Wetland

Affected Environment

Two seasonal wetlands, totaling 0.13 acre, occur in the study area. These wetlands are located along the connector from eastbound I-80 to SR 12E and receive runoff from the road. The vegetation in these wetlands is correspondingly degraded, dominated by nonnative annual grasses and nonnative forbs. Dominant species observed in these wetlands include Italian ryegrass (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum* var. *gussoneanum*), curly dock (*Rumex crispus*), narrow-leaved plantain (*Plantago lanceolata*), and birds-foot trefoil (*Lotus corniculatus*). Wetland functions of seasonal wetlands in the study area include flood storage, groundwater recharge, and wildlife habitat.

Because they are isolated from any creeks, the seasonal wetlands in the study area are not considered jurisdictional by the USACE or subject to regulation under CWA Section 404. Regardless of USACE jurisdiction, however, local, state, and federal agencies recognize seasonal wetlands as sensitive natural communities, and the seasonal wetland would be considered a water of the state.

Environmental Consequences

The seasonal wetland in the study area is not protected under any applicable federal statute. Impacts on this resource are discussed as CEQA-only impacts in Chapter 3.

Perennial Wetland Drainage

Affected Environment

One perennial wetland drainage, Dan Wilson Creek (feature W-53), crosses the study area. This feature supports freshwater marsh vegetation. Dominant plant species observed in perennial wetland drainages include bog rush (*Juncus effusus*), broadleaf cattail (*Typha latifolia*), common tulle (*Scirpus acutus*), Himalayan blackberry, and narrowleaf willow (*Salix exigua*). Wetland functions of the perennial wetland drainage in the study area include flood conveyance and wildlife habitat because of the presence of generally dense wetland vegetation.

Dan Wilson Creek is considered a USACE-jurisdictional wetland, because the freshwater marsh wetland occurs within a drainage that is inundated year-round and connects to navigable waters in Cordelia Slough.

Environmental Consequences

Impact WOW-1: Effect on Perennial Wetland Drainage

No direct adverse effects on perennial wetland drainage habitat would result from the project, however, indirect effects caused by sedimentation or modification of hydrology could occur due to construction activities. Implementation of the avoidance and minimization measures would protect adjacent perennial wetland drainage habitat during construction and avoid potential indirect adverse effects on Dan Wilson Creek.

Wetland habitat in Dan Wilson Creek is under USACE jurisdiction because it is connected to the creek, which flows to a navigable water. The creek and its wetlands are also considered waters of the state, and water quality effects would be regulated by the RWQCB.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of the avoidance and minimization measures described in the “Riparian Woodland” section (Measures NC-1a and NC-1b) and the following Measure would ensure that the proposed project would not result in indirect adverse effects on perennial wetland drainage.

Measure WOW-1: Protect Water Quality and Prevent Erosion in Drainages and Wetlands

Water quality in drainages and wetlands that are outside the project footprint will be protected. Features to be protected include Suisun Creek, unnamed drainages, and wetlands in and adjacent to the project area. The following best management practices (BMPs) will be implemented before and during construction.

- All earthwork or foundation activities involving creeks, culverts, and bridges will occur in the dry season (generally between June 15 and October 15).
- Equipment used in and around drainages and wetlands will be in good working order and free of dripping or leaking engine fluids. All vehicle maintenance, staging, and materials storage will occur at least 300 feet from all drainages and wetlands. Any necessary equipment washing will occur where the water cannot flow into drainages or wetlands.

- Any surplus concrete rubble, asphalt, or other rubble from construction will be taken to a Solano County landfill.
- An erosion control plan will be prepared and implemented for the proposed project. It will include the following provisions and protocols.
 - Discharge from dewatering operations, if needed, and runoff from disturbed areas will be made to conform to the water quality requirements of the waste discharge permit issued by the RWQCB.
 - Material stockpiles will be located in non-traffic areas only. Side slopes will not be steeper than 2:1. All stockpile areas will be surrounded by a filter fabric fence and interceptor dike.
 - Erosion control measures will be applied throughout construction of the proposed project. The stormwater pollution prevention program (SWPPP) for the project will detail the applications and type of measures and the allowable exposure of unprotected soils.
 - Soil exposure will be minimized through the use of temporary BMPs, ground cover, and stabilization measures. Exposed dust-producing surfaces will be sprinkled daily, if necessary, until wet; this measure will be controlled to avoid producing runoff. Paved streets will be swept daily following construction activities.
 - The contractor will conduct periodic maintenance of erosion and sediment control measures.
 - All temporary erosion and sediment control measures will be removed after the working area is stabilized or as directed by the engineer.
 - An appropriate seed mix of native species will be planted on disturbed areas upon completion of construction.

Sandbagged silt fences will be installed in all named and unnamed waterways in which construction work occurs, both upstream and downstream of the construction site. Any accumulated sediment will be removed and trucked to a Solano County landfill or an approved disposal site.

Perennial and Seasonal Drainages

Affected Environment

Both perennial and seasonal drainages occur in the study area. A total of 0.20 acre of perennial drainage and 0.26 acre of seasonal drainage is in the study area. Drainage boundaries were indicated by changes in vegetation, shelving, or watermarks on concrete banks.

Suisun Creek is the only perennial drainage in the study, and it carries flow year-round or nearly year-round. Functions of this perennial drainage habitat in the study area include flood conveyance, fish production, and wildlife habitat. Suisun Creek is considered jurisdictional by the USACE, is subject to regulation under CWA Section 404, and is considered a sensitive natural community.

One of the seasonal drainages mapped in the study area is a concrete-lined irrigation ditch (known as Raines Drain) that connects to navigable waters in Cordelia Slough and is, therefore, considered jurisdictional by the USACE and subject to regulation under CWA Section 404. Other seasonal drainages are drainage ditches along roadsides. These roadside drainage ditches do not connect to a natural stream, are not subject to USACE jurisdiction, and are not considered sensitive natural communities, but could be regulated as waters of the state by the RWQCB. Functions of roadside seasonal drainages in the study area include flood conveyance during and after storm events.

Environmental Consequences

Construction of the project would involve the installation of culverts and placement of fill for road widening, resulting in direct disturbance of jurisdictional and nonjurisdictional seasonal drainages. Impact acreages are based on the USACE field verification of the delineation, which includes both jurisdictional and non jurisdictional features.

Seasonal roadside drainages in the study area are not protected under any applicable federal statute. Impacts on these resources are discussed per CEQA requirements in Chapter 3.

Impact WOW-2: Disturbance of Perennial Drainage during Construction

The bridge over Suisun Creek would be a clear span, and no piers or bridge abutments would be placed within the limits of the ordinary high water mark (OHWM). All construction will occur outside the limits of the OHWM. There would be no direct adverse effects on Suisun Creek due to project construction.

Additional indirect effects caused by sedimentation or modification of hydrology could occur in portions of perennial and seasonal drainages that lie outside the project footprint.

Impact WOW-3: Disturbance of Jurisdictional Seasonal Drainage during Construction

Raines Drain, currently a concrete lined ditch would be replaced with a pipe to maintain the connection from the north side of I-80 to the south side of the proposed project. A total of 0.02 acre of jurisdictional seasonal drainage within an irrigation ditch (feature OW-56a) would be removed for construction, and 0.06 acre would be temporarily affected. Placement of fill within the irrigation ditch would require authorization from the USACE under a CWA Section 404 nationwide permit. Because the cement-lined ditch functions as part of a transport system for irrigation water and does not provide significant wildlife habitat, there is no associated impact on wildlife habitat.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of the avoidance and minimization measures described in the “Riparian Woodland” section (Measures NC-1a and NC-1b) and in the “Perennial Wetland Drainage” section (Measure WOW-1) and the following measure would ensure that the proposed project would avoid and minimize direct and indirect effects on drainage habitats adjacent to the construction area.

Measure WOW-3: Obtain Required Permits, Authorizations, Certifications, and Agreements

Before construction, the following permits will be obtained.

- RWQCB—Waste Discharge Requirements and CWA Section 401 Water Quality Certification
- USACE—CWA Section 404 Nationwide permit.
- State Water Resources Control Board (SWRCB)—National Pollutant Discharge Elimination System (NPDES) permit.
- USFWS—Biological Opinion (BO).
- National Marine Fisheries Service (NMFS)—concurrence letter.
- DFG—Section 1602 Streambed Alteration Agreement.

All conditions that are attached to the state and federal permits will be implemented as part of the project. The conditions will be identified clearly in the construction plans and specifications and will be monitored during and after construction to ensure compliance.

2.3.3 Plant Species

Regulatory Setting

The USFWS and DFG 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 species are formally listed or proposed for listing as endangered or threatened under the federal Endangered Species Act (ESA), the California Endangered Species Act (CESA), or both. No threatened or endangered species occur in the study area.

This section of the document discusses all the other special-status plant species, including non-listed California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for the ESA can be found at United States Code 16 (USC), Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code (CFGC), Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at CFGC Section 1900-1913, and CEQA, PRC Sections 2100-21177.

Affected Environment

During prefield investigations, 52 special-status plant species were determined to have the potential to occur in the project region (Table 2.3-2). Historic alteration of the study area due to construction of I-80, SR-12E, and the existing truck scales has disturbed all habitat within the study area, making the potential for occurrence of special-status plants very low. No special-status plants have been recorded in the study area (California Natural Diversity Database 2008).

Botanical surveys of the study area were conducted in May 2004, May 2005, and August 2007. No special-status plants were observed in the study area during the blooming-period botanical surveys.

Environmental Consequences

No special-status plants are located within the project area, and thus the project would not result in adverse effects on any special-status plants.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures for special-status plants are necessary.

2.3.4 Native Trees

Regulatory Setting

The City of Fairfield Tree Conservation ordinance (*FCC 25.36*) protects native trees, including native oaks (*Quercus* spp.), bay laurel (*Umbellularia californica*), madrone (*Arbutus menziesi*), and California buckeye (*Aesculus californica*), that are greater than 6 inches in diameter at breast height (dbh). Removal of these trees requires a permit and on-site or off-site replacement for the removed trees on an inch-for-inch basis. Most of the study area is outside the Fairfield city limit line, and no native trees occur in that area. Native trees in the remainder of the project area are not protected under the ordinance.

Affected Environment

The City of Fairfield Tree Conservation ordinance regulates the removal of mature native trees, but most of the study area is outside the Fairfield city limit line, and no native trees occur in the part of the study area that is within the city limit. Native trees in the remainder of the project area are not protected under the City of Fairfield ordinance, and Solano County has no specific tree protection requirements outside of hillsides and visually sensitive areas. However, most native trees in the study area occur within or adjacent to riparian and oak woodland communities. These trees are still considered sensitive resources because they occur in natural communities of special concern.

Tree surveys of the study area were conducted on November 20 and December 30, 2007, to map the locations using global positioning system (GPS) of all native trees and to record the species and dbh of each mapped tree. The locations of individual native trees that occur outside the mapped riparian and oak woodland communities are presented in Figure 2.3-1, and information for each tree is listed in Appendix D of the NES (ICF Jones & Stokes 2008i).

Environmental Consequences

Native trees are not protected under any applicable federal statute. Impacts to native trees are discussed as CEQA only impacts in Chapter 3.

Table 2.3-2. Special-Status Plant Species with the Potential to Occur in the Project Region

Common Name, <i>Scientific Name</i>	Legal Status ^a			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Ferris' milk-vetch <i>Astragalus tener</i> var. <i>ferrisiae</i>	–	–	1B.1	Historical range included the Central Valley from Butte County to Alameda County, but it currently occurs only in Butte, Glenn, Colusa, and Yolo Counties	Seasonally wet areas in meadows and seeps, subalkaline flats in valley and foothill grassland; 16–246 feet (5–75 meters)	April–May	Yes	Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys
Alkali milk-vetch <i>Astragalus tener</i> var. <i>tener</i>	–	–	1B.2	Merced, Solano, and Yolo Counties; historically more widespread	Grassy flats and vernal pool margins on alkali soils below 197 feet (60 meters)	March–June	Yes	Marginal habitat, but no suitable soils are present in the study area, and the species was not observed during blooming-period surveys
Heartscale <i>Atriplex cordulata</i>	–	–	1B.2	Western Central Valley and valleys of adjacent foothills	Alkali grassland, alkali meadow, and alkali scrub below 656 feet (200 meters)	April–October	Yes	No suitable vegetation communities or soils are present in the study area, and the species was not observed during blooming-period surveys
Brittlescale <i>Atriplex depressa</i>	–	–	1B.2	Western Central Valley and valleys of adjacent foothills on west side of Central Valley	Alkali grassland, alkali meadow, alkali scrub, chenopod scrub, playas, and valley and foothill grasslands on alkaline or clay soils below 656 feet (200 meters)	May–October	Yes	No suitable soils are present in the study area, and the species was not observed during blooming-period surveys
San Joaquin spearscale <i>Atriplex joaquiniana</i>	–	–	1B.2	West edge of Central Valley from Glenn County to Tulare County	Alkali grassland, alkali meadow, alkali scrub, and saltbush scrub below 1,000 feet (305 meters)	April–October	Yes	No suitable vegetation communities or soils are present in the study area, and the species was not observed during blooming-period surveys
Vernal pool smallscale <i>Atriplex persistens</i>	–	–	1B.2	Central Valley, from Glenn to Tulare County	Dry beds of vernal pools on alkaline soils; 33–377 feet (10–115 meters)	July–October	Yes	No suitable vegetation communities or soils are present in the study area, and the species was not observed during blooming-period surveys

Table 2.3-2. Continued

Common Name, Scientific Name	Legal Status ^a			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Big-scale balsamroot <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	–	–	1B.2	Scattered occurrences in Coast Ranges and Sierra Nevada foothills	Chaparral, cismontane woodland, valley and foothill grassland, sometimes on serpentine soils; 295–4,593 feet (90–1,400 meters)	March–June	Yes	Marginal habitat is present in oak woodlands in the study area, but the species was not observed during blooming-period surveys
Big tarplant <i>Blepharizonia plumosa</i>	–	–	1B.1	San Francisco Bay Area, with occurrences in Alameda, Contra Costa, San Joaquin ^b , Stanislaus, and Solano Counties	Valley and foothill grassland; 98–1,657 feet (30–505 meters)	July–October	Yes	Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys
Narrow-anthered California brodiaea <i>Brodiaea californica</i> var. <i>leptandra</i>	–	–	1B.2	Lake, Napa, and Sonoma Counties	Broadleaved upland forest, chaparral, and lower montane coniferous forest; 295–3,002 feet (90–915 meters)	May–July	No	No suitable vegetation communities are present in the study area
Mt. Diablo fairy-lantern <i>Calochortus pulchellus</i>	–	–	1B.2	Alameda, Contra Costa, and Solano Counties	Cismontane woodland and chaparral; 98–2,756 feet (30–840 meters)	April–June	Yes	Marginal habitat is present in oak woodlands in the study area, but the species was not observed during blooming-period surveys
Tiburon Indian paintbrush <i>Castilleja affinis</i> ssp. <i>neglecta</i>	E	T	1B.2	San Francisco Bay Area; Marin, Napa, and Santa Clara Counties	Serpentine grasslands; 197–1,312 feet (60–400 meters)	April–June	No	No suitable vegetation communities or soils are present in the study area
Holly-leaved ceanothus <i>Ceanothus purpureus</i>	–	–	1B.2	Inner north Coast Ranges; Napa and Solano Counties	Chaparral on volcanic, rocky substrate; 394–2,100 feet (120–640 meters)	February–April	No	No suitable vegetation communities or soils are present in the study area
Congdon's tarplant <i>Centromadia [Hemizonia] parryi</i> ssp. <i>congdonii</i>	–	–	1B.2	East San Francisco Bay Area, Salinas Valley, Los Osos Valley	Annual grassland, on lower slopes, flats, and swales, sometimes on alkaline or saline soils; below 755 feet (230 meters)	June–November	Yes	Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys

Table 2.3-2. Continued

Common Name, Scientific Name	Legal Status ^a			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Pappose tarplant <i>Centromadia [Hemizonia] parryi</i> ssp. <i>parryi</i>	–	–	1B.2	Butte, Colusa, Glenn, Lake, Napa, San Mateo, Solano, and Sonoma Counties	Coastal prairie, meadows and seeps, coastal salt marshes and swamps, alkaline soils in vernal mesic valley and foothill grassland; 7–1,378 feet (2–420 meters)	May–November	Yes	Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys
Suisun thistle <i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	E	–	1B.1	Suisun Marsh, Solano County	Salt marsh; 0–3 feet (0–1 meter)	July–September	No	No suitable vegetation communities are present in the study area
Hispid bird's-beak <i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	–	–	1B.1	Central Valley; Alameda, Kern, Merced, Placer, and Solano Counties	Meadow, grassland, and playa on alkaline soils below 150 meters	June–September	Yes	No suitable soils are present in the study area, and the species was not observed during blooming-period surveys
Soft bird's-beak <i>Cordylanthus mollis</i> ssp. <i>mollis</i>	E	R	1B.2	San Francisco Bay region and Suisun Marsh; Contra Costa, Marin ^b , Napa, Solano, Sacramento ^b , and Sonoma ^b Counties	Tidal salt marsh; 0–10 feet (0–3 meters)	July–September	No	No suitable vegetation communities or hydrologic conditions are present in the study area
Recurved larkspur <i>Delphinium recurvatum</i>	–	–	1B.2	San Joaquin Valley and Central Valley of the south Coast Ranges; Contra Costa County to Kern County	Subalkaline soils in annual grassland, saltbush scrub, cismontane woodland, and vernal pools at 98–2001 feet (30–610 meters)	March–May	Yes	Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys
Dwarf downingia <i>Downingia pusilla</i>	–	–	2.2	Central Valley	Vernal pools and valley and foothill grasslands; 3–1,460 feet (1–445 meters)	March–May	Yes	Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys
Streamside daisy <i>Erigeron biolettii</i>	–	–	3	North Coast, from Humboldt County to Marin County; Solano County	Moist, rocky areas in broadleaved upland forest, cismontane woodland, North Coast coniferous forest, and ledges along rivers; 98–3,609 feet (30–1,100 meters)	June–October		Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys

Table 2.3-2. Continued

Common Name, <i>Scientific Name</i>	Legal Status ^a			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Tiburon buckwheat <i>Eriogonum luteolum</i> var. <i>caninum</i>	–	–	1B.1	Central inner north Coast Range, northern central coast, and northern San Francisco Bay Area: Alameda, Colusa, Lake, Marin, Napa, Santa Clara, San Mateo, Solano, and Sonoma ^b Counties	On serpentinite in chaparral, coastal prairie, valley and foothill grassland; 0–2,297 feet (0–700 meters)	June–September	No	No suitable soils (serpentinite) are present in the study area
Mt. Diablo buckwheat <i>Eriogonum truncatum</i>	–	–	1B.1	Historically known from Alameda, Contra Costa, and Solano Counties; recently rediscovered on Mt. Diablo	Coarse, sandy soils in chaparral, coastal scrub, valley and foothill grassland; 0–1,148 feet (3–350 meters)	April–September	No	Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys
Fragrant fritillary <i>Fritillaria liliacea</i>	–	–	1B.2	Coast Ranges from Marin County to San Benito County	Adobe soils of interior foothills, coastal prairie, coastal scrub, annual grassland, often on serpentinite; 10–1,345 feet (3–410 meters)	February–April	Yes	Marginal habitat, but suitable soils unlikely to be present in the study area, and the species was not observed during blooming-period surveys
Adobe lily <i>Fritillaria pluriflora</i>	–	–	1B.2	Northern Sierra Nevada foothills, inner Coast Ranges foothills, and Sacramento Valley; Butte, Colusa, Glenn, Lake, Napa, Plumas, Solano, Tehama, and Yolo Counties	Chaparral, cismontane woodland, valley and foothill grassland, often on adobe soils; 197–2,313 feet (60–705 meters)	February–April	Yes	Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys
Boggs Lake hedge-hyssop <i>Gratiola heterosepala</i>	–	E	1B.2	Inner north Coast Ranges, Central Sierra Nevada foothills, Sacramento Valley and Modoc Plateau: Fresno, Lake, Lassen, Madera, Merced, Modoc, Placer, Sacramento, Shasta, Siskiyou, San Joaquin, Solano, and Tehama Counties; also Oregon	Clay soils in areas of shallow water, lake margins and vernal pool margins; 33–7,792 feet (10–2,375 meters)	April–August	Yes	No suitable habitat (large vernal pools) is present in the study area, and the species was not observed during blooming-period surveys

Table 2.3-2. Continued

Common Name, <i>Scientific Name</i>	Legal Status ^a			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Diablo helianthella <i>Helianthella castanea</i>	–	–	1B.2	San Francisco Bay Area: Alameda, Contra Costa, Marin ^b , San Francisco ^b , and San Mateo Counties; also reported from San Diego County	At chaparral/oak woodland ecotone, often in partial shade, on rocky soils; also coastal scrub, riparian woodland, grassland; 197–4,265 feet (60–1,300 meters)	March–June	Yes	Marginally suitable habitat is present in riparian woodland in the study area, but the species has no known occurrences in Solano County. Species was not observed during blooming-period surveys
Brewer's western flax <i>Hesperolinon breweri</i>	–	–	1B.2	Southern north inner Coast Ranges, northeast San Francisco Bay region, and Mt. Diablo; Contra Costa, Napa, and Solano Counties	Serpentine slopes in chaparral and grasslands at 98–2,001 feet (30–610 meters)	May–July	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area
Napa western flax <i>Hesperolinon serpentinum</i>	–	–	1B.1	Alameda, Lake, Napa, and Stanislaus Counties	Chaparral on serpentinite; 164–2,625 feet (50–800 meters)	May–July	No	No suitable vegetation communities or soils are present in the study area
Carquinez goldenbush <i>Isocoma arguta</i>	–	–	1B.1	Deltaic Sacramento Valley and Suisun Slough; Contra Costa and Solano Counties	Annual grassland on alkaline soils and flats generally below 69 feet (21 meters)	August–December	Yes	No suitable soils are present in the study area, and the species was not observed during blooming-period surveys
Northern California black walnut <i>Juglans hindsii</i>	–	–	1B.1	Last two native stands in Napa and Contra Costa Counties; historically more widespread through southern north inner Coast Range, southern Sacramento Valley, northern San Joaquin Valley, and San Francisco Bay region	Riparian forest, riparian woodland; 0–1,444 feet (0–440 meters)	April–May	Yes	No native stands are present in the study area
Contra Costa goldfields <i>Lasthenia conjugens</i>	E	–	1B.1	Napa and Solano Counties	Alkaline or saline vernal pools and swales below 1,542 feet (470 meters)	March–June	Yes	Marginal vegetation communities, but no suitable soils are present in the study area, and the species was not observed during blooming-period surveys

Table 2.3-2. Continued

Common Name, Scientific Name	Legal Status ^a			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Delta tule pea <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	–	–	1B.2	Central Valley and San Francisco Bay region; Alameda, Contra Costa, Fresno, Marin, Napa, Sacramento, San Benito, Santa Clara, San Joaquin, and Solano Counties	Coastal and estuarine marshes below 1,001 feet (305 meters)	May–September	No	No suitable vegetation communities are present in the study area
Legenere <i>Legenere limosa</i>	–	–	1B.1	Central Valley	Vernal pools	April–June	Yes	Marginal habitat is present in seasonal wetlands in the study area, but the species was not observed during blooming-period surveys
Heckard's pepper-grass <i>Lepidium latipes</i> var. <i>heckardii</i>	–	–	1B.2	Southern Sacramento Valley, Glenn, Solano, and Yolo Counties	On margins of alkali scalds in annual grassland; below 656 feet (200 meters)	March–May	No	No suitable soil conditions (alkali scalds) are present in the study area
Woolly-headed lessingia <i>Lessingia hololeuca</i>	–	–	3	Southern north Coast Ranges; southern Sacramento Valley; northern San Francisco Bay region; Alameda, Monterey, Marin, Napa, Santa Clara, San Mateo, Solano, Sonoma, and Yolo Counties	Clay or serpentinite soils of coastal scrub, lower montane coniferous forest, valley and foothill grassland; 49–1,001 feet (15–305 meters)	June–October	Yes	Marginal vegetation communities, but no suitable soils are present in the study area, and the species was not observed during blooming-period surveys
Mason's lilaepsis <i>Lilaeopsis masonii</i>	–	R	1B.1	Southern Sacramento Valley, Sacramento River–San Joaquin River Delta, and northeast San Francisco Bay Area; Alameda, Contra Costa, Marin ^b , Napa, Sacramento, San Joaquin, and Solano Counties	Freshwater or brackish marsh, in tidal zone, generally at sea level	April–November	No	No suitable hydrologic conditions (tidal areas) are present in the study area
Delta mudwort <i>Limosella subulata</i>	–	–	2.1	Deltiac Central Valley: Contra Costa, Sacramento, San Joaquin, and Solano Counties; Oregon	Muddy or sandy intertidal flats and marshes, streambanks in riparian scrub generally at sea level; 0–10 feet (0–3 meters)	May–August	No	No suitable hydrologic conditions (tidal areas) are present in the study area

Table 2.3-2. Continued

Common Name, <i>Scientific Name</i>	Legal Status ^a			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Robust monardella <i>Monardella villosa</i> ssp. <i>globosa</i>	–	–	1B.2	North Coast Ranges and eastern San Francisco Bay Area: Alameda, Contra Costa, Humboldt, Lake, Mendocino, Napa, Santa Clara, Santa Cruz, San Mateo, and Sonoma Counties	Grassy openings in oak woodland and chaparral, coastal scrub and grassland; 328–3,002 feet (100–915 meters)	June–July	No	Marginal habitat in the study area, which is below the known elevational range for the species, and the species was not observed during blooming-period surveys
Little mousetail <i>Myosurus minimus</i> ssp. <i>apus</i>	–	–	3.1	Central Valley and South Coast from Butte County south to San Diego County; Baja California; Oregon	Valley and foothill grassland, alkaline vernal pools at 66–2,100 feet (20–640 meters)	March–June	Yes	Marginal vegetation communities present, but no suitable soils are present in the study area, and the species was not observed during blooming-period surveys
Baker's navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	–	–	1B.1	Inner North Coast Range, western Sacramento Valley: Colusa, Glenn, Lake, Mendocino, Marin, Napa, Solano, Sonoma, Tehama, and Yolo Counties	Vernal pools and swales in woodland, lower montane coniferous forest, mesic meadows, and grassland; generally below 5,709 feet (1,740 meters)	May–July	Yes	Marginal habitat is present in seasonal wetlands in the study area, but the species was not observed during blooming-period surveys
Colusa grass <i>Neostapfia colusana</i>	T	E	1B.1	Central Valley; Colusa ^b , Glenn ^b , Merced, Solano, Stanislaus, and Yolo Counties	Adobe soils of vernal pools generally below 656 feet (200 meters)	May–September	Yes	Marginal habitat is present in seasonal wetlands in the study area, and heavy clay soils may occur in the study area, but the species was not observed during blooming-period surveys
San Joaquin Valley orcutt grass <i>Orcuttia inaequalis</i>	T	E	1B.1	Scattered locations along east edge of the San Joaquin Valley and adjacent foothills, from Stanislaus County to Tulare County	Vernal pools; 33–2,477 feet (10–755 meters)	April–September	Yes	Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys
Bearded popcorn-flower <i>Plagiobothrys hystriculus</i>	–	–	1B.1	Endemic to Solano ^b County; last recorded in 1892; rediscovered in 2005	Mesic grasslands and vernal pools; 33–164 feet (10–50 meters)	April–May	Yes	Marginal habitat is present in seasonal wetlands in the study area, but species was not observed during blooming-period surveys

Table 2.3-2. Continued

Common Name, Scientific Name	Legal Status ^a			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Marin knotweed <i>Polygonum marinense</i>	–	–	3.1	Coastal Marin, Marin, Napa, Solano, and Sonoma Counties	Coastal salt marsh, brackish marsh; 0–33 feet (0–10 meters)	April–October	Yes	No suitable habitat occurs in the study area
California beaked-rush <i>Rhynchospora californica</i>	–	–	1B.1	Scattered occurrences in northern California; Butte, Mariposa, Marin, and Sonoma Counties	Freshwater marshes and seeps, bogs and fens, and lower montane coniferous forest; 131–3,314 feet (40–1,010 meters)	May–July	Yes	No suitable habitat occurs in the study area
Rayless ragwort <i>Senecio aphanactis</i>	–	–	2.2	Scattered locations in central western and southwestern California, from Alameda County to San Diego County	Oak woodland, coastal scrub, open sandy or rocky areas, on alkaline soils; 49–2,625 feet (15–800 meters)	January–April	Yes	Marginal habitat is present in oak woodlands in the study area, but the species was not observed during blooming-period surveys
Marin checkerbloom <i>Sidalcea hickmanii</i> ssp. <i>viridis</i>	–	–	1B.3	Sonoma County to San Mateo County	Openings in chaparral on volcanic or serpentinite substrates; 164–1,411 feet (50–430 meters)	May–June	No	No suitable vegetation communities or soils are present in the study area
Suisun marsh aster <i>Symphotrichum lentum</i> [<i>Aster lentus</i>]	–	–	1B.2	Sacramento River–San Joaquin River Delta, Suisun Marsh, and Suisun Bay; Contra Costa, Napa, Sacramento, San Joaquin, and Solano Counties	Tidal brackish and freshwater marsh below 492 feet (150 meters)	May–November	No	No suitable hydrologic conditions (tidal areas) are present in the study area
Showy Indian clover <i>Trifolium amoenum</i>	E	–	1B.1	Coast Range foothills in the San Francisco Bay region; currently known from Marin County	Low elevation grasslands, including swales and disturbed areas, sometimes on serpentinite soils; 13–1,362 feet (4–415 meters)	April–June	Yes	Marginal habitat is present in the study area, but the species was not observed during blooming-period surveys
Saline clover <i>Trifolium depauperatum</i> var. <i>hydrophilum</i>	–	–	1B.2	Alameda, Monterey, Napa, San Benito, Santa Clara, San Luis Obispo, San Mateo, Solano, and Sonoma Counties	Salt marsh, mesic alkaline areas in grasslands, vernal pools; 0–984 feet (0–300 meters)	April–June	Yes	Marginal habitat, but no suitable soils are present in the study area, and the species was not observed during blooming-period surveys
Greene's tuctoria <i>Tuctoria greenei</i>	E	R	1B.1	Scattered distribution along eastern Central Valley and foothills from Shasta County to Tulare County	Dry vernal pools at 98–3,510 feet (30–1,070 meters)	May–September	Yes	Marginal habitat is present in seasonal wetlands in the study area, but the species was not observed during blooming-period surveys

Table 2.3-2. Continued

Common Name, <i>Scientific Name</i>	Legal Status ^a			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Oval-leaved viburnum <i>Viburnum ellipticum</i>	–	–	2.3	Northwest California, San Francisco Bay Area, and north and central Sierra Nevada foothills; Contra Costa, Fresno, El Dorado, Glenn, Humboldt, Mendocino, Napa, Shasta, and Sonoma Counties, as well as Oregon and Washington	Chaparral, cismontane woodland, and lower montane coniferous forest; 705–4,593 feet (215–1,400 meters)	May–June	No	No suitable habitat is present in the study area, and the study area is below the elevational range for the species

Sources: CNDDB 2008; CNPS 2008; Jones & Stokes study area surveys 2004 and 2007.

^a Status explanations:

– = no listing.

Federal

E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.

State

E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
R = listed as rare under the California Native Plant Protection Act; this category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation.

California Native Plant Society

1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.
3 = List 3 species: plants about which more information is needed to determine their status.

California Native Plant Society Code Extensions:

.1 = seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat).
.2 = fairly endangered in California (20%–80% of occurrences threatened).
.3 = not very endangered in California (<20% of occurrences threatened or not current threats known).

^b Known populations believed extirpated from that county.

2.3.5 Animal Species

Regulatory Setting

Many state and federal laws regulate impacts on wildlife. The USFWS, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), and the DFG are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under the ESA or the CESA. Species listed or proposed for listing as threatened or endangered are discussed in the "Threatened and Endangered Species" section below. All other special-status animal species are discussed here, including DFG fully protected species and species of special concern, and USFWS or NMFS candidate species.

Federal laws and regulations pertaining to wildlife include the following.

- NEPA.
- The Migratory Bird Treaty Act (MBTA).
- The Fish and Wildlife Coordination Act.

State laws and regulations pertaining to wildlife include the following.

- CEQA.
- Sections 1600–1603 of the CFGC.
- Sections 3503, 3503.5, 3511, and 3513 of the CFGC.
- Section 4150 and 4152 of the CFGC.

During prefield investigations, 31 special-status wildlife species and 11 special-status fish species were determined to have the potential to occur in the project region (Table 2.3-3). Following field surveys, the following special-status wildlife species (western pond turtle, white-tailed kite, western burrowing owl, loggerhead shrike, migratory birds and raptors, swallows, and roosting bats) and special-status fish species (river lamprey) were determined to have potential to occur in the study area, based on the presence or absence of suitable habitat.

Western Pond Turtle

Western pond turtle is designated as a state species of special concern. Western pond turtle, one of two subspecies of western pond turtle, occurs from the vicinity of the American River in California to the lower Columbia River in Oregon and Washington (Jennings et al. 1992).

Western pond turtles (also referred to as northwestern pond turtles) are thoroughly aquatic, preferring the quiet waters of ponds, reservoirs, and sluggish streams (Stebbins 2003). The species occurs in a wide range of both permanent and intermittent aquatic environments (Jennings et al. 1992). Western pond turtles spend considerable time basking on rocks, logs, emergent vegetation, mud or sand banks, and human-generated debris. They move up to an elevation of 1,300 feet or more, where in upland areas adjacent to watercourses they deposit eggs and overwinter (Jennings and Hayes 1994). Western pond turtles typically become active in March and return to overwintering sites by October or November (Jennings et al. 1992).

Affected Environment

No western pond turtles were observed within or adjacent to Suisun Creek during the CRLF site assessment surveys in late summer 2007 or during the preconstruction swallow nest surveys in spring 2008 for the I-80 high occupancy vehicle (HOV) lanes project. The nearest western pond turtle was observed in Ledgewood Creek (which also drains into Suisun Bay) at I-80 in April 2008 during construction monitoring surveys for the I-80 HOV lanes project. There is moderate potential for western pond turtles to move through Suisun Creek in the project area, and turtles could nest or overwinter in upland habitat adjacent to Suisun Creek.

Environmental Consequences

Western pond turtles are very sensitive to disturbances and quickly retreat into the water when threatened. Pond turtles are not expected to be present in upland habitat in the study area where construction will occur during summer and early fall. In addition, a biological monitor will be present during construction to ensure that there is exclusion fencing between construction activities and the creek. Thus, there will be no adverse effects on western pond turtles.

Avoidance, Minimization, and/or Mitigation Measures

No additional avoidance, minimization, or mitigation measures for western pond turtle are necessary.

White-Tailed Kite

White-tailed kite is a fully protected species under CFGC 3511. The species has a restricted distribution in the United States, occurring only in California, western Oregon, and along the Texas coast (American Ornithologists' Union 1983). The species is fairly common in California's Central Valley lowlands. White-tailed kites nest in riparian and oak woodlands and forage in nearby grasslands, pastures, agricultural fields, and wetlands. White-tailed kites use nearby treetops for perching and nesting sites. Voles and mice are common prey species.

Affected Environment

There is one white-tailed kite nest near Suisun Creek, approximately 0.5 mile south of I-80 (California Natural Diversity Database 2008). Riparian habitat within and adjacent to the study area provides potential nesting habitat for white-tailed kites. Even so, it is unlikely that white-tailed kites would nest in the study area, because of its proximity to I-80. No nesting white-tailed kites were found during the focused nest survey in spring 2008.

Environmental Consequences

Impact AS-1: Loss of White-tailed Kite Foraging Habitat

Approximately 25 acres of higher-quality foraging habitat (open agricultural fields) would be permanently lost in the study area. Because foraging habitat is not limited in the project vicinity, this is not considered an adverse effect.

Impact AS-2: Loss of White-tailed Kite Nesting Habitat and Potential Disturbance to Nesting White-tailed Kites

The project would result in a permanent loss of approximately 0.71 acre and temporary disturbance of 1.0 acre of riparian woodland within and adjacent to the study area, which

Table 2.3-3. Sensitive Wildlife and Fish Species with the Potential to Occur in the Project Region

Common Name, Scientific Name	Legal Status ^a		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Comments
	Federal	State				
Invertebrates						
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	E	–	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn Counties	Large deep vernal pools in annual grasslands	No	Suitable habitat (large, deep vernal pools) is not present in or near the study area
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	T	–	Central Valley and central and south Coast Ranges from Tehama County to Santa Barbara County; isolated populations also in Riverside County	Common in vernal pools; also found in sandstone rock outcrop pools	No	Suitable habitat (vernal pools) is not present in or near the study area
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	E	–	Shasta County to Merced County	Vernal pools and ephemeral stock ponds	No	Suitable habitat (vernal pools) is not present in or near the study area
California freshwater shrimp <i>Syncaris pacifica</i>	E	E	Endemic to Marin, Napa, and Sonoma Counties; extant populations in Lagunitas Creek in Marin County; Huichica Creek in Napa County; and Franz, East Austin, Sonoma, and Salmon Creeks in Sonoma County	Pool areas of low-elevation, low-gradient, permanent streams; among live tree roots of undercut banks; and under overhanging woody debris or vegetation	No	The study area is outside the known range of the species (53 FR 43884)
Delta green ground beetle <i>Elaphrus viridus</i>	T	–	Restricted to Olcott Lake and other vernal pools at Jepson Prairie Preserve in central Solano County	Sparsely vegetated edges of vernal lakes and pools, occurring up to 250 feet (76 meters) from pools	No	The study area is outside the known range of the species; the closest record occurs approximately 13 miles (21 kilometers) east of the study area at Jepson Prairie Preserve
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T	–	Streamside habitats below 3,000 feet (915 meters) above sea level throughout the Central Valley	Riparian and oak savanna habitats with elderberry shrubs and streamside habitats below 3,000 feet (915 meters) above sea level; elderberries are the host plant	Yes	Five elderberry shrubs are present in the study area
Callippe silverspot <i>Speyeria callippe callippe</i>	E	–	San Bruno Mountains, San Mateo County, and a single location in Alameda County	Open hillsides where wild pansy (<i>Viola pendunculata</i>) grows; larvae feed on Johnny jump-up plants, whereas adults feed on native mints and nonnative thistles	No	Suitable habitat (populations of Johnny jump-up plants) is not present in the study area

Table 2.3-3. Continued

Common Name, Scientific Name	Legal Status ^a		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Comments
	Federal	State				
Amphibians						
California red-legged frog <i>Rana aurora draytoni</i>	T	SSC	Along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County	Permanent and semipermanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation; may aestivate in rodent burrows or cracks during dry periods	Yes	Suisun Creek provides potential aquatic and upland habitat
California tiger salamander <i>Ambystoma californiense</i>	T	SSC	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet (305 meters) above sea level and coastal region from Butte County to northeastern San Luis Obispo County	Valley floor grasslands or low (below 1,500 feet [450 meters] above sea level) foothill elevations where lowland aquatic sites like large vernal pools, playa pools, sag ponds, and stock ponds are available for breeding; upland habitat consists of small mammal burrows within approximately 2,200 feet (670 meters) of breeding habitat	No	Suitable habitat (vernal pools and ponds) is not present in the study area
Reptiles						
Giant garter snake <i>Thamnophis couchi gigas</i>	T	T	Central Valley from the vicinity of Burrell in Fresno County to near Chico in Butte County; extirpated from areas south of Fresno	Sloughs, canals, low-gradient streams, and freshwater marshes where there is a prey base of small fish and amphibians; also irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter	No	The study area is on the edge of the species' range; no suitable habitat (perennial marsh and slough) that is hydrologically connected to giant garter snake populations is present in the study area
Northwestern pond turtle <i>Actinemys marmorata</i>	–	SSC	Occurs from the Oregon border of Del Norte and Siskiyou Counties along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of the Sierra Nevada	Ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests	Yes	Suitable aquatic habitat is present in Suisun Creek
Alameda whipsnake <i>Masticophis lateralis euryxanthus</i>	T	T	Restricted to Alameda and Contra Costa Counties	Valleys, foothills, and low mountains associated with northern coastal scrub or chaparral habitat; requires rock outcrops for cover and foraging	No	The study area is outside the range of this species

Table 2.3-3. Continued

Common Name, Scientific Name	Legal Status ^a		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Comments
	Federal	State				
Birds						
California brown pelican <i>Pelecanus occidentalis californicus</i>	E	–	Present along the entire coastline but does not breed north of Monterey County; extremely rare inland	Typically in littoral ocean zones, just outside the surf line; nests on offshore islands	No	No suitable habitat (open water) is present in the study area
Northern harrier <i>Circus cyaneus</i>	–	SSC	Throughout lowland California; has been recorded in fall at high elevations	Grasslands, meadows, marshes, and seasonal and agricultural wetlands	No	No suitable nesting foraging habitat is present in the study area
White-tailed kite <i>Elanus leucurus</i>	–	FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills, to western San Diego County at the Mexico border	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging	Yes	Riparian habitat along the perennial and seasonal drainages provides potential nesting habitat in the study area
Swainson's hawk <i>Buteo swainsoni</i>	–	T	Lower Sacramento and San Joaquin Valleys, Klamath Basin, and Butte Valley; highest nesting densities occur near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	Yes	Riparian habitat throughout the study area provides potential nesting habitat
Western burrowing owl <i>Athene cunicularia hypugea</i>	SC	SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast	Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows; also occurs along agricultural ditches and abandoned lots	Yes	Suitable nesting habitat is present in the study area
Northern spotted owl <i>Strix occidentalis caurina</i>	T	–	A permanent resident throughout its range; found in the north Coast, Klamath, and western Cascade Range from Del Norte County to Marin County	Dense old-growth or mature forests dominated by conifers with topped trees or oaks available for nesting crevices	No	No suitable habitat and study area is outside of its geographical range
Loggerhead shrike <i>Lanius ludovicianus</i>	–	SSC	Resident and winter visitor in lowlands and foothills throughout California; rare on coastal slope north of Mendocino County, occurring only in winter	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches	Yes	Suitable nesting habitat is present in the study area
California clapper rail <i>Rallus longirostris oboletus</i>	E	–	Marshes around San Francisco Bay and east through the Sacramento–San Joaquin River Delta to Suisun Marsh	Restricted to salt marshes and tidal sloughs; usually associated with heavy growth of pickleweed; feeds on mollusks removed from the mud in sloughs	No	No suitable habitat (marsh and slough) is present in the study area

Table 2.3-3. Continued

Common Name, Scientific Name	Legal Status ^a		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Comments
	Federal	State				
California black rail <i>Laterallus jamaicensis coturniculus</i>	—	T, FP	Known from the San Francisco Bay area and the Sacramento–San Joaquin River Delta of the south along the coast to northern Baja California and in Yuba County	Inhabits saltwater, brackish, and freshwater marshes	No	No suitable habitat is present in the study area
California least tern <i>Sterna antillarum</i>	E	E	Nests on beaches along San Francisco Bay and along the southern California coast from southern San Luis Obispo County to San Diego County	Nests on sandy, upper ocean beaches, and occasionally uses mudflats; forages on adjacent surf line, estuaries, or the open ocean	No	No suitable habitat (sandy beaches and mudflats) is present in the study area
Snowy plover <i>Charadrius alexandrinus nivosus</i>	T	—	Population defined as those birds that nest adjacent to or near tidal waters, including all nests along the mainland coast, peninsulas, offshore islands, and adjacent bays and estuaries; 20 breeding sites are known in California from Del Norte to Diego County	Coastal beaches above the normal high tide limit in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent	No	No suitable habitat (sandy beaches) present in the study area
Saltmarsh common yellowthroat <i>Geothlypis trichas sinuosa</i>	—	SSC	The breeding range of salt marsh common yellowthroat as described by Grinnell and Miller (1944) is bounded by Tomales Bay on the north, Carquinez Strait on the east, and Santa Cruz County on the south	In California, yellowthroats are found in freshwater marshes, coastal swales, swampy riparian thickets, brackish marshes, salt marshes, and the edges of disturbed weed fields and grasslands that border soggy habitats (Shuford 1993)	No	No suitable habitat is present in the study area
Suisun song sparrow <i>Melospiza melodia maxillaris</i>	—	SSC	The Suisun song sparrow is a distinct subspecies completely endemic to Suisun Bay	Intermixed stands of bulrush, cattail, and other emergent vegetation provide ideal habitat	No	No suitable habitat is present in the study area
Mammals						
Suisun shrew <i>Sorex ornatus sinuosus</i>	—	SSC	Found in the tidal marshes of the northern shores of San Pablo and Suisun Bays, as far east as Grizzly Island, and as far west as Sonoma Creek and Tubbis Island; also observed near Petaluma and north of San Rafael in Marin County	Occupies tidal marshes that provide dense cover, abundant food (primarily invertebrates), suitable nesting sites, and fairly continuous ground moisture	No	No suitable saltmarsh habitat is present in the study area
Salt marsh harvest mouse <i>Reithrodontomys raviventris</i>	E	E, FP	Vicinity of San Francisco, San Pablo, and Suisun Bays and the Sacramento River–San Joaquin River Delta	Salt marshes with a dense plant cover of pickleweed and fat hen; adjacent to an upland site	No	No suitable habitat (saltmarsh) is present in the study area

Table 2.3-3. Continued

Common Name, Scientific Name	Legal Status ^a		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Comments
	Federal	State				
Pallid bat <i>Antrozous pallidus</i>	–	SSC	Found throughout California	Day roosts include rock outcrops, mines, caves, hollow trees, buildings, and bridges; recent research suggests high reliance on tree roosts	Yes	Suitable roosting habitat occurs in the structures
Long-eared bat <i>Myotis evotis</i>		WBWG: Medium priority	Found throughout California	Day roosts in hollow trees under exfoliating bark and crevices in rock outcrops; found roosting under bark of small black oaks in northern California	Yes	Suitable roosting habitat occurs in the structures
Fringed myotis bat <i>Myotis thysanodes</i>		WBWG: High priority	Found throughout most of California	Roosts in colonies in caves, cliffs, and attics of old buildings; also will use trees as day roosts	Yes	Suitable roosting habitat occurs in the structures
Yuma myotis <i>Myotis yumanensis</i>	–	WBWG:Low -medium priority	Considered common and widespread in northern California up to 5,000 feet (1,524 meters) above sea level; colonies known from Marin and San Francisco Counties	Found in desert scrub, pinyon-juniper woodlands, and other open woodlands and forests; open water is a key habitat element for this species Roosts colonially in a variety of natural and artificial sites, including caves, mines, buildings, bridges, and trees	Yes	Bridges in the study area provide potential roosting sites
Fish						
Delta smelt <i>Hypomesus transpacificus</i>	T	T	Sacramento River–San Joaquin River Delta	Euryhaline estuary channels	No	No suitable habitat present in study area and outside of known range
Coho salmon— central California coast evolutionarily significant unit <i>Oncorhynchus kisutch</i>	E	E	Coastal streams from San Francisco Bay to Punta Gorda and coastal marine waters from California to Alaska	Coastal anadromous coldwater streams	No	The project is not located within current distribution of this run

Table 2.3-3. Continued

Common Name, Scientific Name	Legal Status ^a		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Comments
	Federal	State				
Central California coast steelhead distinct population segment (DPS) <i>Oncorhynchus mykiss</i>	T	–	Coastal streams from the Russian River to Aptos Creek; tributaries to San Francisco, San Pablo, and Suisun Bays; Suisun Marsh; and coastal marine waters off California	Coldwater anadromous streams	Yes	The project is located in inland freshwater stream habitats draining to Suisun Marsh; species occurrence was documented in Suisun Creek; the study area is not included in critical habitat
California central valley steelhead DPS <i>Oncorhynchus mykiss</i>	T	–	The Sacramento and San Joaquin Rivers and their tributaries, excluding San Francisco and San Pablo Bays and their tributaries, and coastal marine waters off California	Coldwater anadromous streams	No	The project area is outside the range of this DPS
Central valley spring-run Chinook salmon <i>Oncorhynchus tshawytscha</i>	T	T	Tributaries to the upper Sacramento River, primarily Butte, Big Chico, Deer, and Mill Creeks, and coastal marine waters off California	Higher-elevation tributaries to the Sacramento River	No	The project area is not located within current distribution of this run; the study area is not included in critical habitat
Winter-run chinook salmon <i>Oncorhynchus tshawytscha</i>	E	E	Upper mainstem Sacramento River, Sacramento River–San Joaquin River Delta (juveniles), and coastal marine waters off California	Spring-fed headwaters to the Sacramento River	No	The project area is not located within current distribution of this run; the study area is not included within critical habitat
River lamprey <i>Lampetra ayresi</i>	–	SSC	Exact range unknown but includes coastal streams from Alaska to San Francisco Bay; in California, it is found within lower Sacramento and San Joaquin Rivers, Napa River, Sonoma Creek, Alameda Creek, Salmon Creek, Russian River tributaries, and tributaries to San Francisco Bay	Habitat requirements poorly understood but include anadromous streams with gravel riffle for spawning and soft-bottomed areas for rearing	Yes	The project is located in freshwater anadromous stream habitats within the range of the species
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	–	SSC	Largely confined to Sacramento River–San Joaquin River Delta, Napa River, Petaluma River, Sacramento River, and Suisun Marsh	Shallow-water, low-salinity habitats throughout slow areas of rivers and sloughs; areas of flooded vegetation for spawning and rearing	No	The project area is outside the known range for this species
Green sturgeon <i>Acipenser medirostris</i>	T	SSC	In marine waters of the Pacific Ocean from the Bering Sea to Ensenada, Mexico. In rivers from British Columbia south to the Sacramento River, primarily in the Klamath/Trinity and Sacramento Rivers	Primarily marine, using large anadromous freshwater rivers and associated estuaries for spawning and rearing	No	The project area does not include large rivers and is not within the primary range of the species

Table 2.3-3. Continued

Common Name, Scientific Name	Legal Status ^a		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Comments
	Federal	State				
Central valley fall/late fall–run Chinook salmon <i>Oncorhynchus tshawytscha</i>	SC	–	Sacramento and San Joaquin Rivers and their tributaries, as well as some tributaries to San Francisco Bay	Lower-elevation coldwater anadromous streams	Yes	The project is located in inland freshwater anadromous stream habitats draining to Suisun Marsh, designated essential fish habitat; species occurrence was documented in Suisun Creek
Longfin smelt <i>Spirinchus thaleichthys</i>	–	SSC	Within California, mostly in the Sacramento River–San Joaquin River Delta, but also in Humboldt Bay, Eel River estuary, and Klamath River estuary	Salt or brackish estuary waters with freshwater inputs for spawning	No	No suitable habitat in the project area

^a Status explanations:

– = no listing.

Federal

E = listed as endangered under the federal Endangered Species Act.

T = listed as threatened under the federal Endangered Species Act.

SC = species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking.

P = officially proposed (in the Federal Register) for listing as endangered or threatened.

C = candidate to become a proposed species.

State

E = listed as endangered under the California Endangered Species Act.

T = listed as threatened under the California Endangered Species Act.

FP = fully protected under the California Fish and Game Code.

SSC = species of special concern in California.

WBWG = Western Bat Working Group (http://www.wbwg.org/speciesinfo/species_matrix/spp_matrix.pdf).

High priority = species are imperiled or at high risk of imperilment.

Moderate priority = This designation indicates a level of concern that should warrant closer evaluation, more research, and conservation actions of both the species and possible threats. A lack of meaningful information is a major obstacle in adequately assessing these species' status and should be considered a threat.

Low priority = While there may be localized concerns, the overall status of the species is believed to be secure.

provides potential nesting habitat for white-tailed kites. Although it is unlikely that birds or raptors would nest adjacent to I-80, tree removal or noise associated with construction activities could result in the disturbance of nesting birds or raptors if active nests are present within or near the construction area. These disturbances could cause nest abandonment and death of young or loss of reproductive potential at active nests located in or near the study area. Such disturbance would violate CFGC 3503.5 and 3511 and the MBTA. Implementation of the measures identified below would ensure that the proposed project would not result in the loss of white-tailed kite eggs or young, and would reduce the effect on nesting birds and raptors. Additionally, the purchase of foraging habitat for Swainson's hawk will benefit white-tailed kite as well.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance and minimization measures described in the "Riparian Woodland" section above, and the following measures, would avoid effects on nesting white-tailed kites.

Measure AS-2: Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary

To avoid and minimize effects on nesting migratory birds, one or more of the following surveys and restrictions will be implemented.

- Tree and shrub removal will occur during the nonbreeding season for most migratory birds and raptors (generally between September 1 and February 15).
- If construction activities, including tree and shrub removal, are scheduled to occur during the breeding season for migratory birds and raptors (generally between February 15 and September 1), a qualified wildlife biologist (with knowledge of the species to be surveyed) will be retained to conduct nesting migratory bird and raptor surveys before the start of construction. The nesting surveys should be conducted within one week before initiation of construction activities (including tree removal) between February 15 and September 1. If no active nests are detected during these surveys, tree removal can proceed.
- If surveys indicate that migratory bird or raptor nests are present in the survey area, a no-disturbance buffer will be established around the site to avoid disturbance or destruction of the nest site until after the breeding season or until after a qualified wildlife biologist determines that the young have fledged (usually late June to mid-July). The extent of these buffers will be determined by the biologist (in coordination with the DFG) and will depend on the level of noise or construction disturbance, the line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. These factors will be analyzed to make an appropriate decision on buffer distances. Suitable buffer distances may vary between species.

Western Burrowing Owl

Western burrowing owl is designated as a state species of special concern. Western burrowing owl is found throughout much of California in annual and perennial grassland, desert, and arid scrubland. It also can be found in vacant lots in residential areas, railroad ballast, dirt roads, and canal levees. The presence of burrows is the most critical requirement for western burrowing owl habitat; the species uses burrows excavated by ground squirrels and badgers, as well as artificial

burrows, such as cement culverts, debris piles, or openings under roads. Its breeding season extends from March through August, peaking in April and May.

Affected Environment

Several (10 or more) occurrences of burrowing owl have been reported within a 10-mile radius of the project area (California Natural Diversity Database 2008). Edges of agricultural ditches and farm roads, and ruderal fields in the project area provide suitable foraging and nesting habitat for burrowing owls. Minimal loss of foraging habitat for western burrowing owls would occur because most of the construction would occur in existing roadbeds and rights-of-way.

Environmental Consequences

Impact AS-3: Potential Loss of Burrowing Owl Habitat

The project would result in a permanent loss of approximately 8.06 acres and temporary disturbance of 3.92 acres of ruderal habitat within and adjacent to the study area that provides potential nesting habitat for western burrowing owl. If western burrowing owls are nesting in or within 250 feet of the construction right-of-way, grading and excavation activities could result in the removal of an occupied breeding or wintering burrow site and loss of adults, young, or eggs. These disturbances could cause nest abandonment and death of young or loss of reproductive potential at active nests located in or near the study area. Such disturbance would violate CFGC 3503.5 and 3511 and the MBTA. Implementation of the measures identified below would ensure that the project would not result in the loss of burrowing owl eggs or young.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance and minimization measures described in the “Riparian Woodland” section above, and the following avoidance and minimization measure, would ensure that the project minimizes direct impacts, and avoids indirect impacts on burrowing owl habitats adjacent to the construction area.

Measure AS-3a: Conduct Preconstruction Surveys for Active Burrowing Owl Burrows and Implement the California Department of Fish and Game Guidelines for Burrowing Owl Mitigation, if Necessary

The DFG (1995) recommends that preconstruction surveys be conducted in suitable habitat (except paved areas) in a project study area and in a 250-foot-wide buffer zone around the construction site to locate active burrowing owl burrows. This would apply to suitable habitat on the south side of I-80. A qualified biologist will be retained to conduct preconstruction surveys for active burrows according to the DFG guidelines. The surveys will include a survey during the nesting season and a survey during the wintering season, which is the season immediately preceding construction.

If no burrowing owls are detected, no further action is required. If active burrowing owls are detected, the following measures will be implemented.

- Occupied burrows will not be disturbed during the nesting season (February 1–August 31).

- When destruction of occupied burrows is unavoidable outside the nesting season (September 1–January 31), unsuitable burrows will be enhanced (enlarged or cleared of debris), or new burrows will be created (by installing artificial burrows) at a ratio of 2:1 on protected lands approved by the DFG. Newly created burrows will follow guidelines established by the DFG.
- If owls must be moved away from the project construction area, passive relocation techniques (e.g., installing one-way doors at burrow entrances) will be used instead of trapping. At least one week will be necessary to accomplish passive relocation and allow owls to acclimate to alternate burrows.
- If avoidance is the preferred method of dealing with potential impacts, no disturbance will occur within 160 feet of occupied burrows during the nonbreeding season (September 1–January 31) or within 250 feet during the breeding season. Avoidance also requires that at least 6.5 acres of foraging habitat (calculated based on an approximately 300-foot foraging radius around an occupied burrow), contiguous with occupied burrow sites, be permanently preserved for each pair of breeding burrowing owls or single unpaired resident bird. The configuration of the protected site will be submitted to the DFG for approval.

Measure AS-3b: Compensate for Loss of Burrowing Owl Nesting Habitat if Owls Are Present

If active burrowing owl burrows are found and the owls must be relocated, the loss of foraging and burrow habitat in the project construction area will be offset by acquiring and permanently protecting a minimum of 6.5 acres of foraging habitat per occupied burrow identified in the project construction area. The protected lands should be located adjacent to the occupied burrowing owl habitat in the project construction area or at another occupied site near the project construction area. The location of the protected lands will be determined in coordination with the DFG. A monitoring plan will be prepared and long-term management and monitoring of the protected lands will be provided. The monitoring plan will specify success criteria, identify remedial measures, and require an annual report to be submitted to the DFG.

Loggerhead Shrike

Loggerhead shrike is designated as a state species of special concern. It is a common year-round resident throughout the lowlands and foothills of California. Loggerhead shrikes prefer open habitats with shrubs, fences, utility line poles, or other perches. They tend to avoid urbanized areas but often frequent open croplands. Nests usually are hidden in densely foliated shrubs or trees. The breeding season is from March through August.

Affected Environment

No loggerhead shrikes were observed in the study area for the project during the 2008 focused nest surveys; however, loggerhead shrikes are known to nest in Solano County, and trees and shrubs in the study area provide suitable nesting habitat for the species.

Environmental Consequences

Impact AS-4: Potential Disturbance to Nesting Loggerhead Shrikes

Implementation of the project could affect nesting loggerhead shrikes if construction activities remove or otherwise disturb occupied nests during the breeding season. Construction activities during the breeding season that result in nest abandonment, death of young, or loss of reproductive potential would violate *CFGC 3503* and *CFGC 3503.5* and the MBTA. Implementation of the measures identified below would ensure that the project would not result in the loss of loggerhead shrike nests, eggs, or young.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance and minimization measures described in the “Riparian Woodland” section above, and Measure AS-2, would avoid and minimize effects on nesting loggerhead shrikes.

Migratory Birds and Raptors

Several migratory birds and raptors could nest in and adjacent to the study area for the project. The breeding season for most birds is generally from February 15 to August 15. The occupied nests and eggs of these birds are protected by federal and state laws, including the MBTA and *CFGC 3503* and *3503.5*.

Affected Environment

Potential nesting habitat for migratory birds and raptors occurs within riparian habitat, trees, oak woodlands, and shrubs in the study area. A focused nest survey was conducted along Suisun Creek in early spring 2008 as part of the preconstruction surveys for the I-80 HOV lanes project construction. No active nests were found.

Environmental Consequences

Impact AS-5: Potential Disturbance to Nesting Birds and Raptors

Implementation of the project could affect nesting birds, including raptors, if construction activities remove or otherwise disturb occupied nests during the breeding season. Construction activities during the breeding season that result in death of young or loss of reproductive potential would violate *CFGC 3503* and *CFGC 3503.5* and the MBTA. Implementation of the measures identified below would ensure that the project would not result in the loss of migratory bird and raptor nests, eggs, or young.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance and minimization measures described in the “Riparian Woodland” section above, and Measure AS-2, would avoid and minimize effects on nesting migratory birds and raptors.

Swallows

Swallows are not considered sensitive wildlife species. However, their occupied nests and eggs are protected by both federal and state laws, including the MBTA. Cliff and barn swallows are

two swallow species that frequently build mud nests on the undersides of artificial structures, such as bridges. The two species winter in South America and arrive back in California to breed in February. Nesting generally occurs from mid-February to August, and migration south occurs in September and October (Zeiner et al. 1990).

Affected Environment

No swallow nests were observed on the undersides of the bridge over Suisun Creek during the 2007 surveys. In addition, no nests or remnant nests were observed in 2008 during monitoring surveys for the I-80 HOV lanes project. New bridge construction would occur approximately 50 feet downstream of the existing bridge, and birds nesting on the south side of the existing bridge could be affected during construction.

Environmental Consequences

Impact AS-6: Potential Disturbance of Swallow Nests

Construction activities associated with bridge construction could result in the direct loss of active swallow nests. Loss of a nest could in turn result in the death of adults, young, or eggs. This would violate CFGC 3503 and the MBTA. Implementation of the measures identified below would ensure that the project would not result in the loss of migratory bird and raptor nests, eggs, or young.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of the following avoidance and minimization measure would ensure that swallows do not begin nesting on the south side of Suisun bridge structures before the start of construction.

Measure AS-6: Remove Nests from the Undersides of Bridges to Prevent Swallows from Nesting Adjacent to New Bridge Construction

To avoid impacts on nesting swallows and other bridge-nesting migratory birds that are protected under the MBTA and CFGC, the following measures will be implemented.

- If bridge construction would take place during the breeding season (generally between February 16 and August 15), a qualified wildlife biologist will be hired to inspect the bridge over Suisun Creek during the swallows' nonbreeding season (August 16 through February 15). If nests are found and are abandoned, they may be removed. To avoid damaging active nests adjacent to new bridge construction, nests must be removed before the breeding season begins (February 16).
- After nests are removed, a biologist will continue to check the underside of the bridge and remove nests throughout the construction period when it coincides with the swallows nesting season.

If appropriate steps are taken to prevent swallows from constructing new nests, work can proceed at any time of the year.

Roosting Bats

The Western Bat Working Group has provided additional rankings for species that may or may not be listed as a state species of special concern. The Western Bat Working Group held a workshop in 1998 and subsequently published a regional priority matrix for western bat species (Western Bat Working Group 1998). The matrix is intended to provide states, provinces, federal land management agencies, and interested organizations and individuals with a better understanding of the overall status of a given bat species throughout its western North American range. Subsequently, the importance of a single region or multiple regions to the viability and conservation of each species becomes more apparent. The matrix also provides a means for prioritizing and focusing on population monitoring, research, conservation actions, and the efficient use of the limited funding and resources currently devoted to bats.

Four special-status bat species were identified as potentially occurring in the study area, including pallid bat, which is a state species of special concern, and long-eared bat, fringed myotis, and Yuma myotis, which are classified as priority species by the Western Bat Working Group. Yuma myotis uses bridges and other artificial structures as roosting sites and could potentially roost in the study area. Crevices, including expansion joints, on the undersides of bridges provide potential roosting and maternity sites for bats. Bats commonly use bridges that are located over perennial waterways or are in or near open agricultural or grassland areas. These areas provide an abundant source of insects, the primary food source for bats.

Affected Environment

At the time of the March 2008 preconstruction surveys for the I-80 HOV lanes project, no evidence of bat presence (guano, urine staining, odor, or vocalizations) was observed on portions of the undersides of the existing bridge over Suisun Creek, which is the nearest bridge to the project site. However, the undersides of the bridge deck contained expansion joints that could provide roosting sites for bats. This habitat would not support a maternal roost but could support a small number of day or night roosting bats.

Environmental Consequences

Impact AS-7: Potential Disturbance of Roosting Bats

Potential bat roosting areas occur within portions of the existing bridge over Suisun Creek upstream of the project site. The existing bridge would not be directly affected during new bridge construction, and no roosting habitat would be removed. Noise disturbances associated with new bridge construction and pile driving could disturb day-roosting bats if they are present within the bridge during construction. However, these disturbances would be temporary, and construction would occur downstream of the existing bridge. The project, therefore, would not result in an adverse impact on protected bats.

Avoidance, Minimization, and/or Mitigation Measures

The proposed project would not remove bat roosting habitat. Because construction would occur downstream of the bridge and existing traffic already produces substantial noise, any noise disturbances due to construction activity are not expected to affect bats. Therefore no avoidance or minimization measures are required.

Central Valley Fall/Late Fall-Run Chinook Salmon

On March 9, 1998 (63 FR 11481), NMFS issued a proposed rule to list fall-/late fall–run Chinook salmon as threatened, but determined that the species did not warrant listing and identified it as a candidate species (64 FR 50393). On April 15, 2004, NMFS downgraded the status of fall-run Chinook salmon to a species of concern (69 FR 19975). This section focuses on fall-run Chinook salmon, because most late fall–run Chinook salmon are found mainly in the Sacramento River (Moyle 2002) and are therefore not likely to be present at the project site. Also, habitat for late fall–run Chinook salmon is not supported by streams in the project area.

Fall-run Chinook salmon spawn from early October through late December, and incubation takes place from October through March. The peak of spawning is in October and November as water temperature drops. Juvenile Chinook salmon emerge from the gravel and migrate downstream to the ocean soon after emerging, rearing in the streams for only a few months before emigrating to the ocean.

Essential Fish Habitat

Essential Fish Habitat (EFH) is the aquatic habitat (water and substrate) necessary for fish to spawn, breed, feed, or grow to maturity (National Marine Fisheries Service 2004), allowing a level of production needed to support a long-term, sustainable commercial fishery and contribute to a healthy ecosystem. Important components of EFH for spawning, rearing, and migration include adequate substrate composition; water quality, quantity, depth, and velocity; channel gradient and stability; food; cover and habitat complexity; space; access and passage; and habitat connectivity.

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended by the Sustainable Fisheries Act of 1996 (Public Law 94-265), specifies that:

- Federal agencies undertaking, permitting, or funding activity that may adversely affect EFH are required to consult with the NMFS.
- The NMFS shall provide conservation recommendations for any federal or state activity that may adversely affect EFH.
- Federal agencies shall, within 30 days after receiving conservation recommendations from the NMFS, provide a detailed response in writing to the NMFS regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH, or reasons for not following the recommendations.

Suisun Creek is considered EFH for Chinook salmon under the Magnuson-Stevens Fishery Conservation and Management Act (Figure 2.3-2).

Affected Environment

Data describing the abundance and distribution of Chinook salmon in Suisun Creek are limited. In recent years, many tributaries of the San Francisco Bay Estuary—where salmon were previously thought to be extirpated—have seen increases in adult Chinook salmon returns (presumably from stray hatchery fish), suggesting that streams in the project vicinity may be subject to the same phenomenon (Moyle 2002; Cox pers. comm.). DFG personnel have

documented Chinook salmon in Suisun and Gordon Valley Creeks (a tributary of Suisun Creek), according to information available from the NMFS. In December 2001, a spawning pair of “salmon” and two spawned-out Chinook salmon carcasses were documented in Wooden Valley Creek, a tributary of Suisun Creek (Leidy et al. 2005). Query results from the DFG anadromous fish distribution data available through CalFish (2008) indicated that the range of Chinook salmon included lower portions of Suisun Creek. The sections of the creek in the specified area were far downstream of the project area, however, and likely comprise estuarine rearing habitats. Apart from these accounts, Suisun and Gordon Valley Creeks are named in the NMFS’s designation of EFH (National Marine Fisheries Service 1998) (Figure 2.3-2). As a result of this designation and the recent accounts of their occurrence, it is reasonable to assume that Chinook salmon are seasonally present in the streams passing through the project vicinity.

The known life history of the species indicates that Chinook salmon are not likely to be present in the project area during the construction period (June 15–October 15). Habitat conditions that support suitable spawning for adult Chinook salmon occur mainly in upper areas of these streams (Hanson Environmental 2002), well above the project area. The migration timing of both adult and juvenile Chinook salmon occurs largely outside the construction period, reducing the chance that Chinook salmon of any life stage would be present at the project site during construction. Adult fall-run Chinook salmon would most likely migrate through the project area during fall and early winter, while juvenile Chinook salmon would emigrate from the system from January to June. Fall-run Chinook salmon are ocean-type salmon, where juveniles typically leave natal streams before summer water temperatures render streams uninhabitable (Moyle 2002). Additionally, little potential rearing habitat for juvenile Chinook salmon is available in the lower portion of Suisun Creek because of the high summer water temperatures found there (Hanson Environmental 2002).

Environmental Consequences

The proposed action is expected to have minimal impacts on habitat structure and habitat conditions for Chinook salmon and EFH. Because no work will be conducted in the channel, all direct impacts on aquatic habitat will be avoided. All possible impacts will be avoided, minimized, or mitigated as outlined in “Central California Coast Steelhead” (below in Section 2.3.6).

Effects on Habitat Structure

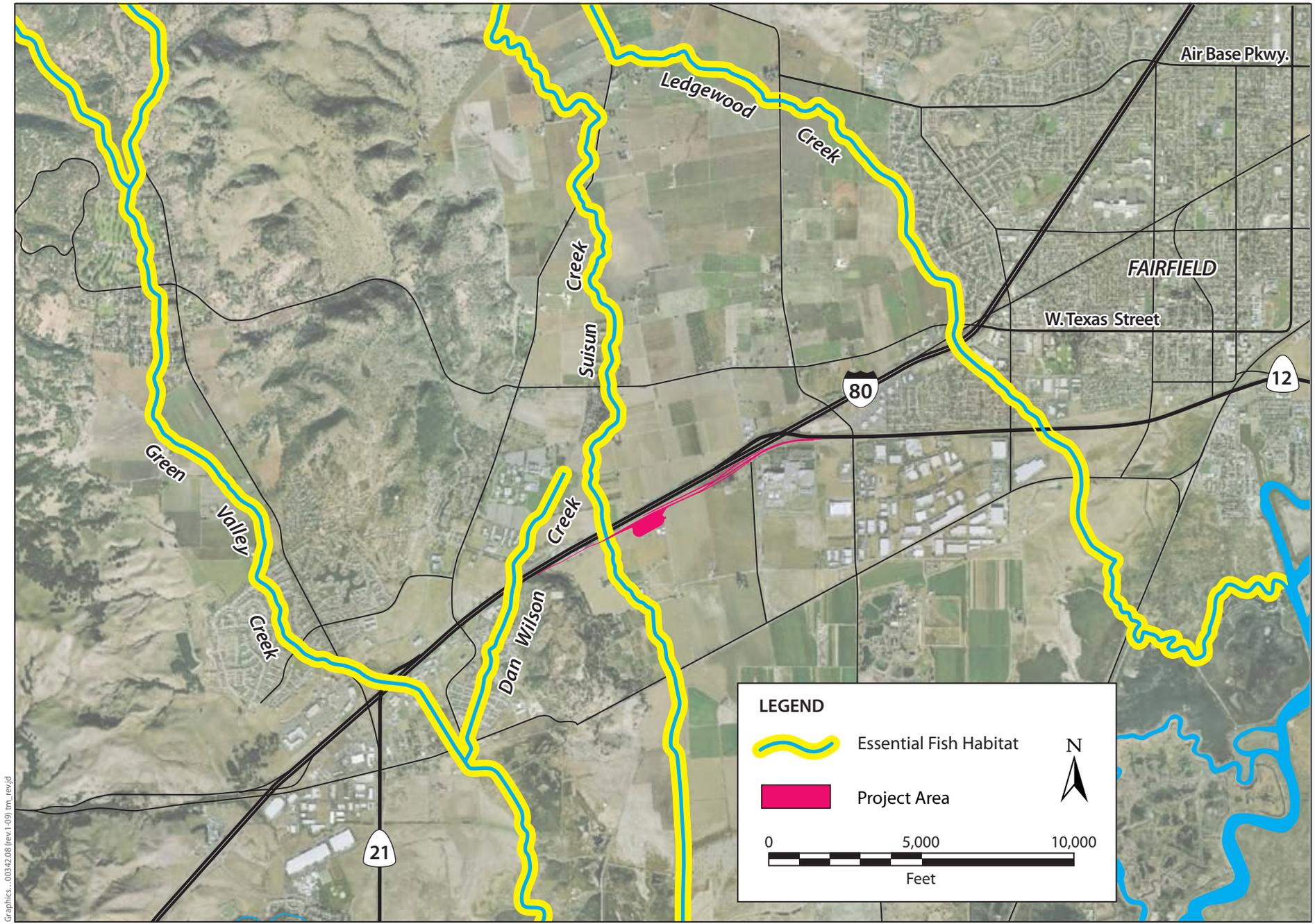
The impacts on habitat structure would be the same as those listed steelhead in “Central California Coast Steelhead” (below in Section 2.3.6).

Water Temperature Effects

The water temperature impacts would be the same as those listed above for steelhead in “Central California Coast Steelhead” (below in Section 2.3.6).

Effects on Water Quality

The impacts on water quality would be the same as those listed above for steelhead in “Central California Coast Steelhead” (below in Section 2.3.6).



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Figure 2.3-2
Essential Fish Habitat in the Project Vicinity

Avoidance, Minimization, and/or Mitigation Measures

The avoidance and minimization measures discussed in “Central California Coast Steelhead” (Section 2.3.6) would protect habitat for Chinook salmon, including EFH.

River Lamprey

River lamprey is currently listed by the DFG (2006) and USFWS (2005a) as a species of special concern. Although it is widely believed to be in decline, the exact status of this species is uncertain. Currently, very little information describing the abundance and distribution of river lamprey is available, perhaps largely because the species is often overlooked and seldom studied. River lamprey is thought to occur throughout Pacific coast streams, but its occurrence in California includes tributaries to San Francisco Bay, such as the Napa River, Sonoma Creek, and Alameda Creek, as well as the Sacramento, San Joaquin, and Russian Rivers (Moyle et al. 1995; Moyle 2002).

Limited information is available regarding the life history of this species in California. Current accounts are based largely on information from Canadian populations (Moyle 2002). River lamprey is a semelparous (spawn once, then die) anadromous fish with long freshwater rearing periods. Adults return to fresh water to spawn in fall and winter, but spawning usually occurs from February through March in gravelly riffles in small tributary streams (Moyle 2002). Juvenile river lamprey (*ammocoetes*) remain in silty backwater habitats, where they filter feed on various microorganisms for approximately three to five years before migrating to the ocean during late spring periods (Moyle et al. 1995; Moyle 2002). Adult lamprey feed on other fish and may reach a total length of around 17 centimeters (Moyle et al. 1995).

Affected Environment

River lamprey could occur in the study area in Suisun Creek, although this is not documented. The species distribution and habitat requirements could fall within the study area. The study area would provide a migration corridor to upstream spawning areas if river lamprey use Suisun Creek for spawning.

Environmental Consequences

The project is not expected to impact river lamprey, because of the lack of spawning and rearing habitat in the study area. Construction is expected to occur from June 15 to October 15, when lampreys would not be migrating upstream to spawn. Juvenile lampreys (*ammocoetes*) rear in backwater areas in the silt and sand. Suisun Creek has high-velocity water and gravel in the construction area. This is unsuitable rearing habitat for *ammocoetes*. No in-water work will occur, so no disturbance to lamprey is expected to occur from project activities.

Avoidance, Minimization, and/or Mitigation Measures

Avoidance and minimization measures described in the section “Central California Coast Steelhead” (Section 2.3.6) would benefit river lamprey.

2.3.6 Threatened and Endangered Species

This section addresses species listed or eligible for listing as threatened or endangered. Tables 2.3-2 and 2.3-3 list the threatened and endangered plant and animal species with potential to

occur in the study area. Five threatened or endangered animal species have the potential to occur in the study area: Swainson’s hawk, valley elderberry longhorn beetle (VELB), California red-legged frog (CRLF), and central California coast steelhead. As mentioned earlier, no threatened or endangered plant species occur in the study area.

Regulatory Setting

The primary federal law protecting threatened and endangered species is the ESA: 16 USC, Section 1531, et seq. See also 50 CFR Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems on which they depend. Under Section 7 of this act, federal agencies, such as the FHWA, are required to consult with the USFWS and the National Marine Fisheries Service (NMFS) to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. *Critical habitat* is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a biological opinion (BO) or an incidental take permit. Section 3 of the ESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, the CESA, CFGC, Section 2050, et seq. The CESA emphasizes early consultation to avoid potential impacts on rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The CDFG is the agency responsible for implementing the CESA. Section 2081 of the CFGC prohibits “take” of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” The CESA allows for take incidental to otherwise lawful development projects; for these actions, an incidental take permit is issued by the DFG. For projects requiring a BO under Section 7 of the ESA, the DFG may also authorize impacts on CESA species by issuing a Consistency Determination under Section 2080.1 of the CFGC.

Swainson’s Hawk

Swainson’s hawk is state listed as threatened by the DFG, is a federal species of concern, and is protected under the MBTA and CFGC 3503.5. The MBTA and CFGC 3503.5 prohibit take of migratory birds, nests, and young. In the Central Valley, this species typically nests in oak or cottonwood trees in or near riparian habitats, in oak groves, in roadside trees, and in lone trees. Swainson’s hawk prefers nesting sites that provide sweeping views of nearby foraging grounds, which consist of grasslands, irrigated pasture, alfalfa, hay, and row and grain crops. Swainson’s hawk is migratory, wintering from Mexico to Argentina and breeding in California and elsewhere in the western United States. The raptor generally arrives in the Central Valley in mid-March and begins courtship and nest construction immediately after arrival at the breeding sites. The young fledge in early July, and most Swainson’s hawks leave their breeding territories by late August or early September.

Affected Environment

There is one Swainson’s hawk nest site approximately 1.5 miles southwest of the study area for the proposed project (California Natural Diversity Database 2008). Agricultural habitat, suitable for foraging, is located along I-80, and large trees, suitable for nesting Swainson’s hawk, are

present along Suisun Creek. However, it is unlikely that Swainson's hawk would nest in the study area, because of the area's proximity to I-80. No nesting Swainson's hawks were found during the focused nest surveys in spring 2008.

Environmental Consequences

Impact TES-1: Potential Disturbance to Nesting Swainson's Hawk

Although there is a low likelihood that Swainson's hawks would nest adjacent to I-80, tree removal or noise associated with construction activities could result in the disturbance of nesting Swainson's hawks if active nests are present within or near the construction area. These disturbances could cause nest abandonment and death of young or loss of reproductive potential at active nests located in or near the study area. The proposed project could result in a substantial effect, through loss of eggs or young, on a species listed as threatened under the CESA. Implementation of the measures described in the "Riparian Woodland" section above, and Measure AS-2, would ensure no take of Swainson's hawk eggs or young, and would reduce the effect on Swainson's hawk habitat.

Impact TES-2: Permanent and Temporary Impacts on Potential Swainson's Hawk Foraging Habitat

The proposed project would result in a permanent loss of approximately 25 acres of higher-quality foraging habitat (open agricultural fields). Loss of a substantial amount of foraging habitat within 5 miles of a known Swainson's hawk nest is considered to be a potentially adverse effect. But through the acquisition of conservation lands that will preserve significant amounts of suitable foraging habitat for the species and the management of these lands for Swainson's hawk habitat values, this effect is reduced.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance and minimization measures described in the "Riparian Woodland" section above, Measure AS-2, and Measure TES-2 would ensure no take of Swainson's hawk eggs or young, and would avoid and minimize effects on nesting Swainson's hawk and its foraging habitat.

Measure TES-2: Compensate for Loss of Swainson's Hawk Foraging Habitat

The DFG requires that loss of foraging habitat for the species be replaced at a ratio of 0.75:1 for projects where nesting Swainson's hawks are known to occur within a 5-mile radius (Melissa Escaron, Environmental Scientist, California Department of Fish and Game email message on 12/8/08: mescaron@dfg.ca.gov). Credits at an approved mitigation bank will be purchased.

Valley Elderberry Longhorn Beetle

VELB is federally listed as a threatened species (45 FR 52803). This species first was described in 1921 from specimens collected in Sacramento (U.S. Fish and Wildlife Service 1984). The species' range extends throughout the associated foothills of the Central Valley in California, from Kern County in the south to Shasta County in the north (Jones and Stokes Associates 1985, 1986, 1987).

VELB is closely associated with elderberry shrubs, an obligate host for beetle larvae. Blue elderberry is considered a typical riparian shrub (Roberts et al. 1977, Katibah et al. 1984, Warner 1984) in California. Blue elderberry is a hardy shrub that successfully grows in a variety of riparian habitat types. A study of Sacramento Valley riparian vegetation found that blue elderberry grows mainly at an intermediate elevation level in the floodplain, in association with box elder (*Acer negundo*) and buttonbush (*Cephalanthus occidentalis*) (Conard et al. 1977). Where a source of water exists, elderberry shrubs grow in nonriparian habitats, although most VELB occurrences are known from elderberry shrubs in or adjacent to riparian communities.

Affected Environment

In the project area, five blue elderberry shrubs (i.e., host plants for VELB) were identified in riparian woodland on Suisun Creek south of I-80 (Figure 2.3-1, Map Sheet 1). Shrubs 1-5 were located during field surveys in 2007. No exit holes that would indicate the presence of VELB were observed in any elderberry stem measuring 1.0 inch in diameter or greater at ground level within the project area.

All shrubs within the study area are within 100 feet of the proposed project construction area. The number and size of stems present on each shrub and riparian habitat associations for each shrub are listed in Table 2.3-4. All five of the shrubs would be directly affected by construction activities.

Table 2.3-4. Summary of Stem Counts for Elderberry Shrubs Adjacent to the Study Area

Shrub	Presence of Exit Holes	Riparian Habitat	Number of Stems (by Diameter)			Effect on Shrub (None, Direct, or Indirect)	Comments
			1-3 inches	3-5 inches	>5 inches		
1	No	Yes	2	3	0	Direct	Located south of I-80, east of the truck scale on creek levee
2	No	Yes	7	0	0	Direct	Located south of I-80, east of the truck scale on creek levee; in a clump
3	No	Yes	1	1	1	Direct	Located south of I-80, east of the truck scale on creek levee; large tree
4	No	Yes	3	0	0	Direct	Located south of I-80, east of the truck scale on creek levee; small shrub with many small stems
5	No	Yes	0	1	1	Direct	Located south of I-80, east of the truck scale on creek levee
Direct total			13	5	2		
Overall total			13	5	2		

Environmental Consequences

Impact TES-3: Direct Impact on Valley Elderberry Longhorn Beetle Habitat

Construction activities would directly impact (by removal or transplanting) five elderberry shrubs. Measures have been identified to address this effect.

As defined under the ESA, indirect impacts are those caused by the proposed project, occur later in time, and are reasonably certain to occur. No elderberry shrubs would be indirectly affected by the proposed project.

Avoidance, Minimization, and/or Mitigation Measures

There are no avoidance and minimization measures because all five shrubs would be directly affected by the project.

Measure TES-3: Compensate for Direct Effects on Valley Elderberry Longhorn Beetle Habitat

STA previously compensated for direct effects on shrubs 1-4 for the I-80 HOV lanes project. The compensation also covered the direct effects on shrub 5. Direct impacts and removal of shrubs 1-5 will be compensated for through transplantation.

Before construction begins, all elderberry shrubs directly affected will be transplanted, if feasible, to a conservation area according to USFWS-approved procedures outlined in the VELB guidelines (U.S. Fish and Wildlife Service 1999). It may not be feasible to remove some shrubs due to bank stability concerns, and some of the shrubs may be too large to transplant; however, additional compensation will not be necessary since it was previously covered in the Biological Opinion for the I-80 HOV lanes project (BO# 1-1-07-F-0146).

If transplanting is feasible, a map and written details identifying the conservation area will be provided to USFWS before initiating the mitigation program. Approval from the USFWS that the conservation area is acceptable must be received. Elderberry shrubs will be transplanted only during the plant's dormant phase (November through the first two weeks of February). A qualified biological monitor will remain on site while the shrubs are being transplanted. Evidence of VELB occurrence in the conservation area, the condition of the elderberry shrubs in the conservation area, and the general condition of the conservation area itself will be monitored over a period of 10 consecutive years, or for seven years over a 15-year period from the date of transplanting. The project proponent will be responsible for funding and providing monitoring reports to the USFWS in each of the years in which a monitoring report is required.

California Red-Legged Frog

The CRLF is listed as threatened under the ESA and is a California species of special concern. Historically, CRLF was common from Redding to Baja California, including the Sierra Nevada and Coast Ranges. Its current range is much reduced, and most remaining populations are found in central California along the coast, from Marin County to Ventura County.

CRLF breeds in lowland and foothill streams and wetlands, including livestock ponds (Jennings and Hayes 1994). CRLF also may be found in upland habitats near breeding areas and along intermittent drainages connecting wetlands. Adults may take refuge during dry periods in rodent holes or leaf litter in riparian habitats. Although CRLF typically remains near streams or ponds, recent studies in Santa Cruz suggest that they are capable of moving 1 mile or more in upland habitat or through ephemeral drainages (Bulger 1999).

Affected Environment

There are 15 California Natural Diversity Database records for CRLF within a 5-mile radius of the project site (California Natural Diversity Database 2008). The nearest records are approximately 3 miles southwest of the project site, where adults and tadpoles were observed in a pond and intermittent drainage. The remaining 13 records are from 1 to 5 miles south and west of the project area (Figure 2.3-3).

Jones & Stokes conducted a CRLF site assessment in 2007 at Suisun Creek and found suitable aquatic habitat in a plunge pool in Suisun Creek on the north side of I-80 adjacent to the study area (ICF Jones & Stokes in prep.). No CRLFs were observed within or adjacent to the study area during either the 2006 or the July and August 2007 site assessment surveys. Monk & Associates (2003a, 2003b, 2004) conducted a site assessment and protocol-level survey in Suisun Creek. No CRLFs were identified in this area during their protocol-level surveys, however these surveys are several years old and are no longer valid.

Potential dispersal and foraging habitat for CRLF occurs in Suisun Creek. If CRLF occurs within Suisun Creek, there is potential for CRLF to move through the study area. Based on the known occurrence of CRLF near the study area and the presence of suitable habitat in the study area, Caltrans prepared a biological assessment (BA) and submitted it to the USFWS for their review and approval.

USFWS submitted a proposal in September 2008 to revise critical habitat boundaries to better reflect lands containing essential features for the California red-legged frog. There are three proposed units in the project vicinity: SOL-1, SOL-2, and SOL-3 (Figure 2.3-4). The SOL-2 unit is the closest to the project site and is approximately 2.5 miles west of Suisun Creek. Suisun Creek is in a separate watershed and the SOL-2 unit is not located in the project's action area. Therefore, no destruction or adverse modification of proposed critical habitat for California red-legged frog is anticipated.

Environmental Consequences

Impact TES-4: Potential Indirect Impacts on California Red-Legged Frog Habitat during Construction

Construction activities associated with bridge construction within potential CRLF habitat in the project area could result in indirect impacts on water quality downstream from the construction work area. Increased sedimentation could reduce the suitability of CRLF habitat downstream of the construction area by filling in pools and smothering eggs. Accidental spills of toxic fluids also could result in the subsequent mortality of CRLF should these substances flow downstream from the construction area and CRLFs are present. Implementation of the measures identified for

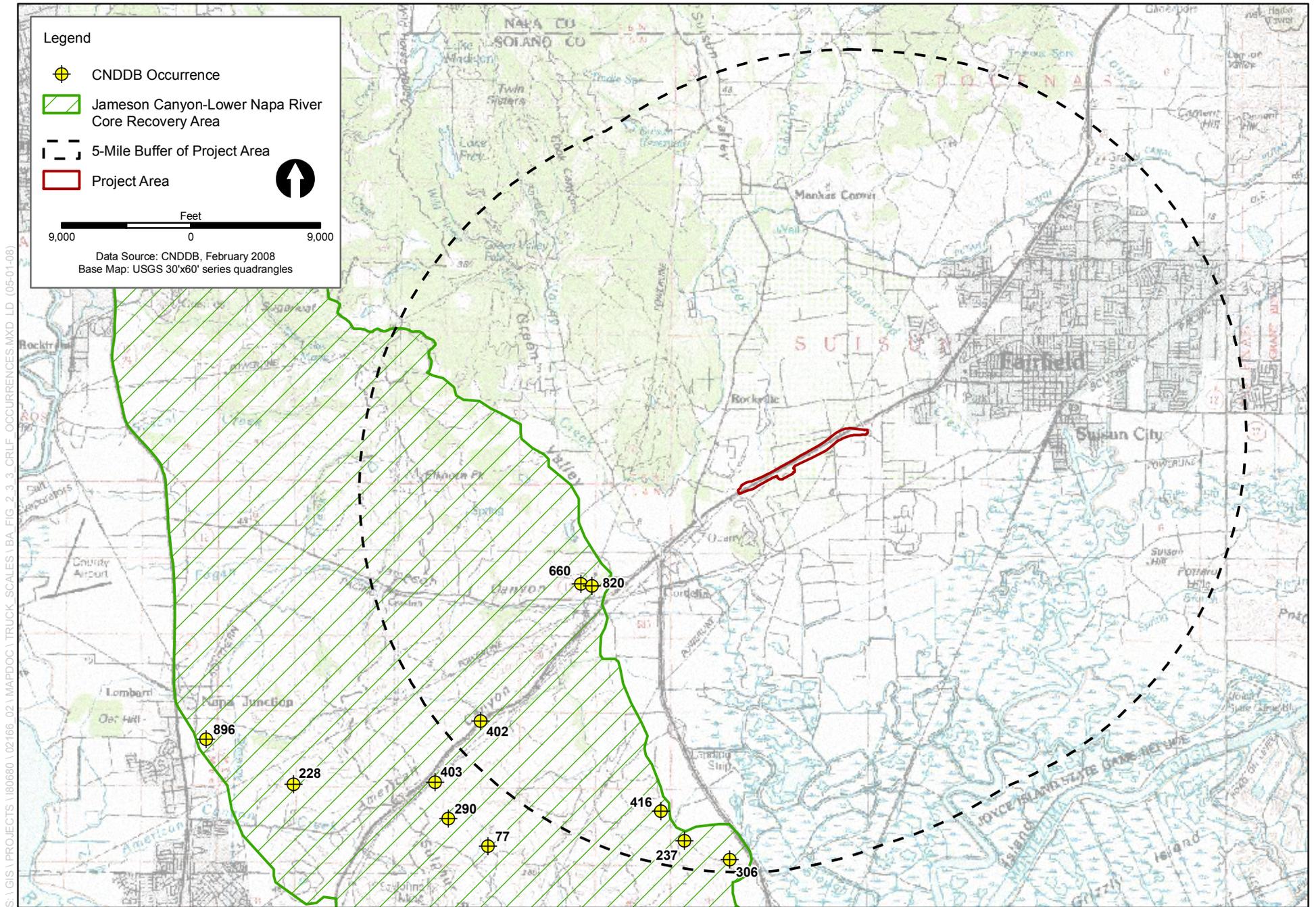


Figure 2.3-3
California Red-legged Frog CNDDDB Occurrences within a 5-Mile Radius of the Project Area

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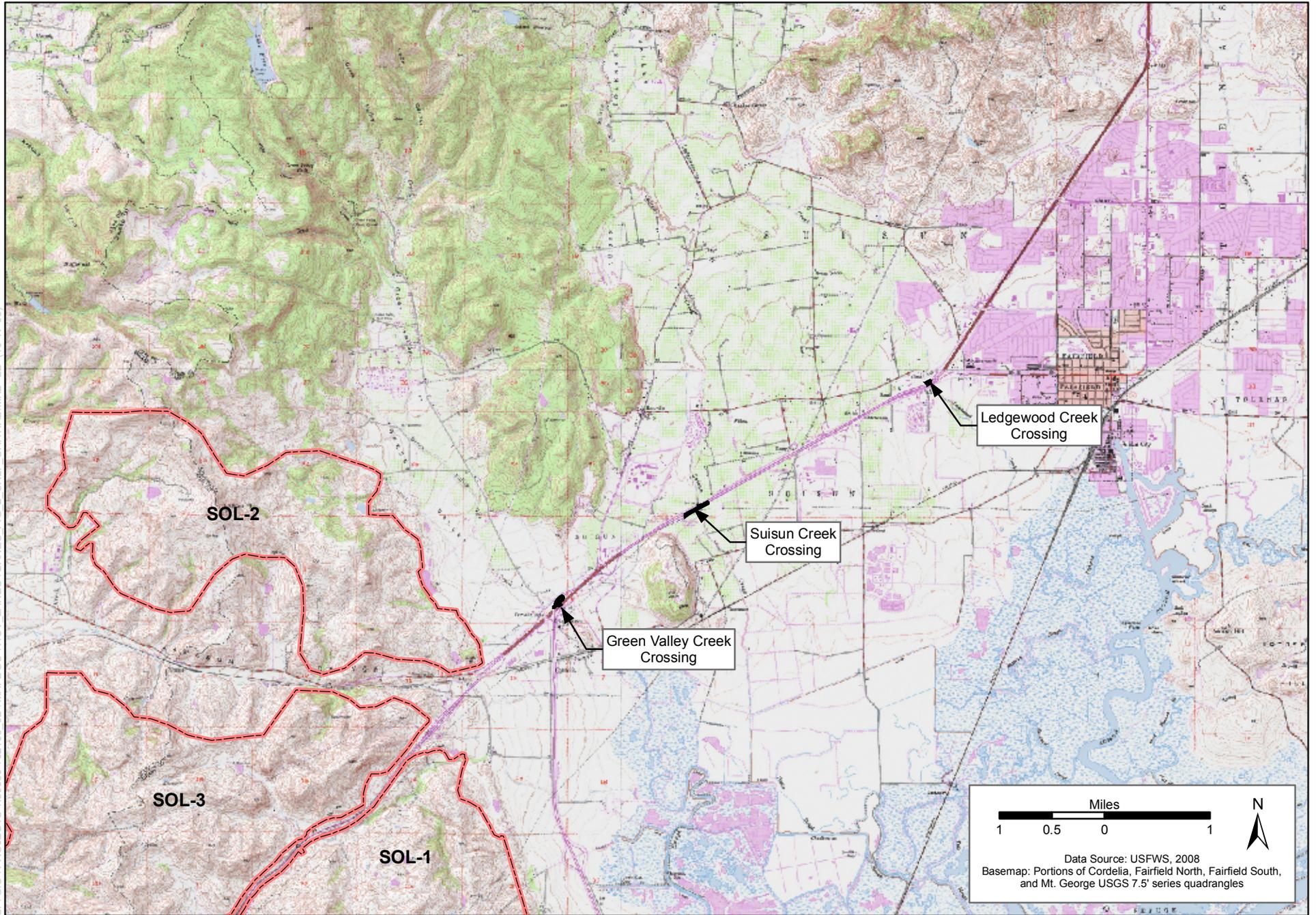


Figure 2.3-4
California Red-legged Frog Critical Habitat

CRLF, construction BMPs, and the measures identified below would reduce indirect effects on CRLF and potential habitat that could occur downstream from the construction area.

Impact TES-5: Potential Direct Impact on California Red-Legged Frog during Construction

CRLF could be directly affected by construction activities occurring adjacent to Suisun Creek. If CRLFs are present within the construction work area, they could be inadvertently killed or wounded by construction vehicles, construction personnel, and accidental spill of toxic fluids (i.e., gasoline and other petroleum-based products). If CRLFs must be captured and relocated outside the construction work area, they could be exposed to increased risks of disease, predation, and competition that could result in increased mortality. Implementation of Measures NC-1b and TES-5 ensure that this is not an adverse effect.

Impact TES-6: Temporary and Permanent Loss of California Red-Legged Frog Upland Habitat

Construction of the proposed project would result in both temporary disturbance and permanent loss of upland habitat for CRLF in riparian woodland along Suisun Creek within the project footprint (see Figure 2.3-1, Map Sheet 2). Construction would result in the temporary disturbance of 2.28 acres of upland habitat (1.28 acres of ruderal and 1.0 acre of riparian woodland). Construction would also result in a permanent loss of 1.02 acres of upland habitat (0.31 acre of ruderal and 0.71 acre of riparian woodland) along the creek banks, which provides potential foraging and refuge sites for CRLF. There would be no temporary or permanent impacts in Suisun Creek, which provides aquatic habitat for CRLF. Implementation of Measure TES-6 would reduce the severity of impact to CRLF upland habitat. Therefore this effect is not adverse.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance, minimization, and mitigation measures described in the “Riparian Woodland” and “Perennial Wetland Drainage” sections above and the following USFWS standardized measures would ensure avoidance and minimization of adverse effects on CRLFs during construction activities associated with bridge construction at Suisun Creek.

Measure TES-4: Construct During the Dry Season

Construction in and adjacent to Suisun Creek will occur during the dry season between June 15 and October 15.

Measure TES-5: Conduct Preconstruction Surveys and Construction Monitoring for California Red-Legged Frog

A preconstruction survey will be conducted immediately preceding any construction activity that occurs in CRLF habitat or any activity that may result in take of the species. A USFWS-approved biologist will carefully search all obvious potential hiding spots for CRLF, such as large downed woody debris, the perimeter of pond or wetland habitats, and the riparian corridors associated with streams and drainages. Any CRLF found will be captured and held for the

minimum amount of time necessary to release them in suitable habitat outside the study area. Suitable release sites will be identified by a qualified biologist approved by the USFWS before the start of construction activities.

A USFWS-approved biologist will monitor all ground-disturbing construction activity near potential CRLF habitat. After ground-disturbing activities are complete, the USFWS-approved biologist will train an individual to act as the on-site construction monitor. The on-site monitor will have attended the training described above. Both the USFWS-approved biologist and construction monitor will have the authority to stop or redirect project activities to ensure protection of resources and compliance with all environmental permits and conditions of the project.

If the USFWS-approved biologist or construction monitor has requested that work stop because of take of any of the listed species, the USFWS and the DFG will be notified within one working day via email or telephone. The USFWS-approved biologist and construction monitor will complete a daily log summarizing activities and environmental compliance.

- If a CRLF is encountered during construction work, activities will cease until the frog is removed and relocated by a USFWS-approved biologist.
- Any person capturing or handling CRLF will be a qualified biologist approved by the USFWS. A qualified biologist means any person who has completed at least four years of university training in wildlife biology or a related science, or has demonstrated field experience in the identification and life history of the CRLF. Resumes of all biologists proposed to capture or handle CRLF will be submitted to the USFWS for approval no later than 30 days before the start of construction.
- If necessary, nets or bare hands may be used to capture CRLFs. The USFWS-approved biologist will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods in which they are capturing and relocating CRLF. To avoid transferring disease or pathogens between aquatic habitats during the course of surveys or handling of CRLF, the USFWS-approved biologist will follow the Declining Amphibian Populations Task Force's Code of Practice. The USFWS-approved biologist will limit the duration of handling and captivity of CRLF. While in captivity, CRLF will be kept in a cool, moist, aerated environment, such as a bucket containing a damp sponge. Containers used for holding or transporting adults of this species will not contain any standing water.
- All construction areas will be flagged, and all activity will be confined to these areas.
- Because dusk and dawn are often the times when CRLF are most actively foraging and dispersing, all construction activities should cease 30 minutes before sunset and should not begin before 30 minutes prior to sunrise.
- A representative will be appointed, who will be the contact source for any employee or contractor who might inadvertently kill or injure a CRLF, or who finds a dead, injured, or entrapped individual. The representative will be identified during the employee education program. The representative's name and telephone number will be provided to the USFWS before the initiation of ground-disturbing activities.

- Tightly woven fiber netting or similar material will be used for erosion control or other purposes at the project site to ensure that CRLF are not trapped. This limitation will be communicated to the contractor through use of special provisions included in the bid solicitation package. Coconut coir matting is an acceptable erosion control material. No plastic monofilament matting will be used for erosion control.
- A litter control program will be instituted at the entire project site. All workers will ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the study area are deposited in covered or closed trash containers. The trash containers will be removed from the study area at the end of each working day.
- After construction is complete, temporarily disturbed areas within the study area will be restored to pre-project conditions or enhanced to compensate for the removal of riparian vegetation.
- Special provisions will be included in bid information, when applicable, that include the avoidance and minimization measures. In addition, contractors involved in the project will be educated and informed about the requirements of applicable permits obtained for the project, including a BO.

Measure TES-6: Compensate for Loss and Disturbance of California Red-Legged Frog Habitat

To compensate for the permanent loss and temporary disturbance of 3.30 acres of upland habitat for CRLF in the study area, the project proponent will enhance an area of suitable acreage amounts or contribute to a mitigation bank for riparian restoration habitat.

The project proponent will compensate for temporary construction-related loss of upland habitat for CRLF by replanting the temporarily disturbed area with native species. Replanting will occur after completion of the construction activities. Additional compensation for temporary impacts on upland habitat will be required (Cleckler pers. comm.).

The project proponent will compensate for the permanent and temporary loss of upland habitat for CRLF at an offsite location. The number of compensation acres will be confirmed through coordination with the USFWS as part of the formal consultation for the proposed project. Potential mitigation areas are available at the Solano Land Trust's Lynch Canyon Open Space, which is northwest of I-80 in American Canyon, and the King Ranch Open Space, which is west of I-680 in the American Canyon area (Wickham pers. comm.). Another potential mitigation area is located at the Solano Community College along Suisun Creek north of I-80.

Central California Coast Steelhead

Central California coast steelhead was listed as threatened by the NMFS on August 18, 1997 (62 FR 43938). There is no state status. Central California coast steelhead includes populations from the Russian River to Aptos Creek and the drainages of San Francisco and San Pablo Bays eastward to the Napa River.

Central California coast steelhead generally enter fresh water between November and April. The preferred migration temperatures for steelhead range from 7.7°C to 11°C (46°F–52°F) (National Marine Fisheries Service 2000). Spawning generally begins in December.

During spawning, the female digs a redd (a gravel nest), into which the eggs are deposited and then fertilized by the male. Steelhead prefer substrate no larger than 10 centimeters (Bjornn and Reiser 1991). Steelhead spawn in cool, well-oxygenated water (Hampton 1988). Optimal water temperatures for spawning and incubation range from 3.8°C to 11°C (39°F–52°F) (Myrick and Cech 2001). Incubation lasts from 1.5 to four months, depending on water temperature (Moyle 2002).

Instream and overhead cover, in the form of undercut banks, downed trees, and overhanging tree branches, is important for juvenile rearing. The addition of cover increases spatial complexity and may increase productivity. Fine-textured instream woody material provides the hydraulic diversity necessary for the selection of suitable velocities, access to drifting food, and escape refugia from predatory fish (Raleigh et al. 1986). Juvenile rearing success is assumed to decline at water temperatures ranging from 17°C to 25°C (62.6°F–77°F) (Raleigh et al. 1984).

Juvenile steelhead feed on a variety of aquatic and terrestrial insects and other small invertebrates. Steelhead smolts emigrate from March to May. Ocean rearing lasts two to three years.

Affected Environment

The following information on steelhead occurrence in streams in the project vicinity is summarized from Leidy et al. (2005). Historical evidence dating back as far as 1940 indicates that steelhead were present throughout the Suisun Creek watershed. Following the construction of Gordon Valley Dam (Lake Curry) in 1926 and subsequent water developments, steelhead populations in the watershed declined. Although the distribution and abundance of steelhead throughout Suisun Creek and its tributaries may have fluctuated over the years, recent surveys found that both adult and juvenile steelhead are still present in this system. An adult steelhead (673 millimeters FL [26.5 inches]) was found approximately 0.25 mile downstream of the Wooden Valley Creek confluence in March 2001, while two other adult steelhead (approximately 530–640 millimeters (20.9–25.2 inches) were observed in June and early July 2001 approximately 6 and 11 miles downstream of Lake Curry (Hanson Environmental 2001 in Leidy et al. 2005). This same survey also noted the occurrence of juvenile *O. mykiss* 160–170 millimeters (6.3–6.7 inches) downstream from the dam.

Historical evidence from the CDFG (1965 cited in Leidy et al. 2005) suggested that Wooden Valley Creek, a tributary of Suisun Creek, contained the highest concentration of steelhead in the watershed (Leidy et al. 2005). Surveys of Wooden Valley Creek conducted in 2002 indicated that juvenile *O. mykiss* were present at both headwater and various other survey locations along the creek (Leidy et al. 2005), suggesting the possibility of an existing steelhead population. Additionally, NMFS believes that Suisun and Wooden Valley Creeks currently support a steelhead population and that sufficient migration, spawning, and rearing habitat exists (50 FR 52504, September 2, 2005).

Hanson Environmental (2002) conducted a more detailed analysis of steelhead habitat quality in Suisun Creek. The study surveyed approximately 95% of the stream from Cordelia Road to Lake Curry during the summer low-flow period. Results from this study indicate that significant habitat constraints exist; these include migration barriers, limited spawning gravel availability, high summer water temperatures, and low habitat diversity. The study concluded that Suisun Creek was unlikely to consistently support self-sustaining steelhead populations. Instead, habitat would most likely be available during wet years when winter flows were high enough to allow upstream passage for adults and summer stream temperatures remained cool enough to support juvenile rearing. During dry years, summer rearing habitat would be constrained to upstream areas immediately below the reservoir, where temperatures would most likely remain within a range suitable to support salmonids.

In Suisun Creek, a potential spawning gravel patch is present about 20 feet downstream of the existing bridge that spans Suisun Creek at I-80.

The NMFS finalized critical habitat designations for central California coast steelhead in September 2005 (70 FR 52488, September 2, 2005). Although Suisun Creek is mentioned as having a steelhead population, it is excluded from the critical habitat designation for central California coast steelhead.

Environmental Consequences

Impact TES-7: Impacts on Fish Habitat Structure

Construction activities associated with the proposed action that would impact fish habitat structure include placement of bridge abutments above the OHWM and vegetation removal. Bridge construction and bank stabilization activities would require removal of vegetation, resulting in short- and long-term loss of vegetative cover and reducing fish habitat complexity and shade. Streamside vegetation, including shaded riverine aquatic (SRA) cover, is an essential component of salmonid habitat. Undercut banks and overhead SRA cover, such as canopy cover and overhanging vegetation, provide fish with protection from predators, maintain shade necessary to reduce thermal input, and provide nutrients to the stream in the form of fallen leaves and insects. Riparian vegetation is also important in controlling streambank erosion, contributing to instream structural diversity, and maintaining undercut banks. Elements of the proposed action would remove vegetation and SRA cover.

Construction of the bridge over Suisun Creek south of I-80 would result in a permanent loss of approximately 0.71 acre of riparian woodland, which includes up to 160 feet of overhanging vegetation (i.e., SRA cover) (assuming continuous riparian coverage) along Suisun Creek within the project footprint (Figure 2.3-5). The permanent impact area primarily comprises shrub understory, such as coyote brush and poison oak. Approximately 1.0 acre of riparian woodland vegetation, including up to 160 feet of SRA (assuming continuous riparian coverage), would be temporarily disturbed during construction. Understory coyote brush and poison-oak would be removed from the project footprint. Riparian vegetation outside the construction area would be protected from construction-related activities using ESA fencing. Implementation of the measures for Riparian Woodland (Measures NC-1a through NC-1d) would reduce riparian effects and offset temporary riparian habitat losses.

Impact TES-8: Water Temperature Impacts

Under existing conditions, habitat in the project area for juvenile steelhead rearing is likely marginal due to unsuitable water temperatures during summer (Hanson Environmental 2002). Water temperature is an important variable that determines the suitability of fish habitat for fish growth, reproduction, survival, and migration. This is especially true for steelhead, which have relatively narrow temperature requirements for carrying out their life history. Any increase in water temperatures could further reduce the suitability of habitat for steelhead in the project area.

Water temperature is controlled primarily by flow, weather, stream width and depth, and shading of the stream surface. The proposed action would impact shade provided by riparian vegetation. The amount of shade that would be affected by vegetation removal would be small, however, compared to total shade on the creek; lost shading would be compensated for by additional shading provided by the new bridge. Consequently, there would be no adverse effects on water temperatures resulting from the project.

Impact TES-9: Impacts on Water Quality

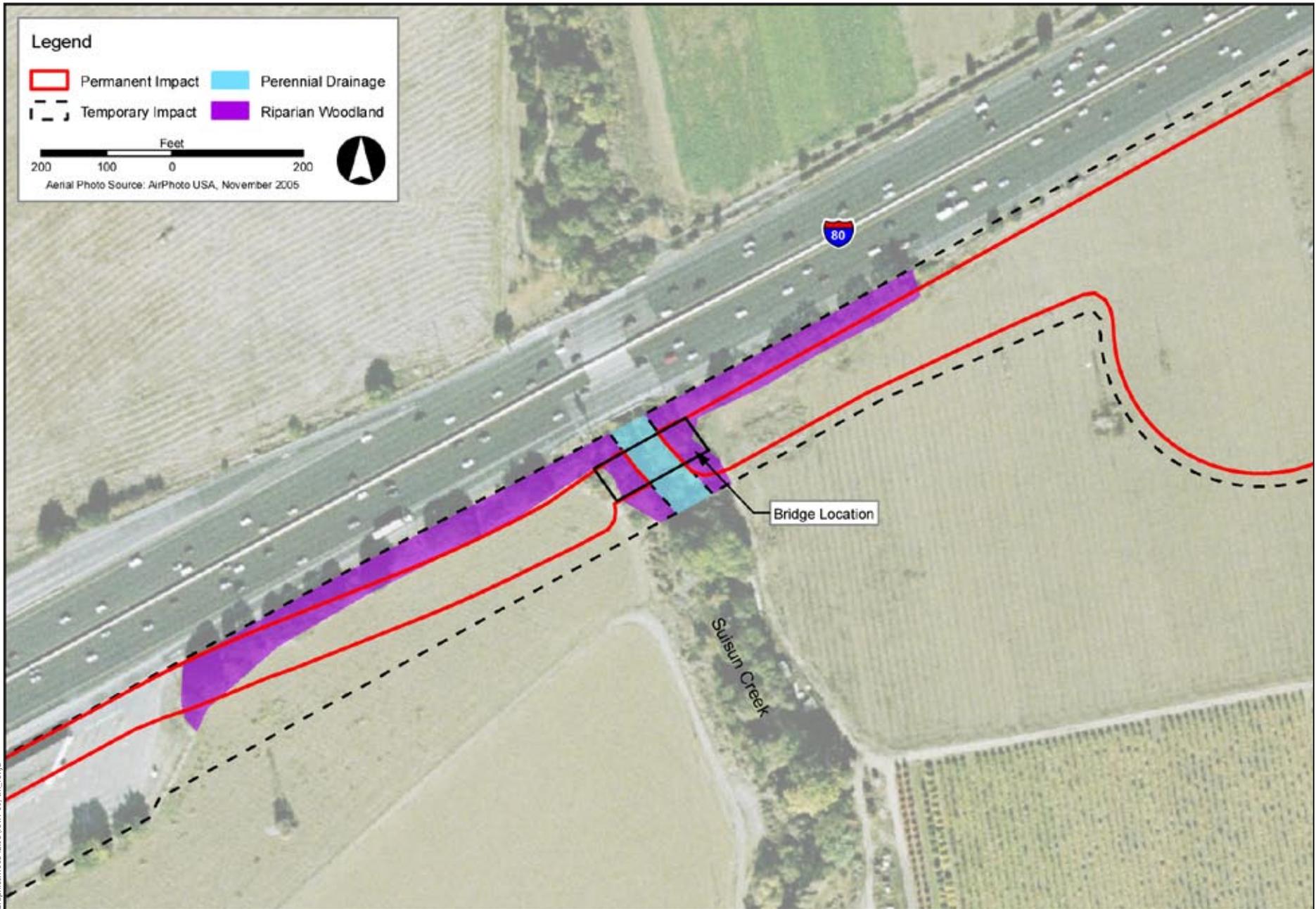
Assessment of water quality addresses the impacts of contaminants on steelhead and their habitat. Contaminants include toxic substances, such as metals, petroleum products, pesticides, fertilizers, sewage, and uncharacteristically high sediment loading. Activities associated with bridge construction and vegetation removal could increase erosion processes, thereby increasing sedimentation and turbidity in downstream waterways. Excessive sediment deposited in or near stream channels can degrade aquatic habitats. Increased turbidity can increase fish mortality; reduce feeding opportunities for fish, including rearing steelhead; and cause fish to avoid important habitat.

Additionally, construction materials, such as concrete, sealants, oil, and paint, could adversely affect water quality if accidental spills occurred during project construction. Increased pollutant concentrations could limit fish production, abundance, and distribution by direct mortality of fish or their prey. Steelhead inhabiting the project area require relatively clean, cold, well oxygenated water for successful growth, reproduction, and survival, and are not well adapted for survival in degraded aquatic habitats.

The potential for sediment and pollutant impacts would be considered an adverse effect. Adverse effects on water quality would be avoided by implementing Measure TES-9 below.

Impact TES-10: Impacts on Fish from Noise and Other Disturbances

Noise, vibrations, artificial light, and other physical disturbances adjacent to streams can harass fish, disrupt or delay normal activities, or cause injury or mortality. The potential magnitude of these impacts depends on a number of factors, including the type and intensity of the disturbance, proximity of the action to the water body, timing of actions relative to the occurrence of sensitive life stages, and frequency and duration of activities. For most activities, the impacts on fish will be limited to avoidance behavior in response to movements, noises, and shadows caused by construction personnel and equipment operating in or adjacent to the water body. However, survival may be altered if disturbance causes fish to leave protective habitat



**Figure 2.3-5
Special-Status Salmonid Habitat in the Project Area**

(e.g., increasing exposure to predators) or is of sufficient duration and magnitude to affect growth and spawning success. Injury or mortality may result from direct contact with humans and machinery, and sound pressure (pile driving), or indirectly from physiological stress associated with disturbance.

Project actions that may temporarily disturb fish include movement of construction equipment and personnel, lighting, removal and disturbance of riparian vegetation, and grading and construction of access roads and staging areas adjacent to the stream. Pile driving above the OHWM could also disturb fish as sound waves travel through the soil to the adjacent channel. There have been no studies that have tested the impacts of pile driving on land in close proximity to the channel. Factors that influence the intensity of pressure waves include proximity to the source, maximum force generated and rate at which it is generated, and characteristics of the medium (e.g., water and substrate) through which the waves travel. Soil is a relatively poor conductor of sound waves and a common avoidance measure is to conduct pile driving in a dry streambed or on land. These potential effects can be minimized by constructing during the dry season as described in Measure TES-10, below.

Impact TES-11: Impacts on Fish Movement and Potential Spawning Habitat

Construction activities associated with the proposed project would not require any work in the channel or redirection of the flow of water through the use of cofferdams or pipelines. Therefore, construction is not likely to adversely affect fish migration. A potential spawning gravel bed was observed on Suisun Creek, approximately 20 feet downstream of the existing bridge. It is anticipated that the gravel bed would not be removed or disturbed by the construction of the new bridge. No construction activity would take place within the creek and all construction equipment would access the construction site from the existing bridge and road.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of the avoidance and minimization measures for Riparian Woodland (Measures NC-1a through NC-1d) will reduce adverse riparian effects and offset temporary riparian habitat losses. Implementation of the following measures would ensure that adverse effects on steelhead and their habitat potentially occurring in Suisun Creek are minimized.

Measure TES-7: Retain and Improve Habitat Structure

Trees and shrubs immediately adjacent to Suisun Creek that must be removed for bridge construction will be cut above ground level to leave roots intact. By leaving roots of affected riparian vegetation intact, bank stability will not be compromised as would normally be expected following vegetation removal.

Under the new bridge, instream geomorphic features will be installed to compensate for affected SRA cover vegetation. Geomorphic features will include rock weirs and vanes, root wads, and deflector logs. By maintaining and improving bank stability and instream cover, habitat for migrating and seasonal rearing of juvenile steelhead and Chinook salmon would be preserved.

Measure TES-9: Implement Water Quality Impact Avoidance Measures

Increased sediment input to the creek will be avoided or minimized. Soil disturbance will be minimized by removing above-ground vegetation and leaving the root system intact. Additionally, contractors would be required to implement a SWPPP as part of the NPDES General Construction Activity Storm Water Permit. Measures in the plan will include:

- Conducting all construction work according to site-specific construction plans that minimize the potential for sediment input to the aquatic system.
- Minimizing the areas to be cleared, graded, and recontoured.
- Avoiding riparian and wetland vegetation outside the construction zone by installing Environmentally Sensitive Area fencing (ESA fencing).
- Grading and shaping of disturbed areas to restore natural topography.
- Covering bare areas with mulch and revegetating all cleared areas using native species.
- Preventing raw cement, concrete or concrete washings, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to aquatic life from contaminating the soil or entering watercourses.
- Establishing a spill prevention and countermeasure plan before project construction that includes strict on-site handling rules to keep construction and maintenance materials out of drainages and waterways.
- Cleaning up all spills immediately according to the spill prevention and countermeasure plan and notifying the CDFG and NMFS immediately of any spills and cleanup activities.
- Providing areas located outside the OHWM for staging and storing equipment, materials, fuels, lubricants, solvents, and other possible contaminants.

Implementation of measures to avoid or minimize the adverse effects of increased sediment input would also avoid and minimize increased input of pollutants associated with sediments and the potential for subsequent impacts on steelhead.

Measure TES-10: Implement Construction Restrictions

Construction activities will be limited to areas located above the OHWM. In addition, construction adjacent to Suisun Creek will be limited to the summer low-precipitation period (June 15 to October 15) to reduce the likelihood of adverse impacts on rearing juvenile steelhead and on adult fish spawning and migration. By limiting construction to June 15 to October 15, two goals would be achieved.

- Construction will not be concurrent with the expected migration (juvenile and adult) and spawning periods of steelhead.
- A 4-month construction period will ensure that construction activities in the vicinity of the creek are completed within one season, thereby avoiding multiple seasons of disturbance.

2.3.7 Invasive Plant Species

Regulatory Setting

On February 3, 1999, President Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Federal Highway Administration guidance issued August 10, 1999 directs the use of the state’s noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

Survey Results

Table 2.3-5 identifies the invasive plant species located in the study area. The infestation of the study area by these species is limited, occurring primarily on isolated patches of vegetation on the edges of roadways.

Environmental Consequences

Impact IPS-1: Potential Introduction and Spread of Invasive Plants

Invasive plant species in the study area are present along roadsides, which are routinely disturbed by shoulder maintenance and vegetation management activities. The proposed project would create additional disturbed area for a temporary period, but it would not substantially increase the area subject to repeated disturbance because the new road shoulders would replace existing road shoulders. The proposed project is not anticipated to increase or decrease the area currently occupied by invasive plants or the potential for spreading invasive plant species. However, procedures have been identified to further ensure the avoidance of potential adverse effects from invasive plants (Measure IPS-1).

Avoidance, Minimization, and/or Mitigation Measures

Implementation of Measure NC-1b and the following measure would avoid and minimize the adverse effect of introduction and spread of invasive plants during construction.

Measure IPS-1: Avoid the Introduction and Spread of Invasive Plants

The introduction of new invasive plants and the spread of invasive plants previously documented in the study area will be avoided. Accordingly, the following measures will be implemented during construction.

- Surface disturbance within the construction work area will be minimized to the greatest extent possible.
- All disturbed areas will be seeded with certified weed-free native mixes and mulched with certified weed-free mulch (rice straw may be used in upland areas).
- Native, noninvasive species will be used in erosion control plantings to stabilize site conditions and prevent invasive species from colonizing.

Table 2.3-5. Invasive Plant Species Located in the Study Area and Vicinity

Species	CDFA	Cal-IPC
Slender wild oat (<i>Avena barbata</i>)	–	Moderate
Wild oat (<i>Avena fatua</i>)	–	Moderate
Black mustard (<i>Brassica nigra</i>)	–	Moderate
Common mustard (<i>Brassica rapa</i>)	–	Limited
Ripgut brome (<i>Bromus diandrus</i>)	–	Moderate
Soft chess (<i>Bromus hordeaceus</i>)	–	Limited
Red brome (<i>Bromus madritensis</i> ssp. <i>rubens</i>)	–	High
Italian thistle (<i>Carduus pycnocephalus</i>)	C	Moderate
Yellow star-thistle (<i>Centaurea solstitialis</i>)	C	High
Bull thistle (<i>Cirsium vulgare</i>)	C	Moderate
Bindweed (<i>Convolvulus arvensis</i>)	C	–
Bermuda grass (<i>Cynodon dactylon</i>)	C	Moderate
Orchard grass (<i>Dactylis glomerata</i>)	–	Limited
Red-stemmed filaree (<i>Erodium cicutarium</i>)	–	Limited
Fig (<i>Ficus carica</i>)	–	Moderate
Fennel (<i>Foeniculum vulgare</i>)	–	High
Mediterranean barley (<i>Hordeum marinum</i> var. <i>gussoneanum</i>)	–	Moderate
Hare barley (<i>Hordeum murinum</i> ssp. <i>leporinum</i>)	–	Moderate
Klamathweed (<i>Hypericum perforatum</i>)	C	Moderate
Smooth cat's ear (<i>Hypochaeris glabra</i>)	–	Limited
Broad-leaved pepper-grass (<i>Lepidium latifolium</i>)	B	High
Italian ryegrass (<i>Lolium multiflorum</i>)	–	High
White horehound (<i>Marrubium vulgare</i>)	–	Limited
Bur-clover (<i>Medicago polymorpha</i>)	–	Limited
Olive (<i>Olea europaea</i>)	–	Limited
Harding grass (<i>Phalaris aquatica</i>)	–	Moderate
Bristly ox-tongue (<i>Picris echioides</i>)	–	Limited
Smilo grass (<i>Piptatherum millaceum</i>)	–	Limited
Narrow-leaved plantain (<i>Plantago lanceolata</i>)	–	Limited
Wild radish (<i>Raphanus sativus</i>)	–	Limited
Himalayan blackberry (<i>Rubus discolor</i>)	–	High
Sheep sorrel (<i>Rumex acetosella</i>)	–	Moderate
Curly dock (<i>Rumex crispus</i>)	–	Limited
Russian thistle (<i>Salsola tragus</i>)	C	Limited
Milk thistle (<i>Silybum marinum</i>)	–	Limited
Charlock (<i>Sinapis arvensis</i>)	–	Limited
Medusahead (<i>Taeniatherum caput-medusae</i>)	C	High
Hedgeparsley (<i>Torilis arvensis</i>)	–	Moderate
Puncture vine (<i>Tribulus terrestris</i>)	C	–
Rose clover (<i>Trifolium hirtum</i>)	–	Moderate
Bigleaf periwinkle (<i>Vinca major</i>)	–	Moderate
Foxtail fescue (<i>Vulpia myuros</i>)	–	Moderate

Notes: The CDFA and Cal-IPC lists assign ratings that reflect the CDFA and Cal-IPC views of the statewide importance of the pest, the likelihood that eradication or control efforts would be successful, and the present distribution of the pest in the state. These ratings are guidelines that indicate the most appropriate action to take against a pest under general circumstances. The Cal-IPC species list is more inclusive than the CDFA list; however, the FHWA requires adherence to Executive Order 13112, which requires the use of only the CDFA list.

The CDFA categories indicated in the table are defined as follows:

B: Eradication, containment, control, or other holding action at the discretion of the county agricultural commissioner.

C: State-endorsed holding action and eradication only when found in a nursery; action to retard spread outside nurseries at the discretion of the county agricultural commissioner.

The Cal-IPC categories indicated in the table are defined as follows:

High: Species with severe ecological impacts, high rates of dispersal and establishment, and usually widely distributed.

Moderate: Species with substantial and apparent ecological impacts, moderate to high rates of dispersal, and establishment dependent on disturbance, and that are limited to widespread distribution.

Limited: Species with minor ecological impacts, low to moderate rates of invasion, and limited distribution, and that are locally persistent and problematic.

2.3.8 No Project Alternative

Under the no project alternative, no construction activities would occur; therefore, no effects on the biological environment would result.

