

## 3.15 Biological Environment

A *Natural Environment Study* (NES) (Parsons 2006), *Preliminary Wetland Delineation Report* (Parsons 2005), and an *Initial Site Assessment for the California Tiger Salamander and California Red-legged Frog* (Parsons 2003) were prepared for the Highway 101 HOV Lane Widening Project. The studies consisted of a comprehensive records and literature search, a reconnaissance survey of the entire project corridor, habitat assessment and protocol surveys for special-status species, and a delineation/assessment of wetlands and other waters of the United States (U.S.). A *Focused Corridor Biological Assessment for the Sonoma County Distinct Population Segment (DPS) of the California Tiger Salamander* (Parsons 2004) and a *Biological Assessment for Vernal Pool Plant Species* (Parsons 2005) were prepared and submitted to the U.S. Fish and Wildlife Service (USFWS) to initiate formal consultation under Section 7 of the Federal Endangered Species Act. A *Biological Assessment for Fish Species* was also prepared and will be submitted to the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) to initiate consultation under Section 7 for potential impacts to fish species under NOAA Fisheries jurisdiction. This section of the environmental document presents findings of these reports and studies for vegetation and wildlife communities, wetlands and other waters of the U.S., threatened and endangered species, and invasive species.

### 3.15.1 Natural Communities

#### 3.15.1.1 AFFECTED ENVIRONMENT

Land uses along the Highway 101 HOV Lane Widening Project are primarily rural and agricultural, as described in Section 3.2.1, Existing and Future Land Use. Vegetation is mostly ruderal/disturbed, non-native grassland, ornamental landscape planted with coast redwood (*Sequoia sempervirens*), and agricultural planted with grapes (*Vitis vinifera*); there are few remaining natural areas. Various waterways traverse the corridor, some in concrete-lined channels or culverts and others in their natural watercourse.

Six biological communities occur in the vicinity of the project corridor: non-native annual grassland; ruderal/disturbed, including ornamental landscape and agriculture; seasonal and freshwater emergent wetlands; willow riparian scrub; coyote brush scrub; and North Coast black cottonwood riparian forest. Preliminary investigations indicate that it is highly unlikely that the project area contains vernal pools or Santa Rosa Plain listed plants. Protocol-level presence/absence surveys are ongoing. Special-status plant species are discussed further in Section 3.15.3.2, paragraph 2.

A description of each community and its associated wildlife assemblage is provided below.

#### Non-Native Grassland

This community is found on fine-textured, usually clay soils, which may range from moist, possibly even waterlogged during the rainy season, to very dry during the dry season. It is primarily composed of non-native annual grasses although native annual forbs (“wildflowers”) may also be present during years of favorable precipitation. Non-native grassland communities are found in the valleys and

foothills throughout much of California. Characteristic species include wild oats (*Avena* spp.), bromes (*Bromus* spp.), Italian ryegrass (*Lolium multiflorum*), California poppy (*Eschscholzia californica*), lupine (*Lupinus* spp.), and baby blue-eyes (*Nemophila menziesii*).

Grasslands provide foraging and nesting habitat for a wide variety of wildlife species including raptors, seed eating birds, small mammals, amphibians, and reptiles. Wildlife species typically associated with grasslands include western skink (*Eumeces skiltonianus*), Pacific gopher snake (*Pituophis melanoleucus catenifer*), common garter snake (*Thamnophis sirtalis*), deer mouse (*Peromyscus maniculatus*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), mule deer (*Odocoileus hemionus*), western meadowlark (*Sturnella neglecta*), and savannah sparrow (*Passerculus sandwichensis*). Grasslands also provide important foraging habitat for raptors such as the American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), and red-tailed hawk (*Buteo jamaicensis*).

Non-native grassland was found in the vicinity of the Shiloh Road and Fulton Road interchanges.

### **Ruderal/Disturbed, Including Urban Ornamental Landscape and Agriculture**

A distinguishing characteristic of urban habitats is the mixture of native and exotic plant species. Exotic plant species may provide valuable habitat elements such as cover for nesting and roosting, as well as food sources such as nuts or berries. Native and introduced animal species that are tolerant of human activities often thrive in urban habitats. These species include western fence lizard (*Sceloporus occidentalis*), barn swallow (*Hirundo rustica*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), house finch (*Carpodacus mexicanus*), house mouse (*Mus musculus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and Virginia opossum (*Didelphis virginianus*).

Common weeds found along the project corridor included Italian ryegrass, wild oats, tall mustard (*Sisymbrium altissimum*), Harding grass (*Phalaris aquatica*), bristly ox-tongue (*Picris echioides*), sow thistle (*Sonchus asper*), wild lettuce (*Lactuca serriola*), and paniculate willow-herb (*Epilobium brachycarpum*). Ornamental landscape plants associated with these weeds included periwinkle (*Vinca major*), English ivy (*Hedera helix*), oleander (*Nerium oleander*), and coast redwood (*Sequoia sempervirens*).

Ruderal/disturbed vegetation and ornamental landscaping are the primary biological communities along the project corridor. Agricultural areas in the project vicinity include several vineyards and an organic vegetable farm.

### **Seasonal and Freshwater Emergent Wetlands**

Seasonal wetlands, including the aquatic environments of the floor of flood control channels, are often formed when ditches and depressions are excavated. Freeway ditches develop into seasonal wetlands by becoming populated by plants species such as semaphore grass (*Pleuropogon californicus*), spikerush (*Eleocharis macrostachya*), water knotweed (*Polygonum lapathifolium*), water evening primrose (*Ludwigia peploides*), pennyroyal (*Mentha pulegium*), rabbitsfoot grass (*Polypogon monspeliensis*), barnyard grass (*Echinochloa crusgalli*), and eragrostoid sedge (*Cyperus*

*eragrostis*). These plant species are either low-growing, tenacious perennials that tolerate the annual maintenance activities being carried out in the channels and ditches, or are annuals that tolerate seasonal wetness and mowing, but later produce seed for the next season. The edges of such wetlands are often dominated by non-native annual weeds including annual ryegrass (*Lolium multiflorum*), alkali mallow, peppergrass (*Lepidium latifolium*), and bristly ox-tongue (*Picris echioides*).

Freshwater marshes are among the most productive wildlife habitats in California. They provide food, cover, and water for more than 160 species of birds as well as a variety of mammals, reptiles, and amphibians. Species that could use these areas in the project vicinity include Pacific tree frogs (*Hyla regilla*), bullfrogs (*Rana catesbeiana*), red-winged blackbird (*Agelaius phoeniceus*), song sparrow (*Melospiza melodia*), yellow warbler (*Dendroica petechia*), voles (*Microtis* spp.), shrews (*Sorex* spp.), and deer mouse.

Seasonal and freshwater emergent wetlands occur at the ditches and equalizers at the Fountain Grove interchange, at Piner Creek and adjacent wetlands, at the ditch near Lavelle Road, at Pruitt Creek, and at the tributary to Windsor Creek. No vernal pools or swales were apparent in the project vicinity. Vernal pool indicator species were observed on private land adjacent to the project corridor, however, permission to enter the property was denied.

### **Willow Riparian Scrub**

This community is found on relatively fine-grained alluvial soils and clays located in the floodplains of sub-perennial streams along canyons and creeks of the Coast Ranges. Characteristic species include red willow (*Salix laevigata*) and shining willow (*S. lucida* ssp. *lasiandra*).

Examples of wildlife that may occur in this community include Pacific tree frog, bushtit (*Psaltiriparus minimus*), Wilson's warbler (*Wilsonia canadensis*), black phoebe (*Sayornis nigricans*), Anna's hummingbird (*Calypte anna*), spotted towhee (*Pipilo maculatus*), raccoon, Virginia opossum, European starling, American crow (*Corvus brachyrhynchos*), Western scrub jay (*Aphelocoma californica*), house finch, house mouse, and Norway rat (*Ratus norvegicus*).

### **Coyote Brush Scrub**

Considered by some ecological workers as the northern version of soft chaparral, coyote brush scrubs are most prevalent on coastal slopes. However, inland scrubs that are dominated by *Baccharis* species are often associated with old disturbed sites, and thus may reflect a seral stage in the development of woodlands from bare ground. The dominant species is coyote brush (*Baccharis pilularis* ssp. *consanguinea*) but may also include species of buck brush (*Ceanothus* species), poison oak (*Toxicodendron diversilobum*), and cow parsnip (*Heracleum lanatum*), together with a whole host of annual forbs and grasses.

Coyote brush scrub provides foraging and nesting habitat for a wide variety of wildlife species including raptors, seed eating birds, small mammals, amphibians, and reptiles (see section on non-native grassland).

### North Coast Black Cottonwood Riparian Forest

This community is found on fine-grained alluvia soils located on bottomlands, floodplains, gravel bars and perennial stream banks. The overstory is generally dominated by black cottonwood (*Populus trichocarpa*), willows (*Salix* spp.) and red alder (*Alnus rubra*), with older stands containing shade-tolerant conifers such as grand fir (*Abies grandis*), douglas fir (*Pseudotsuga menziesii*), and western red cedar (*Thuja plicata*). Understory plants can include twinberry (*Lonicera involucrata*), western sword fern (*Polystichum munitum*), snowberry (*Symphoricarpos mollis*), and salmonberry (*Rubus spectabilis*).

North Coast black cottonwood riparian forest provides a wide range of resources to wildlife, such as movement and migration corridors, cover (nesting, resting, thermal, etc.), water, and a variety of foraging opportunities. Examples of wildlife that may occur in this community include western toad (*Bufo boreas*), pacific treefrog, bushtit (*Psaltriparus minimus*), Wilson's warbler (*Wilsonia canadensis*), black phoebe, great horned owl (*Bubo virginianus*), european starling (*Sturnus vulgaris*), american crow (*Corvus brachyrhynchos*), western scrub jay (*Aphelocoma cali/arnica*), raccoon, Virginia opossum, dusky-footed woodrat (*Neotoma fuscipes*), deer mouse, and hoary bat (*Lasiurus cinereus*).

#### 3.15.1.2 ENVIRONMENTAL CONSEQUENCES

The No-Build Alternative would not result in new highway construction that would involve impacts to the biological environment. Project effects on natural communities that would result from the Highway 101 HOV Lane Widening Project Build Alternative are shown in Table 3.15-1. Impacts would vary with northbound or southbound options A or B at the Fulton Road/Airport Boulevard Interchange Complex. Impacts for all four possible combinations are shown in the table.

<b>Table 3.15-1: Impacts to Natural Communities for the Build Alternative (hectares/acres)</b>				
<b>Affected Natural Communities</b>	<b>Total Area of Impact (Hectares/Acres)</b>			
	<b>Build Alternative (including Options at Fulton Road/ Airport Boulevard Interchange Complex) <sup>1</sup></b>			
	<b>NB-A/SB-A</b>	<b>NB-A/SB-B</b>	<b>NB-B/SB-A</b>	<b>NB-B/SB-B</b>
Ruderal/Disturbed	17.0 ha/ 42.0 ac	17.0 ha/ 42.0 ac	17.0 ha/ 42.0 ac	17.0 ha/ 42.0 ac
Non-native Grassland	0.01 ha/ 0.03 ac	0.01 ha/ 0.03 ac	0.37 ha/ 0.91 ac	0.37 ha/ 0.91 ac
Seasonal/Freshwater Emergent Wetland/Open Water	0.11 ha/ 0.27 ac	0.05 ha/ 0.13 ac	0.15 ha/ 0.36 ac	0.09 ha/ 0.22 ac
Willow Riparian Scrub	0.26 ha/ 0.64 ac	0.24 ha/ 0.60 ac	0.32 ha/ 0.79 ac	0.30 ha/ 0.75 ac
Coyote Brush Scrub	0.0002 ha/ 0.0005 ac	0.0002 ha/ 0.0005 ac	0.0002 ha/ 0.0005 ac	0.0002 ha/ 0.0005 ac
North Coast Black Cottonwood Riparian Forest	0.25 ha/ 0.62 ac	0.30 ha/ 0.74 ac	0.31 ha/ 0.76 ac	0.36 ha/ 0.88 ac

<sup>1</sup> NB – A = Northbound Option A; NB – B = Northbound Option B; SB – A = Southbound Option A; SB – B = Southbound Option B  
Source: Parsons 2005

### **Ruderal/Disturbed**

The HOV lane project would affect up to 17.0 ha (42.0 ac) of ruderal/disturbed vegetation at various locations along the Highway 101 corridor within the project limits.

### **Non-native Grassland**

Approximately 0.01 ha (0.03 ac) to 0.37 ha (0.91 ac) of non-native grassland located primarily near Mark West Creek would be affected by the proposed project.

### **Willow Riparian Scrub**

Up to 0.32 ha (0.79 ac) of willow riparian scrub located along Piner Creek and the Piner and Pool Creek tributaries would be affected.

### **Seasonal/Freshwater Emergent Wetland/Open Water**

The proposed project would affect up to 0.15 ha (0.36 ac) of seasonal and freshwater emergent wetlands and open water in ditches and equalizers near the Fountain Grove Interchange, at the tributaries to Piner and Windsor Creeks, and at Mark West, Pruitt and Pool Creeks.

### **Coyote Brush Scrub**

The Build Alternative would affect up to 0.0002 ha (0.0005 ac) of coyote brush scrub habitat in the vicinity of River Road.

### **North Coast Black Cottonwood Riparian Forest**

Up to 0.36 ha (0.88 ac) of North Coast black cottonwood riparian forest in the vicinity of Mark West Creek would be affected by the proposed project.

#### **3.15.1.3 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

The project has been designed to use existing right-of-way to the greatest extent feasible, thus avoiding or reducing new construction in natural habitat areas. The majority of the widening would be accomplished within the existing roadway median. Retaining walls and side slopes steeper than standard would be constructed at several locations to minimize right-of-way takes and natural community impacts. Linear patches and disjunct segments of ruderal/disturbed vegetation and non-native grassland and a small patch of coyote brush scrub would be permanently affected by Highway 101 project construction. These losses are not considered to be substantially adverse because other vegetation community areas within the project vicinity are of higher quality and would be used by wildlife as an alternative and preferable habitat source. Mitigation measures for impacts to willow/riparian and North Coast black cottonwood riparian forest vegetation communities affording habitat for special-status species and to jurisdictional wetlands and other waters of the U.S. are described in their respective sections on the following pages.

## **3.15.2 Wetlands and Other Waters of the United States**

### **3.15.2.1 REGULATORY SETTING**

Three primary regulations apply to undertakings that may affect wetlands or other waters of the United States, as follows:

#### **Section 404, Clean Water Act**

As established in Section 404 of the Clean Water Act (33 U.S.C. 1344), the U.S. Army Corps of Engineers (USACE) has final authority over the identification of wetlands and other waters of the U.S. in the project vicinity, including their jurisdiction, determination of area affected by the project, and type of permits and conditions required. Section 404 prohibits the discharge of dredged or fill material into waters of the U.S. without a permit from the USACE. In order for a project that affects wetlands to be approved and a permit to be obtained, it must be demonstrated that the proposed project is the least environmentally damaging. A “no net loss of wetland acreages or values” policy is established for mitigation of wetland impacts.

The USACE also administers the Habitat Quality Evaluation (HQE) process. This process was developed by the Sonoma County Vernal Pool Task Force<sup>1</sup> with the purpose of identifying wetland areas in the Santa Rosa Plain that potentially contain rare plant and animal species. These areas are further studied for their potential to be used for wetland and rare species protection, wetland creation, restoration or enhancement.

#### **Section 401, Clean Water Act**

Concurrent with the determination of a project's qualifications for an USACE permit is certification of the project's compliance with California State water quality standards as regulated by the Regional Water Quality Control Board (RWQCB) under Section 401 of the Clean Water Act. The water quality certification may include waste discharge requirements.

#### **Section 1600 et. Seq., California Fish and Game Code**

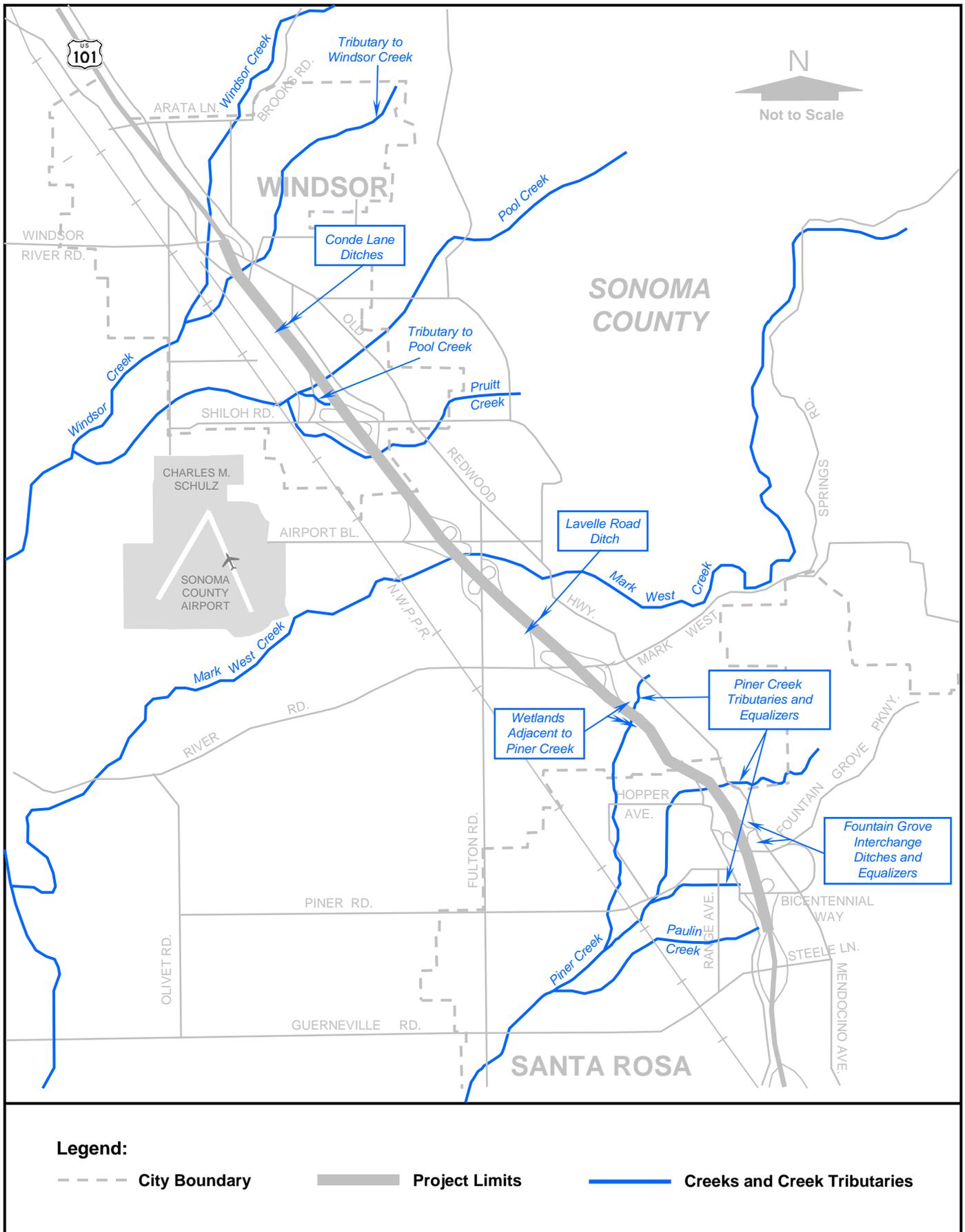
Actions that have the potential to alter a streambed or discharge materials into a stream must obtain a Streambed Alteration Agreement (“1602 permit”) with the California Department of Fish and Game (CDFG) in accordance with Section 1600 and following of the California Fish and Game Code. The Streambed Alteration Agreement effectively applies to any construction work between the banks of a stream or within the floodplain of a waterway. The agreement typically establishes seasonal limits or work windows for construction activities that may affect a streambank.

### **3.15.2.2 AFFECTED ENVIRONMENT**

A delineation of potential jurisdictional wetlands and other waters of the U.S. in the Highway 101 HOV Lane Widening project vicinity was conducted on April 15; May 6, 13, 15,21; June 18, 19; and July 16, 17, 29, 30, 2003 in accordance with the Routine On-Site Determination Method as defined by the USACE. This delineation will be submitted to the USACE for jurisdictional determination.

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<sup>1</sup> The Vernal Pool Task Force was composed of federal, state, and local agencies, local development and agricultural interests, and local environmental groups.



The jurisdiction features that were delineated along Highway 101 are shown on Figure 3.15-1 and on the Wetland Delineation Maps in Appendix G. Jurisdictional wetlands are determined by the presence of three indicators: wetlands soils, wetlands vegetation, and hydrology, or period of inundation. Other waters of the U.S. must possess a defined bed and bank and an ordinary high water mark (OHWM).

### 3.15.2.3 ENVIRONMENTAL CONSEQUENCES

The No-Build Alternative would not result in new highway construction that would affect wetlands or other waters of the U.S. in the project corridor. Depending on the option selected at the Fulton Road/Airport Boulevard Interchange Complex, the proposed project Build Alternative would permanently affect up to 0.024 ha (0.060 acres) of wetlands and other waters of the U.S. Both permanent and temporary (construction phase) impact areas are shown on the Wetland Delineation Maps in Appendix G. Table 3.15-2 reports the amount of wetland or other waters resources within the project limits that would be permanently or temporarily filled.

Based on the amount of total temporary and permanent impacts to wetlands – which is less than the 0.5 acres combined – it is anticipated that the project would qualify for one or more nationwide Section 404 permits, and an individual permit would not be required. It is also anticipated that a Section 1602 Streambed Alteration Agreement with the CDFG would be required prior to construction.

<b>Table 3.15-2: Impacts to Wetlands and Other Waters of the U.S. from the Highway 101 HOV Lane Widening Project: Santa Rosa to Windsor</b>			
<b>Fulton/Airport Interchange Option</b>	<b>Impact Areas</b>	<b>Permanent (hectares/acres)</b>	<b>Temporary (hectares/acres)</b>
Northbound Option A with Southbound Option A	Wetlands	0.016/0.040	0.034/0.084
	Other Waters of the U.S.	0.008/0.019	0.103/0.255
	<b>Total Wetlands/Waters</b>	<b>0.024/0.059</b>	<b>0.137/0.339</b>
Northbound Option B with Southbound Option A	Wetlands	0.016/0.040	0.034/0.084
	Other Waters of the U.S.	0.008/0.020	0.111/0.275
	<b>Total Wetlands/Waters</b>	<b>0.024/0.060</b>	<b>0.145/0.359</b>
Northbound Option A with Southbound Option B	Wetlands	0.016/0.040	0.034/0.084
	Other Waters of the U.S.	0.008/0.020	0.092/0.227
	<b>Total Wetlands/Waters</b>	<b>0.024/0.060</b>	<b>0.126/0.311</b>
Northbound Option B with Southbound Option B	Wetlands	0.016/0.040	0.034/0.084
	Other Waters of the U.S.	0.008/0.020	0.101/0.250
	<b>Total Wetlands/Waters</b>	<b>0.024/0.060</b>	<b>0.135/0.334</b>

Source: Parsons, 2006

#### **3.15.2.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

The project was designed to have the least possible impacts on wetlands and waters of the U.S. The majority of the widening would occur in the median of the roadway. Side slopes steeper than standard would be constructed at several locations to minimize right-of-way takes and impacts to wetlands and other waters of the U.S. Compensation requirements for impacts to wetlands and other waters of the U.S. will be determined through consultation with the USACE and Regional Water Quality Control Board, which will establish the mitigation ratio and other measures to be implemented, based on its review of this *Environmental Assessment/Environmental Impact Report*, the *Wetlands Delineation Report*, and the *Biological Assessment for Vernal Pool Plant Species*. Compensation measures will be identified for both permanent and temporary (construction phase) impacts of the project to ensure no net loss of wetlands.

It is recommended that Caltrans and its partners purchase wetland creation/enhancement credits at an USACE-approved mitigation bank. Alternatively, Caltrans and FHWA will consult with the USACE to identify on-site locations to create or enhance seasonal freshwater marsh and wetlands at ratios to ensure no net loss. In this case, Caltrans and its partners will develop a wetlands compensation plan that will describe the conceptual wetlands creation/enhancement approach, identify the site and preferred plants, and establish performance criteria. Either of these measures will compensate for project effects to wetlands. The USACE's review would be completed and the final compensation measures identified before the *Finding of No Significant Impact/Final Environmental Impact Report* can be approved.

#### **3.15.3 Threatened and Endangered Species**

Special-status plant and wildlife species are species that have been afforded special recognition and protection by federal, state, or local resource conservation agencies and organizations. These species are generally considered rare, threatened, or endangered due to declining or limited populations. For purposes of this environmental document, candidate threatened or endangered species were addressed in the same manner as listed species, since they could be listed during later stages of project development.

##### **3.15.3.1 REGULATORY SETTING**

A variety of laws seek to identify, avoid, minimize and mitigate for impacts to special-status wildlife and plant species, as summarized in the following paragraphs.

##### **Federal Endangered Species Act**

The Secretary of the Interior and the Secretary of Commerce are responsible under the Federal Endangered Species Act of 1973 (ESA) for identifying endangered and threatened species and their critical habitat, carrying out programs for species conservation, and rendering opinions regarding the impact of proposed federal actions on endangered species. The ESA also outlines what constitutes unlawful taking, importation, sale, and possession of endangered species and specifies civil and criminal penalties for unlawful activities.

Biological assessments are required under Section 7(c) of the ESA if listed species or critical habitat may be present in the area affected by any major construction activity conducted by, or subject to issuance of a permit from, a federal agency as defined in Part 404.02. Under Section 7(a)(3) of the ESA, every federal agency is required to consult with the United States Fish and Wildlife Service (USFWS) or National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) on a proposed action if the agency determines that its undertaking may affect an endangered or threatened species.

### **Migratory Bird Treaty Act**

The Migratory Bird Treaty Act (MBTA) of 1918 makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The MBTA also prohibits disturbance or harassment of nesting migratory birds at any time during their breeding season.

### **California Endangered Species Act**

The California Endangered Species Act (CESA, Fish and Game Code Sections 2050-2098) establishes State policy to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat. The Fish and Game Commission is charged with establishing a list of endangered and threatened species. State agencies must consult with the California Department of Fish and Game (CDFG) to determine if a proposed project has the potential to jeopardize the continued existence of listed endangered, threatened, or candidate species.

The CDFG Code defines "take" (Section 86) and prohibits "taking" of species that are listed under the CESA, or fully protected under CDFG Code Sections 3511, 4700, and 5050. Significant impacts are defined as: a) direct mortality; b) permanent or temporary loss of occupied habitat that would result in mortality to or reduced productivity of at least one individual of the species; c) avoidance of biologically important habitat for substantial periods resulting in mortality to or reduced productivity of at least one individual of the species.

Section 2081 of the CDFG Code allows "take" of a species listed under the CESA. Take is defined as any act that involves direct mortality or other actions that may result in adverse impacts when attempting to take individuals of a listed species. Under Section 2081, CDFG may issue a permit to authorize take for scientific, educational or management purposes, or take that is incidental to otherwise lawful activities.

### **California Fish and Game Code Native Plant Protection Policy**

The goal of the California Native Plant Protection Policy (Policy) is to preserve, protect, and enhance endangered or rare plants of the state (Section 1900). Native plants are defined as plants that grow in a wild uncultivated state and which are normally found native to the plant life of the state (Section 1901). The California Fish and Game Commission may adopt regulations governing the taking, possession, propagation, transportation, exportation, importation, or sale of any endangered or rare native plants.

All state departments and agencies shall, in consultation with CDFG, use their authority in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered or rare native plants. Such programs include, but are not limited to, the identification, delineation, and protection of habitat critical to the continued survival of endangered or rare native plants (Section 1911).

### **California Fish and Game Code Sections 1600**

As described in Section 3.15.2.1, actions that have the potential to alter a streambed or discharge materials into a stream must obtain a Streambed Alteration Agreement (“1602 permit”) with the CDFG in accordance with Section 1600 of the California Fish and Game Code. The Streambed Alteration Agreement establishes time periods for construction and other conditions designed to protect streambed habitat areas, maintain flows, and minimize harm to wildlife.

#### **3.15.3.2 AFFECTED ENVIRONMENT**

The USFWS and NOAA Fisheries were contacted for their listings of threatened, endangered, and candidate species that may occur in the project vicinity. Copies of the letter and listings received from each of these agencies is included in Appendix E. Studies and field surveys were performed for all special-status species with potential to be present within the proposed Highway 101 project vicinity. Survey results for plants, wildlife and jurisdictional features are addressed in the NES and BAs. The discussion below focuses on the results of studies conducted for 25 special-status plant species; four fish species, the Russian River tule perch, coho salmon, steelhead, and chinook salmon; three special-status amphibian species, the CTS, northern red-legged frog, and foothill yellow-legged frog; two special-status reptile species, the western and northwestern pond turtle; and three special-status bird species, the western yellow-billed cuckoo, white-tailed kite and loggerhead shrike, all of which have potential to occur in the project area.

#### **Special-status Plant Species**

Twenty-five special-status plant species were identified to have potential to occur in the project area, as listed in Table 3.15-3 Special-status Plant Species.

**Table 3.15-3: Special-status Plant Species**

Species		Status			Habitat Present/Absent	Rationale
		Federal	State	CNPS		
Sonoma alopecurus	<i>(Alopecurus aequalis</i> var. <i>sonomensis)</i>	FE	--	1B	P	Marginal habitat present – no plants observed.
Bent-flowered fiddleneck	<i>(Amsinckia lunaris)</i>	SLC	--	1B	P	Marginal habitat present-no plants observed.
Clara Hunt's milk-vetch	<i>(Astragalus clarianus)</i>	FE	ST	1B	P	Marginal habitat present-no plants observed.
Big-scale balsamroot	<i>(Balsamorhiza macrolepis</i> var. <i>macrolepis)</i>	SLC	--	1B	P	Marginal habitat present-no plants observed.
Sonoma sunshine	<i>(Blennosperma bakeri)</i>	FE	SE	1B	P	Marginal habitat present-no plants observed.
Bolander's reedgrass	<i>(Calamagrostis bolanderi)</i>	SLC	--	4	P	Marginal habitat present-no plants observed.
Thurber's reedgrass	<i>(Calamagrostis crassiglumis)</i>	SC	--	2	P	Marginal habitat present-no plants observed.
Swamp harebell	<i>(Campula californica)</i>	--	--	1B	A	No suitable habitat present-no plants observed.
White sedge	<i>(Carex albida)</i>	FE	SE	1B	P	Marginal habitat present-no plants observed.
Pitkin Marsh Indian paintbrush	<i>(Castilleja uliginosa)</i>	--	--	1A	A	No suitable habitat present-no plants observed.
Dwarf downingia	<i>(Downingia pusilla)</i>	--	--	2	P	Marginal habitat present-no plants observed.
Hayfield tarplant	<i>(Hemizonia congesta</i> ssp. <i>Leucocephala)</i>	--	--	3	P	Potential habitat present-no plants observed.
Burke's goldfields	<i>(Lasthenia burkei)</i>	FE	SE	1B	P	Marginal habitat present-no plants observed.
Legenere	<i>(Legenere limosa)</i>	SC	--	1B	P	Marginal habitat present-no plants observed.
Sebastopol meadowfoam	<i>(Limnanthes vinculans)</i>	FE	SE	1B	P	Marginal habitat present-no plants observed.
Marsh microseris	<i>(Microseris paludosa)</i>	SLC	--	1B	P	Marginal habitat present-no plants observed.
Baker's navarretia	<i>(Navarretia leucocephala</i> spp. <i>Bakeri)</i>	SC	--	1B	P	Marginal habitat present-no plants observed.
Many-flowered navarretia	<i>(Navarretia leucocephala</i> ssp. <i>Plieantha)</i>	FE	SE	1B	P	Marginal habitat present-no plants observed.
North Coast semaphore grass	<i>(Pleuropogon hooverianus)</i>	SC	ST	1B	P	Marginal habitat present-no plants observed.
White beaked-rush	<i>(Rhynchospora alba)</i>	--	--	2	A	No suitable habitat present-no plants observed.
California beaked-rush	<i>(Rhynchospora californica)</i>	SC	--	1B	A	No suitable habitat present-no plants observed.
Brownish beaked-rush	<i>(Rhynchospora capitellata)</i>	--	--	2	A	No suitable habitat present-no plants observed.
Round-headed beaked-rush	<i>(Rhynchospora globularis</i> var. <i>globularis)</i>	--	--	2	A	No suitable habitat present-no plants observed.
Showy Indian clover	<i>(Trifolium amoenum)</i>	FE	--	1B	P	Marginal habitat present-no plants observed.
Saline clover	<i>(Trifolium depauperatum</i> var. <i>hydrophilum)</i>	SLC	--	1B	P	Marginal habitat present-no plants observed.

Preliminary botanical surveys resulted in negative findings for all special-status plants. It is unlikely that these species exist within the project area. No vernal pools or swales were apparent in the project vicinity. Presence/absence botanical surveys are ongoing to complete the USACE HQE process. Final survey results and results of any consultations with the USACE and USFWS will be reported in the final environmental document.

### **Special-status Wildlife Species**

**Russian River Tule Perch:** The Russian River tule perch (*Hysteroecarpus traski poma*) is currently confined to the Russian River and its tributaries in Sonoma and Mendocino counties. Russian river tule perch require clear, flowing water and abundant cover. Although they will feed in shallow waters, they generally require deep pools for refuge and feeding. They are also very sensitive to stream pollution and tend to be absent from turbid, slow-moving water. The decline of Russian River tule perch in recent years has been attributed primarily to habitat alteration due to dams on the Russian River that have increased turbidity and decreased water quality. The Russian River tule perch is currently listed as a species of concern by both the federal government and the CDFG.

**Pacific Salmon and Trout: Steelhead and Coho Fisheries:** Pacific salmonids and trout are anadromous fish. Anadromous is defined as those fish species that move from sea (saltwater) to fresh water for reproduction. The life cycle of anadromous salmonids entails hatching in cool headwater tributaries of large river systems and moving out to saltwater as young fish. In the ocean they grow rapidly to adults. Upon reaching maturity they return to hatching streams to spawn, typically followed by death.

Successful spawning, incubation, and juvenile rearing require clean, coarse, well-oxygenated gravels free of fine sediments. Excessive accumulations of sediment fines reduce the hatching success of eggs and retard embryo and juvenile growth. Upon emerging from gravel, juveniles (fry) remain in cool, shaded, clean water with resting and escape habitat and ample invertebrates available for food through late summer and fall. Spawning and juvenile rearing usually occur along upper reaches of smaller tributaries with suitable habitat. As fry reach the smolt phase, they migrate downstream, typically March through June annually.

Each of the salmonid species has genetically distinct populations (runs), termed evolutionarily significant units (ESU) associated with each major tributary. The ESU serves as an alternative definition for “distinct population segments” under the federal Endangered Species Act (NOAA Fisheries 2002a). Due to differing life history strategies, management considerations and conservation threats, each ESU is treated as a separate species.

Three salmonid species consisting of five ESUs of salmonid fisheries have suitable habitat at Mark West Creek within the project area: coho salmon (*Oncorhynchus kisutch*) - Central California Coast ESU; steelhead (*Oncorhynchus mykiss*) - Central California Coast ESU; and chinook salmon (*Oncorhynchus tshawytscha*) - Central Valley fall/late fall-run ESU, Central Valley spring-run ESU, and California coastal ESU, as described below.

**Coho Salmon:** The Central California coast coho salmon is federally listed as threatened by the NOAA Fisheries and state listed as endangered by CDFG. Primary distribution of the coho salmon is

the American and Sacramento rivers and other drainages northward from San Francisco Bay to Alaska. There are some minor coho runs documented for Santa Cruz County. Historically, coho salmon were never common in the Sacramento Valley or generally as far south as the Bay Area. Coho salmon have recently been recorded both upstream and downstream from the project area in Mark West Creek.

**Steelhead:** The Central California coast steelhead is federally listed as threatened by NOAA Fisheries. Steelhead are migratory trout, saltwater-tolerant, and may include resident (non-migratory), potamodromous (migratory within drainage up to estuarine waters only), or anadromous (migrate to open ocean) life histories. Regardless whether resident or migratory, adults return to hatching sites to spawn after one to three years. Unlike other Pacific salmon species, adults do not necessarily die after spawning; up to 20 percent of adults live to repeat the breeding cycle three or four times.

Central California coast steelhead spawning runs begin in late October and continue through May, with peak migration from mid-December through mid-April. Eggs hatch in about two to three weeks. Hatching young may remain at the hatch site or disperse immediately, but generally remain in headwaters for about one year before moving out to salt water. Spawning and juvenile rearing usually occurs along upper reaches of smaller tributaries with suitable habitat. As fry reach the older juvenile phase, they migrate downstream, typically during March through June.

Watersheds in the project area have been proposed for designation as critical habitat for steelhead.

**Chinook Salmon:** The California coastal and Central Valley spring-run chinook salmon are federally listed as threatened by the NOAA Fisheries, and the Central Valley fall/late fall-run Chinook salmon is federally listed as a species of concern by NOAA Fisheries.

Ecologically, chinook salmon are big river fish and require large waterways and stable flows for their life cycle requirements. Within Sonoma County, only the Russian River, Sonoma and Carriger creeks are known to support chinook fisheries. Within the project area, suitable habitat for the chinook salmon occurs only at Mark West Creek, a tributary to the Russian River.

Chinook salmon ESUs occur in large coastal streams and rivers from the San Francisco Bay-Sacramento River drainage northward. The Central Valley fall/late-fall run has historically been the most abundant population while California chinook ESUs have shown long-term declines since 1967. Recent optimal ocean conditions and hatchery releases have increased abundance of this ESU; however, NOAA Fisheries (2002a) is considering listing this ESU as threatened due to doubts that hatcheries can augment population numbers. Hatchery stocks in the Bay Area have augmented natural runs, especially the fall/late fall ESU; however, hatchery stocks of chinook salmon, regardless of ESU, are not protected under terms and conditions of state and/or federal endangered species acts.

Watersheds in the project area have been proposed for designation as critical habitat for chinook salmon.

**California Tiger Salamander:** The California tiger salamander (CTS), (*Ambystoma californiense*) is federally listed as threatened in the Santa Barbara, Sonoma, and Central California Distinct

Population Segment (DPS) and state-listed as a 'species of special concern'. A member of the family Ambystomatidae, the CTS is a large, terrestrial salamander with a broad, rounded snout. Coloration of the CTS varies, but in general, it is black above with large pale yellow to white spots along the sides. Adults reach a length of three to five inches. CTS are restricted to grasslands, oak savannah, and edges of mixed forest plant communities throughout their range. CTS use three distinct habitats during three different stages of their life cycle: breeding habitat, upland aestivation habitat, and movement or dispersal habitat.

The proposed project corridor is located approximately four miles north and east of the nearest known CTS record. There are no historical or recent sightings of CTS within the project limits. Drift fence surveys conducted during the 2003 survey season also detected no CTS. The Alton Preserve, a man-made preserve, located approximately two miles west of the project corridor, contains vernal pools that could provide CTS breeding habitat. If CTS do use these pools at Alton Preserve, it is highly unlikely that they migrate to the project vicinity due to the presence of substantial barriers to movement, including a railroad corridor, existing urban developments, roads, and streams. There is a stock pond located west of Conde Lane near the proposed project's northern terminus, but there are no CTS sightings from this vicinity.

**Northern Red-legged Frog:** The northern red-legged frog (*Rana aurora aurora*), a CDFG species of special concern, occupies the northwestern corner of California, north to southern British Columbia, west of the Cascade crest, mainly at low altitudes. It breeds in cool ponds or slow-moving streams, lakes, ditches, and ponds close to vegetation. This frog can live in forests far from open water during moist conditions. Degradation or loss of habitat, as well as predation and competition from bullfrogs are the main threats facing the northern red-legged frog. Within the project area, suitable habitat for the frog occurs only at Mark West Creek. CNDDDB records show no occurrence of northern red-legged frog within two miles of the project area. Previous sampling for aquatic biota with the City of Santa Rosa's Incremental Recycled Water Project identified no northern-red legged frogs during 10 years of sampling at Mark West Creek.

**Foothill Yellow-legged Frog:** The foothill yellow-legged frog (*Rana boylei*) is a moderate-sized highly variably colored frog, but usually dark to light gray, brown, green or yellow with a somewhat mottled appearance. Foothill yellow-legged frogs require shallow, flowing water, preferentially in small to moderate-sized streams with at least some cobble-sized substrate. They are infrequent or absent in habitats where introduced aquatic predators (i.e., various fishes and bullfrogs) are present, probably because their aquatic developmental stages are susceptible to such predators. In California, *R. boylei* was historically distributed throughout the foothill portions of most drainages from the Oregon border to the San Gabriel River. The foothill yellow-legged frog is considered both a federal and state species of special concern in the Coast Ranges north of the Salinas River. *Rana boylei* still occurs at many localities in coastal drainages north of the Salinas River system in California. CNDDDB records show no occurrence of foothill yellow-legged frog within two miles of the project. Previous sampling for aquatic biota with the City of Santa Rosa's Incremental Recycled Water Project identified no yellow-legged frogs during ten years of sampling at Mark West Creek.

**Western and Northwestern Pond Turtle:** The western pond turtle (*Clemmys marmorata*) historically occurred along the Pacific coast, principally west of the Cascade-Sierra Nevada-Peninsula Mountains, with the Central Valley hosting the highest densities. Decline of this species is attributed to conversion of native wetlands to urban and agricultural uses. Preferred habitat includes ponds, lakes or sloughs isolated from streamflow, but may include streams and associated riparian habitats. The western pond turtle is a species of management concern by CDFG.

The northwestern pond turtle (*Clemmys marmorata marmorata*) is a subspecies of the western pond turtle that ranges from the Oregon-Washington border to central California, where it intergrades with the southwestern pond turtle (*Clemmys marmoratapallida*). Northwestern pond turtles inhabit a range of aquatic habitats with abundant logs, rocks, submerged vegetation, mud, undercut banks, and ledges. Due primarily to loss of aquatic habitat, this subspecies has declined through 75 to 80 percent of its historic range and is classified as a species of concern by both the USFWS and CDFG. The northwestern pond turtle historically occurred throughout the Steele Lane to Windsor River Road project area, but had only three recorded occurrences within the project area between 1992 and 1996, and none since 1996. Within the proposed project area, suitable habitat for the northwestern pond turtle occurs only at Mark West Creek.

**Western Yellow-billed Cuckoo.** The western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is a slender brown bird with white underparts. In flight, its wings show rufous or cinnamon color, and its tail shows black with white spots. The western yellow-billed cuckoo is considered an endangered species by the CDFG. Although the cuckoo nests in walnut and almond orchards in California, its natural nesting habitat is in cottonwood-tree willow riparian forest. The nest typically is on the horizontal branch of a tree willow in a location hidden from view from the ground or surrounding trees. Riparian areas within the project vicinity provide suitable nesting habitat for western yellow-billed cuckoo. Historically, the cuckoo was known to breed in all regions of California except the central and northern Sierra Nevada, the Great Basin, and the Colorado Desert. Now, the bird likely is found only along the upper Sacramento Valley portion of the Sacramento River, the Feather River in Sutter County, the south fork of the Kern River in Kern County, and along the Santa Ana, Amargosa, and lower Colorado rivers.

This bird is threatened by loss and degradation of its habitat. Adverse impacts to cuckoo habitat are attributed to clearing of land for urban and suburban development and for agriculture, human disturbance (e.g., illegal camping), fire in riparian habitat, OHVs, livestock trampling and grazing on tree saplings, invasion of non-native plants (e.g., tamarisk and giant reed), flood control projects, pumping of groundwater, and diversion of surface water.

**White-tailed Kite:** The white-tailed kite (*Elanus leucurus*) was threatened with extinction in the early part of the twentieth century but has since recovered and is now found in virtually all California lowlands west of the Sierra Nevada. Although California currently holds the largest population of white-tailed kites in North America, the species is still considered rare and is listed as a federal species of concern during breeding season and afforded fully protected status by the CDFG.

White-tailed kites are most often found in areas surrounded by open habitat such as lowland grasslands, agriculture, wetlands, oak-woodland and savannah habitats, and riparian areas. White-tailed kites breed and winter in low densities throughout central and into northern California. The CNDDDB has a record of one breeding pair approximately 18.5 km northwest of the project limits, however, nesting and foraging habitat occurs along the Highway 101 corridor in several locations.

**Loggerhead Shrike:** The loggerhead shrike (*Lanius ludovicianus*) is a predatory songbird that is resident in the project area. It is identified as a species of concern for USFWS and a species of special concern by CDFG and is protected under the Migratory Bird Treaty Act. Under CEQA guidelines, rare species must be considered in project planning regardless of formal listing as endangered or threatened. The loggerhead shrike qualifies as it is considered rare, restricted in distribution, or declining throughout its California range according to CDFG.

Loggerhead shrikes prefer open habitat characterized by forbs and grasses interspersed with low shrubs, widely-spaced trees, and bare ground. Prairies, grasslands, pastures, fencerows or shelterbelts, mowed road rights-of-way, abandoned railroad rights-of-way, cemeteries, golf courses, open woodlands, farmsteads, and old orchards are examples of the types of habitats where loggerhead shrikes most commonly occur. Scattered shrubs or trees, particularly dense, thorny species, are typically used for nesting and hunting perches. As opportunistic predators, loggerhead shrikes feed on a wide variety of prey, including insects, small mammals and birds, reptiles, amphibians, and occasionally carrion.

Loggerhead shrikes are adaptable to urban environments and may occur anywhere along the Highway 101 corridor as long as preferred habitat characteristics and abundant prey supplies are present.

### **3.15.3.3 ENVIRONMENTAL CONSEQUENCES**

The No-Build Alternative would not result in new highway construction that would involve impacts to special-status plant and wildlife species. Impacts of the proposed project Build Alternative on special-status species are reported in the following paragraphs.

#### **Special-status Plant Species**

Protocol-level presence/absence surveys for vernal pool plant species are ongoing to complete the HQE process as required pursuant to San Francisco USACE final regional conditions affecting Nationwide Permits for projects within the Santa Rosa Plain. Preliminary investigations suggest that it is highly unlikely that vernal pool plant species exist within the immediate project area. If ongoing surveys find otherwise, avoidance and mitigation measures will be developed in accordance with the Santa Rosa Plain Conservation Strategy. Protocol-level presence/absence surveys for other special-status plant species are also ongoing. All study results will be reviewed in consultation with the USACE, USFWS, and CDFG. To ensure no take of such plant species, additional plant surveys are also recommended prior to construction during the bloom period for each of the plant species, as described in Section 3.15.3.4, Avoidance, Minimization, and/or Mitigation Measures,

### **Special-status Wildlife Species**

**Russian River Tule Perch:** The proposed project would permanently affect up to 0.0039 ha (0.0097 ac) of aquatic habitat at Mark West Creek that provides suitable habitat for Russian River tule perch.

**Pacific Salmon and Trout: Coho Salmon, Steelhead and Chinook Salmon:** The proposed project would permanently affect up to 0.0039 ha (0.0097 ac) of aquatic habitat at Mark West Creek that provides suitable habitat for Coho salmon, steelhead, and Chinook salmon. The proposed roadway improvements could impact these sensitive species by direct take; destruction of reproduction or seasonal habitat; increased run-off of sediments that could degrade bottom habitat and water quality; and construction of barriers to fish movement. This is the same area that Russian River tule perch could inhabit.

**California Tiger Salamander:** Consultation with the USFWS to determine project related impacts to CTS habitat and compensatory mitigation in accordance with the Santa Rosa Plain Conservation Strategy is ongoing. The project has been designed to avoid impacts to natural areas insofar as feasible, and avoidance measures would be implemented during construction. The project is likely to affect but would not adversely affect the CTS.

Formal consultation with the USFWS was initiated on October 25, 2004 regarding impacts of the proposed project on CTS. The USFWS will review the NES/BA and is expected to return its no-jeopardy Biological Opinion identifying project conditions and measures to minimize harm to the species. The USFWS no-jeopardy Biological Opinion is anticipated before the environmental document for this project would be approved. The CDFG will review the NES/BA and determine if the USFWS biological opinion and conditions and measures to minimize harm to the species are consistent with the California Fish and Game code. It is also expected that CDFG's consistency determination will be received before the final environmental document would be approved.

**Northern Red-legged Frog:** The proposed project would permanently affect up to 0.0039 ha (0.0097 ac) of aquatic habitat at Mark West Creek that provides suitable habitat for northern red-legged frog. This is the same area that special-status fish species, described above, could inhabit.

**Foothill Yellow-legged Frog:** Due to the absence of foothill yellow-legged frogs from the project corridor, no impacts are expected.

**Western and Northwestern Pond Turtle:** The proposed project would permanently affect up to 0.0039 ha (0.0097 ac) of aquatic habitat at Mark West Creek that provides suitable habitat for western and northwestern pond turtle. This is the same area that special-status fish species and the northern red-legged frog, described above, could inhabit.

**Western Yellow-billed Cuckoo:** Although riparian habitat in the project area is suitable for the cuckoo, there are no known occurrences of this species anywhere near the project area. The species was not observed during wildlife surveys and it is highly unlikely to be present in the project area; therefore, no impacts are expected.

**White-tailed Kite, Loggerhead Shrike, and Other Migratory Birds:** The CNDDDB identifies no occurrences of white-tailed kite within two miles of the project area and no white-tailed kites were

seen during field surveys; however, suitable nesting habitat exists in the riparian forest in the project vicinity. Loggerhead shrikes and other migratory birds are adaptable to urban environments and may occur anywhere along the project corridor as long as preferred habitat characteristics and abundant prey supplies are present. Project construction and the conversion of previously undeveloped areas would cause the loss of potential habitat for white-tailed kite and loggerhead shrike as well as more common migratory birds that are protected by the Migratory Bird Treaty Act (MBTA). There is abundant alternative foraging and nesting habitat in the general area. Preconstruction mitigation measures will be implemented as described in Section 3.15.3 to ensure no take of individual nests, eggs, or young of the species.

A Focused Biological Assessment for coho salmon, steelhead and chinook salmon will be submitted to the NOAA Fisheries to initiate formal consultation pursuant to Section 7 of the Federal Endangered Species Act (FESA). NOAA Fisheries will review the Biological Assessment and will return their Biological Opinion regarding whether the project is likely to jeopardize the continuation of the federally-listed fish species. It is anticipated that NOAA Fisheries will issue a no-jeopardy Biological Opinion incorporating project conditions and measures to minimize harm to the species before the environmental document for this project would be approved. The USFWS was requested on October 25, 2004 to concur that the project is unlikely to affect CTS. This concurrence was requested as part of the corridor CTS consultation being carried out with USFWS for three Highway 101 projects. A Biological Assessment for Vernal Pool Plant Species was submitted to the USFWS, with request for their concurrence that that project is unlikely to affect listed plants.

The California Department of Fish and Game (CDFG) will review the Draft EA/EIR and will determine if the USFWS biological opinion and conditions and measures to minimize harm to the species are consistent with the California Fish and Game Code and whether any additional measures are required to prevent harm to the Russian River tule perch, northern red-legged frog, foothill yellow-legged frog, western and northwestern pond turtles. It is also expected that CDFG's consistency determination will be received before the final environmental would be approved.

#### **3.15.3.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

The following avoidance, minimization, and mitigation measures are proposed to address the special-status species impacts identified in the foregoing section. The final measures will be subject to concurrence by the USFWS, NOAA Fisheries, and CDFG.

#### **Special-status Plant Species**

The project has been designed to use existing right-of-way to the greatest extent feasible, thus avoiding impacts to natural habitats in the project area that provide potential habitat for special-status plants. Retaining walls and side slopes steeper than standard have been incorporated at several locations to minimize right-of-way takes and impacts to natural communities that provide habitat for special-status plant species. Preliminary investigations indicate that it is unlikely that any vernal pool or other special-status plant species occur in the project area. Protocol-level surveys for listed vernal pool plant species are ongoing to complete the USACE HQE process for projects within the Santa Rosa Plain. Pre-construction surveys are also recommended during the bloom period for special-

status plants. In the unlikely event special-status plant species are found, mitigation will be discussed with the USFWS and CDFG and specific avoidance, minimization and/or mitigation measures will be established in accordance with the Santa Rosa Plain Conservation Strategy. Types of mitigation may include marking and protecting plants with orange safety fencing until seed-set later in the flowering season and/or collecting, storing, and growing seeds in a regional preserve or center for plant conservation following California Native Plant Society (CNPS) and CDFG plant protection guidelines.

### **Special-Status Wildlife Species**

The project has been designed to use existing right-of-way to the greatest extent feasible, thus avoiding impacts to natural habitats in the project area that provide habitat for special-status wildlife species. Potential for presence and impacts to special-status wildlife species is limited primarily to four fish species, three amphibian species, and two reptile species. Construction phase avoidance, minimization and/or mitigation measures are described in Section 3.16.13.2 for special-status wildlife species that may enter project drainage.

**Russian River Tule Perch and Pacific Salmon and Trout: Coho Salmon, Steelhead, and Chinook Salmon:** Modifications at the Mark West Creek crossing would be developed in consultation with NOAA Fisheries, and protective measures would be implemented to minimize incidental take of the species and to avoid jeopardizing the continued existence of the species. Revegetation, including erosion control, seeding and planting, will occur to maintain water clarity and nutrients. Revegetation of the creek and surrounding riparian areas will increase cover for Russian River tule perch, coho salmon, steelhead and chinook salmon, prevent erosion in streams, and provide a source of nutrients for the fish. Modifications and revegetation at Mark West Creek would be consistent with the CDFG's *California Salmonid Stream Habitat Restoration Manual*. Riparian habitat will be restored at a mitigation ratio to be established in consultation with NOAA Fisheries, USFWS and CDFG.

**Northern Red-legged Frog, Foothill Yellow-legged Frog, Western and Northwestern Pond Turtle:** Preconstruction surveys for these species, as described in Section 3.16.13, will be conducted at Mark West Creek. In the unlikely event that individual northern red-legged frogs, foothill yellow-legged frogs, western or northwestern pond turtles are encountered, they would be moved immediately to a pre-approved relocation site that is a minimum of 100 m (330 ft) downstream from the construction area boundary.

**California Tiger Salamander:** Consultation with the USFWS to determine appropriate compensation measures for potential impacts to CTS areas in accordance with the Santa Rosa Plain Conservation Strategy is ongoing. Replacement that would most benefit the species would involve purchase of sufficient property rights for habitat conservation to ensure preservation in perpetuity. This approach presumes the identification of suitable land located sufficiently within the Highway 101 corridor to address project impacts, but sufficiently far from the threat of future roadway or urban development to ensure preservation. A multi-agency cooperative endeavor including FHWA, Caltrans, SCTA, and a local public agency such as the Sonoma County Agricultural Preservation and Open Space District that would assume responsibility for maintenance of the habitat conservation

easement appears the most promising, subject to consultation with the USFWS and CDFG. Alternatively, SCTA would purchase credits at a USFWS/CDFG-approved habitat conservation bank. Final selection of compensatory measures for the CTS will be determined through coordination with the USFWS during the formal Section 7 consultation process.

### **3.15.4 Trees and Other Mature Vegetation**

#### **3.15.4.1 REGULATORY SETTING**

##### **California State Senate Concurrent Resolution No. 17**

California State Senate Concurrent Resolution No. 17 was filed with the Secretary of State on September 1, 1989. This resolution addresses the protection of native Valley/Coast live oak woodlands with respect to land use/transportation planning projects. The resolution specifically calls for State agencies to “preserve and protect native oak woodlands to the maximum extent feasible,” or “provide for replacement plantings where designated oak species are removed from oak woodlands.”

##### **California State Senate Bill 1334**

California State Senate Bill 1334 was filed with the Secretary of State on September 24, 2004. The bill outlines oak woodland mitigation options for counties to achieve feasible and proportional habitat mitigation under CEQA. If a county determines that a project within its jurisdiction may result in a significant effect to oak woodlands, the county shall require one or more mitigation alternatives as outlined in the bill to mitigate the effect of the conversion of oak woodlands.

##### **Sonoma County Tree Protection Ordinances**

The following Sonoma County ordinances apply to trees in County jurisdiction:

- The Sonoma County Tree Protection Ordinance No. 4044 establishes general provisions and construction standards to ensure that projects shall be designed to minimize the destruction of protected trees. Protected trees (greater than nine inches), their protected perimeters and whether they are to be retained or removed are to be clearly shown on all improvement plans. Applicants are required to comply with the conditions established in the Ordinance and are encouraged to use a qualified specialist to establish tree protection methods. The Ordinance also states that the Valley Oak (*Quercus lobata*) shall receive special consideration in the design review process to the extent that mature specimens shall be retained to the fullest extent feasible.
- The Sonoma County Valley Oak Ordinance No. 4991 defines Valley Oak sizes and mitigation options for removal of valley oaks. A written notice must be filed at least five days prior to removal.
- The Sonoma County Heritage Tree Ordinance No. 3651 provides for the identification and protection of designated heritage trees. The Ordinance requires approval and mitigation for removal of designated heritage trees.

#### **3.15.4.2 AFFECTED ENVIRONMENT**

Trees and other mature vegetation are located along the edge of Highway 101 at various locations throughout the project corridor. Mature trees in the corridor consist primarily of redwoods, with some Monterey Pines, eucalyptus, and oak trees. Consistent with the regulatory setting above, this section focuses on oak trees in the project vicinity. Existing redwood trees along Highway 101 are considered aesthetic resources because they were planted when the highway was originally constructed and are outside of their biological range, do not provide habitat, and do not support redwood populations, yet offer scenic amenity to the highway corridor. Therefore, redwood trees and other ornamental vegetation along the project corridor are discussed in Section 3.6, Visual/Aesthetics.

Existing trees within the project limits are grouped into two classifications:

- Mature trees, which have trunks greater than 25 cm (10 in) in diameter at breast height; and
- Trees/vegetation of relatively small size, which have trunks from 2.5 cm to 25 cm (one to 10 in) in diameter at breast height.

#### **3.15.4.3 ENVIRONMENTAL CONSEQUENCES**

The No-Build Alternative would not result in construction that would affect trees in the Highway 101 corridor. The proposed project would require removal of a total of 77 Valley oaks; 26 of these trees are classified as mature. Twenty-five Coast live oaks would be removed by the proposed project; 11 of these trees are classified as mature.

#### **3.15.4.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

The project has been designed to use existing right-of-way to the greatest extent feasible in order to reduce impacts to mature trees in the project area. The majority of the widening occurs in the median of the roadway. Retaining walls and side slopes steeper than standard would be constructed at several locations to minimize right-of-way and impacts to mature trees. Mature oak trees would be replaced within the project right-of-way or at a nearby location at a ratio to be determined in consultation with the CDFG. Caltrans and their contractors would comply with Federal, State and Sonoma County quarantine regulations related to Sudden Oak Death (SOD) and the disposal and transport of vegetation debris. Caltrans would comply with the conditions established in the Sonoma County Tree Protection Ordinance prior to removal of any trees outside of the State right-of-way and within County jurisdiction.

### **3.15.5 Invasive Species**

#### **3.15.5.1 REGULATORY SETTING**

On February 3, 1999, President Clinton signed Executive Order 13112, which directs the agencies of the executive branch of the federal government to work to prevent and control the introduction and spread of invasive species. Species that are likely to harm the environment, human health, or the economy are of particular concern. The executive order builds on the National Environmental Policy Act (NEPA) of 1969, the Federal Noxious Weed Act of 1974, and the Endangered Species Act of

1973 to prevent the introduction of invasive species; provide for their control; and take measures to minimize economic, ecological, and human health effects.

Invasive species, with respect to a particular ecosystem, are defined as any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to the ecosystem and is likely to cause economic or environmental harm or harm to human health.

Under the executive order, a federal agency cannot authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere unless all reasonable measures to minimize risk of harm have been analyzed and considered. Complying with the executive order means that federal-aid and Federal Lands Highway Program funds cannot be used for construction, revegetation, or landscaping that purposely includes the use of known invasive plant species.

The executive order established a National Invasive Species Council, and until an approved national list of invasive plants is defined by the council, “known invasive plants” are defined as those listed on the official noxious weed list of the state in which the activity occurs.

The following discussion complies with Executive Order 13112.

#### **3.15.5.2 AFFECTED ENVIRONMENT**

Highway 101 between Steele Lane and Windsor River Road consists of a four-lane freeway. Adjacent land use is primarily rural and agricultural, with single- and multi-family residential, commercial and industrial uses near the city centers. Vegetation is mostly ruderal/disturbed, ornamental landscape planted with coast redwood (*Sequoia sempervirens*), and agricultural planted with grapes (*Vitis vinifera*); there are few remaining natural areas. A variety of waterways traverse the corridor, some in excavated ditches or culverts and others in natural bottom channels or their natural watercourse. Soils in the project corridor are varied and consist of strongly cemented old valley floor alluvial soils, or clayey alluvial soils derived from mixed sedimentary, volcanic ash, or basic rock sources.

#### **3.15.5.3 ENVIRONMENTAL CONSEQUENCES**

The Highway 101 corridor provides opportunities for the movement of invasive species through the landscape. Invasive plant and animal species can move on vehicles and in the loads they carry. Weed seed can be inadvertently introduced into the corridor during construction on equipment and through the use of mulch, imported soil or gravel, or sod. Some invasive plant species might be deliberately or inadvertently planted in erosion control, landscape, or wildflower projects. The Highway 101 corridor is adjacent to a variety of private lands. Many of these adjacent lands have weed problems, and the highway and local roadway rights-of-way provide corridors along which these noxious and exotic weeds can spread. Implementation of avoidance and minimization efforts, as described below, would ensure that the proposed project would not contribute to the spread of invasive species.

#### **3.15.5.4 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

To prevent or minimize any introduction or spread of invasive species in the project area, the following methods will be incorporated into the construction specifications:

- Using high pressure water blasting or steam cleaning methods, clean all earthmoving equipment of dirt, mud, and seed residue before initially entering the project area.
- Avoid any unnecessary disturbance of project areas known to be infested with noxious weeds.
- Minimize soil disturbance within right-of-way.
- If soil disturbance outside slope stake limits is necessary, keep disturbed area to a minimum, monitor and control disturbed areas and topsoil stockpiles for growth of weed species subject to control, and re-vegetate in accordance with the landscape plans or other project specifications when disturbance is no longer necessary.
- Control weeds with pre-emergent, selective and nonselective herbicides. Inspect and monitor erosion control and other disturbed soils throughout construction. Inspect and monitor landscaping/seeding during the vegetation re-establishment period.
- Include payment for equipment cleaning under bid item for mobilization.
- Construction contractor shall comply with Federal, State and Sonoma County quarantine regulations related to SOD and the disposal and transport of vegetation debris.

To prevent or minimize any introduction or spread of invasive animal species in the project area, the construction specifications will require that the contractor adopt sanitation and exclusion methods for preventing spread of invasive species, such as the following:

- Restrict use of contaminated soils and fills,
- Require pest-free forage and mulch and weed-free sod,
- Wash construction equipment.

### **3.16 Construction Impacts**

#### **3.16.1 Construction Stages, Schedule, and Work Hours**

To minimize disruption to the traveling public, it is anticipated that the Highway 101 HOV Lane Widening Project would be constructed in stages. The following paragraphs present a feasible and reasonable method of construction staging for the purposes of identifying and evaluating construction impacts. Specific construction staging requirements would be defined during the final design process and an actual construction staging plan would be developed by the contractor. It is anticipated that construction of this project would take approximately two years to complete. The construction contract would be followed by a replacement planting contract that would require approximately six months to complete and would include a three-year plant establishment period.

Each construction stage would maintain two lanes of traffic on Highway 101 in each direction and all existing bicycle and pedestrian access would be maintained throughout the construction period,

except during critical short-term construction activities requiring closure to perform construction or for safety reasons.

Lane closures for this project would be made during non-peak travel periods. Closures would require advance approval by the Resident Engineer and would be allowed only during periods of low traffic defined through traffic studies made during the design phase in support of the construction project.

Most of the work could be done during daylight hours, but some nighttime work would be necessary to permit temporary closures for tasks that could interfere with mainline traffic or create safety hazards. Examples of these tasks include placing and removing temporary construction barriers, placing pre-cast bridge segments, or connecting or conforming ramps to the mainline or local streets.

A Transportation Management Plan (TMP) would be developed, in conjunction with the local jurisdictions. The TMP would provide advance notice to motorists and transportation and emergency service providers of information on construction activities and durations, detours, and access issues during each stage of construction. The TMP would identify services to facilitate the safe implementation of the construction project such as increased California Highway Patrol presence during critical construction operations and increased Freeway Service Patrol during peak travel periods. It would also include a public information program to provide motorists with advance notice of information related to the construction activities and durations, temporary closures and detours.

Temporary nighttime lane closures and/or detours would be required for activities such as placing and removing temporary concrete barriers to separate construction work areas and traffic. Some short-term closures (closures of a few hours to a few days) of existing interchange ramps may be necessary during some construction activities such as constructing conforms between existing and new roadways, paving operations, and lane striping. Advance notice would be provided of ramp closures, and traffic would be detoured to the adjacent interchanges for these periods. To maintain traffic on Highway 101 and local streets, construction activities requiring traffic lane or ramp closures would not be permitted at adjacent interchanges of Highway 101 at the same time.

In general, the construction staging for the mainline widening would require four stages. Stage 1 would construct the new southbound roadway and structures in the median. Once the median area roadway and structures are complete, Stage 2 would begin with shifting the southbound traffic to the newly constructed roadway in the median, and construction of the southbound outside lanes and shoulders would be performed. Stage 3 would shift southbound traffic to the newly completed southbound roadway, northbound traffic would be shifted to the median, and construction of the remaining northbound mainline outside lane and shoulder work would begin. Stage 4 would shift northbound traffic to its permanent location and construct remaining smaller elements of work such as the concrete median barrier.

Retaining walls would be constructed with the associated widening work in each stage and soundwalls would be constructed as early in each stage as practicable to help mitigate construction noise.

The Airport/Fulton Interchange Complex modifications would require the most complex staging on the project due to the combination of ramp reconfiguration and grade changes. However, the new

ramp structure work can be completed without the need for detours during construction, and the proximity of alternative ramps will result in only minor out-of-direction travel through the Airport/Fulton intersection when ramp closure and detouring is necessary.

### **3.16.2 Traffic and Transportation/Pedestrian and Bicycle Facilities**

#### **3.16.2.1 ENVIRONMENTAL CONSEQUENCES**

The following subsection discusses anticipated construction phase effects on traffic, pedestrian, and bicycle access. Section 3.16.1, Construction Stages, Schedule and Work Hours, discusses the conditions that might affect access during construction.

During the construction phase of the project, traffic in the vicinity of the Highway 101 interchanges or along the Highway 101 mainline in the project area could be disrupted by construction equipment and vehicles. Traffic on Highway 101 may also be affected by trucks hauling construction materials and debris. Each construction stage would maintain two lanes of traffic on Highway 101 in each direction and bicycle and pedestrian access would be maintained throughout the construction period, except during critical short-term construction operations requiring closure to perform construction or for safety reasons. Most work on the freeway would be performed in work areas separated from the moving traffic by temporary concrete barriers.

Some minor detours would be required on the ramps and connecting streets during such short-term closures. During construction of conforms of the ramps to the mainline, which would occur at night, traffic would be detoured to the adjacent interchanges. Most of the work could be done during daylight hours, but some nighttime work would be required to permit temporary closures for tasks that could interfere with mainline traffic or create safety hazards. Examples of these tasks include placing and removing temporary construction barriers, placing pre-cast bridge segments, or connecting or conforming ramps to the mainline or local streets.

Construction activities for the project are not expected to have substantial impact on the availability of parking. Impacts to non-motorized traffic would be similar to those affecting motorized traffic. Bicycles and pedestrians are prohibited on the Highway 101 right-of-way, but all detours of roadways that permit these modes of travel would include provisions for maintaining pedestrian and bicycle access during construction. Ramps meeting ADA requirements would be installed in sidewalks at all crosswalks affected by the project.

#### **3.16.2.2 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

Construction staging plans would be developed to minimize impacts to existing roadways. Contractors would be required to coordinate activities with commute schedules to minimize impacts to highway traffic in the corridor. Closure of one or more lanes for construction activities will be limited to late night and weekend hours when traffic is at a minimum.

The project TMP would include a public information program to provide motorists and transportation and emergency service providers with information related to construction activities and durations, temporary closures and detours. The SCTA would coordinate with Caltrans and the local

jurisdictions to provide the public with advance notice of any proposed traffic detours and their duration.

Construction crews would follow established safety practices, including using flaggers, to protect work crews in the construction zone not working behind a temporary concrete barrier. Provisions would be incorporated into the construction contracts to designate areas for construction worker parking and to avoid parking impacts to residential or business areas.

Construction haul routes would utilize Highway 101 during non-peak hours to the greatest extent practicable to avoid traffic impacts to residential or business areas.

### **3.16.3 Farmlands/Agricultural Lands**

It is not anticipated that construction activities would disturb agricultural land, crops or soils. Permanent effects on agricultural land in the project area are described in Section 3.3.

### **3.16.4 Community Impacts**

Construction of the Highway 101 HOV Lane Widening Project would involve temporary short-term lane closures or detours in the vicinity of the project. These are expected to have little or no effect on the ability of community members to access public services and facilities in the area. The primary effect would be the need for emergency vehicles to observe any short-term road closures and temporary construction detours. A Traffic Management Plan (TMP) would be developed by the construction contractor to address maintenance of traffic and emergency services delivery during construction. One element of the TMP would be to provide advance notice of and coordinate with emergency service providers regarding such short-term closures and detours. Construction-phase detours and road closures and the TMP were described in Section 3.16.2, Transportation and Traffic/Pedestrian and Bicycle Facilities.

Temporary construction easements would be required during construction of noise walls between Shiloh Road and Old Redwood Highway, temporarily affecting residential properties along the east side of Highway 101. No substantial adverse effects are anticipated, and therefore no mitigation is necessary beyond best management practices. As described in Section 3.16.6, Visual/Aesthetics, the construction contractor would be responsible to clear the work site of any trash or debris created by construction workers or activities and to maintain the site in an orderly manner. Dust control during construction is discussed in Section 3.16.11, Air Quality. Noise control measures relating to the construction of the proposed project are discussed in Section 3.16.12, Noise.

### **3.16.5 Utilities/Service Systems**

It is anticipated that utility relocation work would be performed in advance of the Highway 101 HOV lane widening work. However, some utilities may require protection in place during construction of the roadway improvements. Caltrans would coordinate with all utility providers during the preliminary engineering and design phases of the project so that effective design treatments and construction procedures are incorporated to avoid adverse impacts to existing utilities and traffic during construction. Nonetheless, the potential exists for construction activities to encounter

unexpected utilities within the area of roadway improvements. In addition, utility relocations may require short-term, limited interruptions of service. No interference to existing utility services is anticipated during the realignment of the overhead power transmission lines because PG&E would put customer loads on alternate lines until the connections are re-established.

If unexpected underground utilities are encountered, the construction contractor would coordinate with the utility provider to develop plans to address the utility conflict, protect the utility if needed, and limit service interruptions. Any short-term, limited service interruptions of known utilities would be scheduled well in advance and appropriate notification provided to users.

Caltrans would also coordinate with emergency service providers, and through the public information program, to avoid emergency service delays by ensuring that all providers are aware well in advance of road closures or detours.

### **3.16.6 Visual/Aesthetics**

All construction activities for the project would involve the use of a variety of construction equipment, stockpiling of soils and materials, and other visual signs of construction. While construction activity would be evident to corridor residents and employees/employers at businesses in the project area, these visual changes would be short-term. The construction contractor would be responsible to clear the work site of any trash or debris created by construction workers or activities and to maintain the site in an orderly manner. No substantial adverse impacts are anticipated, and therefore, no mitigation is necessary beyond best management practices, as described above. Dust control during construction is discussed in Section 3.16.11, Air Quality.

### **3.16.7 Cultural Resources**

#### **3.16.7.1 ARCHAEOLOGICAL IMPACTS**

As described in Section 3.7, Cultural Resources, a systematic and thorough program of subsurface investigation has been conducted in addition to secondary research to identify buried cultural resources. As a result of these efforts, it is not anticipated that construction activities would disturb buried cultural materials. In the unlikely event that buried cultural resources are inadvertently discovered during any ground-disturbing activities, Caltrans and FHWA would comply with 36 CFR 800.13 regarding late discoveries.

#### **3.16.7.2 HISTORIC ARCHITECTURAL IMPACTS**

No construction-phase adverse impacts to historic architectural resources are anticipated. There are no eligible historic resources in the project vicinity that could be affected by construction activities.

### **3.16.8 Hydrology and Floodplains**

#### **3.16.8.1 IMPACTS**

The Highway 101 HOV Lane Widening Project would involve construction over seven water bodies: East Windsor Creek; Pool Creek; Faught Creek; Pruitt Creek; Mark West Creek; and the north and middle branches of the Santa Rosa Flood Channel. Construction associated with waterway crossings could cause temporary changes in water volume or flow and increased siltation, sedimentation, erosion, and water turbidity from bankside activities and construction access.

#### **3.16.8.2 MITIGATION**

A Stormwater Pollution Prevention Plan (SWPPP) would be prepared and implemented, in accordance with Section 402 of the federal Clean Water Act, as amended. One purpose of the SWPPP is to identify areas of concern related to construction within or close to major waterways. As part of the requirements for the SWPPP, best management practices (BMPs) would be identified to be used during construction to minimize the effect of construction activities on waterways. Recommended construction-period BMPs include:

1. Scheduling construction during the non-rainy season.
2. Monitoring the forecast for rainfall; adjusting the construction schedule to allow implementation of soil stabilization and sediment treatment controls before the onset of rain.
3. Minimizing disturbance of stream crossings by selecting the narrowest crossing, avoiding steep and unstable banks or highly erodible soils, selecting equipment that reduces the amount of pressure exerted on the ground (e.g. using wide or high flotation tires, dual tires, tracked machines, etc), and using overhead or aerial access for transporting equipment across streams whenever possible.
4. Limiting temporary stream crossings to culverts or bridges if the stream crossing remains during the rainy season.
5. Continuously monitoring pumps and incorporating a standby pump for pumped diversion of in-stream flows. Employing velocity dissipation at the outlet as necessary to control erosion.
6. Sizing diversion channels and/or culverts to accommodate a minimum 10-year storm event if placed within the channel during the rainy season.
7. Isolating work areas within the waterway from the flow using sheet piling, k-rails, rip rap berms, or other methods of isolation.
8. Keeping equipment used in a waterway leak-free.
9. Stabilizing waterway embankments where necessary using rock slope protection, netting, erosion control blankets, gravel bag berms, fiber rolls, etc.
10. Protecting all drainage systems (culvert entrances, inlets, etc) from debris and sediment laden waters.

11. Washing the fines (using water from a water truck or hydrant) back into the interstitial spaces of the existing gravel and cobbles if in-channel disturbance of fines (sand and silt sized particles) occurs.

### **3.16.9 Water Quality and Stormwater Run-off**

#### **3.16.9.1 IMPACTS**

The Highway 101 HOV Lane Widening Project would involve construction over seven water bodies: East Windsor Creek; Pool Creek; Faught Creek; Pruitt Creek; Mark West Creek; and the north and middle branches of the Santa Rosa Flood Channel. Construction would involve cut and fill earthwork, asphalt paving, lengthening of culverts, bridge construction, retaining wall construction, site clearing, and landscaping. Each of these construction activities could have deleterious effects on the surrounding watershed and streams if stormwater and non-stormwater pollution controls were not in place during the time of construction. Another construction-phase impact would be the discharge of construction-related pollutants, including pollutants from stormwater and non-stormwater discharges.

#### **3.16.9.2 MITIGATION**

The contractor would prepare a SWPPP to identify construction-period BMPs to reduce water quality impacts. The SWPPP would emphasize: 1) standard temporary erosion control measures to reduce sedimentation and turbidity of surface run-off from disturbed areas, 2) personnel training, 3) scheduling and implementation of BMPs throughout the various construction phases and during various seasons, 4) identification of BMPs for non-stormwater discharge such as fuel spills, and 5) mitigation and monitoring throughout the construction period. The plan would be submitted to Caltrans and the Regional Water Quality Control Board.

During construction, erosion control procedures would be used such as the placement of mulch on all disturbed areas, fiber rolls along slopes, silt fences at the boundaries of the construction site, stabilized construction entrances and exits equipped with tire washing capability, and check dams placed strategically to reduce flow velocity and to filter flows in defined drainage-ways.

Construction over and adjacent to waterways would include special construction BMPs to minimize the debris deposition into those waterways, as follows:

- Demolition and construction over and adjacent to waterways would be accomplished using non-shattering methods that would not scatter debris (for example, wrecking balls would not be acceptable).
- Platforms would be placed under/adjacent to bridges over waterways to collect debris.
- Watertight curbs or toe-boards on bridges over waterways would be provided to contain spills and prevent materials, tools, and debris from falling from the bridge.
- Materials adjacent to waterways would be secured to prevent discharges via wind.

- Attachments would be placed on construction equipment such as backhoes to catch debris from small demolition operations.
- Accumulated debris and waste from demolition would be stockpiled away from the waterway.
- Work areas within the waterway would be isolated from the flow using sheet piling, k-rails, rip rap berms, or other methods.
- Drip pans would be used during equipment operation, maintenance, cleaning, fueling and storage for spill prevention. Drip pans would be placed under all vehicles and equipment placed on bridges when expected to be idle for more than 1 hour.
- Equipment would be kept in a leak-free waterway.
- Waterway embankments would be stabilized, using rock slope protection, netting, erosion control blankets, gravel bag berms, fiber rolls, and other stabilization methods, as necessary.
- All drainage systems (such as culvert entrances and inlets) would be protected from debris and sediment laden waters.
- Logs of all storm and spill events would be kept.

Groundwater may be encountered during excavation work for the cross culvert extensions. Early discussions with permitting agencies such as the County and the Regional Water Quality Control Board would be initiated during the final design phase to discuss requirements for handling and disposal of groundwater water during construction. The groundwater would be tested for potential contamination as a part of the Hazardous Waste Site Investigation to be conducted during the final design phase. Handling and disposal requirements of the groundwater would be based upon the level of contaminants reported in the Site Investigation Report.

### **3.16.10 Hazardous Wastes/Materials**

#### **3.16.10.1 IMPACTS**

Two principal types of hazardous wastes or materials may cause impacts during construction: (1) hazardous materials used during the construction process, and (2) hazardous wastes that are generated during construction. Construction phase impact may be caused by hazardous material used for construction and hazardous wastes that are generated during the construction process. Section 3.11, Hazardous Waste/Materials, discusses the potential for encountering pre-existing hazardous wastes within the project area and identifies appropriate mitigation measures.

Some hazardous materials, including fuels and motor oils, paints, cleaners, degreasers, and insulating materials, would be used during construction. While many of these materials are commonly used, they are considered hazardous materials (fuels, for example, are flammable) based on their physical properties, and improper handling could endanger workers and the public or result in contamination of soil and/or water.

The degree of hazard associated with these impacts on human or environmental receptors would depend upon the chemical properties, concentrations, or volumes of contaminants; the nature and

duration of construction activities; and contaminant migration pathways. The largest potential exposure risk is to the construction workers.

### **3.16.10.2 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

An approved Worker Health and Safety Plan (WH&SP) would address any hazardous materials handling during construction activities pursuant to Title 8 of the California Code of Regulations regarding workers' safety and the use of protective equipment during excavation, moving, or handling or contaminated soil or water. The WH&SP would establish measures to avoid or minimize potential worker and public exposure to airborne contaminant migration by incorporating dust suppression techniques in construction procedures. The plan also would address avoidance and minimization of worker and environmental exposure to contaminant migration via surface water run-off pathways by implementation of comprehensive measures to control drainage from excavations. In addition, the WH&SP would address handling, storage, and disposal of any hazardous materials used in the construction process. Since construction workers are in the closest proximity to potential hazards, a plan that avoids impacts to construction workers would provide adequate protection for surrounding residents, workers, and the traveling public.

## **3.16.11 Air Quality**

### **3.16.11.1 IMPACTS**

The BAAQMD's approach to the analysis of construction impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions. PM<sub>10</sub>, which is primarily emitted from earthmoving activities, is the pollutant of greatest concern with respect to construction activities. Under appropriate construction controls, there would be no adverse impacts from air pollutant emissions for construction activities.

Construction of the Build Alternative would consist of six phases over approximately two years, from 2009 to 2011: 1) clearing and grubbing; 2) earthwork; 3) construction of structures; 4) construction of retaining walls and sound walls; 5) paving; and 6) finishing. Pollutant emissions would be generated from the following construction activities:

1. Clearing and grubbing,
2. Grading and excavation,
3. Mobile emissions related to construction worker travel to and from project sites,
4. Mobile emissions related to the delivery and hauling of construction supplies and debris to and from project sites, and
5. Fuel combustion by on-site construction equipment.

The South Coast Air Quality Management District's (SCAQMD) construction emissions calculation formulas were used to estimate construction emissions. Table 3.16.11-1, Construction Emissions, shows the estimated emissions associated with each phase of construction for the five criteria pollutants.

**Table 3.16.11-1: Construction Emissions**

Construction Phase	Pounds per Day				
	CO	ROG	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
1. Clearing & Grubbing	25	7	84	14	64
2. Earthwork	30	8	97	16	68
3. Structures	45	10	130	23	53
4. Retaining Walls & Soundwalls	36	9	106	19	52
5. Paving	32	8	103	17	71
6. Finishing	18	5	67	11	18

Source: Terry A. Hayes Associates LLC, 2005.

### 3.16.11.2 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Caltrans will develop a Construction Emissions Mitigation Plan that would include measures such as the following:

- All active construction areas shall be watered at least twice daily.
- All trucks hauling soil, sand, and other loose materials shall be covered and shall maintain at least two feet of freeboard.
- All unpaved access roads, parking areas, and staging areas at the construction site shall be watered at least three times daily or shall be applied with non-toxic soil stabilizers.
- All paved access roads, parking areas, and staging areas at the construction site shall be swept daily with water sweepers.
- Streets shall be swept daily with water sweepers if visible soil material is carried onto adjacent public streets.
- Non-toxic soil stabilizers shall be applied to inactive construction areas (previously graded areas that are inactive for ten days or more).
- Exposed stockpiles of dirt, sand, or debris shall be enclosed, covered, watered at least twice daily, or applied with non-toxic soil binders.
- Traffic speeds on unpaved roads shall be limited to 15 miles per hour.
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways.
- Operations on any unpaved surfaces shall be suspended during “Spare the Air” days.
- Vegetation in disturbed areas shall be replanted as quickly as possible.
- Tires or tracks of all trucks and equipment leaving the site shall be washed.
- Excavation and grading activities shall be suspended when winds exceed 25 miles per hour.
- Construction equipment shall use cool exhaust recirculation.

Table 3.16.11-2 shows estimated construction emissions with mitigation applied.

**Table 3.16.11-2: Construction Emissions With Mitigation**

Construction Phase	Pounds per Day				
	CO	ROG	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
Clearing & Grubbing	3	1	51	14	30
Earthwork	4	1	58	16	32
Structures	5	1	78	23	24
Retaining Walls & Soundwalls	4	1	63	19	24
Paving	4	1	62	17	34
Finishing	3	1	40	11	8

Source: Terry A. Hayes Associates LLC, 2005.

### 3.16.12 Noise

Noise at the construction sites would be intermittent and would vary in intensity at different areas of the project site. The degree of construction noise would vary also with types of construction activities.

#### 3.16.12.1 REGULATORY SETTING

During the construction period, contractors would be required to comply with the noise ordinances of the cities of Windsor and Santa Rosa:

**Town of Windsor** – Windsor limits construction activities to the hours between 7:00 AM and 7:00 PM, Monday through Friday, and 8:00 AM to 7:00 PM on Saturdays. Construction is not permitted on Sundays unless authorized by the Planning Commission or Town Council (Windsor, 2004).

**City of Santa Rosa** – The city does not have any specific regulations that limit construction activities to certain hours of the day. However, the noise ordinance of the municipal code limits the noise level of machinery and equipment to within five decibels above the background ambient noise level when averaged over a 15-minute period. If the ambient noise levels are lower than the base ambient levels listed in Table 3.16.12-1, then the base levels in the table shall be used as the ambient level (Santa Rosa, 2004).

**Table 3.16.12-1: Base Ambient Noise Levels for the City of Santa Rosa**

Community Zone	Time	Base Ambient Level, dBA
Single-family residential	7 AM – 7 PM	55
	7 PM – 10 PM	50
	10 PM – 7 AM	45
Multi-family residential	7 AM – 10 PM	55
	10 PM – 7 AM	50
Office and Commercial	7 AM – 10 PM	60
	10 PM – 7 AM	55
Intensive Commercial	7 AM – 10 PM	65
	10 PM – 7 AM	55
Industrial	Anytime	70

Source: City of Santa Rosa, 2004.

### **3.16.12.2 IMPACTS**

Long-duration construction noise exposures are difficult to quantify due to the intermittent nature of construction noise. Highway construction is accomplished in several different phases, during which some receptors near the highway may be exposed to high noise levels. Table 3.16.12-2 lists the calculated noise level for typical construction activities that could be expected in the project area.

### **3.16.12.3 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

The following control measures would be implemented to minimize noise disturbances at sensitive receptors during construction:

#### **Equipment Noise Control**

- Ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine enclosures, and engine vibration isolators intact and operational. All construction equipment would be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding, etc.) (Caltrans, 1999).
- Ensure that all idling equipment is turned off.

#### **Administrative Measures**

- Implement a construction noise monitoring program to limit the impacts.
- Plan noisier operations during times of least sensitivity for receptors.
- Keep noise levels relatively uniform and avoid impulsive noises.
- Maintain good public relations with the community to minimize objections to unavoidable construction noise. Provide frequent activity updates of all construction activities.

Application of the mitigation measures will reduce construction noise at the sensitive receptors; although, a temporary increase in noise would likely occur.

**Table 3.16.12-2: Construction Operation Noise Levels**

No. of Items	Equipment Type	Maximum Equipment Noise Level at 15 m, dBA	Hourly Equivalent Noise Levels at 15 m, dBA <sup>1</sup>	Hourly Equivalent Noise Levels at 30 m, dBA <sup>1</sup>	No. of Items	Equipment Type	Maximum Equipment Noise Level at 15 m, dBA	Hourly Equivalent Noise Levels at 15 m, dBA <sup>1</sup>	Hourly Equivalent Noise Levels at 30 m, dBA
<b>Clear and Grub</b>					<b>Earthwork</b>				
1	Excavator	83	80	74	1	Excavator	83	80	74
1	Backhoe	75	72	66	1	Backhoe	75	72	66
4	Heavy Duty Dump Trucks	73	70	64	1	Front Loader	76	73	67
<b>Overall L<sub>eq</sub>(h)</b>			82	76	1	Dozer	85	82	76
<b>Bridge Demolition</b>					1	Trencher	80	77	71
1	Front Loader	76	73	67	4	Heavy Duty Dump Trucks	73	70	64
1	Hoe Ram	89	86	80	<b>Overall L<sub>eq</sub>(h)</b>			86	80
4	Heavy Duty Dump Trucks	73	70	64	<b>Structures</b>				
<b>Overall L<sub>eq</sub>(h)</b>			87	81	1	Excavator	83	80	74
<b>Retaining Walls</b>					1	Backhoe	75	72	66
1	Backhoe	75	72	66	1	Backhoe	75	72	66
1	Bomag BMP 851	80	77	71	1	Bomag BMP 851	80	77	71
1	Concrete Pump	74	71	65	1	Crane	78	75	69
1	Compressor	68	65	59	1	Concrete Pump	74	71	65
3	Ready Mix Trucks	72	69	63	1	Compressor	68	65	59
4	Medium Duty Dump Trucks	77	74	68	1	Bridge Deck Paver	77	74	68
2	Flatbed Truck	70	67	61	2	Flatbed Truck	75	72	66
<b>Overall L<sub>eq</sub>(h)</b>			84	78	1	Pile Driver	80	77	71
<b>Paving</b>					4	Medium Duty Dump Trucks	73	70	64
1	Grader	75	72	66	3	Ready Mix Trucks	81	78	72
1	Water Truck	77	74	68	<b>Overall L<sub>eq</sub>(h)</b>			88	82
1	Vibratory Roller	78	75	69	<b>Misc.</b>				
1	Compactor	76	73	67	1	Front Loader	76	73	67
1	Concrete Pump	74	71	65	1	Dozer	79	76	70
3	Ready Mix Trucks	72	69	63	2	Medium Duty Dump Trucks	73	70	64
1	Asphalt Paver	79	76	70	<b>Overall L<sub>eq</sub>(h)</b>			79	73
1	Asphalt Roller	78	75	69	<b>Notes:</b> Calculated construction noise levels assume that all equipment operates for six hours out of an eight hour day. Calculations also assume that all equipment are operated at full load 70 % of the time.				
1	Sweeper	79	76	70	1 - Predicted noise levels are from the center of the construction activity.				
4	Medium Duty Dump Trucks	73	70	64	Source: Parsons 2005				
2	Flatbed Truck	70	67	61					
<b>Overall L<sub>eq</sub>(h)</b>			85	79					

### 3.16.13 Biological Resources

#### 3.16.13.1 IMPACTS

This section focuses on the short-term, temporary impacts of constructing the Build Alternative on biological resources in the project vicinity. Permanent impacts and mitigation measures are addressed in Section 3.15, Biological Environment.

#### Natural Communities

Temporary effects on natural communities that would result from the Build Alternative are shown in Table 3.16.13-1. Impacts would vary with northbound or southbound options A or B at the Fulton Road/Airport Boulevard Interchange Complex. Impacts for all four possible combinations are shown in the table.

<b>Table 3.16.13-1: Temporary Impacts to Natural Communities for the Build Alternative (hectares/acres)</b>				
<b>Affected Natural Communities</b>	<b>Total Area of Impact (Hectares/Acres)</b>			
	<b>Build Alternative (including Options at Fulton Road/ Airport Boulevard Interchange Complex) <sup>1</sup></b>			
	<b>NB-A/SB-A</b>	<b>NB-A/SB-B</b>	<b>NB-B/SB-A</b>	<b>NB-B/SB-B</b>
Ruderal/Disturbed	13.0 ha/ 32.5 ac	13.0 ha/ 32.5 ac	13.0 ha/ 32.5 ac	13.0 ha/ 32.5 ac
Non-native Grassland	0.05 ha/ 0.13 ac	0.05 ha/ 0.13 ac	0.10 ha/ 0.25 ac	0.10 ha/ 0.25 ac
Seasonal/Freshwater Emergent Wetland/Open Water	0.02 ha/ 0.06 ac	0.05 ha/ 0.13 ac	0.02 ha/ 0.06 ac	0.05 ha/ 0.13 ac
Willow Riparian Scrub	0.08 ha/ 0.20 ac	0.08 ha/ 0.20 ac	0.06 ha/ 0.15 ac	0.08 ha/ 0.75 ac
Coyote Brush Scrub	0.006 ha/ 0.014 ac	0.006 ha/ 0.014 ac	0.006 ha/ 0.014 ac	0.0002 ha/ 0.014 ac
North Coast Black Cottonwood Riparian Forest	0.20 ha/ 0.50 ac	0.25 ha/ 0.63 ac	0.26 ha/ 0.65 ac	0.31 ha/ 0.78 ac

<sup>1</sup> NB – A = Northbound Option A; NB – B = Northbound Option B; SB – A = Southbound Option A; SB – B = Southbound Option B  
Source: Parsons 2005

#### Wetlands and Other Waters of the United States

The project has the potential to temporarily affect up to 0.034 ha (0.084 ac) of jurisdictional wetlands and 0.111 ha (0.275 ac) of other waters of the U.S., or 0.145 ha (0.359 ac) total wetlands/waters. Impacts would vary with northbound or southbound options A or B at the Fulton Road/Airport Boulevard Interchange Complex. Impacts for all four possible combinations are shown Tables 3.15-3a and 3b in Section 3.15.2 Wetlands and Other Waters of the U.S. Avoidance and minimization measures are proposed in Section 3.15.3.4.

### **Threatened and Endangered Species**

As described in Section 3.15, Biological Environment, suitable habitat for four special-status fish species, coho salmon, steelhead, chinook salmon, and Russian River tule perch, occurs in the project area at Mark West Creek. Avoidance and minimization measures, including best management practices, are proposed to avoid incidental take of individuals and minimize impacts to their habitat (See Section 3.16.13.2, below).

No evidence of northern red-legged frog, foothill yellow-legged frog, western or northwestern pond turtle was observed in the project area; however, suitable habitat for these species occurs within Mark West Creek, which could be affected during construction activities. Avoidance and minimization measures, including pre-construction surveys, are proposed to avoid incidental take of individuals and minimize impacts to the species' habitat. If project activities cannot avoid the bird breeding season, pre-construction surveys are proposed for white-tailed kite and loggerhead shrike, as well as other migratory bird species.

No special-status plants were identified in the project vicinity during preliminary field studies, and it is not anticipated that special-status plants would occur in the project vicinity at the time of construction. Protocol-level presence/absence surveys for 25 special-status plant species for which potentially suitable habitat was identified are ongoing. Pre-construction surveys are also recommended for these plant species to ensure that no harm to the species would occur during construction.

#### **3.16.13.2 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

Construction phase impacts would be avoided or minimized by using Caltrans standard specifications and BMPs that have been established for construction of State highway facilities (Caltrans 1995). Procedures are identified with respect to individual biological resource issues in the following paragraphs.

#### **Natural Communities**

**Willow Riparian Scrub and North Coast Black Cottonwood Riparian Forest.** Avoidance measures to minimize construction-phase effects on willow riparian scrub and North Coast black cottonwood riparian forest would consist of identifying, marking, and protecting trees with protective orange fencing to avoid disturbance or accidental intrusion by workers or equipment.

#### **Wetlands and Other Waters of the U.S.**

The following avoidance measures would be included in the project specifications and special provisions to avoid or minimize effects on wetlands/other waters of the U.S.:

- Construction within wetlands and drainages would be avoided during the rainy season to prevent excessive siltation and sedimentation;
- Materials and fluids generated by construction activities would be placed at least 30 meters (100 feet) from wetland areas or drainages until they could be disposed of in accordance with applicable regulations; and

- All natural communities and wetland areas located outside of the construction zone that could be affected by construction activities would be temporarily fenced off and designated as Environmentally Sensitive Areas (ESAs) to prevent accidental intrusion by workers and equipment.

Wetland habitats that are temporarily lost or disturbed due to project construction would be restored on-site to preconstruction conditions. Revegetation would be with native species such as cattails (*Typha* spp.), *Juncus* spp., or *Cyperus* spp. Any revegetation would be carried out by a contractor qualified in habitat restoration.

### **Special-Status Plant Species**

Protocol-level presence/absence surveys for special-status plant species are ongoing as described in Section 3.15.3.2 Affected Environment – Special-status Plant Species. Pre-construction plant surveys for special-status plant species are recommended during the bloom period prior to construction. In the unlikely event, special-status plant species are found, mitigation will be discussed with the USFWS and CDFG and specific mitigation measures identified as appropriate. Types of mitigation may include marking and protecting plants with high visibility fencing until seed-set later in the flowering season and/or collecting, storing, and growing seeds in a regional preserve or center for plant conservation following CNPS and CDFG plant protection guidelines.

### **Special-Status Wildlife Species**

**Pacific Salmon and Trout: Coho Salmon, Steelhead and Chinook Salmon:** The construction contractor shall adopt BMPs that NOAA Fisheries, USFWS, and CDFG believe would help avoid jeopardizing the continued existence of the species, including:

- Loss of vegetation and delivery of sediments to streams will be minimized through the creation of buffer zones where the project crosses through riparian areas. Construction activities, such as staging, stockpiling of materials or equipment, and equipment movement will be limited to locations outside of riparian areas, where possible. Riparian areas will be identified as ESAs and will be clearly marked with fencing.
- Construction and grading that would affect Mark West Creek and drainages, or upland areas that might erode into the creek or drainages, would be restricted to the period from June 15 to October 15.
- A Storm Water Pollution Prevention Plan (SWPPP) will be implemented to minimize storm water and groundwater pollution caused by construction activities. The SWPPP will outline erosion control measures and other BMPs to control and prevent to the maximum extent practicable the discharge of pollutants to surface and water and groundwater.
- Mark West Creek will be temporarily piped through the construction area between June 15 and October 15.
- All coho salmon, steelhead and chinook salmon present in dewatered areas will be captured and transported to free flowing water by a NOAA Fisheries approved biologist.

**Russian River Tule Perch:** Avoidance and minimization measures, as described above for coho salmon, steelhead and chinook salmon, would be sufficient to protect Russian River tule perch.

**Northern Red-legged Frog, Foothill Yellow-legged Frog, and Western and Northwestern Pond Turtle:** Avoidance and minimization efforts, including preconstruction surveys, would be implemented to avoid construction-related impacts to northern red-legged frog, foothill yellow-legged frog, and western and northwestern pond turtle, as described below.

- BMPs would be implemented during all phases of construction.
- The construction contractor shall furnish a biologist qualified to survey for northern red-legged frogs, foothill yellow-legged frogs, and western and northwestern pond turtles.
- Twenty-four hours prior to construction activities, the project areas would be surveyed by the qualified biologist for northern red-legged frog, foothill yellow-legged frog, and western and northwestern pond turtle. Surveys of the project area would be repeated if a lapse in construction activity of two weeks or greater should occur.
- A Worker Environmental Awareness Program would be conducted to provide construction personnel with information on their responsibilities with regard to the northern red-legged frog, foothill yellow-legged frog, and western and northwestern pond turtle.
- A permitted biological monitor shall be on-call and capable of responding to the work site within one hour.
- If individual northern red-legged frogs, foothill yellow-legged frogs, western or northwestern pond turtles are encountered, they would be moved immediately to a site that is a minimum of 100 meters from the construction area boundary. The relocation site would be determined prior to commencement of construction activities.
- If northern red-legged frogs, foothill yellow-legged frogs, western or northwestern pond turtles are encountered during construction, all activities shall cease until appropriate corrective measures have been completed or it has been determined that the species will not be harmed.

**White-tailed Kite, Loggerhead Shrike and Other Migratory Birds:**

- If project activities cannot avoid the bird breeding season (generally February 1 – August 31), focused pre-construction breeding surveys will be conducted for white-tailed kite and loggerhead shrike, as well as other species protected under the MBTA.
- Surveys shall be conducted in all areas that may provide suitable nesting habitat by a suitably qualified ornithologist to be furnished by the contractor.
- Surveys would include areas within 500 feet of the construction area that provide potential nesting habitat (access permitting).
- No more than two weeks before construction, a survey for nesting would be conducted by a qualified ornithologist.
- If nesting birds are identified, occupied nests would not be disturbed during the nesting season (February 1 through August 31 for raptors; March 1 through August 31 for other species),

including a minimum 250-foot buffer zone around any occupied nest, 150 feet for other non-special status passerine birds, and up to 500 feet for raptors.

- Construction-related activities would not be allowed within the buffer zone until the young have fledged.
- For activities that occur outside the bird breeding season (generally September 1 through February 28), such surveys would not be required.

### **3.16.14 Construction Employment**

Given the size of the Bay Area economy, neither the No-Build nor the Build alternatives would result in substantial changes to regional socioeconomics beyond current regional planned and forecasted growth. The Build Alternative would result in a temporary increase in construction related employment, as described below.

#### **3.16.14.1 METHODOLOGY AND IMPACTS**

Table 3.16.14-1 provides an estimate of the number of employment positions and level of economic activity created by the expenditure of construction funds for the No-Build and Build Alternatives. Estimates are based in part on an input/output study of construction activity in Texas by the Federal Highway Administration (Politano and Roadifer, 1989). Funds created in economic output include the multiplier effect of direct construction being re-spent in service or other sectors of the economy. Economic activity generated by the proposed project is anticipated to benefit the San Francisco Bay Area region and would also follow the labor and material markets for transportation-related construction.

With respect to job creation, FHWA found nationally in the early 1980s that a one million dollar investment in transportation construction would directly generate 10 on-site, full-time construction jobs (person years of employment [PYE]). This number has been adjusted to 5.5 PYE positions to reflect inflation through 2006. When off-site, construction-related and service-industry-related jobs and related increases in consumer demand (direct, indirect, and induced effects) are considered, the total number of full time PYE positions created rises to about 11.0, adjusting for inflation, for each one million dollars of highway investment.

Compared with the No-Build Alternative, capital costs for construction of the Build Alternative would be \$131.3 to \$133.7 million, exclusive of right-of-way. Construction expenditures would generate approximately 700 on-site full-time construction positions (PYE) and from 1,400 to 1,500 total positions (PYE), including direct, indirect, and induced, as compared to the No-Build Alternative, depending on which option is selected.

The impact of this direct and indirect employment added to the regional economy would be positive.

**3.16.14.2 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES**

As the impacts are beneficial, no mitigation is proposed.

<b>Table 3.16.14-1: Impacts from Construction Investment in the Highway 101 HOV Widening Project: Steele Lane to Windsor River Road (millions of 2006 dollars)</b>					
<b>Alternative</b>	<b>Construction Value*</b>	<b>Regional Economic Output</b>	<b>Total Earnings</b>	<b>Job Creation (Person Years of Employment)</b>	
				<b>On-Site</b>	<b>Total</b>
Build Alternative – Option NB - A / SB - A	\$131.3	\$228.2	\$60.4	700	1,400
Build Alternative – Option NB - A / SB - B	\$132.7	\$230.6	\$61.1	700	1,500
Build Alternative – Option NB - B / SB - A	\$132.3	\$229.9	\$60.9	700	1,500
Build Alternative – Option NB - B / SB - B	\$133.7	\$232.4	\$61.6	700	1,500
<b>No-Build Alternative</b>	N/A	N/A	N/A	N/A	N/A

\* Construction impacts are based on preliminary estimates for construction value, which exclude right-of-way costs and include design, construction management, and agency costs.  
N/A =Not Applicable  
Sources:  
A.L Politano and Carol J. Roadifer, *Regional Economic Impact Model for Highway Systems, Transportation Research Record 1229*, Transportation Research Board, Washington D.C., 1989. (Model adjusted to reflect inflation.)  
Parsons, 2006.