

2.3 BIOLOGICAL ENVIRONMENT

2.3.1 NATURAL COMMUNITIES

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in **Section 2.3.5, Threatened and Endangered Species**. Wetlands and other waters are also discussed below in **Section 2.3.2, Wetlands and Other Waters**.

AFFECTED ENVIRONMENT

The following analysis is based on the Natural Environment Study (NES) prepared for the project (Caltrans, 2014k).

The biological study area (BSA) for the project includes the physical footprint of the Build Alternative, including all areas where ground disturbance would occur from the construction of the proposed improvements (e.g., construction staging areas, demolition, earthmoving activities, etc.), areas of right-of-way to be obtained for the project, and temporary access areas. The BSA was defined to also include the areas of indirect potential effects that may occur outside of the direct physical footprint of the Build Alternative. **Appendix H** illustrates the limits of the BSA for the Build Alternative.

The BSA does not extend far beyond the project limits, thus the majority of the land within the BSA is disturbed or developed. The BSA totals 778.13 acres, of which the majority is disturbed or developed. In general, the BSA runs within approximately 20 miles of Caltrans state right-of-way associated with the I-80 corridor, from just west of Red Top Road to east of the intersection of I-80 and I-505 (post mile 10.2 to 30.4). Formal studies of biological resources within the BSA were conducted on the following listed survey dates:

- Botanical surveys conducted between September 2011, March 2012, May 2012, March 2013, May 2013, and August 2013, served as reconnaissance to map vegetation and identify suitable habitat for special-status plant species in the BSA. The results were used to inform the specific timing and locations for subsequent botanical surveys.
- Multiple field investigations were conducted from April to June and August to September in 2011 to delineate potential waters of the U.S., including wetlands and water features.
- Large branchiopod surveys were conducted from March 2012 to April 2013.

- Bat assessments were conducted in August 2011 at each bridge and crossing within the BSA.
- A habitat assessment for anadromous fish was conducted in 2012.
- A protocol-level site assessment for the California tiger salamander (*Ambystoma californiense*) was conducted in August 2013.
- Protocol-level California red-legged frog (*Rana draytonii*) surveys were conducted in August 2013.
- Reconnaissance level surveys for the Swainson's hawk (*Buteo swainsoni*) were conducted in April 2012.
- Multiple tree surveys were conducted in September 2011 and between October and December 2011.

Subsequent to the completion of biological field surveys conducted in 2011 and 2012, the project limits were extended 1 mile in each direction to accommodate changes to entrance and exit signage, and to facilitate utility connections. Each survey was reviewed upon changes to the project limits, and additional surveys were performed in 2013, if necessary. All acreages (e.g., impact areas and land cover types) discussed in this section reflect the current project limits.

There are 14 habitat types in the BSA. Of the various habitats present within the BSA, oak woodlands, riparian woodlands, mixed oak woodlands, and wetlands are considered sensitive habitat types. Impacts to four types of aquatic and wetland habitats are discussed in **Section 2.3.2, Wetlands and Other Waters**, which discusses jurisdictional wetlands and other waters within the BSA.

Table 2.3-1 lists the remaining ten land use communities present within the BSA. **Appendix H** illustrates the distribution of the natural communities within the BSA. Principal characteristics and general locations of these communities as they exist within the BSA are described below. The vegetation types identified within the BSA support a variety of wildlife species, including mammals, birds, amphibians, reptiles, and fishes. Marsh habitats can provide habitat for fish nurseries, amphibians, aquatic reptiles, wading birds, waterfowl, and songbirds. Riparian woodland can provide foraging, roosting, and nesting habitat for a variety of birds and provide cover and refuge sites for small mammals, amphibians, and reptiles. Detailed descriptions of each habitat and vegetation mapping are described in greater detail in the NES.

Table 2.3-1 Land Cover Types within the BSA

Land Cover Type	Total Area within BSA (acres)
West Segment	
Non-Native Annual Grassland	39.72
Landscaped	25.18
Ruderal	22.47
Barren	14.79
Mixed Oak Woodland	0.89
Riparian Woodland	0.26
Eucalyptus Grove	4.44
Row Crops	0.58
Coyote Brush Scrub	0.22
Developed	238.45
West Segment Total	347.00
East Segment	
Non-Native Annual Grassland	68.33
Landscaped	39.05
Ruderal	39.64
Barren	2.32
Mixed Oak Woodland	14.90
Riparian Woodland	3.31
Eucalyptus Grove	5.02
Row Crops	3.13
Coyote Brush Scrub	2.84
Developed	239.75
East Segment Total	418.29
Build Alternative	
Non-Native Annual Grassland	108.05
Landscaped	64.23
Ruderal	62.11
Barren	17.11
Mixed Oak Woodland	15.79
Riparian Woodland	3.57
Eucalyptus Grove	9.46
Row Crops	3.71
Coyote Brush Scrub	3.06
Developed	478.20
Total Build Alternative	765.29

Source: Caltrans, 2014k

Non-Native Annual Grassland

Vegetation

Non-native grassland occurs in small patches throughout the BSA and is the dominant vegetation type within the BSA abundant habitat types. Non-native grassland is generally dominated by exotic annual grasses and forbs including wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), Italian ryegrass (*Festuca perennis*), yellow star-thistle (*Centaurea solstitialis*), hare barley (*Hordeum murinum* ssp. *leporinum*), medusa-head grass (*Elymus caput-medusae*), mustards (*Brassica* spp.), and filarees (*Erodium* spp.). Occasional native species are also present, but less dominant than non-native species. These include the blue wildrye (*Elymus glaucus*) and California poppy (*Eschscholzia californica*).

Wildlife in Grassland Habitat

Grasslands lack the structural diversity necessary to support a high diversity of wildlife species, but are used as foraging, burrowing, and nesting locations by moderate numbers of wildlife species. Annual grassland habitat in the BSA is used by reptiles and amphibians such as the western fence lizard (*Sceloporus occidentalis*), western skink (*Eumeces skiltonianus*), and western toad (*Anaxyrus boreas*) that feed on invertebrates found within and beneath debris in the vegetation. Insect and seed eating birds, including the western scrub-jay (*Aphelocoma californica*), barn swallow (*Hirundo rustica*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), golden-crowned sparrow (*Zonotrichia atricapilla*), and white-crowned sparrow (*Zonotrichia leucophrys*), also use this habitat for foraging, and the scattered trees provide nesting habitat. A number of mammal species, including the deer mouse (*Peromyscus maniculatus*), Botta's pocket gopher (*Thomomys bottae*), and black-tailed hare (*Lepus californicus*), forage and nest within these grasslands. These mammals also attract predatory wildlife including the gopher snake (*Pituophis catenifer*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), and gray fox (*Urocyon cinereoargenteus*).

Landscaped

Vegetation

Landscaped areas occur throughout the BSA in close association with existing development. These areas have been impacted by grading, mowing, filling, and urban uses. Landscaped areas include irrigated lawns as well as ornamental trees and shrubs. In some cases, landscaping includes planted native trees such as the California sycamore (*Platanus racemosa*), Fremont's cottonwood (*Populus fremontii*), bishop pine (*Pinus muricata*), and Monterey cypress (*Hesperocyparis macrocarpa*).

Wildlife in Landscaped Habitat

The landscaped areas within the BSA are frequently disturbed, and are used only by the most disturbance-tolerant wildlife species. The species that are found here are often introduced, non-natives such as rock pigeons (*Columba livia*), European starlings (*Sturnus vulgaris*), and house sparrows (*Passer domesticus*). Other species occurring within landscaped habitat include mourning doves, Brewer's blackbirds (*Euphagus cyanocephalus*), killdeer (*Charadrius vociferus*), and northern mockingbirds.

Ruderal*Vegetation*

Ruderal habitat is generally dominated by non-native species that are able to rapidly colonize and establish on recently disturbed soil. Ruderal habitat occurs in numerous small patches along the roadside in the BSA. Typical dominant vegetation in these areas includes winter vetch (*Vicia villosa*), Italian thistle (*Carduus pycnocephalus*), milk thistle (*Silybum maritimum*), filarees, prickly sow-thistle (*Sonchus asper*), riggut brome, wild radish (*Raphanus sativus*), mustards (*Brassica* spp.), bur-clover (*Medicago polymorpha*), and horseweed (*Conyza canadensis*).

Wildlife in Ruderal Habitat

Wildlife species found in ruderal areas are typically those species found in developed habitats and that use adjacent ruderal areas for foraging and moving. Common wildlife species found in ruderal habitats include western fence lizards, killdeer, house finches (*Haemorhous mexicanus*), western meadowlarks (*Sturnella neglecta*), red-winged blackbirds (*Agelaius phoeniceus*), American goldfinches (*Carduelis tristis*), mourning doves, house mice (*Mus musculus*), black-tailed hares, and California ground squirrels (*Spermophilus beecheyi*).

Barren*Vegetation*

In the BSA, barren habitat typically occurs along roadsides and in other areas that experience frequent, heavy disturbance. Although these areas are not covered in hardscape (i.e. asphalt or concrete), the soil is either heavily compacted or covered in gravel which prohibits the growth of most plant species. Total plant cover in these areas is less than five percent.

Wildlife in Barren Habitat

Barren habitat provides few resources to wildlife species. Although some species associated with adjacent habitats likely forage on the soil of the barren habitat to some extent, use of this habitat by wildlife is expected to be limited.

Mixed Oak Woodland

Vegetation

Mixed oak woodland often occurs along riparian corridors within the BSA, but can also occur in upland settings away from stream and creek channels. This habitat is generally co-dominated by valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), and interior live oak (*Quercus wislizenii* var. *wislizenii*). Other common native species include elderberry (*Sambucus nigra*), California buckeye, and poison oak (*Toxicodendron diversilobum*). The understory of the mixed oak woodland habitat is generally composed of non-native annual grassland.

Wildlife in Mixed Oak Woodland Habitat

Mixed oak woodland habitat can support diverse animal communities in California. Both valley and coast live oaks in this habitat provide shelter for wildlife in the form of cavities, bark crevices, and complex branching growth, as well as abundant food resources, including nuts and invertebrates. Leaf litter and fallen logs in the mixed oak woodland may provide cover and foraging habitat for California slender salamanders (*Batrachoseps attenuatus*), western fence lizards, and other common reptiles. Common bird species in the mixed oak woodland includes the Anna's hummingbird (*Calypte anna*), Nuttall's woodpecker (*Picoides nuttallii*), western scrub-jay, violet-green swallow (*Tachycineta thalassina*), chestnut-backed chickadee (*Poecile rufescens*), bushtit (*Psaltriparus minimus*), Bewick's wren (*Thryomanes bewickii*), dark-eyed junco (*Junco hyemalis*), house finch, and lesser goldfinch (*Spinus psaltria*). Medium-sized urban-associated mammals such as raccoons (*Procyon lotor*) and striped skunks (*Mephitis mephitis*) are also expected to frequent this habitat type. Several species of bats, including the California myotis (*Myotis californicus*) and western red bat (*Lasiurus blossevillii*), may roost in small numbers in the larger trees within the BSA.

Riparian Woodland

Vegetation

Riparian woodland occurs along stream and creek channels within the BSA. The riparian woodlands support a relatively diverse assemblage of native trees and shrubs including valley oak, coast live oak, willows (*Salix* spp.), California bay (*Umbellularia californica*), Fremont's cottonwood, Oregon ash (*Fraxinus latifolia*), California buckeye, and elderberry. The understory is composed of a mix of native and non-native grasses, forbs, and woody vines. Common native species include mugwort (*Artemisia douglasiana*), California wild rose (*Rosa californica*), poison oak, and California wild grape (*Vitis californica*). Common non-native species include Himalayan blackberry (*Rubus armeniacus*), as well as a variety of exotic grasses and forbs similar to those observed in non-native grassland.

Wildlife in Riparian Woodland Habitat

Riparian habitats in California generally support exceptionally rich animal communities and contribute a disproportionately high amount to landscape-level species diversity. The oaks, willows, and cottonwoods in the riparian woodlands attract a number of avian species to this habitat. Some of these species are resident year-round, breeding in the riparian habitat in spring and summer and using it for cover and foraging during the non-breeding season. Common bird species nesting and foraging in this habitat include the chestnut-backed chickadee, bushtit, oak titmouse (*Baeolophus inornatus*), downy woodpecker (*Picoides pubescens*), Bewick's wren, spotted towhee (*Pipilo maculatus*), and song sparrow (*Melospiza melodia*). Raptors, such as red-shouldered hawks (*Buteo lineatus*) and Cooper's hawks (*Accipiter cooperii*), may nest within the riparian woodland in the BSA and forage in adjacent habitats year round.

A number of species of reptiles and amphibians occur in the leaf litter, downed tree branches, and fallen logs of this habitat. These include the arboreal salamander (*Aneides lugubris*), western toad, and Sierran chorus frog (*Pseudacris sierra*), western fence lizard, western skink, and southern alligator lizard (*Elgaria multicarinata*). Small mammals such as ornate shrews (*Sorex ornatus*), California voles (*Microtus californicus*), and western grey squirrels (*Sciurus griseus*) and medium-sized mammals such as raccoons, striped skunks, and non-native opossums (*Didelphis virginianus*) are common, urban-adapted species present in the riparian woodland habitat.

Eucalyptus Grove

Vegetation

Eucalyptus grove habitat occurs in many small patches in the BSA. Eucalyptus trees are non-native and have been planted for a variety of purposes, most commonly as windbreaks. The eucalyptus groves in the BSA are dominated by one or more eucalyptus tree species including blue gum (*Eucalyptus globulus*) and red gum (*Eucalyptus camaldulensis*). The understory is sparsely vegetated and dominated by leaf and bark litter in dense groves, and non-native grassland species where there are larger canopy gaps.

Wildlife in Eucalyptus Grove Habitat

The eucalyptus grove habitats in the BSA support many common species of amphibians, reptiles, birds, and mammals. Although most of these species are expected to be less common, a few, such as the Anna's hummingbird and the yellow-rumped warbler (*Setophaga coronata*), may be seasonally common in this habitat. In addition, these trees may be used as nesting sites by raptors such as the white-tailed kite (*Elanus leucurus*) and red-shouldered hawk. Bird and mammal species associated with low, dense vegetation are expected to be rare in, or absent from, the eucalyptus grove habitat.

Row Crops

Vegetation

The BSA encroaches upon the edges of agricultural fields located on the westbound side of I-80, near the Cherry Glen Road intersection. Areas mapped as row crops are routinely plowed/disked and support agricultural crops on a seasonal basis. When fallow, these areas support a plant community similar to that described for ruderal habitats above.

Wildlife in Row Crops

The row crop habitat in the BSA provides wildlife habitat similar to that found in the non-native grassland discussed above. The major difference is that the periodic disking¹ associated with the agricultural areas in the BSA disrupts burrows and other refugia for reptiles, rodents, and other small animals. Efficient burrowers such as California ground squirrels are capable of recolonizing these habitats after the disturbance has passed. These colonizations are usually limited to the peripheries of the fields.

Coyote Brush Scrub

Vegetation

Coyote brush scrub habitat typically occurs within non-native grassland and is generally transitional between woodland and grassland habitat types in the BSA. Coyote brush can grow approximately 10 feet tall and has evergreen leaves. This habitat is dominated by coyote brush (*Baccharis pilularis*) with a non-native grasslands understory and scattered poison oak shrubs.

Wildlife in Coyote Brush Scrub Habitat

Coyote brush scrub habitats are typically dry and provide relatively low and homogeneous vegetative structure resulting in low wildlife species diversity. In the BSA, coyote scrub habitat is restricted and surrounded by grassland and developed habitats resulting in the occasional use of this habitat type by wildlife species that occur in the adjacent habitats. Amphibians are usually absent or scarce in coyote brush scrub habitat due to the very dry conditions. Mammals that use the northern coyote brush scrub habitats for foraging and cover include the coyote (*Canis latrans*), bobcat (*Lynx rufus*), and brush rabbit (*Sylvilagus bachmani*), among others. Bird species that nest in coyote brush scrub habitats include the western scrub-jay, California thrasher (*Toxostoma redivivum*), California towhee (*Melospiza crissalis*), spotted towhee, California quail (*Callipepla californica*), wrentit (*Chamaea fasciata*), and Anna's hummingbird. Reptiles that occur in these habitats include the gopher snake, southern alligator lizard, and western fence lizard.

¹ Agricultural technique to laterally displace and invert soil through the use of concave steel disk blades.

Developed

Vegetation

Developed areas are the predominant land use type within the BSA and include all paved surfaces including roadways, parking lots, and structures.

Wildlife in Developed Areas

Paved roadways in developed areas do not provide high-quality wildlife habitat. However, snakes and lizards may bask on road surfaces, and a wide variety of wildlife cross or move along the road en route to other habitats. Bridges can function as sheltering habitat for an assortment of wildlife species. Crevices found within bridges provide protection from inclement weather as well as from potential predators, and can encourage their use as nesting habitat. Eight of the seventeen bridges/culverts within the BSA were determined to provide suitable day roosting and/or night roosting habitat for bats, including the Yuma myotis (*Myotis yumanensis*) and nesting birds such as cliff swallows (*Petrochelidon pyrrhonota*) and black phoebes (*Sayornis nigricans*).

Wildlife Corridors

The existing traffic lanes of the I-80 corridor currently present a substantial passage impediment to smaller, less mobile animals and partial passage impediment to larger, more, mobile animals within the BSA. Less mobile animals include reptiles such as the western pond turtle, amphibians such as the California red-legged frog, and rodents. Larger and more mobile animals include birds such as the burrowing owl and Swainson's hawk and mammals such as the American badger. However, there are several creek crossings and underpass structures, in both the West and East Segments, which provide potential pathways for animal passage across I-80. The current condition of existing wildlife corridors (including fish passage for federally listed species) within the BSA is discussed in greater detail under **Section 2.3.4, Animal Species**, and **Section 2.3.5, Threatened and Endangered Species**, as it pertains to specific sensitive and/or special-status animal species.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

The temporary and permanent effects of the Build Alternative to the different habitat types within the BSA are shown in **Table 2.3-2**, which identifies the temporary and permanent impacts of the Build Alternative to each natural community. Project effects that are considered temporary include the use of areas of habitat as staging areas and temporary construction access areas.

The West Segment boundaries overlap the boundaries of two other projects for which Caltrans also led the environmental compliance efforts; the I-80/I-680/SR-12 Interchange Project Phase 1 initiated in the spring of 2014 and the Truck Scales project completed in

2013. To avoid redundant environmental compliance efforts, wherever the project anticipated an overlap with impact areas identified in the I-80/I-680/SR-12 Interchange project Phase 1 or Truck Scales projects, the following methods were applied:

- Permanent Impacts. I-80 Express Lanes Project impact areas that overlap with the I-80/I-680/SR-12 Interchange Project Phase 1 or Truck Scales permanent impact areas are not counted as I-80 Express Lanes Project impacts.
- Temporary Impacts. I-80 Express Lanes Project impacts that would spatially overlap with the I-80/I-680/SR-12 Interchange Project Phase 1 or Truck Scales temporary impact areas are counted as I-80 Express Lanes project impacts.

Thus, it is noted that **Table 2.3-2** and **Table 2.3-3** (see **Section 2.3.2, Wetlands and Other Waters**) summarize the project's temporary and permanent impacts on habitat/land cover types within the BSA, including those impacts already mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 or Truck Scales projects.

Table 2.3-2 includes isolated calculations for the West Segment and East Segment of the Build Alternative. In total, the Build Alternative would result in permanent impacts to approximately 1.35 acres of mixed oak woodlands, all of which would be affected within the East Segment. Permanent impacts to approximately 0.03 acre of riparian woodland would also occur; 0.01 acre in the West Segment and 0.02 acre in the East Segment.

Compensatory mitigation will be required for impacts of mixed oak woodlands as mitigation for state and federally listed species (see **Section 2.3.5**) and for riparian habitat.

Adverse effects related to wetlands and other waters of the U.S., including riparian woodlands and freshwater marsh habitat, are discussed in **Section 2.3.2, Wetlands and Other Waters**. Adverse effects related to special-status plant and animal species associated with the remaining habitat types of the BSA are discussed in **Sections 2.3.3, Plant Species; 2.3.4, Animal Species; and 2.3.5, Threatened and Endangered Species**.

West Segment –Fundable First Phase

Construction of the West Segment of the Build Alternative would result in approximately 0.01 acre of direct impacts to riparian woodlands and no direct impacts to mixed oak woodlands within the BSA.

The effects to the remaining habitat types within the BSA of the construction of the West Segment of the Build Alternative are listed in **Table 2.3-2**, and are discussed in greater detail in the subsequent sections of this analysis.

Table 2.3-2 Impacts to Land Cover Types within the BSA

Land Cover Type	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated ¹ (acres)	Permanent Impacts – Not Previously Mitigated ¹ (acres)
West Segment					
Non-Native Annual Grassland	2.82	0.07	2.89	1.57	0.05
Landscaped	3.39	0.22	3.61	3.39	0.22
Ruderal	2.56	0.12	2.68	2.49	0.10
Barren	2.30	0.07	2.37	1.75	0.02
Mixed Oak Woodland	0.00	0.00	0.00	0.00	0.00
Riparian Woodland	0.00	0.01	0.01	0.00	0.01
Eucalyptus Grove	0.26	0.00	0.26	0.25	0.00
Row Crops	0.00	0.00	0	0.00	0.00
Coyote Brush Scrub	0.03	0.01	0.04	0.03	0.01
Developed	10.90	0.80	11.7	6.21	0.65
West Segment Total	22.58	1.31	23.89	15.69	1.06
East Segment					
Non-Native Annual Grassland	8.46	2.6	11.06	_ ²	_ ²
Landscaped	4.41	9.88	14.29	_ ²	_ ²
Ruderal	7.42	4.68	12.1	_ ²	_ ²
Barren	1.14	0	1.14	_ ²	_ ²
Mixed Oak Woodland	0.00	1.35	1.35	_ ²	_ ²
Riparian Woodland	0.00	0.02	0.02	_ ²	_ ²
Eucalyptus Grove	0.83	0.14	0.97	_ ²	_ ²
Row Crops	0.00	0.00	0.00	_ ²	_ ²
Coyote Brush Scrub	0.03	0.00	0.03	_ ²	_ ²
Developed	4.42	9.16	13.58	_ ²	_ ²
East Segment Total	27.66	27.99	55.65	_ ²	_ ²
Build Alternative					
Non-Native Annual Grassland	11.28	2.67	13.95	10.03	2.65
Landscaped	7.80	10.10	17.9	7.80	10.10
Ruderal	9.98	4.80	14.78	9.92	4.78

Land Cover Type	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated ¹ (acres)	Permanent Impacts – Not Previously Mitigated ¹ (acres)
Barren	3.44	0.07	3.51	2.90	0.03
Mixed Oak Woodland	0.00	1.35	1.35	0.00	1.35
Riparian Woodland	0.00	0.03	0.03	0.00	0.03
Eucalyptus Grove	1.09	0.14	1.23	1.09	0.14
Row Crops	0.00	0.00	0	0.00	0.00
Coyote Brush Scrub	0.06	0.01	0.07	0.06	0.01
Developed	15.32	9.96	25.28	10.63	9.81
Total Build Alternative	48.97	29.30	79.54	42.43	28.90

Note¹: Project impact area less overlapping permanent impact areas mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales projects.

Note²: Temporary and permanent impacts not previously mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales project do not overlap with the East Segment.

Source: Caltrans, 2014k

No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-80 within the project limits. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lanes would be repurposed or constructed. No bridge structures would be widened or replaced. As such, the No-Build Alternative would not result in impacts to habitat types within the BSA. Adverse effects to riparian woodlands and mixed oak woodlands in areas outside of the BSA would be determined under separate environmental review and environmental permitting from regulatory agencies.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Avoidance, minimization, and/or mitigation measures specific to wetlands and other waters of the U.S., including riparian woodlands and aquatic and wetland habitat, are discussed in **Section 2.3.2, Wetlands and Other Waters**. Measures specific to adverse effects to special-status plant and animal species associated with the natural communities of the BSA are discussed in **Sections 2.3.3, Plant Species; 2.3.4, Animal Species; and 2.3.5, Threatened and Endangered Species**.

Mitigation Measure BIO-A: Compensatory Mitigation for Oak Woodlands – Replacement. Compensation for impacts to 1.35 acres of oak woodland habitat will be mitigated at a replacement ratio of 2:1 within the BSA and, if needed, outside the BSA. An on-site Mitigation Monitoring Plan (MMP) for replacement of trees and shrubs will be developed by Caltrans. The MMP will specify that the mitigation plantings either will be composed of the same species and at the same ratios as those removed, or will reflect the composition and

density of a reference site near the BSA. In addition, planting areas will be seeded with a native seed mixture that is similar in species and cover to what occurs in each of the oak woodland habitats. All woody plant materials will be replaced using a local native seed source. If the replacement of oak woodland habitat cannot be implemented within the BSA, or there is not a sufficient area to mitigate oak woodland tree and shrub impacts, as determined by Caltrans, acreage for oak woodland plantings will be acquired within the vicinity of the project.

Mitigation Measure BIO-B: Compensatory Mitigation for Oak Woodlands – Habitat Mitigation and Monitoring Plan. Prior to issuance of a grading permit, Caltrans will prepare an Oak Woodland Habitat Mitigation & Monitoring Plan (HMMP) for oak woodland habitat creation. An open space or conservation easement, or other similar instrument, will be recorded on property associated with the mitigation lands to protect the created habitats' plant and wildlife resources in perpetuity. The Oak Woodland HMMP will be prepared by a qualified restoration ecologist and will provide, at a minimum, the following items:

- Habitat impacts summary and proposed habitat mitigation actions
- Goals of the restoration to achieve no net loss
- The location of the mitigation sites and existing site conditions
- Mitigation design including:
 - Proposed site construction schedule
 - Description of existing and proposed soils, hydrology, geomorphology and geotechnical stability
 - Site preparation and grading plan
 - Invasive species eradication plan, if applicable
 - Soil amendments and other site preparation
 - Planting plan (plant procurement/propagation/installation)
 - Maintenance plan
 - Monitoring measures, performance and success criteria
 - Monitoring methods, duration, and schedule
 - Contingency measures and remedial actions
 - Reporting measures

This mitigation will be deemed complete and Caltrans released from further responsibilities when the final success criteria have been met as determined by applicable regulatory/resource agencies.

Avoidance measures would also avoid or minimize impacts to oak woodlands within the BSA (**Measure BIO-1**). **Mitigation Measures BIO-A** and **BIO-B** would reduce effects to Oak Woodlands.

2.3.2 WETLANDS AND OTHER WATERS

REGULATORY SETTING

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

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (U.S. EPA 40 Code of Federal Regulations [CFR] Part 230), and whether permit approval is in the public interest. The 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally

damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

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

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

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities that may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. See **Section 2.2.2, Water Quality and Storm Water Runoff**, for additional details.

AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans 2014k). Field investigations were conducted in 2011 and 2013 to preliminarily delineate jurisdictional wetlands and other waters of the U.S., which are regulated by the USACE, and other federal waters of the State regulated by the RWQCB and CDFW. The delineations were conducted in accordance with USACE guidance. **Table 2.3-3** summarizes the potential jurisdictional waters within the BSA by feature type.

The jurisdictions of individual features as discussed in this section have not yet been officially verified by the USACE. The Preliminary Determination of Jurisdictional Waters was sent by Caltrans to the USACE on October 29, 2014 and is included as **Appendix L**. A wetland

verification site visit will be attended by USACE and Caltrans during the next project phase (PS&E) for official verification. If the delineated wetlands are determined to be USACE-jurisdictional, impacts to these wetlands due to project-related activities are likely to require a Section 404 permit issued by the USACE (a Regional or Nationwide General Permit if possible; an Individual Permit only if a General is not possible). However, wetlands determined to be isolated wetlands, and not USACE-jurisdictional, remain potentially State jurisdictional since isolated waters are considered waters of the State.

The vast majority of wetlands and aquatic habitats providing important ecological functions and values within the BSA are considered jurisdictional waters of the U.S. by the USACE, including all perennial drainages. However, some seasonal drainages and wetlands in the BSA may not be considered waters of the U.S. by the USACE because they have no hydrological connection, although this determination ultimately will be made by the USACE during the PS&E phase of the project. **Table 2.3-4** summarizes impacts to wetlands and waters by feature type as they relate to permitting needs, which are described in more detail in *Permitting*.

Table 2.3-3 Wetlands and Water Features Affected by the Build Alternative

Aquatic Habitat	Total Area within BSA (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated ¹ (acres)	Permanent Impacts – Not Previously Mitigated ¹ (acres)
West Segment						
Perennial Wetland	0.51	0.00	0.00	0	0.00	0.00
Seasonal Wetland	1.12	0.00	0.01	0.01	0.00	0.00
Perennial Drainage	0.54	0.00	0.00	0	0.00	0.00
Seasonal Drainage	2.29	0.32	0.00	0.32	0.31	0.00
West Segment Total	4.46	0.32	0.01	0.33	0.31	0.00
East Segment						
Perennial Wetland	1.24	0	0.06	0.06	²	²
Seasonal Wetland	0.58	0	0.01	0.01	²	²
Perennial Drainage	3.44	0.38	0.03	0.41	²	²
Seasonal Drainage	3.12	0.54	0.06	0.6	²	²
East Segment Total	8.38	0.92	0.16	1.08	²	²
Build Alternative						
Perennial Wetland	1.75	0.00	0.06	0.06	0.00	0.06
Seasonal Wetland	1.70	0.00	0.02	0.02	0.00	0.02

Aquatic Habitat	Total Area within BSA (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated ¹ (acres)	Permanent Impacts – Not Previously Mitigated ¹ (acres)
Perennial Drainage	3.98	0.38	0.03	0.41	0.38	0.03
Seasonal Drainage	5.41	0.86	0.06	0.92	0.85	0.06
Total Build Alternative	12.84	1.24	0.17	1.41	1.23	0.17

Note¹: Project impact area less overlapping permanent impact areas mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales projects.

Note²: Temporary and permanent impacts not previously mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales project do not overlap with the East Segment.

Source: Caltrans 2014k

Within the BSA, there are 12.84 acres of aquatic habitats, which includes 1.75 acres of perennial wetlands, 1.70 acres of seasonal wetlands, 3.98 acres of perennial drainages, and 5.41 acres of seasonal drainages. Perennial wetlands occur within the low-flow channel of six drainages as well as two marshes that are outside of these drainages. In addition, 10 perennial drainages occur within the BSA. Seasonal wetlands and seasonal drainages are scattered throughout the BSA. The different types of wetlands and drainages and their locations are described further below.

Table 2.3-4 Impacts to Wetlands and Water Features by Permit Requirement

Aquatic Habitat	Temporary Impacts (acres)			Permanent Impacts (acres)		
	Non-jurisdictional	State & Federal ¹	1602 ²	Non-jurisdictional	State & Federal ¹	1602 ²
Perennial Wetland	0.00	0.00	0.00	0.00	0.00	0.06
Seasonal Wetland	0.00	0.00	0.00	0.00	0.02	0.00
Perennial Drainage	0.00	0.00	0.38	0.00	0.00	0.03
Seasonal Drainage	0.12	0.74	0.00	0.00	0.06	0.00
Total	0.12	0.74	0.38	0.00	0.08	0.09

Note¹: Features that are expected to be considered jurisdictional by both the State and the USACE but would not need a 1602 permit. These may require a Section 404 permit from USACE and Section 401 Water Quality Certification from the State. Refer to *Permitting* section for further description of these requirements.

Note²: Features that are expected to be considered jurisdictional and require a Section 1602 permit.

Source: Caltrans, 2014k

Perennial Wetland

Perennial wetland habitat includes areas mapped as perennial wetland, perennial drainage, or perennial marsh. Perennial marsh occurs within the following drainages in the BSA:

- Green Valley Creek

- Dan Wilson Creek
- an unnamed drainage ditch between Holiday Lane and I-80, just west of the intersection with Alvarado Court
- an unnamed drainage ditch between Hillborn Road and I-80
- an unnamed drainage ditch north of the I-80W off-ramp to Hickory Lane
- drainage ditches in the cloverleaf east of the intersection of I-80 and North Texas Street

These areas support perennial or near perennial surface water and are dominated by emergent perennial hydrophytes including cattails (*Typha* spp.), and hardstem bulrush (*Schoenoplectus acutus*). Other common species include giant horsetail (*Equisetum telmateia* ssp. *braunii*), water plantain (*Alisma plantago-aquatica*), and water pepper (*Persicaria hydropiperoides*). In addition, the following two perennial marsh wetlands occur in the BSA:

- between I-80 and Nelson Road, west of the intersection with Lagoon Valley Road
- in the cloverleaf west of the intersection of I-80 and Leisure Town Road

Wildlife in Perennial Wetlands

Perennial wetlands provide habitat for numerous bird species, including ducks, herons, egrets, and other waterbirds. American coots (*Fulica americana*), pied-billed grebes (*Podilymbus podiceps*), and several species of ducks breed in freshwater wetlands in and around emergent vegetation. Perching bird species that breed in freshwater marshes include the marsh wren (*Cistothorus palustris*), song sparrow, common yellowthroat (*Geothlypis trichas*), and red-winged blackbird (*Agelaius phoeniceus*). Amphibians such as the native Sierran chorus frog and western toad, as well as the non-native American bullfrog (*Lithobates catesbeianus*), are also present in these habitats.

Seasonal Wetland

Vegetation

Seasonal wetlands are scattered throughout the BSA. These features are often located in close proximity to existing development and in some cases may be supported by runoff from developed areas. Due to their proximity to development, these wetlands include a mix of both native and non-native plants. Dominant native plants include common spikerush (*Eleocharis macrostachya*), iris leaf rush (*Juncus xiphioides*), balticus rush (*Juncus balticus*), and tall flatsedge (*Cyperus eragrostis*). Dominant, non-native plants include dallisgrass (*Paspalum dilatatum*), Italian ryegrass (*Festuca perennis*), rabbits-foot grass (*Polypogon monspeliensis*), and Bermuda grass (*Cynodon dactylon*). Other commonly observed species include curly dock (*Rumex crispus*), bristly ox-tongue (*Helminthotheca echioides*), birds-foot trefoil (*Lotus corniculatus*), teasel (*Dipsacus fullonum*), and alkali mallow (*Malvella leprosa*).

Wildlife in Seasonal Wetlands

Wildlife species found in seasonal wetlands include the same bird and amphibian species detailed in the ***Wildlife in Perennial Wetlands*** discussion above.

Perennial Drainage

Vegetation

Perennial drainage habitat in the BSA is generally unvegetated and supports perennial flows in a normal rainfall year. The following areas provide perennial drainage habitat:

- Alamo Creek
- Dan Wilson Creek
- Horse Creek
- Laguna Creek
- Ledgewood Creek
- Pine Tree Creek
- Suisun Creek
- Ulatis Creek
- Unnamed perennial drainage 1
- Unnamed perennial drainage 2

Wildlife in Perennial Drainage

Amphibians such as the western toad, Sierran chorus frog, and bullfrog are present in the perennial drainages in the BSA. The native western pond turtle (*Actinemys marmorata*) may also be present in perennial drainages. Waterbirds, such as the mallard (*Anas platyrhynchos*), green heron (*Butorides virescens*), great egret (*Ardea alba*), and belted kingfisher (*Megaceryle alcyon*), forage in these waters, and bats, including the Yuma myotis and big brown bat (*Eptesicus fuscus*), forage aerially on insects over these channels. A number of fish also use the creek and stream channels in the watershed, including several species of native fishes such as hardhead (*Mylopharodon conocephalus*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), California roach (*Lavinia symmetricus*), three spine stickleback (*Gasterosteus aculeatus*), and sculpin (*Cottus* spp.), as well as introduced species such as the mosquitofish (*Gambusia affinis*).

Seasonal Drainage

Vegetation

Seasonal drainage habitat is scattered throughout the BSA and includes both natural and constructed features that carry water on an ephemeral or seasonal basis. Seasonal drainages help to reduce flooding by conveying stormwater during and after storm events. Most natural seasonal drainages in the BSA ultimately drain to Suisun Bay via either Cordelia Slough or Peytonia Slough. Constructed seasonal drainages include features that were artificially constructed in uplands to convey stormwater runoff and do not replace natural features. Both concrete lined and earthen bottom ditches are located alongside roadways, railroads, and agricultural fields throughout the BSA.

Wildlife in Seasonal Drainage Habitat

Wildlife found in seasonal wetlands includes the same bird and amphibian species detailed in the ***Wildlife in Perennial Wetlands*** discussion above. However, the native western pond turtle may also be present in some seasonal drainages when water is present.

ENVIRONMENTAL CONSEQUENCES

The Build Alternative is the only action alternative moving forward for the proposed project. Other alternatives were considered but eliminated as none were deemed viable because of physical constraints and feasibility, or because they did not meet the project's purpose and need. See **Section 1.4.3, Alternatives Considered but Eliminated from Further Discussion**.

Build Alternative

Direct Impacts

The Build Alternative effects to the aquatic and wetland habitat, within the BSA are shown in **Table 2.3-3**, which includes isolated calculations for the West and East Segments. Although the impact area is relatively small, the permanent loss of aquatic habitat could affect existing functions and values along both channels if such values were not replaced. Direct permanent impacts on wetlands would occur because of road widening. Construction of the Build Alternative would involve substantial grading and earth moving activities, stockpiling of soils, and the loading, unloading, and transport of excavated and fill material. Temporary impacts on aquatic habitat may occur from grading or access activities and from dewatering as part of placement of cofferdams in the creeks. This work would be temporary in nature and fill would be removed within one season and pre-construction conditions restored. Aquatic habitat is expected to re-establish rapidly after these activities. Permanent impacts would include direct placement of fill within wetlands and loss of wetland vegetation due to shading effects. Impacts to wetlands and other habitat types are shown in **Appendix H**.

Aquatic and wetland communities are natural communities of special concern that perform many important environmental functions, including recycling nutrients, purifying water, attenuating floods, recharging ground water, and providing habitats for flora, fauna, and aquatic species. Detailed descriptions of this habitat and mapping are included in greater detail within the NES (Caltrans, 2014k).

Indirect Impacts

Rainfall could carry loose soils into adjacent waterways, resulting in increased sedimentation and adverse effects to water quality. Concentrated flow due to grading in some areas will increase the potential for erosion and for increased sediment transport into the adjacent areas. Construction equipment debris and fuel could also further degrade the quality of storm water runoff if fueling activity and maintenance products are not handled properly. This contamination could impact nearby waterways, including the jurisdictional water features within the BSA. Temporary measures and Best Management Practice (BMPs) that will control pollutant discharges during construction activities are described in **Section 2.2.2, Water Quality and Storm Water Runoff**. Indirect impacts on wetlands also include shading effects from the new wider bridges at Ulatis Creek and Horse Creek within the East Segment. The resulting impact on vegetation growth is expected to be permanent.

The Build Alternative would add over 1 acre of new impervious area, through road and structure widening and modifications to the existing roadway and ramps. Additional impervious area prevents runoff from naturally dispersing and infiltrating into the ground, resulting in increased concentrated flow. The additional flow has the potential to transport an increased amount of sediment and pollutants to waterways and water resources, and create increased erosion resulting from changes to waterway hydrographs (flow versus time) pre- and post-construction. This phenomenon is termed hydromodification.

Project-specific, permanent effects on aquatic and wetland habitat would be substantial if not mitigated. Coordination with USACE regarding these effects is discussed above in *Affected Environment*.

West Segment – Fundable First Phase

Construction of the West Segment of the Build Alternative would result in approximately 0.01 acre of permanent impacts to wetland habitat and 0.32 acre of temporary impacts to aquatic habitat within the BSA. The indirect effects of the Build Alternative associated with water quality and the natural functions of the wetlands and waters within the BSA, as described above, apply to the West Segment.

Permitting

A Section 404 permit is necessary when a project will result in fill to waters under USACE jurisdiction. A preliminary jurisdictional delineation of these resources will be completed and submitted to USACE for verification. The Build Alternative would result in permanent and temporary effects to wetland and water features within the Caltrans right-of-way. A Section 404 permit would be required for the Build Alternative.

A Section 401 Water Quality Certification is necessary when a project requires a Section 404 permit from the USACE, and under other special circumstances. Because the Build Alternative would require a 404 permit, a 401 Water Quality Certification from RWQCB would also be required.

A Section 1602 Lake or Streambed Alteration Agreement with CDFW is necessary when a project will alter the flow, bed, channel, or bank of a stream or lake. The East Segment would result in work within the channel of Ulatis Creek and Horse Creek. Therefore, a Section 1602 permit would be required. No work resulting in the alteration of a stream or lake is anticipated within the West Segment of the Build Alternative.

Executive Order 11988 directs all federal agencies to avoid the long- and short-term adverse impacts associated with the modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative and to restore and preserve the natural and beneficial values served by floodplains. The project would not result in the substantial or adverse modification of any floodplain. Similarly, the project does not directly or indirectly support further development within a floodplain.

No-Build Alternative

The No-Build Alternative would make no physical or operational improvements to I-80 corridor within the BSA. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of jurisdictional waters as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USACE, RWQCB, and CDFW requirements regarding protected Waters of the U.S., should those features be identified within areas that would be directly or indirectly affected. The potential presence of jurisdictional waters in areas outside of the BSA would be determined under separate environmental review.

Least Environmentally Damaging Practicable Alternative

A detailed discussion of the considerations made in the determination of the LEDPA is included in this section under *Only Practicable Finding*. The Build Alternative encompasses the best possible design, based on predicted 2040 traffic conditions and physical features of the area. The Build Alternative is the LEDPA, and includes measures to reduce harm to wetlands, as described below under *Only Practicable Finding*.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Construction activities and operation of the roadway improvements would be regulated under the applicable Caltrans' National Pollutant Discharge Elimination System (NPDES) permit and Storm Water Management Plan (SWMP), which regulate storm water discharge from activities on roadways. The potential for adverse effects to water quality will be avoided by implementing the temporary and permanent BMPs outlined in the Storm Water Pollution Prevention Plan (SWPPP). Caltrans erosion control BMPs will be used to minimize any wind or water-related erosion. The project would not violate any water quality standards, deplete groundwater supplies, alter drainage patterns, or create capacity exceeding runoff. See **Section 2.2.1, Hydrology and Floodplain**, and **Section 2.2.2, Water Quality and Storm Water Runoff (Measures HYDR-1 and WQ-1)** for a more detailed analysis of the avoidance measures that would be implemented to protect water quality. These avoidance measures would also protect the natural functions of the affected wetlands and waters and any associated habitat. Additionally, avoidance measures would also avoid or minimize impacts to riparian woodlands within the BSA (**Measure BIO-1**) and Caltrans standard BMPs will be incorporated into the project to protect water quality during construction (**Measure BIO-2**). Implementation of these measures (**Measures HYDR-1, WQ-1, BIO-1, and BIO-2**) would provide the avoidance and minimization measures required to minimize the indirect impacts to wetlands and other water features located within the BSA.

Mitigation Measure BIO-C: Compensatory Mitigation for Aquatic and Wetland Restoration. Compensation for permanent impacts on up to 0.17 acre of aquatic and wetland habitat will be mitigated at a replacement ratio of 1:1 (created wetlands: impacted wetlands) based on square footage offsite. These effects may be mitigated at a USACE-approved wetland mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turn-key mitigation property located in close proximity to the project, such as Grizzly Bay Preserve. Temporary impacts on 1.23 acres of aquatic habitat (i.e. impacted areas not previously mitigated) will be mitigated on-site by restoring impacted areas to pre-project conditions.

Mitigation Measure BIO-D: Compensatory Mitigation for Riparian Woodland Replacement. Compensation for permanent impacts to up to 0.03 acre of riparian habitat will be mitigated at a replacement ratio of 3:1 (habitat replaced: habitat lost) based on acreage offsite. These effects may be mitigated at a CDFW-approved riparian mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turnkey mitigation property located in close proximity to the project, such as Grizzly Bay Preserve.

Mitigation Measures BIO-C and BIO-D, in combination with the avoidance and minimization measures listed above (**Measures HYDR-1, WQ-1, BIO-1, and BIO-2**), would reduce effects to wetlands and waters of the U.S. to a negligible level, and may be used to satisfy the conditions of multiple agencies and jurisdictions. With the implementation of

these avoidance, minimization, and mitigation measures, the project would not have a substantial effect on riparian woodland or aquatic habitat because no net loss of habitat would occur and other project effects would be relatively small and of a temporary nature.

ONLY PRACTICABLE FINDING

Executive Order for the Protection of Wetlands (EO 11990) regulates the activities of federal agencies with regard to wetlands. This executive order states that a federal agency, such as the Federal Highway Administration (FHWA) and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

Within the existing project corridor, no other build alternatives were deemed viable because of the physical constraints and developed land uses surrounding the roadways. Other alternatives were considered but eliminated as none were deemed viable because of the physical constraints and feasibility, or because they did not meet the project's identified purpose and need (see **Section 1.4.5, Alternatives Considered but Eliminated from Further Discussion**). As such, there are no alternatives that would avoid impacting wetland resources.

With implementation of the Build Alternative there would be permanent and temporary effects to wetland and water features within the Caltrans right-of-way. However, the appropriate permitting would be obtained and adhered to. A Section 404 permit would be implemented for the Build Alternative. Because the Build Alternative would require a 404 permit, a 401 Water Quality Certification from RWQCB would also be required. No work resulting in the alteration of a stream or lake is anticipated within the West Segment of the Build Alternative. Therefore, a Section 1602 Lake or Streambed Alteration Agreement with CDFW is not necessary for the West Segment.

In addition to the adherence of the permitting requirements stated above, Mitigation **Measures HYDR-1 and WQ-1, BIO-1, BIO-2, BIO-C, and BIO-D** would also ensure that the least possible impact would occur to jurisdictional wetlands and other waters upon project implementation. Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

2.3.3 PLANT SPECIES

REGULATORY SETTING

The U.S. Fish and Wildlife Service (USFWS) and CDFW have regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a

general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see **Section 2.3.5, Threatened and Endangered Species** in this document for detailed information about these species.

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

The regulatory requirements for FESA can be found at 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act, CA Public Resources Code, Sections 2100-21177.

AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans, 2014k).

The identification of special-status plant species with potential to occur in the region was based on a search of the USFWS Species List Database and the CNPS Inventory of Rare and Endangered Plants for the following 7.5-minute quadrangles: Cordelia, Fairfield South, Fairfield North, Elmira and Allendale, California. The California Natural Diversity Database (CNDDB) was queried for all occurrence records within 10 miles of the BSA. As previously discussed, botanical surveys conducted between 2011 and 2013 to locate, map, and record any special-status plant populations within the BSA. Repeat surveys were conducted throughout the growing season in order to capture the blooming and/or fruiting periods of all target special-status plant species.

The database searches and initial habitat mapping identified 66 special-status plant species that could potentially occur within the BSA [see Appendix D of the NES (Caltrans2014k)]. Only one special-status plant was identified during the protocol-level surveys, Ferris' goldfields (*Lasthenia ferrisiae*), which is listed as a California Rare Plant. This species was

found in a newly re-constructed I-80 on-ramp within the West Segment. The area appeared to have recently undergone construction activities (i.e., the area had been hydroseeded and straw wattles were present at the time of the survey).

Ferris' goldfields is an annual herb in the sunflower family that blooms from February through May. It occurs in central and northern California in alkaline, clayey vernal pools, and clay-based alkaline sinks at elevations of 66 to 2297 feet. Ferris' goldfields is known to be tolerant of soil disturbance and intolerant of competition with non-natives. Construction activities in the area where this plant was found likely temporarily improved habitat quality for this species by reducing competition with non-native grasses and by providing supplemental irrigation. The combination of soil disturbance and irrigation likely stimulated the germination of dormant seeds. However, this population of Ferris' goldfields within the BSA will likely not persist over time, as non-native species become increasingly dominant and the area no longer receives supplemental watering.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Project activities, such as grading, structure and infrastructure placement, and equipment staging, could directly affect individual Ferris' goldfields. Individual plants and populations may be lost as a result of mechanical or physical removal of vegetation in the BSA, and damage to plants may occur as a result of crushing by equipment; trampling; and compaction of soil, which could result in damage to plant roots. These activities could result in death, altered growth, or reduced seed set through physically breaking, crushing, wilting, or uprooting plants. However, due to the proximity of the population to development and the resulting altered hydrology, this population is unlikely to persist, even in the absence of additional construction disturbance. This species was not observed during a reconnaissance site visit on May 9, 2014. Further, this species is widely distributed across California (including Solano County). Thus, project activities would potentially affect only a very small proportion of the regional populations of this species, and possibly would not affect this species at all. Therefore, this project would not result in substantial adverse effects on Ferris' goldfields.

West Segment –Fundable First Phase

Adverse effects to Ferris' goldfields described above for the Build Alternative are applicable to the West Segment. As previously discussed, the distribution of suitable habitat types within the BSA varies depending on the characteristics and needs of the plant species. Project activities within the West Segment would potentially affect only a very small proportion of the regional populations of this species, and possibly would not affect this species at all. Therefore, the construction of the West Segment would not result in substantial adverse effects on Ferris' goldfields..

No-Build Alternative

The No-Build Alternative would make no physical or operational improvements to the northbound I-80 corridor, within the project limits. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of special-status plant species as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USFWS and CDFW requirements regarding protected plant species, should those species be identified within areas that would be directly or indirectly affected. The potential presence of special-status plant species in areas outside of the BSA would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Project activities are not expected to have a substantial adverse effect on Ferris' goldfields populations or their habitats, thus no avoidance measures or compensatory mitigation is warranted for this species.

2.3.4 ANIMAL SPECIES

REGULATORY SETTING

Many state and federal laws regulate impacts to wildlife. The USFWS, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) and the CDFW are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in **Section 2.3.5, Threatened and Endangered Species**. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries Service candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the California Fish and Game Code
- Section 4150 and 4152 of the California Fish and Game Code

AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans, 2014k).

The identification of special-status animal species with potential to occur in the region was based on a search of the USFWS Species List Database, the CNDDDB for the five USGS quadrangles surrounding the BSA, reports previously prepared for the project, other relevant information from the CDFW, technical publications, field reconnaissance surveys, and habitat assessments completed for the project. The results of these efforts are further discussed under the appropriate topics within this section, and are documented in the NES.

A literature and database search, and the biologist's familiarity with the region, identified 55 wildlife species that could potentially occur within the BSA. **Appendix I** lists each of these species and describes whether or not the species could occur in the BSA. A wildlife habitat assessment was conducted within the BSA in 2011, 2012, and 2013 and 37 of these species were dropped from consideration based on a lack of suitable habitat, or because the BSA is outside the known range of the species. Those species dropped from consideration are not discussed further. The following five species that have the potential to occur within the BSA are federally and/or state threatened species and are described in **Section 2.3.5, Threatened and Endangered Species:**

- Valley elderberry longhorn beetle
- Central Valley steelhead
- Central California Coast steelhead
- California red-legged frog
- Swainson's hawk

The short-eared owl (*Asio flammeus*) is only a California species of special concern when nesting, and it is not expected to breed in the BSA or be adversely affected by project activities. Thus, it is not discussed further. The remaining 12 special-status species are discussed below.

Central Valley Fall-Run Chinook Salmon

The Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*) is an anadromous California species of special concern that represents a population of Chinook salmon that migrate from the ocean to spawning streams in late fall and begin spawning in beds of coarse river gravels between October and December. Chinook salmon spawn and rear in the mainstem Sacramento River and suitable perennial tributaries. The species has been documented within several drainages that run through the BSA. More recently, Chinook salmon have been observed in the project region in:

- Green Valley Creek upstream to the base of Green Valley Falls
- Suisun Valley Creek upstream to the Napa/Solano County line
- LedgeWood Creek upstream of I-80
- Laurel Creek from upstream to Travis Boulevard
- Immediately north of I-80
- Ulatis Creek at Nut Tree Road

American Badger

The American badger (*Taxidea taxus*), a California species of special concern, is a highly specialized fossorial (adapted for burrowing or digging) mammal that occurs in a range of habitats, such as annual grasslands, oak woodland savannas, and semi-arid shrub/scrubland, that contain friable soils and relatively open ground. Badgers are primarily nocturnal, though they are often active during the day. They dig burrows both in pursuit of prey (e.g., gophers, kangaroo rats, and chipmunks) and to create dens for cover and raising of young. Badgers breed during late summer, and females give birth to a litter of young the following spring. Solitary animals, the home range of individuals varies by sex, season, and resource availability.

Suitable habitat is present in the BSA and surrounding vicinity, as evidenced by the observation of a roadkill individual within the BSA during surveys of the site. Because badgers are territorial and solitary, and have large home ranges, badgers are expected to occur in the BSA only in very low numbers. They are most likely to occur in the central portion of the BSA where large expanses of grassland occur adjacent to the I-80 corridor.

Western Pond Turtle

The western pond turtle, (*Actinemys marmorata*) is a California species of special concern. Western pond turtles can be found in intermittent and perennial slow-moving waters, including stock ponds, streams, rivers, marshes, and lakes. Pond turtles require areas with ample basking sites and underwater refugia, and eggs are laid in grasslands or other open uplands. Nesting sites seem to require open habitat with full sun exposure and are typically located along stream or pond margins, but if no suitable habitat is available adults may travel overland up to 0.25 mile or more from water to nest. The nesting season typically occurs from April through July with the peak occurring in late May to early July. Suitable habitat is present in the BSA and the species was observed during surveys of the site. Although no focused surveys were performed for this species, individuals were observed in Laguna Creek within the BSA during field surveys. In addition, the CNDDDB includes a record of this species in a channel near the outlet of Lagoon Valley Reservoir approximately 0.2 mile east of the BSA. All the perennial drainages and wetlands within the BSA provide suitable aquatic

foraging and dispersal habitat for the pond turtle year round, while the seasonal drainages and wetlands provide suitable foraging and dispersal habitat when water is present. Further, uplands adjacent to wetlands and drainages within the BSA provide potential nesting habitat for the species.

Bat Species

Three state special-status bat species have potential to occur within the BSA based on range, habitat, and recorded occurrences in the region:

- Pallid bat (*Antrozous pallidus*), a California species of special concern
- Townsend's big-eared bat (*Corynorhinus townsendii*), a California species of special concern
- Western red bat (*Lasiurus blossevillii*), a California species of special concern.

Pallid bats are most commonly found in oak savannah and in open dry habitats with rocky areas, trees, buildings, or bridges for roosting. Coastal colonies commonly roost in deep crevices in rocky outcroppings, in buildings, under bridges, and in the crevices, hollows, and exfoliating bark of trees. Colonies can range from a few individuals to over a hundred, and usually this species occurs in groups larger than 20 individuals. Males and females typically occupy the same late-fall and winter roosts found in canyon bottoms and riparian areas. After mating with males during the late-fall and winter season, females leave to form a separate maternity colony, often on ridge tops or other warmer situations. Pups are typically born from late April to July, and weaning occurs in August, although dates vary across latitudes and between years. Although crevices are important for day roosts, night roosts often include open buildings, porches, garages, highway bridges, and mines. Pallid bats may travel up to several miles for water or foraging sites if roosting sites are limited. They may also occur in open coniferous forests. Pallid bat roosts are very susceptible to human disturbance. Eight bridges/culvert crossings within the BSA provide suitable roosting habitat. Although no pallid bats were detected during focused surveys of these structures, the surveys were conducted outside the maternity season.

The Townsend's big-eared bat is a colonial species, and females aggregate in the spring at maternity colonies to begin their breeding season, which may extend through the end of August. Females give birth to one young, and females and young show a high fidelity to both their group and their specific roost site. Although the Townsend's big-eared bat is usually a cave dwelling species, many colonies are found in anthropogenic structures, such as the attics of buildings or old abandoned mines. Known roost sites in California include limestone caves, lava tubes, mine tunnels, buildings, and other structures. This species also roosts in deep crevices of redwood trees. Radio tracking studies suggest that movement from a colonial roost during the maternity season is confined to the area within 9 miles of the roost. This species is easily disturbed while roosting in buildings, and females are known to abandon their young when disturbed. Suitable roosting habitat is not present in the BSA; however, the species may forage over the BSA and was detected during focused bat surveys of the area.

The western red bat does not breed in the project area but roosts in the foliage of trees in Solano County during winter or migration. Western red bats are strongly associated with intact cottonwood/sycamore valley riparian habitats in low elevations and the loss of such habitat throughout its range threatens the persistence of the species. Both day and night roosts are usually located in the foliage of trees; red bats in the Central Valley show a preference for large trees and extensive, intact riparian habitat. Day roosts are often located along the edges of riparian areas, near streams, grasslands, and even urban areas. During the breeding season, red bats establish individual tree roosts and occasionally small maternity colonies in riparian habitats, in locations usually hidden from every direction except below. Little is known about the habitat use of western red bats during the nonbreeding season. The red bat uses echolocation to capture insects in mid-flight and require habitat mosaics or edges that provide close access to foraging sites as well as cover for roosting. This species was detected at three locations within the BSA.

Focused surveys within the BSA identified six bridges/culvert crossings (including sites in both the East and West Segments) that provide suitable night roosting habitat for bats, and two bridges (both in the East Segment) that provide potential day roosts (see **Table 2.3-5**).

No pallid bats were detected during these surveys, suggesting that the species does not regularly use the BSA. However, the surveys were conducted between 31 August and 1 October, which is outside the pallid bat maternity season. As pallid bats can occupy different roost sites during the maternity season than during the fall, it is possible that pallid bats could day and/or night roost in several bridges/crossings identified in **Table 2.3-5**. Although suitable roosting habitat for the Townsend's big-eared bat is not present in the BSA due to the lack of caves, mines, or abandoned buildings, suitable foraging habitat is present and the species was detected foraging in the BSA during focused bat surveys. Western red bats were detected in the BSA during the focused bat surveys in low numbers, and may roost in foliage in trees, particularly those within the riparian habitat throughout the BSA.

Specifically, in the West Segment, focused surveys for bats and bat roosting habitat within the BSA identified four bridges/culvert crossings that provide suitable night roosting habitat for bats, including the pallid bat. However, no potential day roosting habitat for bats was identified within the West Segment (see **Table 2.3-5**). Although suitable roosting habitat for the Townsend's big-eared bat is not present within the West Segment, suitable foraging habitat is present. Western red bats occur in the West Segment, in low numbers as migrants and winter residents and may roost in foliage in trees, particularly those within riparian habitat.

Table 2.3-5 Bridge/Crossing Structures within the BSA that Provide Bat Roosting Habitat

Bridge/Crossing	Segment	Day Roosting Habitat Present?	Night Roosting Habitat Present?	Bats Detected
Green Valley Creek Bridge	West	No	Yes	Yuma myotis California myotis
Dan Wilson Creek Bridge	West	No	Yes	Yuma myotis California myotis
Suisun Creek Bridge	West	No	Yes	Yuma myotis California myotis Western red bat
Ledgewood Creek Bridge	West	No	Yes	None
Soda Springs Culvert	East	Yes	Yes	Yuma myotis California myotis Western red bat Townsend's big-eared bat
Laurel Creek Culvert	East	No	Yes	Yuma myotis California myotis Western red bat Townsend's big-eared bat
Laguna Creek Bridge	East	Yes	Yes	Yuma myotis
Alamo Creek Bridge	East	No	Yes	Yuma myotis California myotis

Source: Caltrans 2014k

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a California species of special concern. This species favors flat, open grassland or gentle slopes and sparse shrubland ecosystems for breeding, though they will also readily colonize agricultural fields and other developed areas. Mammal burrows, or other structures that mimic burrows, provide secure nesting locations and nonbreeding refuges and are a fundamental ecological requirement of burrowing owls. In California, owls are most often found in close association with California ground squirrel burrows. Ideal habitat for burrowing owls is comprised of annual and perennial grasslands with low vegetation height, sparse or nonexistent tree or shrub cover, and an abundance of mammal burrows. The nesting season as recognized by the CDFW (1995) runs from February 1 through August 31. After nesting is completed, adult owls may remain in their

nesting burrows or in nearby burrows, or may migrate; young birds disperse across the landscape.

No burrowing owls, or secondary evidence of owl presence, were observed within the BSA during reconnaissance surveys, although the biologists did not conduct focused surveys for this species. However, burrowing owl habitat is present within the BSA, and five occurrences of the species have been recorded in the project vicinity; the nearest known extant population located approximately 1.2 miles to the east. Suitable habitat (i.e., ground squirrels and other small mammal burrows) was observed in the grasslands and ruderal areas in the BSA. Burrowing owls may nest and/or forage within these areas.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) (16 USC 703) protects migratory birds, their occupied nests, and their eggs. Removal or disturbance of active nests would be in violation of these regulations. All native birds in the project area are protected under the MBTA and California Fish and Game Code. In addition to common bird species, several special-status bird species have at least some potential to nest or forage within the BSA, including:

- Swainson's hawk (*Buteo swainsoni*), State threatened species
- Northern harrier (*Circus cyaneus*), California species of special concern
- Grasshopper sparrow (*Ammodramus savannarum*), California species of special concern.
- Tri-colored blackbird (*Agelaius tricolor*), California species of special concern at its nesting colonies.
- Loggerhead shrike (*Lanius ludovicianus*), California species of special concern when nesting.
- White-tailed kite (*Elanus leucurus*), State fully protected species.

The Swainson's hawk is discussed in **Section 2.3.5, Threatened and Endangered Species**. The northern harrier nests in marshes and moist fields, and forages over open areas. Grasslands and agricultural fields in and adjacent to the BSA provide suitable nesting and foraging habitat. Northern harriers have been observed in the vicinity of the BSA although none were observed within the BSA during surveys conducted by the biologists. The grasslands and marsh habitat within the BSA provide suitable foraging habitat for this species; however, harriers typically nest and forage in the interiors of large expanses of open habitat, not very close to high volume roadways. Thus, although individuals may occasionally forage in the BSA, they are not expected to nest there.

Tri-colored blackbird nesting colonies are usually located near fresh water in dense emergent vegetation. The species is highly colonial when nesting, forming dense breeding colonies that, in some areas, may consist of up to tens of thousands of pairs. Suitable nesting and

foraging habitat is present in the BSA. Potential foraging habitat (e.g., perennial marsh, seasonal marsh, and grasslands) for the tricolored blackbird is present within and immediately adjacent to the BSA. However, the tricolored blackbird has not been recorded breeding in the BSA, the nearest record of its occurrence is located approximately 11 miles to the east near Jepson Prairie Preserve, and the species is not expected to breed within the BSA due to the high levels of disturbance associated with the freeway. Thus, although individuals may occasionally forage in the BSA, they are not expected to nest there.

The grasshopper sparrow breeds in open, short grasslands with scattered clumps of shrubby vegetation, constructing domed ground nests with grasses in patches of dense vegetation. They nest and forage in extensive open grasslands, meadows, fallow fields, and pastures. Grasslands within the BSA provide suitable nesting and foraging habitat for the grasshopper sparrow. Although some grasslands within the BSA represent potentially suitable breeding and foraging habitat for the grasshopper sparrow, much of the grassland habitat occurs as small, isolated patches that are unlikely to be occupied by this species, which prefers large, unfragmented areas of grassland. Further, this species is not expected to nest close to I-80, both due to the disturbance and noise associated with the highway and because this species typically nests in the interiors of large grassland areas, rather than at the edges formed by the highway. The species has been observed in the vicinity of the BSA, although none were observed within the BSA during surveys conducted by the biologists.

The loggerhead shrike can be found in grasslands, scrub habitats, riparian areas, other open woodlands, ruderal habitats, and developed areas including golf courses and agricultural fields. Ideal breeding habitat for loggerhead shrikes is open, with short grassy vegetation punctuated by many perches, shrubs, or trees for nesting, and sharp branches or barbed wire fences for impaling prey. They nest in tall shrubs and dense trees and forage in grasslands, marshes, and ruderal habitats. The breeding season may begin as early as late February and lasts through July. Suitable breeding and foraging habitat is present in the BSA and the species was observed during surveys of the BSA. However, because of the BSA's proximity to I-80, particularly given that high quality nesting and foraging habitat (e.g., open agricultural fields and pastures) more removed from the high levels of disturbance caused by the I-80 are abundant in the project region, the number of pairs of loggerhead shrikes that may nest in the BSA is expected to be very low.

The white-tailed kite (*Elanus leucurus*), a State fully protected species, is a year-round resident in the project vicinity, establishing breeding territories in grasslands, agricultural fields, cismontane woodlands, and other open habitats that encompass open areas with healthy prey populations, and snags, shrubs, trees, or other nesting substrates. The presence of white-tailed kites is closely tied to the presence of prey species, particularly voles. The presence of prey may be the most important factor in determining habitat quality for white-tailed kites. This species nests in tall shrubs and trees and forages in grasslands, marshes, and ruderal habitats. Suitable nesting and foraging habitat is present and the species was observed during surveys of the BSA. However, because of the BSA's proximity to high levels of disturbance caused by I-80, and the abundance of high quality nesting and foraging habitat

(e.g., open agricultural fields and pastures) more removed from freeway corridor, the number of pairs of white-tailed kites that may nest in the BSA is expected to be very low.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Central Valley Fall-Run Chinook Salmon

The project would result in the permanent loss of 0.03 acre of perennial drainage due to placement of new piers at the Ulatis and Horse Creek bridge crossings and increased shading of aquatic habitat due to the new wider bridges. The project would also result in the temporary disturbance of 0.37 acre of perennial drainage due to temporary dewatering for construction (if required) and construction access at the Ulatis and Horse Creek bridge sites. The majority of reaches with the most suitable gradient for salmonid habitat in Upper Ulatis Creek, including the reach within the BSA, are located in a region that exceeds the temperature threshold for salmonids (i.e., too hot to provide suitable rearing habitat in summer). In addition, two potential fish passage barriers (i.e., water control structures that create 6-foot vertical drops in the concrete-lined portions of the flood control channel) have been identified in Ulatis Creek downstream of the BSA, reducing the potential for salmonids to reach the project area. Similarly, Horse Creek within the BSA appears to go dry often during the summer months and is unlikely to support salmonid rearing habitat in the summer. Because of the low quality of salmonid habitat within the reaches of Ulatis Creek and Horse Creek within the BSA, Chinook salmon are not expected to be present in any numbers.

Salmonids may experience reduced foraging success due to project-related turbidity downstream. Although the project proposes modification of the bridges at Ulatis and Horse Creeks to facilitate widening of the freeway, the modifications would not result in the addition of new barriers or exacerbation of any existing impediments to salmonid movement.

American Badger

Implementation of the Build Alternative would not result in the loss of a substantial amount of habitat for the American badger; only 2.67 acres of non-native annual grassland would be permanently impacted. Grasslands are abundant in the project region, and the loss of 2.67 acres would not result in a substantial decrease in the amount of this habitat type available regionally to the species. Further, the project would not impede movement of badgers through the area or substantially increase the risk of road mortality. However, badgers may occur in the BSA in low numbers and may be directly impacted by project activities through injury and mortality. If badgers have to be evicted from their dens, there is some potential that they may be exposed to greater predation risk or greater road mortality while they are seeking out new denning sites, especially if suitable habitat in adjacent areas is already occupied by badgers. However, the number of badgers within the BSA is expected to be extremely low.

Western Pond Turtle

Implementation of the Build Alternative might result in the injury or mortality of small numbers of turtles as a result of individual turtles or their eggs being crushed by personnel or equipment or as a result of desiccation or burying during project work near perennial drainages and wetlands within the BSA. The Build Alternative would result in the permanent loss of 0.17 acre of aquatic/wetland habitat due to the placement of piers at the Ulatis and Horse Creek bridge sites, and the fill of wetlands due to the widening of the freeway in the East Segment. Due to the regional abundance of similar aquatic/wetland habitats in the project vicinity, the loss of 0.17 acres of aquatic habitat is not expected to result in a substantial adverse effect on the western pond turtle.

Bat Species

The Build Alternative may result in a temporary impact on foraging pallid bats, western red bats, and Townsend's big-eared bats through the alteration of foraging patterns (e.g., avoidance of work sites because of increased noise and activity levels during project construction). However, due to the abundance of suitable foraging habitat in the project vicinity and the mobility of these bats, as well as the relatively low proportion of potential foraging habitat that would be disturbed as a result of the project, impacts to these three bat species would not be substantial.

Pallid Bat

Implementation of the Build Alternative would not result in the modification of any structures identified as providing suitable day and/or night roosting habitat for bats. Thus, the project is not expected to result in the permanent loss of roosting habitat or the pallid bat. However, project disturbance associated with construction activities near bridges that provide suitable pallid bat day roosting habitat (i.e., Laguna Creek Bridge and Soda Springs Culvert) could result in bats flushing from their roost under a bridge during the day. These bats could potentially suffer increased predation rates, and construction during the maternity season (April 1 to July 31) could result in abandonment of young by their mothers, resulting in mortality of the young.

Western red bat

Construction of the Build Alternative could result in the loss of roosting sites for western red bats due to tree removal. Further, if trees that contain individual western red bats are removed, modified, or exposed to increased disturbance, individual bats could be subjected to physiological stress as a result of being disturbed during torpor, or subjected to increased predation due to exposure during daylight hours. However, red bats are likely to flush from trees when approached by heavy equipment, before trees themselves are impacted, so that injury or mortality is unlikely. Further, western red bats are not colonial. Thus, the permanent loss of a roost site (e.g., tree) would not result in a substantial impact on local or regional populations as only individuals, not entire colonies, would be affected. Further,

suitable roost sites for this species are sufficiently abundant and widespread that the loss of small numbers of trees from the project would not substantially reduce roost site availability, either locally or regionally.

Townsend's big-eared bat

Townsend's big-eared bats are not expected to roost in the BSA. Thus, the project would not adversely affect roosting habitat for this species.

Burrowing Owl

The Build Alternative is not expected to result in impacts on high-quality burrowing owl breeding habitat due to the proximity to I-80 and the lack of evidence of owl use in the project limits. However, the project would result in impacts on low-quality nesting, foraging, and/or roosting habitat for burrowing owls. Approximately 2.67 acres of nonnative annual grassland and 4.80 acres of ruderal habitat would be permanently lost as a result of roadway improvements. In addition, 11.28 acres of non-native annual and 9.98 acres of ruderal habitats would be temporarily disturbed as a result of project staging and temporary construction access. However, such areas will be restored to pre-construction conditions following project completion. In the unlikely event that owls are found to be nesting within the BSA, construction related disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment.

Migratory Birds

Although project activities would occur along the margins of suitable habitat for the Swainson's hawk, northern harrier, grasshopper sparrow, tri-colored blackbird, loggerhead shrike, and white-tailed kite, the potential for such activities to disturb a nest to the point of abandonment would be very low because none of these species are expected to nest near the high volume roadway where project activities would be concentrated. Further, although vegetation removal for the Build Alternative could reduce nesting habitat for a number of bird species protected under the Migratory Bird Species Act, disturbance of foraging habitat would unlikely have a substantial effect on local and regional populations of these species because of the low number of breeding birds relative to the extent of suitable foraging habitat and abundance of prey. Therefore, the project is not expected to substantially reduce these species' populations or nesting habitats and any project impacts would be minimal.

West Segment – Fundable First Phase

Adverse effects to animal species described above for the Build Alternative are applicable to West and East Segments. The effects summarized in the above discussion provide specific sensitive habitat locations for each animal species. As previously discussed, the distribution of suitable habitat types within the BSA varies depending on the characteristics and needs of the animal species. The West Segment portion of the Build Alternative, from west of Red Top Road to Air Base Parkway, would convert approximately eight miles of existing HOV lanes into express lanes. Work would comprise mostly of foundation installation for poles and

gantries where new signs would be installed and foundation pad and trenching for electrical conduits. Certain impacts are more prevalent in the East Segment of the Build Alternative because of the more expansive work proposed as part of the freeway widening, specifically the structural improvements proposed at Ulatis Creek and Horse Creek. The construction activities needed for the conversion of the HOV lanes to express lanes within the West Segment is substantially less intensive. As such, the West Segment of the Build Alternative is expected to have lower direct and indirect effects to animal species when compare to the East Segment (see **Table 2.3-2**).

The Build Alternative would have no impact on stream crossings within the West Segment; no adverse effects to Chinook salmon are anticipated. Within the West Segment, only 0.07 acre of non-native annual grassland would be permanently impacted. Thus, construction of the West Segment would not have a substantial adverse effect on the American Badger habitat. Construction of the West Segment would not require work near any structures identified as providing suitable day roosting habitat for bats (i.e., Laguna Creek Bridge and Soda Springs Culvert). Construction of the West Segment would therefore not have the potential for day roost disturbance.

No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-80 within the project limits. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lane in the northbound direction would be constructed. No bridge structures would be widened or replaced. As such, the No-Build Alternative would not result in impacts to biological resources. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of special-status animal species as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USFWS and CDFW requirements regarding protected animal species, should those species be identified within areas that would be directly or indirectly affected. The potential presence of special-status animal species in areas outside of the BSA would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Central Valley Fall-Run Chinook Salmon

Water quality during construction and project operation would be protected by BMPs that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality; Measures HYDR-1 and WQ-2** and **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** below), for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA are maintained for the special-status species that

could be present in these aquatic habitats. Additionally **Measure BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, and BIO-8** as detailed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**, below include provisions on worker environmental training, construction to avoid take, disturbances or injury of the Chinook salmon, habitat protection, and biological monitoring.

American Badger

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures** below would reduce the potential for adverse effects to the American badger during project construction. These measures include pre-construction surveys (**Measure BIO-9**) and development of appropriate measures, in consultation with the CDFW, if an active den is found (**Measure BIO-10** and **BIO-11**).

Western Pond Turtle

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures** below would reduce the potential for adverse effects to the western pond turtle during project construction. These measures include water quality protection during construction (**Measure BIO-2**), pre-construction surveys (**Measure BIO-12**), required buffer zones if a nest is detected (**Measure BIO-13**), and daily surveys during construction when warranted (**Measure BIO-14**).

Bat Species

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for effects to roosting bats during project construction. These measures include work restrictions and buffer zones for day roosting habitat (**Measure BIO-15**), bat eviction procedures and timelines (**Measure BIO-16**), and biologist assessments (**Measure BIO-17**).

Burrowing Owl

Mitigation Measure BIO-E: Compensatory Mitigation for the Burrowing Owl.

Compensatory mitigation will be provided in the form of habitat preservation and/or management if burrowing owls are located in the BSA during pre-construction surveys. The loss of foraging and nesting habitat in the project construction area will be offset by acquiring and permanently protecting suitable foraging and breeding habitat.

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for effects to burrowing owls during project construction. These measures include preconstruction surveys (**Measure BIO-18**), biologist consultations and recommendations (**Measure BIO-19**), and coordination with regulatory agencies for any owl evictions (**Measure BIO-20**).

Implementation of the avoidance and minimization measures and mitigation measure listed above would ensure that active burrowing owl nests are not disturbed, that individuals are safely relocated before their burrows are impacted, and that permanent loss of occupied burrowing owl breeding habitat is adequately compensated.

Migratory Birds

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for adverse effects to migratory bird species. These measures include a work window for vegetation removal and preconstruction surveys (**Measure BIO-21**), deterrence of nesting birds and nest-start removal (**Measure BIO-22**), and non-disturbance buffers for nesting birds (**Measure Bio-23**).

West Segment – Fundable First Phase

No avoidance, minimization, or mitigation measures specific to the West Segment would be required beyond the ones described above under the Build Alternative. The West Segment portion of the Build Alternative, from west of Red Top Road to Air Base Parkway, would convert approximately eight miles of existing HOV lanes into express lanes. Work would comprise mostly of foundation installation for poles and gantries where new signs would be installed and foundation pad and trenching for electrical conduits. Certain impacts are more prevalent in the East Segment of the Build Alternative because of the more expansive work proposed as part of the freeway widening, specifically the structural improvements proposed at Ulatis Creek and Horse Creek. The construction activities needed for the conversion of the HOV lanes to express lanes within the West Segment is substantially less intensive. As such, the West Segment of the Build Alternative is expected to have lower direct and indirect effects to animal species when compare to the East Segment (see **Table 2.3-2**). Where applicable, the avoidance and minimization measures specify the locations in which the measures should be applied (i.e., measures that dictate restrictions on work within Ulatis Creek are thereby only applicable to East Segment of the project).

2.3.5 THREATENED AND ENDANGERED SPECIES

This section addresses species listed or eligible for listing as threatened or endangered. The USFWS list of federally listed species with the potential to occur within the BSA is provided in **Appendix H**.

REGULATORY SETTING

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway

Administration (FHWA), are required to consult with the USFWS and the NOAA Fisheries Service to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence and/or documentation of a No Effect finding. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

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

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

AFFECTED ENVIRONMENT

Valley elderberry longhorn beetle

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is a Federally threatened species. The beetle’s habitat consists primarily of riparian forests whose dominant plant species include cottonwood, sycamore, valley oak, and willow, with an understory of elderberry shrubs. Blue elderberry shrubs in the Central Valley with basal stem diameters larger than 1 inch are considered by the USFWS as potential valley elderberry longhorn beetle habitat. The valley elderberry longhorn beetle life cycle is intimately connected to its habitat, elderberry shrubs. Following mating, the female lays her eggs in crevices in the elderberry bark. Upon hatching (after about 10 days), the larvae bore into the

pith of the shrub and feed inside stems larger than 1 inch in diameter for 1 to 2 years until they mature. They emerge during the spring as adults through exit holes chewed through the bark. The adult beetles feed on the elderberry foliage until they mate, completing the cycle. The BSA is not within designated critical habitat for the valley elderberry longhorn beetle. However, suitable habitat (i.e., elderberry shrubs) is present in the BSA and the beetle species has been documented approximately 0.03 mile west of the BSA. Thirty-eight elderberry shrubs with a minimum diameter of 1 inch at ground level were mapped within the BSA (Caltrans 2014k). No valley elderberry longhorn beetles were observed during survey, but potential beetle bore holes were observed, confirming the species' presence. The valley elderberry longhorn beetle is shown as threatened in the *Invertebrates* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the USFW and will be included in the forthcoming Biological Opinion.

Central Valley steelhead

The Central Valley steelhead (*Oncorhynchus mykiss*) is a Federally threatened species. The steelhead is an anadromous form of rainbow trout that migrates upstream from the ocean to spawn in late fall or early winter, when flows are sufficient to allow it to reach suitable habitat in far upstream areas. Steelhead typically spawn in gravel substrates located in clear, cool, perennial sections of relatively undisturbed streams, with dense canopy cover that provides shade, woody debris, and organic matter. Steelhead usually cannot survive long in pools or streams with water temperatures above 70 °F; however, they can use warmer habitats if adequate food is available. The NMFS has categorized steelhead into distinct population segments (DPS).

The Central Valley DPS, includes all naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in the Sacramento and San Joaquin rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries, as well as two artificial propagation programs: the Coleman National Fish Hatchery, and Feather River Hatchery steelhead hatchery programs. This species spawns in cool, moderately fast flowing water with gravel bottom. No critical habitat is present within the BSA. However, the Central Valley steelhead range overlaps the northeastern-most portion of the BSA (i.e., Ulatis and Alamo Creeks), and a winter steelhead distribution map produced by the CDFW indicates that anadromous steelhead were observed in 2004 in Alamo Creek and Ulatis Creek. Central valley steelhead is shown as threatened in the *Fish* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will be included in the forthcoming Biological Opinion.

Central California Coast steelhead

The Central California Coast steelhead, (*Oncorhynchus mykiss*), is a Federally threatened species. As discussed above for the Central Valley species, the Central California Coast steelhead is an anadromous form of rainbow trout categorized into a DPS. The Central

California Coast DPS consists of all runs from the Russian River in Sonoma County south to Aptos Creek in Santa Cruz County, including all steelhead spawning in streams that flow into the San Francisco Bay. This species requires cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats. No critical habitat for salmonids is present within the BSA. The Central California Coast steelhead range overlaps all but the northeastern-most portion of the BSA, and a winter steelhead distribution map produced by the CDFW indicates that anadromous steelhead were observed in 2004 in Jameson Canyon Creek, Green Valley Creek, and Suisun Valley Creek. In 2005, there were reports of steelhead being observed in Green Valley Creek and Suisun Valley Creek, with observations being made at several locations upstream of I-80 on Green Valley Creek. Central California coast steelhead is shown as threatened in the *Fish* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will be included in the forthcoming Biological Opinion.

California red-legged frog

The California red-legged frog, (*Rana draytonii*) is a Federally threatened species. The species inhabits perennial freshwater pools, streams, and ponds. The key to this species' occurrence in these habitats is the presence of perennial, or near perennial, water and a general lack of introduced aquatic predators.² Adults need dense shrubby or emergent riparian vegetation closely associated with deep (more than 2.3 feet) still or slow-moving water. Preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters, as well as shallow benches to act as nurseries for juveniles. Non-breeding frogs may be found adjacent to streams and ponds in grasslands and woodlands as refugia. The species does not have a distinct breeding migration as some remain at breeding sites all year while others disperse. Movements may occur along riparian corridors, but some individuals move directly from one site to another through normally inhospitable habitats. The distance moved is highly site-dependent, as influenced by the local landscape. The USFWS considers 1 mile a typical dispersal distance for the species in its critical habitat designation.

The project BSA does not fall within designated critical habitat; however, the southwestern most end of the BSA is located immediately adjacent to critical habitat units Sol-1 and Sol-3 (see Appendix A of the NES). Suitable habitat is present, and one individual was observed during protocol-level red-legged frog surveys of the BSA on the westbound (northwest) side of I-80, in a ponded area of Jameson Canyon Creek (a culvert inlet flowing under I-80). In addition, there are 13 CNDDDB records of California red-legged frogs in Solano County, including a known California red-legged frog breeding pond located approximately 0.2 mile west northwest of the junction of SR 12 and I-80. This record is the northern-most record in Solano County.

² A perennial water body is one that keeps full or flowing water throughout the year.

As the dispersal distance of the California red-legged frog is approximately 1 mile, portions of the BSA located more than 1 mile north of the northern-most breeding pond or waterways hydrologically connected to this breeding pond are considered to be outside the range of the California red-legged frog. Thus, the species is presumed absent from the northeastern portion of the West Segment and the entire East Segment. This presumption is supported by the negative results of protocol-level red-legged frog surveys within those areas. Within the southwestern portion of the West Segment, where the species is presumed present, natural habitats in the median of I-80 are not considered habitat for the California red-legged frog. Heavily traveled roads are considered barriers to this species, with the exception that frogs may be able to pass under such roadways where underpasses or culverts are present. As such, the habitat within the BSA that is considered potential California red-legged frog habitat consists of natural land cover types (i.e., other than “developed”) that are located on the outer edges of the existing highway, and creeks/culverts that flow under I-80. California red-legged frog is shown as threatened in the *Amphibians* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the USFW and will be included in the forthcoming Biological Opinion.

Swainson’s hawk

The Swainson’s hawk is a California state threatened species. Swainson’s hawks in California are strongly associated with riparian habitats, though they are also found in oak woodlands and other open habitats. Prime breeding habitat for the Swainson’s hawk encompasses riparian draws or clumps of trees surrounded by open grassland or oak savannah for foraging. In the project region, Swainson’s hawks forage in dryland pasture and irrigated pasture, as well as row crops and grain crops, particularly during and after harvest, when prey are numerous and conspicuous. They are also attracted to flood irrigation areas, primarily in alfalfa fields, when prey take refuge on field margins. Swainson’s hawks build sturdy stick nests in low willows, box elders, oaks, or other trees, breeding from early March through July. Individuals frequently use the same nest or nest tree in successive breeding seasons or move. Suitable nesting and foraging habitat is present in the BSA and the species was recorded nesting within the BSA, north of Cherry Glen Road, in 2005 and in eucalyptus trees bordering Pine Tree Creek in 1996 through 2006.

No Swainson’s hawk nests were observed within the BSA during focused surveys conducted in 2012. However, suitable nest trees are present within the riparian woodlands and eucalyptus groves in both the East and West Segments. Swainson’s hawk were observed flying over the BSA during field surveys in September 2011 and April 2012, just east of the I-505/I-80 interchange. Further, there are two CNDDDB records of nesting Swainson’s hawks within the East Segment of the BSA: one pair nested in a eucalyptus tree north of Cherry Glenn Road (nest occupied 2004-2005); and a second pair nested in a eucalyptus tree bordering Pine Tree Creek near the Nut Tree Airport (nest occupied 1996-2006). However,

the highest densities of breeding Swainson's hawks in Solano County occur within irrigated agricultural areas in the north-central and northeastern portions of the County, and over 95 percent of all Swainson's hawk records in the County occur to the north and east of the BSA.

The CDFW defines an active Swainson's hawk nest as one that was used during one or more of the last five years. Based on this criterion, there are currently no known active nests within the BSA. The nearest active nest is the nest located east of Pleasants Valley Road. The BSA also includes 3.71 acres of row crops and 108.05 acres of nonnative annual grasslands that may serve as foraging habitat for the Swainson's hawk. However, Swainson's hawks have not been observed foraging within the BSA, and it is unlikely that Swainson's hawks forage frequently or in large numbers in the roadside areas within the BSA, given the abundance of suitable foraging habitat further away from I-80.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Valley elderberry longhorn beetles, California Valley and Central California Coast steelheads, California red-legged frogs, and Swainson's hawks may be adversely affected by the construction of the Build Alternative. Specific impacts for each of these species are detailed below. Construction activities would have temporary and permanent effects on various habitat types that provide upland, foraging, and dispersal habitats for these protected species. Proposed compensatory mitigation for impacts to each protected species is provided in the *Avoidance, Minimization, and Mitigation Measures* section presented further below. Final approved avoidance, minimization, and mitigation measures have been determined in consultation with the appropriate permitting agencies.

Valley elderberry longhorn beetle

The Build Alternative would not have any direct impacts on the valley elderberry longhorn beetle or its habitat through project design treatments and implementation of construction measures to avoid habitat. Indirect impacts to the species and/or habitat could occur if construction activities are conducted within 100 feet of the elderberry shrubs through dust generation, vehicle and equipment refueling, and herbicide use. Two of the 38 elderberry shrubs mapped within the BSA were determined to be located within 100 feet of project temporary impact areas. Implementation of the avoidance measures presented in the *Avoidance, Minimization, and Mitigation Measures* section presented below will minimize impacts on individuals and their habitat due to indirect impacts from dust, soil compaction, and accidental spills. No compensatory mitigation is required. The project **may affect, but is not likely to adversely affect**, the valley elderberry longhorn beetle and will have no effect on critical habitat for this species.

Central Valley steelhead and Central California Coast steelhead

Direct and indirect impacts to the Central Valley steelhead and Central California Coast steelhead and their habitat would result due to loss or disturbance of, habitat as detailed

above for the Central Valley Fall-Run Chinook salmon in **Section 2.3.4, Animal Species**. The project **may affect, but is not likely to adversely affect**, the Central Valley steelhead and Central California Coast steelhead and will have no effect on critical habitat for these species. Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below would avoid takes of, and impacts to, salmonids. No compensatory mitigation is required.

California red-legged frog

The Build Alternative could affect individual red-legged frogs as a result of the following:

- Direct injury or mortality during construction as a result of trampling by construction personnel or equipment;
- Direct injury or mortality from the collapse of underground burrows (which may be used as refugia in upland areas by red-legged frogs), resulting from soil compaction;
- Substrate vibrations may cause individuals to move out of refugia, exposing them to a greater risk of depredation or desiccation, may interfere with predator detection, and may result in a decrease in time spent foraging;
- Individuals that are found during pre-activity surveys and relocated to suitable habitat outside of the BSA may be subjected to physiological stress and greater risk of predation, or may undergo increased competition with other amphibians already present in the area to which they are relocated; and
- Reduction of suitable dispersal and foraging habitat resulting from the permanent loss of non-native annual grasslands and other upland habitats.

The project would not result in any impacts on suitable breeding habitat for the California red-legged frog, including perennial wetlands, perennial drainages, or seasonal wetlands within the species' range. The Build Alternative would impact up to 1.67 acres of potential red-legged frog foraging and dispersal habitat, all located within the West Segment. It is assumed that red-legged frogs could occur virtually anywhere in the portion of the BSA within the species' range, all impacted natural habitats (i.e., areas that were not already paved or otherwise developed) within this range, and that were not located within the highway median were considered impacted red-legged frog habitat. The project **may affect, and is likely to adversely affect**, the California red-legged frog.

Permanent Impacts

Approximately 0.04 acre of potential red-legged frog dispersal habitat would be permanently lost due to the construction of pavement and other hardscape in areas that currently provide natural habitat that may be used by red-legged frogs. This permanently impacted habitat consists of coyote brush scrub, non-native annual grassland, and ruderal habitats along the edge of the freeway.

Temporary Impacts

Approximately 1.62 acres of potential red-legged frog habitat, including aquatic habitat for foraging and upland/riparian habitat for cover and dispersal, would be used for temporary construction access and staging while the project is being constructed or would be impacted by grading (cut/fill) activities as part of the project. Areas used for construction access and staging would not be paved or otherwise permanently altered. These areas are expected to provide habitat of similar quality to existing conditions shortly (i.e., in less than one year) after the completion of construction. Areas that would be temporarily impacted by grading would be revegetated following the completion of construction; such areas are expected to provide habitat of similar quality to the existing habitat that would be impacted, from the perspective of California red-legged frogs, within approximately one year after the completion of construction.

Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below will minimize impacts on individuals and their habitat during construction. Compensatory mitigation is proposed to mitigate for any permanent loss of the California red-legged frog dispersal or foraging habitat.

Swainson's hawk

The Build Alternative is not expected to result in impacts on high quality Swainson's hawk foraging habitat (e.g., open agricultural fields and pastures) due to the proximity of I-80. The BSA represents a very small fraction of the total foraging habitat available to this species in the region. No row crops and only 2.67 acres of non-native grasslands (i.e., potentially suitable foraging habitat) would be permanently impacted by the project. This represents less than 0.01 percent of the foraging habitat available within 10 miles of the nearest active nest. Therefore, the Build Alternative **is not expected** to reduce this species' populations or reproduction potential in any way, and any project impacts would be minimal. Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below would avoid take of, and impacts to, Swainson's hawks, including eggs and young. Therefore, no compensatory mitigation is required.

West Segment –Fundable First Phase

Adverse effects to the protected species described above for the Build Alternative are applicable to West and East Segments. As previously discussed, the distribution of suitable habitat types within the BSA varies dependent on the characteristics and needs of the animal species. California red-legged frog habitat is only present within the West Segment of the Build Alternative. As such, the West Segment of the Build Alternative is expected to have slightly higher direct and indirect effects to habitats that support protected animal species when compare to the East Segment.

No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-80 within the project limits. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lanes would be constructed. No bridge structures would be widened or replaced. As such, the No-Build Alternative would not result in impacts to biological resources. Implementation of the currently planned and funded transportation projects outside the BSA but within the project region would be subject to the same potential presence of threatened and endangered animal species as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USFWS and CDFW requirements regarding protected animal species, should those species be identified within areas that would be directly or indirectly affected. The potential presence of threatened and endangered animal species in areas outside of the BSA would be determined under separate environmental review.

Formal Consultation

Caltrans initiates consultation with USFWS when a project has the potential to affect a federally listed species. Formal consultation with USFWS under FESA was initiated with the submission of a Biological Assessment (BA) prepared for the project for the valley elderberry longhorn, Central Valley steelhead, Central California Coast steelhead, and California red-legged frog. A Biological Opinion (BO) was obtained from the USFWS on August 17, 2015.

CESA generally parallels the main provisions of FESA, but extends the take prohibitions to species proposed for listing. Section 2080 of California Fish and Game Code prohibits the take (defined as hunting, pursuing, catching, capturing, or killing) of endangered, threatened, or candidate species unless otherwise authorized by permit. CESA allows for take incidental to otherwise lawful development projects except for those species listed as fully protected. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any listed or candidate species or result in destruction or adverse modification of essential habitat.

The project has the potential to affect the one species listed under CESA: Swainson's hawk. However, with implementation of **Measure BIO-30**, an Incidental Take Permit (ITP) from the CDFW is not expected to be needed.

Caltrans also initiates consultation with the National Marine Fisheries Service (NMFS) when a project has the potential to affect a federally listed anadromous fish species and/or adversely affect designated critical habitat. As the project has the potential to affect Central Valley steelhead and Central California Coast steelhead, federally listed anadromous fish, informal consultation with the NMFS was initiated in March 2015 with the submission of a BA prepared for the project. The NMFS agreed that because the project did not propose pile driving, there would be no likely impacts to the Central Valley steelhead and Central California Coast steelhead. Accordingly, NMFS agreed that under the Programmatic Biological Opinion for Caltrans' Routine Maintenance and Repair Activities Program in

Caltrans' Districts 1, 2, and 4 issued to Caltrans by NOAA, the project is covered under Category 3. As such, no further opinion was needed.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Biological Opinion

The Biological Opinion describes measures that must be taken to avoid, minimize, or mitigate effects to federally listed species. **Measure BIO-32, Compliance with Biological Opinion**, states that Caltrans will include a copy of the biological opinion within its solicitations for design and construction of the proposed project, making the primary contractor aware of all requirements and obligations included within the biological opinion. The Resident Engineer or their designee will be responsible for implementing the Conservation Measures and Terms and Conditions of the biological opinion. The Resident Engineer or their designee will maintain a copy of the biological opinion onsite whenever construction is taking place. Their name and telephone number will be provided to the USFWS at least 30 calendar days prior to groundbreaking. Prior to ground breaking, the Resident Engineer will submit a letter to the USFWS verifying that they possess a copy of the biological opinion and have read the Terms and Conditions. Implementation of this measure will ensure that required consultation and concurrence with the USFWS is obtained prior to construction

Valley elderberry longhorn beetle

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for adverse effects to the valley elderberry longhorn beetle during project construction. These measures include worker environmental training (**Measure BIO-3**), barrier fencing to protect habitat at specified buffer zones (**Measures BIO- 24** and **BIO-25**), erosion control and re-vegetation of buffer zones (**Measure BIO-26**), use prohibition of harmful chemicals within specified distance of habitat (**Measure BIO-27**), and a dust control program (**Measure BIO-28**).

Central valley steelhead and Central California coast steelhead

Water quality during construction and project operation would be protected by BMPs that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality; Measures HYDR-1** and **WQ-2** and **Section 2.3.7 Avoidance and Minimization Measures and Project Mitigation Measures**, below), for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA are maintained for the special-status species that could be present in these aquatic habitats. Additionally **Measure BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, and BIO-8** as detailed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**, below include provisions on worker environmental training, construction to avoid takes, disturbances or injury of the Central valley steelhead and the Central California coast steelhead, habitat protection, and biological monitoring. The

project will also implement all applicable Additional BMPs (ABMPs) as specified in the Programmatic Biological Opinion for Caltrans' Routine Maintenance and Repair Activities Program in Caltrans' Districts 1, 2, and 4 (NOAA 2013).

California red-legged frog

The avoidance and minimization measures listed in **Section 2.3.7, Avoidance and Minimization Measures**, will reduce the potential for effects to California red-legged frogs during project construction. These measures include biological monitoring worker environmental awareness training, pre-construction surveys, relocation plan, construction material and storage inspections, and exotic species control by a qualified biologist (**Measure BIO-28**).

Water quality during construction and project operation would be protected by BMPs and other measures that would be developed approved prior to construction (see **Section 2.2.2, Water Quality, Measures HYDR-1, WQ-1, BIO-1, and BIO-2**). Implementation of these measures would ensure that the natural beneficial values of the waterways within the BSA were maintained for California red-legged frogs that could be present in or near this aquatic habitat.

Mitigation Measure BIO-F: Compensatory Mitigation for the California Red-Legged Frog. Caltrans will mitigate for any permanent loss of California red-legged frog dispersal or foraging habitat at a 3:1 ratio (mitigation : impact) and any temporary loss of dispersal and foraging habitat at a 1:1 ratio on an acreage basis, estimated at approximately 1.05 acres of habitat to be preserved. Compensatory mitigation may be carried out through purchasing credits at a habitat mitigation bank and/or one or both of the following methods, in order of preference:

- Establishment of a conservation easement for habitat used for California red-legged frog dispersal.
- Purchase of USFWS-approved banking credits for upland dispersal habitat.
- Provide funds to conservation group for aid and support of California red-legged frog conservation.

Swainson's hawk

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**, below would reduce the potential for adverse effects to the Swainson's hawk during project construction. These measures include timing of construction activities outside nesting periods, pre-construction surveys, disturbance free buffer zones, and biological monitoring (**Measure BIO-30**).

West Segment - Fundable First Phase

Avoidance, minimization, and mitigation measures described above for the Build Alternative are applicable to the East and West Segments. Certain impacts are more prevalent in the West Segment of the Build Alternative because of the distribution of suitable habitat for protected species. Where applicable, the avoidance and minimization measures specify the locations in which the measures should be applied (i.e., measures that dictate compensatory mitigation related to California red-legged frogs are thereby only applicable to West Segment of the project).

2.3.6 INVASIVE SPECIES

REGULATORY SETTING

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State’s invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project.

AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans, 2014k). Several invasive plant species were observed within or adjacent to the BSA (**Table 2.3-6**). These species included understory invaders such ripgut brome and milk thistle, and shrub invaders such as Himalayan blackberry.

Table 2.3-6 List of Invasive Plant Species Observed in the BSA and the California Invasive Plant Council Ratings.

Common Name	Scientific Name	Rating*	Common Name	Scientific Name
Tree-of-heaven	<i>Ailanthus altissima</i>	Moderate	Tree-of-heaven	<i>Ailanthus altissima</i>
Giant reed	<i>Arundo donax</i>	High	Giant reed	<i>Arundo donax</i>
Black mustard	<i>Brassica nigra</i>	Moderate	Black mustard	<i>Brassica nigra</i>
Field mustard	<i>Brassica rapa</i>	Limited	Field mustard	<i>Brassica rapa</i>
Ripgut brome	<i>Bromus diandrus</i>	Moderate	Ripgut brome	<i>Bromus diandrus</i>
Soft chess	<i>Bromus hordeaceus</i>	Limited	Soft chess	<i>Bromus hordeaceus</i>
Red brome	<i>Bromus madritensis</i>	High	Red brome	<i>Bromus madritensis</i>

Common Name	Scientific Name	Rating*	Common Name	Scientific Name
Italian thistle	<i>Carduus pycnocephalus</i>	Moderate	Italian thistle	<i>Carduus pycnocephalus</i>
Highway iceplant	<i>Carpobrotus edulis</i>	High	Highway iceplant	<i>Carpobrotus edulis</i>
Yellow star-thistle	<i>Centaurea solstitialis</i>	High	Yellow star-thistle	<i>Centaurea solstitialis</i>
Squarrose knapweed	<i>Centaurea virgata</i> var. <i>squarrosa</i>	Moderate	Squarrose knapweed	<i>Centaurea virgata</i> var. <i>squarrosa</i>
Poison hemlock	<i>Conium maculatum</i>	Moderate	poison hemlock	<i>Conium maculatum</i>
Bull thistle	<i>Cirsium vulgare</i>	Moderate	Bull thistle	<i>Cirsium vulgare</i>
Pampasgrass	<i>Cortaderia jubata</i>	High	Pampasgrass	<i>Cortaderia jubata</i>
Silverleaf	<i>Cotoneaster pannosus</i>	Moderate	Silverleaf	<i>Cotoneaster pannosus</i>
Artichoke thistle	<i>Cynara cardunculus</i>	Moderate	Artichoke thistle	<i>Cynara cardunculus</i>
Bermuda grass	<i>Cynodon dactylon</i>	Moderate	Bermuda grass	<i>Cynodon dactylon</i>
Annual dogtail	<i>Cynosurus echinatus</i>	Moderate	Annual dogtail	<i>Cynosurus echinatus</i>

Source: Caltrans 2014k

ENVIRONMENTAL CONSEQUENCES

Build Alternative

The project is not expected to result in a substantial increase in invasive species within the BSA due to the limited disturbance that would occur outside of the highly disturbed areas of the I-80 corridor. However, some grading and temporary staging areas would be located within natural habitats adjacent to the freeway. Therefore, care must be taken to limit the effects of site disturbance. All areas temporarily disturbed by vegetation removal, grading, construction access, and bridge and road modifications would be seeded with a native seed mixture that would help prevent erosion and also would increase the amount of native species within the herbaceous layer of the existing habitats. Invasive species, particularly fast-growing herbaceous invaders, are often disturbance-adapted, and soil disturbance (an effect expected for this construction project) will often be followed by an invasion of the disturbed area by these species. However, areas that will be affected by project activities will be seeded and planted with native species. Therefore, project-related effects are not expected to cause an increase in invasive species populations within the BSA.

West Segment

The minimal effects related to invasive species for the Build Alternative are applicable to the West Segment.

No-Build Alternative

The No-Build Alternative will make no physical or operational improvements to I-80 or the connecting roadways within the BSA. Implementation of the currently planned and funded projects outside the BSA but within Solano County will have the same potential to introduce or spread invasive species into currently un-infested areas. Transportation projects will be subject to the same avoidance measures prescribed by Caltrans and EO 13112, thereby reducing potential adverse effects related to the spread of invasive species.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Project activities are not expected to cause an increase in invasive species populations within the study area, thus no avoidance measures or compensatory mitigation is warranted for this species.

2.3.7 AVOIDANCE AND MINIMIZATION MEASURES AND PROJECT MITIGATION MEASURES

AVOIDANCE AND MINIMIZATION MEASURES

To avoid and minimize effects to sensitive species and their habitats within the BSA, Caltrans would implement the general avoidance and minimization measures described below. The measures would be included as part of the special provisions of the construction bid package as measures that would be implemented during construction. These measures apply to all of the proposed improvements under the Build Alternative, including the East and West Segments. These measures will include minimizing the area of impact, installing wildlife exclusion fencing, implementing work windows, conducting environmental education for the construction crews, conducting preconstruction surveys, requiring presence of an on-site biological monitor during designated periods, and other construction-site best management practices (BMPs).

Measure BIO-1: Orange construction barrier fencing will be installed to identify ESAs, including oak and riparian woodlands, present within the BSA but that are to be avoided by project activities. A qualified biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans. Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction

activities are initiated, maintained throughout the construction period, and be removed after completion of construction.

Measure BIO-2: The following Caltrans standard BMP's shall be implemented during construction to avoid or minimize impacts on aquatic habitats:

- All work within the banks of an active channel will be restricted to the dry season (June 1–October 15).
- Orange construction barrier fencing will be installed to identify environmentally sensitive areas (ESAs), including aquatic and wetland habitat, present within the BSA but that are to be avoided by project activities. A qualified biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans.
- Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated, maintained throughout the construction period, and removed only after completion of construction.
- Caltrans will implement BMPs as recommended or required by the State Water Quality Control Board to protect water quality. These measures will include, but are not limited to the following:
 - No debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products or other organic or earthen material will be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the U.S./State or aquatic habitat.
 - No equipment will be operated in the live stream channel.
 - Equipment staging and parking areas will occur within established access areas in upland habitat above the top of bank.
 - Machinery or vehicle refueling, washing, and maintenance will occur at least 60 feet from the top-of-bank. Equipment will be regularly maintained to prevent fluid leaks. Any leaks will be captured in containers until the equipment is moved to a repair location.

- A spill prevention and response plan will be prepared prior to construction and will be implemented immediately for cleanup of fluid or hazardous materials spills.
- Standard erosion control and slope stabilization measures will be required for work performed in any area where erosion could lead to sedimentation of a water body.
- Caltrans will provide a dewatering and diversion plan for agency approval as needed.

Measure BIO-3. A Worker Environmental Awareness Training (WEAT) program will be given by a qualified biologist before the onset of to explain to construction personnel how best to avoid the accidental take of steelhead and Chinook salmon and the valley elderberry longhorn beetle. The biologist will conduct a training session that will be scheduled as a mandatory informational field meeting for contractors and all construction personnel. Handouts, illustrations, photographs, and/or project mapping showing areas where minimization and avoidance measures are being implemented will be included as part of this worker awareness program. Upon completion of the program, employees will sign a form stating that they attended the training session and understand all the conservation and protection measures.

Measure BIO-4. All work within a low-flow channel associated with the construction of the Ulatis and Horse creek bridge modifications will occur during the dry season (June 1 to October 15). During this time, drainage flows in Ulatis and Horse creeks are expected to be at annual lows, and it is possible that the drainages may be completely dry; during this time, steelhead and Chinook are expected to be absent from the reaches of Ulatis and Horse creeks within the BSA.

Measure BIO-5. When work in a flowing stream is unavoidable and before work commences, any stream flow will be diverted around the work area by a barrier/cofferdam, temporary culvert, or a new channel capable of permitting upstream and downstream fish movement. The material used to construct the cofferdams will be clean material, contained, for example in sacks, and placed over plastic or filter fabric (or like material) so it can be completely removed from the streambed and preserve existing riverbed substrate. Construction of the barrier/cofferdam or the new channel will normally begin in the downstream area and continue in an upstream direction and the flow will be diverted only when construction of the diversion is completed.

Measure BIO-6. During construction activities that involve physical modification of any bridge over aquatic habitat, netting or other structures will be installed under the existing bridge to prevent debris from entering the channel, as such debris could degrade water quality downstream and potentially injure steelhead or Chinook salmon (e.g., when work on the bridge deck is occurring during the wet season).

Measure BIO-7. If flow is present in the drainage when in-water construction is scheduled to occur, a qualified biologist will be present to monitor all activities involving the placement of fill in the drainage, including any cofferdam construction. The biologist will inspect the area where the cofferdam will be constructed prior to construction and will ensure that any fish have vacated the cofferdam area before in-water work begins. A water diversion plan will be developed and submitted to resource agencies prior to construction start. Once all fish have moved out of the work area, the cofferdam will be completed so that fish cannot re-enter this area.

Measure BIO-8. If at any time an individual steelhead or Chinook salmon appears to be at risk of injury or mortality due to project-related activities, all work will stop until Caltrans has consulted with NMFS to determine a means of avoiding impacts on the individual(s).

Measure BIO-9. In order to avoid and minimize project impacts on badgers, a qualified mammalogist will conduct pre-construction surveys for badger dens non-native annual grassland throughout the BSA, within two weeks prior to groundbreaking. Because badger dens, if present, are most likely to occur in open grassland and ruderal habitats, this survey could be conducted in conjunction with the preconstruction survey for burrowing owls.

Measure BIO-10. If an active badger maternity den is located, the mammalogist will determine the size of a construction-free buffer that will be maintained around the den to avoid impacts on the den during the pupping season (i.e., February 15 through July 1, or as otherwise determined through surveys and monitoring of the den), in consultation with the CDFW.

Measure BIO-11. If an active den is found outside of the pupping season, the badger will be evicted by excavation of the den using hand tools, in consultation with the CDFW and under the supervision of a qualified biologist. These precautionary measures will ensure that no active pupping dens are impacted by the project.

Measure BIO-12. A qualified biologist will conduct a pre-construction survey for western pond turtles and their nests. If a western pond turtle is found in an area where it could be injured or killed by project activities, the qualified biologist will relocate the turtle to an appropriate site outside the project area.

Measure BIO-13. If an active western pond turtle nest is detected within the activity area, a 25-foot buffer zone around the nest will be established and maintained during the nesting season (April 1 through August 31). The buffer zone will remain in place until the young have left the nest, as determined by a qualified biologist.

Measure BIO-14. Following the initial survey, a qualified biologist will conduct a survey of the aquatic habitat within the activity area each morning prior to the onset of construction activities. If a turtle is located, all work in the vicinity will immediately cease, and a qualified biologist will be contacted. Work within the area will not resume until the turtle has been relocated or has moved out of the area where it could be impacted.

Measure BIO-15. Work within 100 feet of bridges/crossings identified in Table 9 of Caltrans 2014i as providing suitable bat day roosting habitat (i.e., Laguna Creek Bridge and Soda Springs Culvert) will be avoided during the maternity season (April 1 through July 31) to the extent feasible. Outside of the maternity season, when construction activities will occur within 100 feet of the roost, the bats may be habituated enough to noise and vibration that they may tolerate the work activities and not abandon the roost. Those bats that cannot tolerate this disturbance are expected to leave the roost, dispersing to other roost habitat in the vicinity (e.g., other bridges). However, based on the bats' obvious habituation to noise and vibrations associated with existing traffic, impacts on the colony will be lower if the bats are allowed to decide whether to abandon based on their own level of tolerance than if the bats are evicted prior to work, which is assured of causing the abandonment of the entire colony. As a result, no eviction of bats is proposed for work conducted outside of the maternity season. Performing work outside of the maternity season will ensure that no non-flying young are abandoned or harmed during work activities. Further, in case the bats do disperse from the bridge when work commences, all work activities involving jackhammering within 100 feet of the roost will commence in the evening, after sunset, in order to minimize the risk of predation of bats leaving the roost. If work within 100 feet of potential day roosts sites during the maternity season cannot be avoided, the following measures will be implemented.

Measure BIO-16. If jackhammering or other ground-disturbing activities will occur on the freeway immediately above a potential day roost, bats will be safely evicted from the potential roost site under the direction of a qualified bat biologist. Eviction activities will be performed prior to the breeding season (i.e. April 1) in the year in which project activities are scheduled to occur. Eviction of bats will occur at night to decrease the likelihood of predation (compared to eviction during the day). Evictions will occur between September 1 and March 32, outside the maternity season, but will not occur during long periods of inclement or cold weather (as determined by the bat biologist) when prey are not available or bats are in torpor. Following eviction, bat exclusion devices will be installed to prevent bats from taking up occupancy of the structure prior to the onset of the proposed activity.

Measure BIO-17. If jackhammering or other ground-disturbing activities will not occur on the freeway immediately above the roost but will occur within 100 feet of the roost, a qualified bat biologist will determine whether the bats will be evicted, using the methods outlined in **BIO-15** and **BIO-16**, on a case-by-case basis depending on the level of disturbance that is proposed.

Measure BIO-18. Pre-construction surveys for burrowing owls will be conducted in potential habitat in conformance with the CDFW's 2012 protocol (CDFW 2012).

Measure BIO-19. If burrowing owls are present during the nonbreeding season, (generally 1 September 1 to January 31), the approved biologist will establish a protective buffer zone in coordination with resource agencies. During the breeding season (generally 1 February 1 to August 31), a 250-foot buffer, within which no new project-related activities will be permissible, will be maintained between project activities and occupied nests. Owls present

between February 1 and August 31 will be assumed to be nesting unless monitoring evidence indicates that the owls are no longer nesting, or the young owls are foraging independently, or only a single owl (rather than a breeding pair) is present after 1 July and there is no evidence that young owls are present, in which case the buffer may be reduced or the owls may be relocated prior to August 31, in consultation with the CDFW.

Measure BIO-20. If construction will directly impact occupied burrows, eviction of owls will occur in coordination with the regulatory agencies.

Measure BIO-21. If vegetation is to be removed by the project, potential nesting substrate (e.g., bushes, trees, snags, grass, and suitable artificial surfaces) that will be disturbed should be removed during the nonbreeding season (i.e., they should be removed between September 1 and February 14), if feasible, to help preclude nesting. If it is not feasible to schedule vegetation removal during the nonbreeding season, then pre-construction surveys for nesting birds will be conducted by a qualified biologist to ensure that no nests will be disturbed during project implementation. This survey will be conducted no more than seven days prior to the initiation of construction activities. During this survey, the ornithologist will inspect all trees, shrubs, and other potential nesting habitats in and immediately adjacent to the BSA for nests. If an active nest is found sufficiently close to work areas to be disturbed by these activities, the biologist, in consultation with the CDFW, will determine the extent of a buffer zone to be established around the nest, typically 300 feet for raptors and 50 feet for other birds, to ensure that no nests of species protected by the MBTA or the California Fish and Game Code will be disturbed during project implementation.

Measure BIO-22. Alternatively, nest starts may be removed on a regular basis (e.g., every second or third day), starting in late January or early February, or measures such as exclusion netting may be placed over the existing bridges to prevent active nests (i.e., nests with eggs or young) from becoming established. Netting needs to be installed by an experienced deterrence contractor and be well maintained to prevent entanglement or entrapment of birds.

Measure BIO-23. Because the entire BSA is already subject to disturbance by vehicles, activities that will be prohibited from occurring within the buffer zone around a nest will be determined on a case-by-case basis. In general, activities prohibited within such a buffer while a nest is active will be limited to new construction-related activities (i.e., activities that were not ongoing when the nest was constructed) involving significantly greater noise, human presence, or vibrations than were present prior to nest initiation.

Measure BIO-24. Before any ground-disturbing activity, orange construction barrier fencing will be installed to identify ESAs, including elderberry shrubs, present within the BSA but that are to be avoided (i.e., no ground disturbance activities will occur within 20 feet of the two shrubs present within 100 feet of project impact areas) by project activities. The fencing will be installed at least 20 feet from the driplines of all elderberry shrubs on which direct impacts will be completely avoided. A qualified biologist will identify sensitive biological

resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans.

Measure BIO-25. Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated, maintained throughout the construction period, and be removed after completion of construction.

Measure BIO-26. Any damage to the buffer area during construction will be restored following construction. Restoration will include erosion control and re-vegetation with native plants as appropriate.

Measure BIO-27. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant will be used within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or greater in diameter at ground level.

Measure BIO-28. Caltrans will include provisions in the construction bid documents that the contractor will implement a dust control program to limit fugitive dust emissions. The dust control program may include, but not be limited, to the following elements, as appropriate:

- Water active construction sites at least twice daily.
- Pursuant to California Vehicle Code, Section 23114 (State of California 2004), all trucks hauling soil and other loose material to and from the construction site will be covered or should maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of load and the trailer).
- Exposed stockpiles of soil and other backfill material will be enclosed or covered, and watered twice daily or have soil binders added.
- Any topsoil that is removed for the construction operation will be stored on-site in piles not to exceed 4 feet in height. These topsoil piles will be clearly marked and flagged. Topsoil piles that will not be immediately returned to use will be revegetated with a non-persistent erosion control mixture.

Measure BIO-29. Caltrans will submit to the USFWS the name(s) and credentials of biologists who would conduct activities related to the California red-legged frog specified in the following measures:

- A WEAT program will be given by an approved biologist before the onset of construction within potential California red-legged frog habitat to explain to construction personnel how best to avoid the accidental take of red-legged frogs. The

biologist will conduct a training session that will be scheduled as a mandatory informational field meeting for contractors and all construction personnel. Handouts, illustrations, photographs, and/or project mapping showing areas where minimization and avoidance measures are being implemented will be included as part of this worker awareness program. Upon completion of the program, employees will sign a form stating that they attended the training session and understand all the conservation and protection measures.

- Prior to the initiation of the pre-construction survey, a relocation plan for any California red-legged frogs found on the project site will be submitted to the USFWS for approval.
- The approved biologist will perform pre-construction surveys.
- A USFWS-approved biologist will be present at all times during initial disturbance of potential red-legged frog habitat to monitor for red-legged frogs.
- All construction pipes, culverts, or similar structures that are stored at the site within suitable red-legged frog habitat for one or more overnight periods will be either securely capped prior to storage or thoroughly inspected by the approved biologist or on-site monitor before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a California red-legged frog is discovered inside a pipe, the approved biologist will move the animal to an approved location, as described above.
- During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.
- A qualified biologist will permanently remove any individuals of exotic species.

Measure BIO-30. If construction-related work is conducted outside the nesting period (February 1 through August 31), potential impacts on active nests of Swainson's hawks will be avoided. If it is not feasible to schedule construction during the nonbreeding season, the following measures will be implemented.

- A pre-construction survey for nesting Swainson's hawks within 0.25 miles of the BSA will be conducted within 15 days prior to the initiation of construction activities; this survey will be conducted by a qualified biologist. If an active Swainson's hawk nest is detected, the following measure will be implemented.
 - To reduce the potential for Swainson's hawks to abandon their nest or territory due to construction disturbance during their reproductive period, if nesting Swainson's hawks are present, a buffer free from new disturbance will be established within a 600-foot radius of the nest. No new project-related activities (i.e., activities that were not already ongoing when the nest was established, or that are of a substantially greater intensity than when the nest was established)

will be undertaken within the buffer. In some cases (e.g., if the construction is not visible from the nest site), it is possible that a lesser buffer would be adequate to avoid disturbance of the nesting Swainson's hawks, but such a variance would require approval of the CDFW. In such a case, the biologist and agency personnel will agree on a reduced buffer, and the biologist will monitor the behavior of the nesting birds during the two days immediately prior to the onset of construction activities within 0.25 miles of the nest to establish a behavioral baseline. The biologist will also monitor the behavior of the nesting birds during the first full day of construction activity within 0.25 miles of the nest. The biologist will look for signs of stress such as repeated alarm calls, agitated behavior, or departure of the birds from the nest. If the birds do not show signs of habituation to the new disturbance by resuming their normal nesting activities, work within the vicinity of the nest will stop and the CDFW will be consulted to refine the buffer determination. If the birds continue their normal activities, the biologist will inspect the nest site every one to two days (the frequency determined in consultation with the CDFW) for as long as the nest is active and work is ongoing within the reduced buffer to confirm that the birds are tolerant of the construction activities. Any required buffer will remain in place until young are no longer dependent on the nest, or until the nesting attempt fails (for reasons other than project activities) and it is determined that the birds will not attempt to re-nest. A qualified biologist will determine through direct observation when the nest is no longer in use (e.g., if the young have fledged or the nesting fails for non-project-related reasons). Constant monitoring of the nest is not necessary, but before construction activities occur within the agreed-upon buffer, the biologist must have confirmed that the nest is no longer active.

Measure BIO-31. In compliance with the Executive Order on Invasive Species, EO 13112, and guidance from the Federal Highway Administration (FHWA), the landscaping and erosion control included in the project will not use species listed as invasive.

In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

Measure BIO-32: Compliance with the Biological Opinion. Caltrans will include a copy of the biological opinion within its solicitations for design and construction of the proposed project, making the primary contractor aware of all requirements and obligations included within the biological opinion, and to educate and inform all other contractors involved in the project as to the requirements of the biological opinion. The Resident Engineer or their designee will be responsible for implementing the Conservation Measures and Terms and Conditions of the biological opinion. The Resident Engineer or their designee will maintain a copy of the biological opinion onsite whenever construction is taking place. Their name and telephone number will be provided to the USFWS at least 30 calendar days prior to groundbreaking.

Prior to ground breaking, the Resident Engineer will submit a letter to the USFWS verifying that they possess a copy of the biological opinion and have read the Terms and Conditions.

MITIGATION MEASURES

Compensatory mitigation as described below will minimize adverse effects to natural communities, wetlands and other waters, animal species, and threatened and endangered species to a negligible level. A portion of the overall mitigation acreage requirements will be satisfied by restoring temporarily impacted areas (on-site mitigation). The remaining acreage requirement will be satisfied either through purchase of credits if necessary at an approved mitigation bank, or through off-site mitigation. Since some species have similar habitat requirements, some mitigation acreage may be considered as having value for several species, and consequently would be applied as multi-species conservation credits when tracking Caltrans' fulfillment of the proposed mitigation.

Mitigation Measure BIO-A: Compensatory Mitigation for Oak Woodlands Replacement.

Compensation for impacts to 1.35 acres of oak woodland habitat will be mitigated at a replacement ratio of 2:1 within the BSA and, if needed, outside the BSA. An on-site Mitigation Monitoring Plan (MMP) for replacement of trees and shrubs will be developed by Caltrans. The MMP will specify that the mitigation plantings either will be composed of the same species and at the same ratios as those removed, or will reflect the composition and density of a reference site near the BSA. In addition, planting areas will be seeded with a native seed mixture that is similar in species and cover to what occurs in each of the oak woodland habitats. All woody plant materials will be replaced using a local native seed source. If the replacement of oak woodland habitat cannot be implemented within the BSA, or there is not a sufficient area to mitigate oak woodland tree and shrub impacts, as determined by Caltrans, acreage for oak woodland plantings will be acquired within the vicinity of the project.

Mitigation Measure BIO-B: Compensatory Mitigation for Oak Woodlands Habitat

Mitigation and Monitoring Plan. Prior to issuance of a grading permit, Caltrans will prepare an Oak Woodland Habitat Mitigation & Monitoring Plan (HMMP) for oak woodland habitat creation. An open space or conservation easement, or other similar instrument, will be recorded on property associated with the mitigation lands to protect the created habitats' plant and wildlife resources in perpetuity. The Oak Woodland HMMP will be prepared by a qualified restoration ecologist and will provide, at a minimum, the following items:

- Habitat impacts summary and proposed habitat mitigation actions
- Goals of the restoration to achieve no net loss
- The location of the mitigation sites and existing site conditions
- Mitigation design including:
 - Proposed site construction schedule

- Description of existing and proposed soils, hydrology, geomorphology and geotechnical stability
- Site preparation and grading plan
- Invasive species eradication plan, if applicable
- Soil amendments and other site preparation
- Planting plan (plant procurement/propagation/installation)
- Maintenance plan
- Monitoring measures, performance and success criteria
- Monitoring methods, duration, and schedule
- Contingency measures and remedial actions
- Reporting measures

Mitigation Measure BIO-C: Compensatory Mitigation for Aquatic and Wetland Restoration. Compensation for permanent impacts up to 0.17 acre of aquatic and wetland habitat will be mitigated at a replacement ratio of 1:1 (created wetlands: impacted wetlands) based on square footage offsite . These effects may be mitigated at a USACE-approved wetland mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turn-key mitigation property located in close proximity to the project, such as Grizzly Bay Preserve. Temporary impacts on 1.23 acre of aquatic habitat (i.e. impacted areas not previously mitigated) will be mitigated on-site by restoring impacted areas to pre-project conditions.

Mitigation Measure BIO-D: Compensatory Mitigation for Riparian Woodland Replacement. Compensation for permanent impacts to up to 0.03 acre of riparian habitat will be mitigated at a replacement ratio of 3:1 (habitat replaced: habitat lost) based on acreage offsite . These effects may be mitigated at a CDFW-approved riparian mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turnkey mitigation property located in close proximity to the project, such as Grizzly Bay Preserve.

Mitigation Measure BIO-E: Compensatory Mitigation for the Burrowing Owl. Compensatory mitigation will be provided in the form of habitat preservation and/or management if burrowing owls are located in the BSA during pre-construction surveys. The loss of foraging and nesting habitat in the project construction area will be offset by acquiring and permanently protecting suitable foraging and breeding habitat.

Mitigation Measure BIO-F: Compensatory Mitigation for the California Red-Legged Frog. Caltrans will mitigate for any permanent loss of California red-legged frog dispersal or foraging habitat at a 3:1 ratio (mitigation : impact) and any temporary loss of dispersal and foraging habitat at a 1:1 ratio on an acreage basis, estimated at approximately 1.05 acre of

habitat to be preserved. Compensatory mitigation may be carried out through purchasing credits at a habitat mitigation bank and/or one or both of the following methods, in order of preference:

- Establishment of a conservation easement for habitat used for California red-legged frog dispersal.
- Purchase of USFWS-approved banking credits for upland dispersal habitat.
- Provide funds to conservation group for aid and support of California red-legged frog conservation.

Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

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