3.3 Biological Environment

3.3.1 Introduction

The information presented under Biological Environment is based upon Caltrans Natural Environment Study, revised August 2008.

This section covers the diversity of plant and wildlife species and habitats found in the MSN Project area. Natural communities, including the areas' extensive bay-oak woodlands, are described in Section 3.3.2. Wetland habitats that receive state and federal protection are presented in Section 3.3.3. Plant communities and wildlife species known to occur in the project vicinity are discussed in Sections 3.3.4 and 3.3.5, respectively. Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act (FESA) are discussed in the Threatened and Endangered Species Section 3.3.6. Finally, a description of invasive plant species is provided in Section 3.3.7.

In preparation of this analysis, Caltrans obtained a list of species that may potentially occur in the project area from California Department of Fish and Game (CDFG), California Natural Diversity Database (CNDDB) and United States Fish and Wildlife Service (USFWS). The special status species with the potential to occur within the project include the federal and state endangered salt-marsh harvest mouse (SMHM) (*Reithrodontomys raviventris)*, the federal threatened Central California coast steelhead (CCCS) (*Oncorhynchus mykiss*), the federal threatened southern DPS North American green sturgeon (*Acipenser mediaostris*), the federal threatened and state species of special concern California red-legged frog (CRLF) (*Rana aurora draytonii*), and seven listed plant species. These plants are Sonoma alopecurus (*Alopecurus aequalis var. sonomensis*) (federal endangered), soft bird's beak (*Cordylanthus mollis ssp. mollis*) (federal endangered), Baker's larkspur (*Delphinium bakeri*) (federal endangered), Burke's goldfields (*Lasthenia burkei*) (federal endangered), Contra Costa goldfields (*Lasthenia conjugens*) (federal endangered), and showy Indian clover (*Trifolium amoenum*) (federal endangered).

In addition, potential habitat for fall-run Central Valley Chinook salmon (Chinook salmon) (*Oncorhynchus tshawytscha*) within and downstream of the project is designated as Essential Fish Habitat (EFH). EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (NMFS, 2007d). Animal species, like the Chinook salmon, that are present in the

project area, but not under the jurisdiction of the FESA or the California Endangered Species Act (CESA), are discussed in Section 3.3.5.

A list of these and other species and habitats within the MSN Project area can be found in Appendix H.

Figure 3.3-1a-d presents some of the significant biological resources in the MSN Project area. The information is generalized and intended only to show the approximate extent and location of the some of the natural resources that occur in the project area. As noted above, more detailed information is available.

3.3.2 Natural Communities

This section 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.

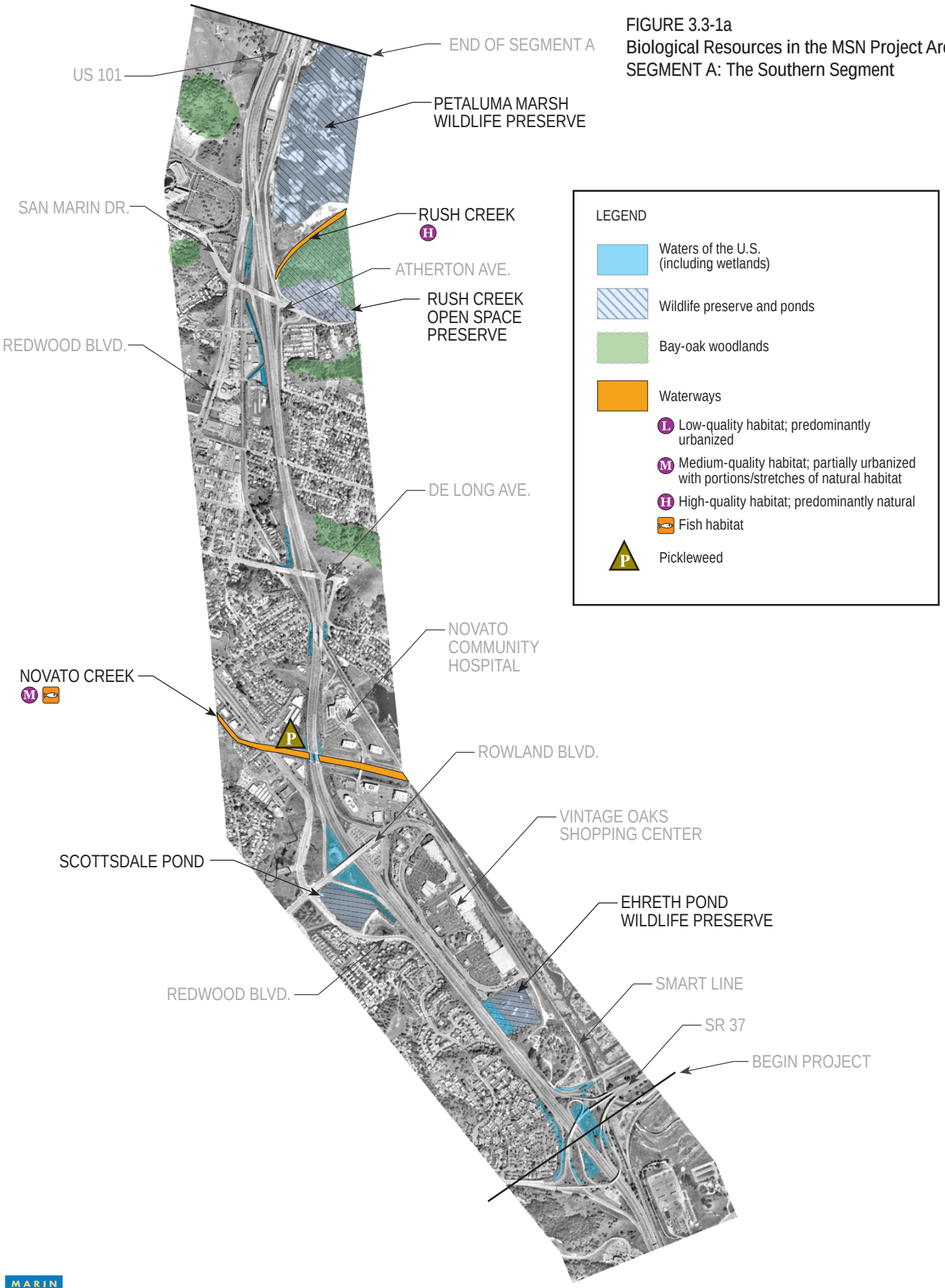
Natural communities that encompass wetlands and other waters are also discussed in Section 3.3.3. Communities that have been designated as critical habitat under the Federal Endangered Species Act are discussed in the Threatened and Endangered Species, Section 3.3.6.

3.3.2.1 Regulatory Setting

Fish and game code sections 1600-1616 declare that the protection and conservation of the fish and wildlife resources of this state are of utmost public interest. An entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake, unless certain criteria set forth by the Department of Fish and Game are met.

An innovative effort called the California Oak Woodlands Conservation Program, enacted by Chapter 588, Statutes of 2001, has been implemented. The Act recognizes the importance of California's oak woodlands, their contribution to the

FIGURE 3.3-1a
Biological Resources in the MSN Project Area
SEGMENT A: The Southern Segment



MARIN SONOMA NARROWS

NORTH

Note: Not to Scale

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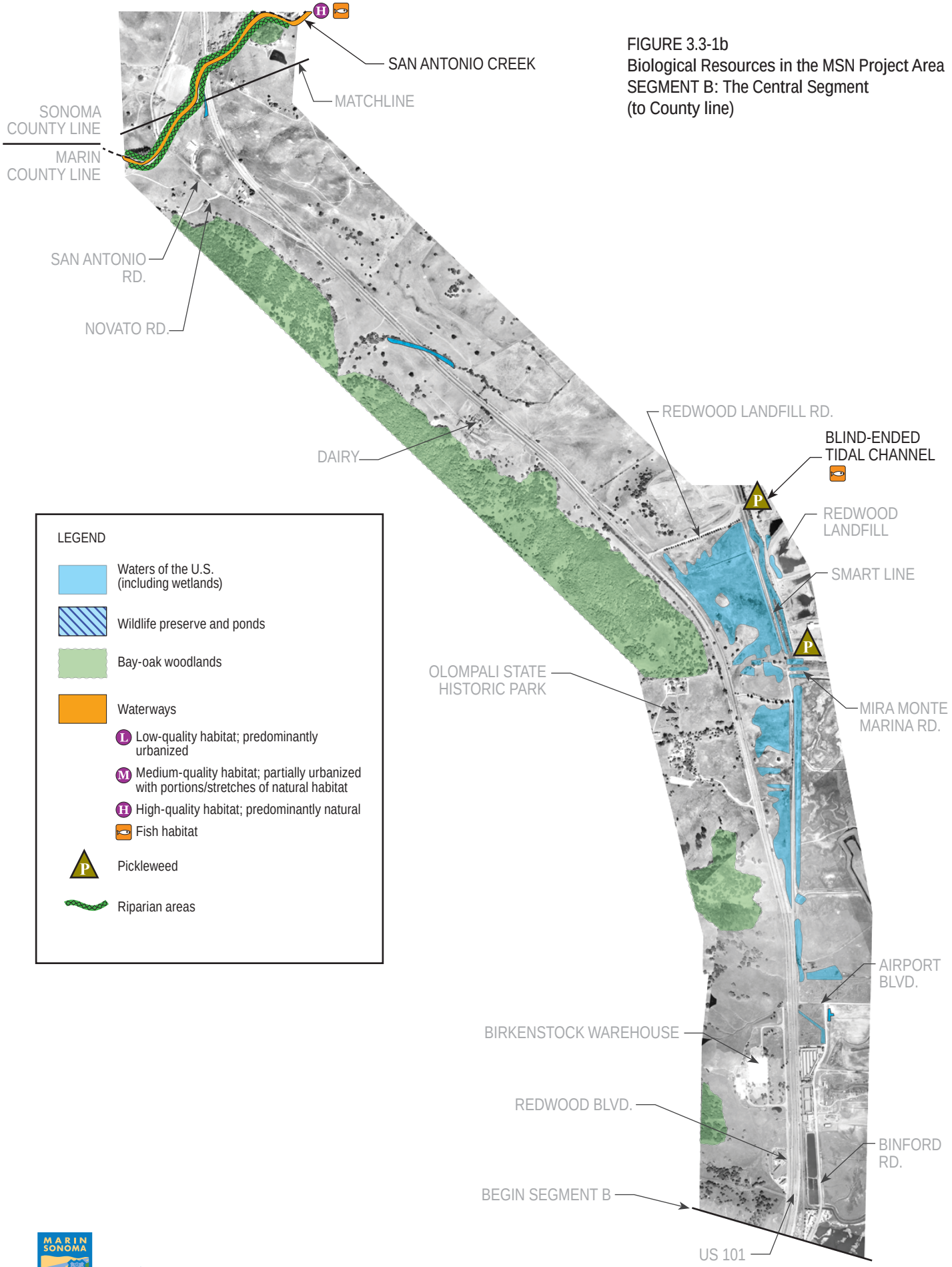
FIGURE 3.3-1b
Biological Resources in the MSN Project Area
SEGMENT B: The Central Segment
(to County line)



Note: Not to Scale

TB042006002BAO_MSN_basemaps.indd 10-09-07

FIGURE 3.3-1c
Biological Resources in the MSN Project Area
SEGMENT B: The Central Segment
(from County line)

Note: Not to Scale

TB042006\02BAO_MSN_basemaps_BiologicalResources.indd 12-29-08

FIGURE 3.3-1d
Biological Resources in the MSN Project Area
SEGMENT C: The Nothern Segment

Note: Not to Scale

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natural and scenic, the critical role of the private landowner and the importance of private land stewardship. The Act further acknowledges how oak woodlands increase the monetary and ecological value of real property and promote ecological balance. The Oak Woodlands Conservation Program offers landowners, conservation organizations, cities and counties, an opportunity to obtain funding for projects designed to conserve and restore California's oak woodlands. To accomplish the legislative intent, the Act identifies the Wildlife Conservation Board (WCB) as the responsible entity to implement the Oak Woodlands Conservation Program. The Act authorizes the WCB to purchase oak woodland conservation easements and provide grants for land improvements and restoration efforts.

Subsequently, Senate Bill 1334, enacted in January 2005, provides oak woodlands mitigation options for counties. The Oak Woodlands Conservation Environmental Quality Act seeks to create a vehicle for feasible and proportionate habitat mitigation choices for counties that have prepared a countywide oak woodland management plan pursuant to the Oak Woodlands Conservation Act. Specifically, following identification of a significant oak woodlands impact under CEQA, SB 1334 identifies the following mitigation approaches: (1) conserve through conservation easements, (2) plant an appropriate number of trees at a minimum of two new ones for each one removed, (3) contribute funds to the Oak Woodlands Conservation Fund, or (4) other measures.

3.3.2.2 Affected Environment

General Description

The City of Novato near the southern terminus of the project consists of steep upland slopes and poorly-drained soils associated with bays and tidelands. Novato Creek and Rush Creek are two major creeks located within this area of the project (see Figure 3.3-1a). Novato Creek has some tidal influence and flows east, emptying into San Pablo Bay; while Rush Creek is contained within the Rush Creek Open Space Preserve. Two other hydrologic resources include Ehreth Pond Wildlife Preserve and Scottsdale Pond, located in the vicinity of the Vintage Oaks Shopping Mall.

Northward past Atherton Avenue, and for approximately 15.5 km (9 mi), the project area transitions to a rural setting, with several scattered ranches. The west side of US 101 consists of rolling hills dominated by oak woodlands, while the

east side is characterized by seasonal wetlands and brackish marsh that border the Petaluma River as it flows to San Pablo Bay (see Figure 3.3-1b). This area also consists of steep upland slopes and well-drained loams derived from shale and sandstone.

San Antonio Creek, surrounded by mature riparian habitat, flows east at the border of Marin and Sonoma Counties, draining into the tidally influenced Petaluma River (see Figure 3.3-1c). This segment also contains several ephemeral drainage channels and large seasonal wetlands. Habitat types in this setting also include bay-oak woodlands, grasslands, alkali meadows, tidal salt marshes, agricultural pastures (e.g., cattle fields, equestrian stables), and ruderal habitat associated with roadsides.

Further north, the project area transitions back to dense suburban development in the City of Petaluma. Several creeks flow west and empty into the Petaluma River (see Figure 3.3-1d). These creeks, which include Washington Creek, Lynch Creek, and Corona Creek, are highly urbanized flood control channels and are degraded due to dense development.

Tree Communities

Intact oak woodlands, once a common component of California's landscape, are diminishing and continually threatened by the encroachment of urbanization, agriculture, overgrazing, and the spread of invasive weeds. A growing concern for the future of California's oak woodlands is the spread of Sudden Oak Death Syndrome.

Bay-oak woodland and scattered oak savannah dominate much of the landscape in the Central Segment from north of Atherton to South Petaluma Boulevard. The western side of US 101 along the southern and central portion of this segment is fairly flat immediately adjacent to the roadway. Toward the west, the landscape then rises along the east-facing slope of Mount Burdell. The sloped face of Mount Burdell, which includes Olompali State Historical Park, is dominated by bay-oak woodland (see Figure 3.3-1b). The most common species in this area include California bay (*Umbellularia californica*), valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), and blue oak (*Quercus douglasii*). The northern section of this area consists of rolling hills and scattered oaks. The eastern side of US 101 is relatively flat, and is characterized by oak savannah with scattered large-diameter oaks that fan out toward the salt marshes of San Pablo Bay.

Outside of the oak woodlands and riparian corridors, a variety of types of both native and non-native trees are found through the project area. Some occur naturally, while a wide variety of ornamental trees have been planted, particularly in the northern and southern urbanized segments of the project area. In the non-urbanized Central Segment of the project area, California bay laurel, a native species, is commonly found among the oak woodlands, oak savannah, and riparian corridors.

Although native to the coastal region of northern California, there are many redwood trees (*Sequoia sempervirens*) in the Petaluma corridor that are considered non-native. These redwoods were planted along the shoulder of US 101 and would not naturally occur in that area, as they require a cool, moist environment characteristic of the coast. The redwoods in this area are in very poor condition due to the fact that they are subject to hot, dry summers and constantly exposed to high levels of vehicle exhaust. Several unknown species of eucalyptus (*Eucaplyptus* sp.) have been planted and are common along the shoulder of the roadway in this Sonoma County segment. These and various other types of ornamental tree species are scattered along the length of the project.

Riparian Communities

San Antonio Creek is a major riparian corridor that divides Marin and Sonoma Counties. Riparian vegetation along San Antonio Creek is dominated by California buckeye (*Aesculus californica*), red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), California black walnut (*Juglans nigra*), coast live oak, valley oak, and bay laurel. Many types of wildlife were observed during field visits, including coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), and a wide diversity of birds such as wild turkey (*Meleagris gallopano*). Evidence of two species of night-roosting bats, including pallid bat (*Antrozous pallidus*) and either big brown bat (*Eptesicus fucus*) or little brown bat (*Myotis lucifugus*) and cliff swallow nests (*Petrochelidon pyrrhonota*) were also observed during field visits.

The presence of riparian habitat varies in the waterways crossing the project area. The Petaluma River is tidally-influenced and dominated by pickleweed along its banks. Washington Creek, Lynch Creek, and Corona Creek are all urbanized, flood control channels/freshwater creeks that contain low-quality habitat and feed into the Petaluma River. These creeks are degraded due to their proximity to the densely urbanized portion of Petaluma. While Washington Creek does not flow

year-round, Caltrans biologists observed large puddles during the summer months. The dominant vegetation present along Washington Creek consists of willow (*Salix* sp.), poplar (*Populus* sp.), redwood (*Sequoia sempervirens*), and a variety of ornamental shrubs. There was no evidence of bats or swallow nests observed during field visits.

Lynch Creek has both urban and perennial qualities. The northern embankment of the creek within the project boundaries is adjacent to a bicycle path. This unvegetated northern embankment is composed of cemented rip-rap. Along the eastern portion of the creek, there are a few trees separating the bicycle path from a parking lot. These trees consist of white alder (*Alnus rhombifolia*) and redwood. The southern embankment east of the bridge contains a dense stand of red willow, arroyo willow, California buckeye, and redwood. The western portion the creek is dominated by cattails (*Typha* sp.) with a few previously planted coast live oak saplings along the southern embankment. Caltrans biologists observed cliff swallow nests beneath the undercrossing and western toad (*Bufo boreas*) juveniles within the creek on the western side of US 101.

Corona Creek is ephemeral with little to no riparian vegetation. The creek contains a moderate amount of wetland vegetation, mainly cattails, within its banks.

Fish Communities

San Antonio Creek is a well-established creek containing high-quality seasonal rearing habitat for CCCS and Chinook salmon. The portion of the creek within the project boundaries dries up during the summer months. The bottom of the streambed is composed of large cobble, although the area beneath the San Antonio Creek Bridge on US 101 contains a deep layer of silt.

In addition to San Antonio Creek, juvenile steelhead and Chinook salmon may seasonally rear in the lower segments of Novato Creek and within the project limits of the Petaluma River and Lynch Creek. Seasonally, migratory adult steelhead and Chinook salmon are known to pass through the project area at Novato Creek and the Petaluma River to and from habitat further upstream. Both adult and juvenile steelhead and Chinook salmon may also seasonally occupy the project features known as the “Landfill Channel” and the “Lakeville Channel” downstream of the flapgate at Lakeville Highway.

Lynch and Washington Creeks may provide habitat suitable for spawning, incubation, and rearing for Sacramento splittail.

Green sturgeon may be present within the Petaluma River.

See further discussions of Central California coast steelhead, green sturgeon, and Chinook salmon in Sections 3.3.6 and 3.3.5.

3.3.2.3 Impacts

Fixed HOV Lane Alternative. This alternative has been identified as the Preferred Alternative. Table 3.3-1 summarizes the number of native and non-native trees that would be impacted by the Fixed HOV Lane Alternative by project segment. These numbers are preliminary and will be updated during the design phase. Efforts will be made to minimize impacts to trees throughout the design and construction phases. Project impacts to trees would differ by Access Option, as shown in Figures 3.3-2a-d and described below.

Table 3.3-1 Trees Potentially Impacted by the MSN Project Including the Fixed HOV Lane, Reversible HOV Lane, and No Build Alternatives

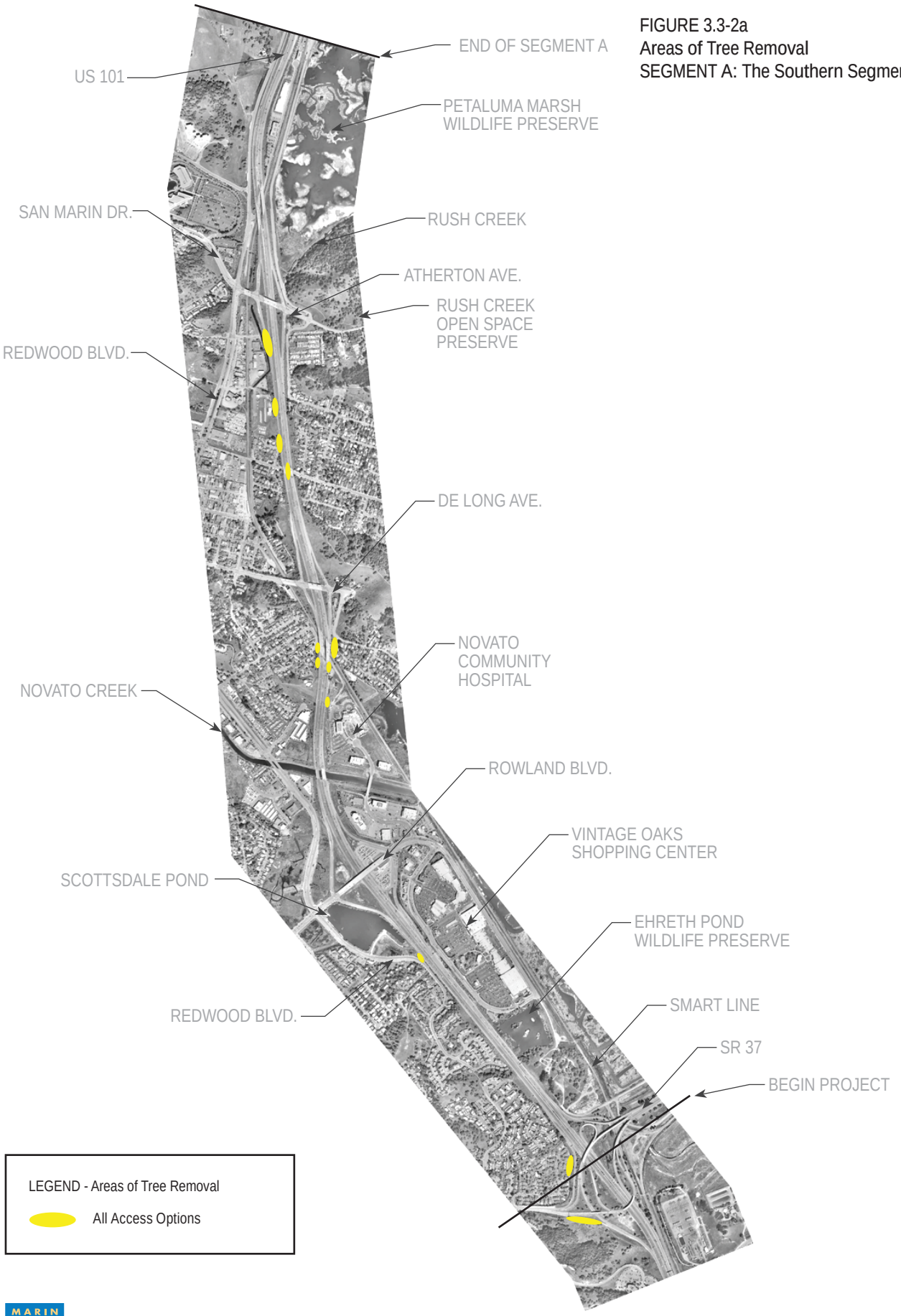
Category	Segment A (Southern Segment)	Segment B (Central Segment)				Segment C (Northern Segment)
		Access Option 4b	Access Option 12b	Access Option 14b	Access Option 14d	
Native Oaks	84	331	441	344	311	44
Other Native	15	381	576	347	346	4
Non Native Trees	33	250	250	248	247	259
Totals	132	962	1267	939	904	307
Combined Totals*	--	1401	1706	1378	1343	--
No Build	0	0	0	0	0	0

Shaded areas depict potential impacts under either Build Alternative.

* Combined totals depict the potential impacts under each Access Option combined with the southern and northern segments (e.g., 132+962+307=1401).

While the Fixed HOV Lane Alternative would result in the removal of trees in the more urbanized areas of Novato and Petaluma (Segments A and C, respectively), the greatest amount of tree removal would occur in Segment B (the Central Segment). This alternative could result in the removal of approximately 1,343 to 1,706 native and non-native trees, including approximately 311 to 441 native oaks (*Quercus* sp.) depending upon the Access Option identified as part of the Preferred Alternative (Table 3.3-1, also see discussion below).

FIGURE 3.3-2a
Areas of Tree Removal
SEGMENT A: The Southern Segment



MARIN SONOMA NARROWS

NORTH

Note: Not to Scale

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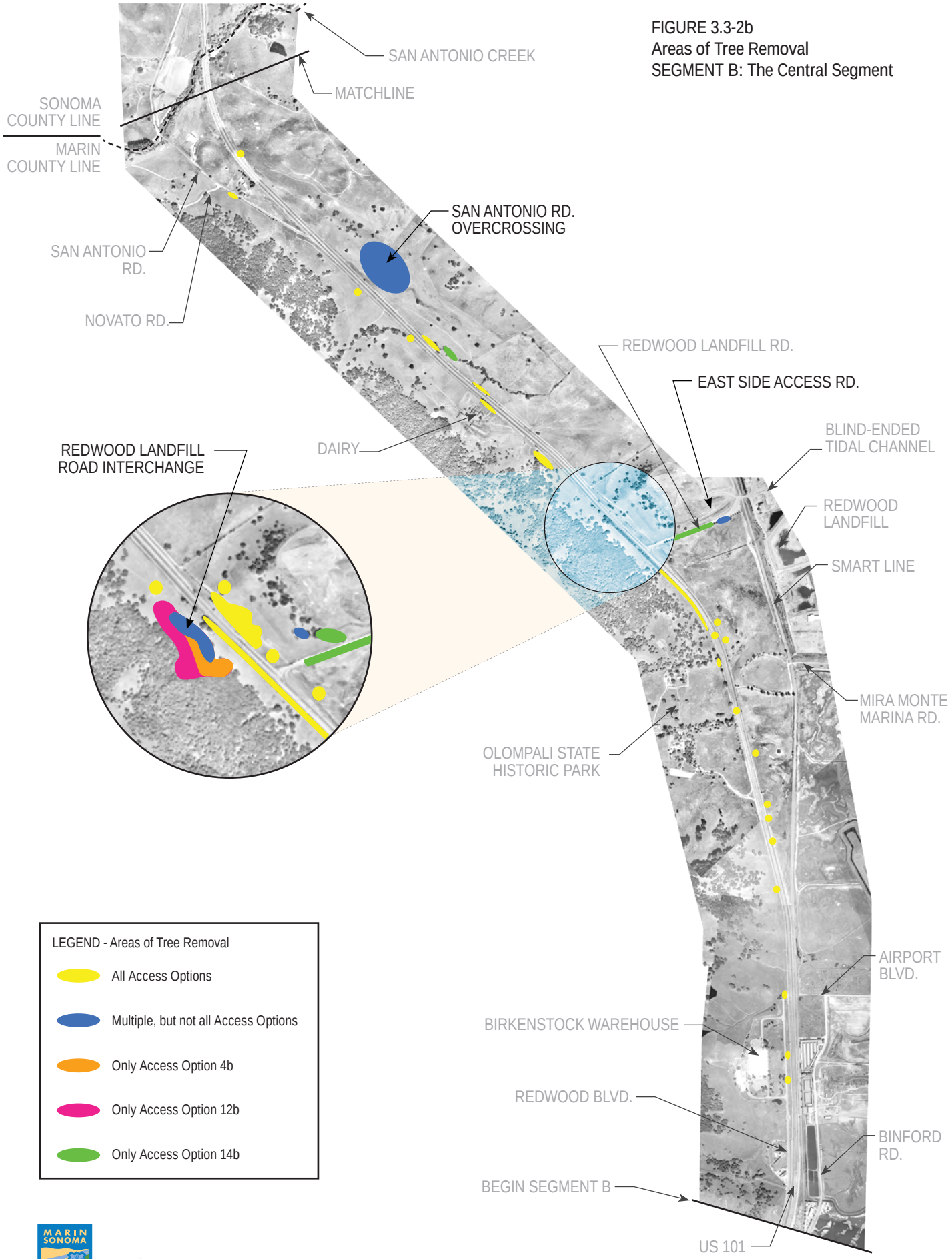
FIGURE 3.3-2b
Areas of Tree Removal
SEGMENT B: The Central Segment



Note: Not to Scale

TB042006002BAO_Fig3.3-2_TreeRemoval.indd

FIGURE 3.3-2c
Areas of Tree Removal
SEGMENT B: The Central Segment
(from county line)

Note: Not to Scale

TB042006002BAO_Fig3.3-2_TreeRemoval.indd

FIGURE 3.3-2d
Areas of Tree Removal
SEGMENT C: The Northern Segment

LEGEND - Areas of Tree Removal

All Access Options

NORTH

Note: Not to Scale

TB042006U02BAO_Fig3.3-2_TreeRemoval.indd

Riparian tree impacts would mainly result from the bridge work at San Antonio Creek in Segment B and Lynch Creek in Segment C. No riparian trees would be impacted in Segment A as bridgework would occur in tidally influenced waterways.

Reversible HOV Lane Alternative. Table 3.3-1 summarizes the number of native and non-native trees that would be impacted by the Reversible HOV Lane Alternative by project segment. Project impacts to trees would differ by Access Option, as shown in Figure 3.3-2a-d.

The Reversible HOV Lane Alternative would include the same footprint as the Fixed HOV Lane Alternative. As a result, the Reversible HOV Lane Alternative would have the same impact to trees as identified above for the Fixed HOV Lane Alternative.

Access Options. Any of the Access Options would work with either of the Build Alternative. Access Option 12B has been identified as the preferred one to complete Segment B of the Fixed HOV Lane Alternative. Access Option 12b would impact the largest number of trees (1,706); 131 of the trees impacted are less than 5 inches in diameter breast height (dbh).[7] The majority of the oak trees (368) that would be affected by Access Option 12b range from 5 to 16 inches dbh. The next largest group (129) ranges from 17 to 30 dbh, and few (34) trees that would be affected by Access Option 12b exceed 30 dbh. This profile is similar to that of the other native and non-native trees surveyed in Segment B.

Access Option 12b would impact more trees than the other Access Options due to the westward alignment of a proposed frontage road on the west side of US 101 at the Redwood Landfill Road Interchange. The frontage road would cut deeper into the hillside than any of the other Access Options.

Riparian trees are represented under Native Oaks, Other Natives, and Non Native tree in Table 3.3-1. Riparian tree impacts in Segment B would result from bridgework over San Antonio Creek. The impact to riparian trees varies depending on the Access Option. More specifically, 286, 298, 280, and 277 riparian trees would be impacted under Access Options 4b, 12b, 14b, and 14d, respectively.

[7] Diameter at breast height (dbh) is a measurement of the width of the tree trunk at approximately 4.5 feet above the ground.

No Build Alternative. The No Build Alternative proposes no modifications to US 101 within the project boundaries other than routine maintenance and rehabilitation to support the continuing operations of the existing freeway when needed. While tree removal could occur in the execution of these activities, impacts would be negligible.

3.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans follows the CEQA and the NEPA guidelines, which direct the agency to avoid and minimize impacts to natural resources to the practicable extent possible. In accordance with these guidelines, Caltrans will preserve and maintain as many healthy trees and native vegetation as practicable during the planning, design, and construction of the MSN Project.

During the alternatives development process, Caltrans reduced the size of the project footprint and eliminated several interchange alternatives to avoid and minimize impacts to many biological resources, including oak trees. The original project footprint contained approximately 2,217 native oak trees, approximately 978 native riparian trees (dominated by California buckeye, California black walnut, Fremont cottonwood (*Populus fremontii*), arroyo willow, and red willow), and approximately 926 California bay laurel trees along the length of the project.

Although the tree loss has been substantially reduced, Caltrans will continue to reduce impacts to trees where practicable throughout the design process. Avoidance and minimization measures to lessen tree removal would also be in effect during construction. In addition, establishment of environmentally sensitive areas and implementation of erosion control measures would be implemented to minimize disturbance to riparian areas.

Caltrans' identification of potential tree impacts has led to discussions with CDFG regarding various mitigation measures. Caltrans will develop mitigation measures for native and non-native trees based upon the Preferred Alternative and final project plans and then develop a mitigation agreement with CDFG. On-site locations will be utilized to the fullest extent possible; however, due to the size of this project, both on and off-site mitigation locations may be required to fulfill proposed mitigation.

Although specific off-site locations have not been identified, Caltrans is exploring various resource areas, such as California State Parks, and private conservation covenants.

3.3.3 Wetlands and Other Waters of the United States

3.3.3.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act, 33 U.S.C. 1344 (CWA), is the primary law regulating wetlands and waters. The Clean Water Act regulates 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 subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the USACE with oversight by the USEPA. NEPA and the 404 process have been integrated through a Memorandum of Understanding (MOU) between various agencies with responsibilities over both processes. The NEPA/404 process for the MSN Project is described in Section 6.3, Regulatory Agency Coordination.

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

The least environmentally damaging practicable Alternative (LEDPA) is the Fixed HOV Lane Alternative with the 12b Access Option as stated in Section 2.4. Caltrans considered all practicable measures to minimize harm in considering this

Alternative. A wetland only practicable finding has been developed to satisfy E.O. 11990 and can be found in Appendix Q.

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

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the CWA. Please see Water Quality, Section 3.2.3, for additional details.

3.3.3.2 Affected Environment

Wetlands

Brackish Novato Creek consists of an isolated stand of dense pickleweed, and some saltgrass (*Distichlis spicata*) is scattered throughout portions of the project area that quickly transitions to upland as it approaches US 101.

Throughout the project, roadside ditches occur adjacent to US 101, the majority of which are considered freshwater wetlands. The majority of the remaining ditches are considered Waters of the U.S. These roadside ditches would function mainly in filtering roadside runoff. Other functions and values of wetlands in general that may pertain to these ditches include surface and subsurface water storage, nutrient cycling (including processing of organic wastes), particulate removal, maintenance of plant and animal communities, water filtration or purification, and groundwater recharge.

Birds and mammals may also rely on wetlands for food, shelter, and water, especially while migrating and/or breeding. Since most of the wetlands in the

project area are seasonal, we can apply this information seasonally to species such as deer and cattle, which would use it during both wet and dry periods.

Birds that could utilize these areas while wet would be waterfowl, including various ducks, geese, great blue heron (*Ardea herodias*), great egret (*Ardea albus*), snowy egret (*Egretta thula*), various swallows, tri-colored blackbird (*Agelaius tricolor*), red-winged blackbird (*Agelaius phoeniceus*), black phoebe (*Sayornis nigricans*) and saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*). Birds that may utilize the area while dry, and could also overlap the ones mentioned above, include red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensus*), oak titmouse (*Baeolophus inornatus*), white-tailed kite (*Elanus leucurus*), loggerhead shrike (*Lanius ludovicianus*), various hummingbird and sparrow species, and turkey vulture (*Cathartus aura*). Amphibians, such as CRLF (*Rana aurora draytonii*) may use the area while wet, as well as during dry periods as a dispersal corridor. However, the probability of amphibians in the area is low.

Cattle use one of the largest wetland areas within the project boundaries; specifically, the areas on the east side of US 101 in Segment B across from Olompali SHP (see Figure 3.3-1b). It is unknown whether cattle's use of these areas is seasonal. Use during wet periods could detrimentally impact soils formation and trample plant and animal habitat.

The roadside ditches in this area are also part of a larger network of wetlands between US 101 eastward toward the Petaluma River, providing drainage for the western side of US 101 as well as the expressway within Segment B itself.

There is a channel adjacent to the Mira Monte Marina driveway north of Novato and east of the highway, which consists of sparse, fragmented pickleweed, but is dominated by other types of hydrophytic plant species (see Figure 3.3-1b).

Heading north, there is also a channel located on a parcel belonging to the Redwood Sanitary Landfill east of the highway (see Figure 3.3-1b). This channel contains a narrow band of pickleweed bordering the channel’s ordinary high-water mark. Further north there is a portion of a wetland consisting of pickleweed adjacent to the South Petaluma Boulevard off-ramp.

There is pickleweed along the northeast side of the Petaluma River Bridge, and a tidally-influenced channel that runs perpendicular to the bridges containing a small amount of pickleweed (see Figure 3.3-1c).

Waters of the U.S.

In Novato, Rush Creek is contained within the Rush Creek Open Space Preserve. Ehreth Pond Wildlife Preserve, Scottsdale Marsh, and Scottsdale Pond are located in the Vintage Oaks Shopping Mall area. Novato Creek and Rush Creek are tidally-influenced waterbodies that contain non-riparian wetland vegetation along their banks.

In Segment B, San Antonio Creek is a major riparian corridor that divides Marin and Sonoma Counties. The Petaluma River is tidally-influenced and dominated by pickleweed along its banks. As noted earlier, Washington Creek, Lynch Creek, and Corona Creek are all urbanized, flood control/freshwater creeks that feed into the Petaluma River. While Washington Creek does not flow year-round, Caltrans biologists observed large puddles during the summer months.

3.3.3.3 Impacts

Wetlands

Fixed HOV Lane Alternative. Impacts to wetlands in Segments A and C are minor compared to Segment B of the project (Table 3.3-2). The impact numbers are based on the jurisdictional determination received from the USACE on December 23, 2008. The largest area of potential wetland impacts under the Fixed HOV Lane Alternative occurs along roadside ditches across from the Olompali SHP, along the east side of US 101. The wetland impacts in this area would be due to an eastward mainline realignment and an access road parallel to the mainline. The amount of wetlands impacted would vary slightly depending on the Access Option identified, as described below.

Table 3.3-2 Potential Impacts to Waters of the U.S. under the Build and the No Build Alternatives

Segments		Wetlands Hectares (Acres)		Other Waters of the U.S. Hectares (Acres)	
		Temporary	Permanent	Temporary	Permanent
Segment A (Southern Segment)		0.07 (0.17)	0.037 (0.092)	0.003 (0.007)	0.04 (0.1)
Segment B (Central Segment)	4b	0.89 (2.19)	2.94 (7.32)	0.23 (0.56)	1.17 (2.90)
	12b	0.85 (2.10)	2.89 (7.15)	0. 25 (0.62)	1.19 (2.93)
	14b	0.78 (1.92)	2.75 (6.80)	0.27 (0.66)	1.07 (2.66)
	14d	0.89 (2.19)	2.94 (7.32)	0.25 (0.62)	1.2 (2.96)
Segment C (Northern Segment)		0.014 (0.035)	0.08 (0.19)	0.003 (0.007)	0.03 (0.07)
Total Temporary		0.86-0.97 (2.13-2.40)		0.24-0.28 0.59-0.69	
Total under either Build Alternative		0.86-0.97 (2.13-2.40)	2.87-3.06 (7.09-7.56)	0.24-0.28 0.59-0.69	1.14-1.27 (2.82-3.14)
No Build Alternative		0	0	0	0
Shaded areas depict potential impacts for either Build Alternative.					

Because Caltrans would be replacing and enlarging culverts throughout the project, the functions of the wetlands would not be adversely impacted.

Reversible HOV Lane Alternative. Impacts to wetlands under the Reversible HOV Lane Alternative would be the same as those identified for the Fixed HOV Lane Alternative, above, because both alternatives propose the same project footprint and alignment. The operational differences between the two alternatives (i.e., the operation of the HOV lane) would not affect wetlands.

Access Options. The majority of wetland impacts would occur in Segment B, and the amount of wetlands impacted would vary slightly by Access Option. Access Option 12b would affect a slightly larger area of wetlands (2.89 ha, or 7.15 ac) than Access Option 14b (2.75 ha, or 6.8 ac) and Access Option 14d and 4b (2.94 ha, or 7.3 ac).

No Build Alternative. The No Build Alternative proposes no modifications to US 101 within the project boundaries other than routine maintenance and rehabilitation to support the continuing operations of the existing freeway when needed. As such, this alternative would produce no effects on wetlands.

Other Waters of the U.S.

Fixed HOV Lane Alternative. Table 3.3-2 summarizes the temporary and permanent to wetlands and other Waters of the U.S. (other waters) In Segments A and C, the Fixed HOV Lane Alternative would result in permanent impacts of 0.07 ha (0.17 ac) to other Waters of the U.S. Additional potential impacts to other waters in Segment B depend upon the Access Option, but in total, the Fixed HOV Lane Alternative could result in between 1.07 and 1.2 ha (2.66 to 2.96 ac) in permanent impacts to Waters of the U.S. Temporary impacts would affect between 0.23 and 0.27 ha (0.56 and 0.66 ac).

Reversible HOV Lane Alternative. Impacts to other waters for the Reversible HOV Lane Alternative would be equal to those identified for the Fixed HOV Lane Alternative. Both alternatives propose the same project footprint and alignment and scope of work.

Access Options. Within Segment B, the amount of other waters affected by the Access Options would be virtually identical (see Table 3.3-2). For permanent impacts, the drainage channels adjacent to the south side of Silveira Dairy would be affected (see Volume 2 Waters of the U.S). In addition, Access Options 4b, 14b, and 14d would impact drainage channels on the east side of US 101 in the footprint of the South San Antonio Road Overcrossing. Access Options 4b and 14d would impact 1.20 ha (3.2 ac) and Access Option 14b would impact 1.07 ha (2.66 ac); in contrast, Access Option 12b would have no impacts in this area, because Access Option 12b omits this overcrossing.

Other impacts to other waters common to all the Access Options would occur with the Petaluma River Bridge replacement, involving 0.26 ha (0.64 ac) of temporary impacts.

No Build Alternative. The No Build Alternative proposes no modifications to US 101 within the project boundaries other than routine maintenance and rehabilitation to support the continuing operations of the existing freeway when needed. As such, this alternative would produce no immediate impacts to other waters.

3.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

Consultations with state and federal regulatory agencies and subsequent design modifications have led to wetland impact reductions from approximately 61.8 ha

(152.5 ac) to approximately 1.99-3.00 ha (4.91-7.43 ac), depending upon the identified Access Option for all the segments combined. Similar efforts have led to impact reductions in other waters at Scottsdale Pond, Rush Creek, Ehreth Pond Wildlife Preserve, Black John Slough, Scottsdale Marsh, Lakeville Channel, Novato Creek, San Antonio Creek, and the Petaluma River.

Clean Water Act 404 Permit and Streambed Alteration Agreement. Caltrans will obtain a 404 Individual Permit from the USACE under Section 404 of the Clean Water Act, and a 1602 Lake and Streambed Alteration Agreement from the CDFG. During the mitigation phase of this process, Caltrans and the FHWA, in consultation with the USEPA, the USACE, and the RWQCB will determine replacement ratios to mitigate for impacts to wetlands and other waters. It is expected, however, that the hectares (or acres) realized through compensation would result in a net increase over the amount of wetlands impacted under the Build Alternatives based upon FHWA's nationwide goal for replacing impacted wetlands at 1.5:1. In addition, Caltrans and FHWA would establish successful wetland compensation ahead of construction to compensate for impacts associated with project segments undertaken. Therefore, there would be no temporary impacts. Potential mitigation sites for permanent impacts are being explored by Caltrans and include Skaggs Island, Petaluma River, and other locations potentially available through private conservation covenants.

The majority of the wetland mitigation would be to restore and enhance freshwater and seasonal wetland habitat. Accordingly, this mitigation may also incorporate habitat for aquatic species, including salmonids and the California red-legged frog, affected by the Build Alternatives.

Wetland Only Practicable Finding

The following analysis of the alternatives, including No Build, and all practicable measures to minimize harm, is intended to satisfy the requirement of Executive Order 11990, Protection of Wetlands.

The need and purpose of the action (project) and alternatives considered and withdrawn are presented in Chapters 1 and 2, respectively. The permits and regulations that pertain to the project are discussed throughout this volume and summarized in Section S.5.As discussed in Section 2.4, the Fixed HOV Lane Alternative with Access Option 12b has been identified as the Preferred Alternative, to add both a northbound and a southbound HOV lane along US 101

throughout the 26 km (16.1 mi) project boundaries. This alternative would also entail upgrading the expressway in Segment B to full freeway standards. Section 2.2 provides a description of the alternatives.

Although the Preferred Alternative meets the project need and purpose, it will reduce 2.89 ha (7.15 acres) of wetlands and 1.19 hectares (2.93 acres) of other waters of the U.S. (see Table 3.3-2). The Preferred Alternative will require a Section 404 Permit from the USACE, a 1602 Lake and Streambed Alteration Agreement from the CDFG, and a Section 401 Water Quality Certification from the California Regional Water Quality Control Board (RWQCB).

The Caltrans also considered other alternatives, which would reduce or eliminate impacts to wetlands. Under the No Build Alternative only routine repairs and emergency maintenance would be conducted within the project limits, therefore no immediate impacts to wetlands are anticipated. However, the No Build Alternative would not meet the need and purpose of the project and would propagate existing and projected traffic congestion and operational deficiencies (see Section 2.2.3). The No Build Alternative is also not consistent with planned congestion management measures because congestion relief measures cannot be effectively implemented under existing (baseline) conditions through Segment B of US 101 (see Section 3.1.2.3).

Caltrans and FHWA also evaluated complete avoidance of wetlands, in particularly on the east side of US 101. Considerations included shifting the mainline alignment further west, which would have encroached into Olompali SHP right-of-way. While this strategy could have avoided or considerably reduced impacts to wetlands and waters, there are multiple adverse effects that would result. A westward alignment shift would widen the project footprint due to the existing mountainous topography on the west side of US 101, adding substantial earthwork and the need for disposal or off-hauling of excess materials. Extensive excavation and additional retaining walls would also be required, marring the natural rolling terrain in this rural area of the project. In addition, a further westerly alignment into the Park would impact more native trees and reduce oak tree mitigation planting area. This shift would also significantly increase adverse impacts to archaeological sites that are within Olompali SHP than are impacted under the Preferred Alternative. Finally, Olompali SHP is a 4(f) resource under the DOT Act (see Section 3.1.43), and FHWA would not be able

to justify impacts to the Park that could otherwise be avoided, with few public or environmental benefits.

Other project alternatives were also considered and withdrawn from further consideration because they cannot meet the need and purpose of the project, and these are discussed in Section 2.6.

All Practical Measures to Minimize Harm

Caltrans and FHWA have been incorporating all practicable measures to minimize environmental harm into the project design. . During the environmental scoping process, Caltrans and FHWA minimized the original footprint, which included approximately 61.8 ha (152.5 acres) of USACE jurisdictional wetlands, and at least 12 ha (30 acres) of jurisdictional waters of the United States. Reducing the project footprint through this process eliminated several interchange alternatives and minimized potential harm to biological resources and many acres of wetlands. In order to further minimize harm to wetlands, Caltrans has realigned an access road away from higher-value wetlands and will incorporate 2:1 slopes and 1-3 feet between tow of slope and right of way in maintenance areas. Further avoidance, minimization, and mitigation efforts will continue throughout the Design, PS&E and construction processes.

Caltrans will develop a wetland habitat mitigation plan to compensate for the impacts of the Preferred Alternative. Proposed mitigation measures are discussed in Section 3.3.3.4.

The increased impervious surface may reduce the functions of the wetlands in the project area. Minimizing harm to wetlands will be accomplished by adding numerous bioswales to help filter the water coming off of the highway (Section 3.2.3.4).

<u>Finding</u>

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. In light of the above considerations, the Preferred Alternative is also the least environmentally damaging practicable alternative (LEDPA). Through the incorporation of all practicable measures to minimize harm into the design of the Preferred Alternative, the permanent loss of wetlands and other

waters of the U.S. will be reduced and/or mitigated. There is no other alternative that can meet the need and purpose and avoid or further reduce construction within the subject wetlands.

Through the project alternatives analysis and participation in the NEPA/404 process, Caltrans and FHWA have satisfied the requirements of Executive Order 11990, Protection of Wetlands, and incorporated all measures to minimize harm. Caltrans and FHWA will continue to avoid and minimize harm throughout project design and construction.

3.3.4 Plant Species and Vegetation

3.3.4.1 Regulatory Setting

The USFWS and CDFG share regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please refer to Section 3.3.6 in this document for a discussion of these species.

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

The regulatory requirements for FESA can be found at U.S.C.16, Section 1521, et. seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et. seq. Caltrans projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and CEQA.

3.3.4.2 Affected Environment

Caltrans biologists conducted plant surveys according to the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Species* (USFWS 1996). Although appropriate habitat for several special status species or sensitive plants is present in the project area, non-federal

or state-listed special status plant species were not observed within the project boundaries.

The dominant plant species found in the riparian corridors within the project area include poison oak (*Toxicodendron diversilobum*), California bay laurel, California buckeye, red willow, arroyo willow, valley oak, and stinging nettle (*Urtica dioica*).

The dominant plant species found in the bay-oak woodlands within the project area include coast live oak, blue oak, valley oak, California bay laurel, California buckeye, and poison oak. There are also a variety of grass species, such as perennial rye grass (*Lolium perenne*), slender wild oats (*Avena barbata*), ripgut grass (*Bromus diandrus*), and soft chess *(Bromus hordeaceus*).

Grasslands, pastures, alkali meadows, and seasonal wetlands are also dominated by the above-mentioned grasses as well as many species of wildflowers, including narrow-leaf mule-ears (*Wyethia glabra*), California buttercup (*Ranunculus californicus*), blow-wives (*Achyrachaena mollis*), blue dicks (*Dichelostemma capitatum*), smooth tidy-tips (*Layia chrysanthemoides* var. *chrysanthemoides*), and blue-eyed grass (*Sisyrinchium bellum*). Other dominant vegetation in these areas include rattlesnake grass (*Briza maxima*), yellow star thistle (*Centaurea solstitialis*), Fuller's teasle (*Dipsacus sativus*), hayfield tarweed (*Hemizonia congesta*), Italian thistle (*Carduus pycnocephalus*), coyote brush (*Baccharis pilularis*), and winter vetch (*Vicia villosa*).

The dominant vegetation along the roadsides, including the shoulders and the ditches primarily consists of wild oat, sweet fennel (*Foeniculum vulgare*), yellow star thistle, Italian thistle, wild mustards (*Brassica* sp.), common nut sedge (*Cyperus eragrostis*), common sow thistle (*Sonchus oleraceus*), cut-leaved geranium (*Geranium disectum*), and wild radish (*Raphanus sativus* var. *sativus*).

3.3.4.3 Impacts

Fixed HOV Lane Alternative. There would be no impacts to non-federal or state listed special status plant species under the Fixed HOV Lane Alternative, because there are no special status plant species within the project footprint.

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative has the same footprint as the Fixed HOV Lane Alternative. Accordingly, the impacts for the two Build Alternatives would be identical. As described for the Fixed

HOV Lane Alternative, there would be no impacts to special status plant species under the Reversible HOV Lane Alternative, because there are no special status plant species within the project footprint.

Access Options. The project area associated with the Access Options was surveyed along with the mainline project area. The results are the same as those reported under the Fixed and Reversible HOV Lane Alternatives above. There would be no impacts to special status plant species.

No Build Alternative. The No Build Alternative would involve routine maintenance and upkeep of US 101 and would have no impacts to special status plant species are anticipated.

3.3.4.4 Avoidance, Minimization, and/or Mitigation Measures

The project area originally included an area east of the SMART railway known to contain special status plant species. However, a design modification resulted in reducing the project footprint to exclude this potential encroachment and completely avoiding impacts to this sensitive area.

3.3.5 Animal Species

3.3.5.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The USFWS, the National Marine Fisheries Service (NOAA Fisheries) and the CDFG are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under FESA or CESA. Species listed or proposed for listing as threatened or endangered are discussed in Section 3.3.6. All other special-status animal species are discussed here, including CDFG fully protected species and species of concern, and USFWS or NOAA Fisheries 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
- Magnuson-Stevens Fishery Conservation and Management Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1601-1603 of the Fish and Game Code
- Sections 3511, 4700, 5050, and 5515 of the Fish and Game Code

3.3.5.2 Affected Environment

Sacramento Splittail (splittail)

Habitat surveys for sensitive fish were conducted prior to the 2003 delisting of Sacramento splittail (*Pogonichthys macrolepidotus*) as federally threatened. This fish remains a federal and state species of special concern. According to that report, the lower reaches of Novato Creek, the tidal channel at the Redwood Landfill, a portion of the Lakeville Channel, and the lower reaches of Lynch Creek may provide spawning, incubation, and rearing habitat for Sacramento splittail (see Figures 3.3-1a-d). The Petaluma River may also provide migration and rearing habitat for this species. The lower reaches of Washington Creek may provide limited spawning, incubation, and rearing habitat if access to Petaluma River is provided. However, poor seasonal hydrology and limited seasonal duration of connectivity to the Petaluma River minimizes potential presence of splittail at Washington Creek. Other factors against species presence are poor habitat quality and quantity, and the lack of upstream watershed areas from Washington Creek.

Chinook Salmon

Potential habitat for Chinook salmon (*Oncorhynchus tshawytscha*) within and downstream of the project is designated as EFH. EFH is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (NMFS, 2007d). The Evolutionary Significant Unit of this species present in the action area, fall-run Central Valley Chinook salmon, is not federally listed and therefore not under the jurisdiction of the Federal Endangered Species Act.

Personal communication with Bill Cox, CDFG, on February 7, 2003 led to Caltrans identifying potential habitat for Chinook salmon in the project area., Novato Creek, San Antonio Creek, Petaluma River, and Lynch Creek are all considered essential habitat for these salmon under the Magnuson-Stevens Fishery and Conservation Act.

Chinook salmon may be periodically found in the tributary streams to Northern San Francisco Bay including the Petaluma River (NMFS, 2007a). The use of habitats within the action area by Chinook salmon are most likely by wandering adult Chinook salmon natal to streams within the Central Valley of California. Novato Creek may serve as a migratory corridor for Chinook salmon. The stream channel in the action area may provide seasonal rearing habitat. The Petaluma River may provide migration and rearing habitat for Chinook salmon. The blind end of the tidal channel adjacent to the Redwood Landfill may provide seasonal rearing habitat if the salmon can access this area from the Petaluma River. San Antonio Creek may provide seasonal rearing habitat for Chinook salmon. Chinook salmon may occur seasonally in the area (Hamaker pers. comm.). The blind end of the tidal channel downstream of the flapgate at the Lakeville Channel also provide seasonal rearing habitat if this species is present in the Petaluma River. The portion of Lynch Creek downstream of the action area may provide seasonal spawning and/or rearing habitat for Chinook salmon if hydrological conditions and access to the Petaluma River is provided.

Roosting Bats

A substantial amount of potential bat habitat is present throughout the project area. The large quantity of trees and the presence of several old barns may provide roosting habitat for bats in the area surrounding the MSN Project.

Biologists observed urine staining and bat guano beneath San Antonio Creek Bridge along US 101, indicating the presence of roosting bats. However, no bats were observed during daytime site visits. Caltrans biologists visited the site at night and observed several individuals of either big brown bat or little brown bat. Caltrans biologists also observed that the piles of bat guano contained exoskeletons of Jerusalem crickets (*Stenopelmatus* sp.), indicating that the site may also serve as a night roost for pallid bats.

Nesting Birds

There is a large abundance of potential nesting habitat within the project area. Trees, shrubs, grasslands, bridges, and some commercial and residential structures may provide nesting habitat for many species of birds.

Cliff swallow nests were observed beneath the Novato Creek Bridge structure and the San Antonio Creek Bridge structure along US 101. Similarly, nests were observed beneath the San Antonio Creek Freeway Historic Bridge along San

Antonio Road. Several large nests were observed in a stand of eucalyptus trees located on private property adjacent to San Antonio Road. These large nests appeared to be vacant and thus were impossible to identify. Caltrans biologists speculate that they were most likely either raptor nests, such as red-shoulder red hawk or red-tailed hawk, great-blue heron, snowy egret or great egret nests. A snowy egret, great egret and great blue heron rookery is also present along Petaluma Boulevard near Station 2043.

Several unidentified nests were observed in the oak woodlands in Olompali SHP and on property belonging to the Silveira Dairy.

Other Species

Other species that may potentially be found in the MSN Project area include various species of birds protected by the Migratory Bird Treaty Act and the state species of special concern northwestern pond turtle (*Emys* (=*Clemmys*) *marmorata marmorata).*

According to CNDDB records, there are black rail in close proximity to SR 37. However, Caltrans believes it is unlikely that this state threatened species is present within the project boundaries. Their preferred cordgrass habitat is not present in the area. Pickleweed, another preferred habitat area, occurs in a very small patch adjacent to the Petaluma River Bridge bordered by a parking lot and the SMART railroad tracks. Furthermore, noise disturbances associated with extensive development as well as US 101 and SR 37 indicate the existence of this species within the project boundaries is unlikely.

3.3.5.3 Impacts

Sacramento Splittail

Fixed HOV Lane Alternative. The Fixed HOV Lane Alternative would completely avoid impacts to the tidal channel at the Redwood Landfill and the portion of Lakeville Channel that may provide spawning, incubation, and rearing habitat for Sacramento splittail. Therefore, impacts to potential Sacramento splittail habitat would be limited to Novato Creek, Lynch Creek, and the Petaluma River, as shown in Table 3.3-3. In total, this alternative would permanently impact approximately 0.257 ha (0.63 ac) of splittail habitat.

Table 3.3-3 Potential Impacts to Potential Sacramento Splittail Habitat

Habitat	Area
Novato Creek (Segment A)	0.0425 ha (0.1050 ac)
Petaluma River (Segment B)	0.20 ha (0.49 ac)
Lynch Creek (Segment C)	0.0149 ha (0.0369 ac)
Total Area	0.257 ha (0.63 ac)

Reversible HOV Lane Alternative. Both Build Alternatives propose the same project footprint, alignment, and scope of work in the three waterways that could provide spawning, incubation, and rearing habitat for Sacramento splittail. The Reversible HOV Lane Alternative would have the same impacts to potential splittail habitat as the Fixed HOV Lane Alternative.

Access Options. Potential impacts to splittail would not vary by Access Option. All four Access Options would permanently impact approximately 0.20 ha (0.49 ac) of splittail habitat along the Petaluma River.

No Build Alternative. Under the No Build Alternative, there would be no impacts to Sacramento splittail, since this alternative would involve no improvements other than routine maintenance and upkeep of the existing US 101 facilities.

Chinook Salmon

Fixed HOV Lane Alternative. The Fixed HOV Lane Alternative would result in approximately 0.47 ha (1.16 ac) of permanent impacts to salmonid habitat, including Chinook salmon. Table 3.3-4 lists the effects by water body.

Table 3.3-4 Summary of Impacts to Potential Chinook Salmon Habitat

Project Segment	Creek	Permanent Impacts (ha/ac)
A	Novato Creek	0.0425 ha (0.1050 ac)
B	Tidal Channels	0
	San Antonio Creek New Mainline Bridge	0.2004 ha (0.4911 ac)
	San Antonio Creek SB Bridge Removal	-0.0304 ha (-0.0711 ac)
	San Antonio Creek New County Bridge	0.0305 ha (0.0712 ac)
	Petaluma River	0.20 ha (0.49 ac)
Total		0.40 ha (0.98 ac)
C	Lynch Creek	0.0149 ha (0.0369 ac)
	Washington Creek	0.0106 ha (0.0261 ac)
Total		0.0304 ha (0.070 ac)
Overall Total		0.47 ha (1.16 ac)

The Fixed Lane HOV Alternative would involve work in Novato Creek, Petaluma River, San Antonio Creek, Lynch Creek, and Washington Creek. While the Novato Creek and Lynch Creek bridges would be widened, Petaluma River Bridge would be replaced with a new structure. The San Antonio Freeway Bridge would be replaced with a new structure and a second crossing would be constructed just west of the historic San Antonio Creek Bridge for two-way traffic on San Antonio Road.

The Fixed HOV Lane Alternative would not propose work in the blind-ended tidal channel adjacent to the Redwood Landfill; thus, potential effects would be limited to Novato Creek, San Antonio Creek, Lynch Creek, and the Petaluma River and could impact the Chinook salmon that could use these waterways for seasonal rearing habitat as well as provide migratory channels for adults passing through the project area to and from upstream habitat areas.

Caltrans and FHWA determined that there would be an adverse affect to Chinook salmon Essential Fish Habitat (EFH). NOAA Fisheries concluded in EFH consultation that conservation measures in the project description and Terms and Conditions in the Biological Opinion (BO) would minimize adverse affects to Chinook salmon EFH.

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative would have identical effects to the Chinook salmon as the Fixed HOV Lane Alternative, because the Reversible HOV Lane Alternative proposes the same footprint and improvements in the areas around Novato Creek, San Antonio Creek, Lynch Creek, Washington Creek, and the Petaluma River. In total, this alternative would approximately 0.47 ha (1.16 ac) of permanent impacts to salmonid habitat.

Access Options. Each of the Access Options would have similar, temporary effects to the Chinook salmon, because the improvements around San Antonio Creek and the Petaluma River are common to all Access Options.

No Build Alternative. Under the No Build Alternative, there would be no effects to Chinook salmon or their habitat, because this alternative proposes no improvements other than routine maintenance and upkeep of the existing US 101.

Roosting Bats

Fixed HOV Lane Alternative. The Fixed HOV Lane Alternative could temporarily impact bat roosting habitat by preventing bats from roosting beneath the northbound section of the San Antonio Creek Freeway Bridge structure during demolition of the southbound section of the bridge. This is the only structure that was identified as being utilized by bats for roosting purposes within the project boundaries.

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative proposes the same improvements to the San Antonio Creek Freeway Bridge structure as the Fixed HOV Lane Alternative. Consequently, bats would be temporarily impacted in the same manner as described above for the Fixed HOV Lane Alternative. In addition, the Reversible HOV Lane Alternative would include the same footprint as the Fixed HOV Lane Alternative. As a result, the Reversible HOV Lane Alternative would have the same impact to trees as identified above for the Fixed HOV Lane Alternative and thus the same potential impact to roosting bats.

Access Options. The modifications to the San Antonio Creek Freeway Bridge structure are common improvements under both Build Alternatives and all four Access Options. As a result, the Access Options have the same potential impact to roosting bats.

No Build Alternative. The No Build Alternative would continue existing operations and maintenance of US 101, which would not impact roosting bats.

Nesting Birds

Fixed HOV Lane Alternative. The nesting bird season in Marin and Sonoma counties is between February 15 and September 1. If no avoidance measures are taken, nesting birds could be affected by tree and vegetation removal operations under the Fixed HOV Lane Alternative as reported in Table 3.3-1.

Reversible HOV Lane Alternative. As described above for the Fixed HOV Lane Alternative, if no avoidance measures are taken, the Reversible HOV Lane Alternative could affect nesting birds. Because the footprint of the Reversible HOV Lane Alternative is identical to that of the Fixed HOV Lane Alternative, the impacts would be the same for both Build Alternatives.

Access Options. Each of the Access Options would require tree and vegetation removal. As shown in Table 3.3-1, tree removal would vary between 1,401 trees under Access Option 4b and 1,706 trees under Access Option 12b. If no avoidance measures are taken, each of the four Access Options could affect active nests of birds.

The rookery of great egrets, snowy egrets and great blue herons east of Petaluma Road is directly within the MSN Project footprint and the rookery itself will be impacted. Modifications were made under the Preferred Alternative to decrease the radius of the ramp along Petaluma Boulevard in order to minimize impacts to the rookery; however, it is not possible to avoid the rookery entirely. Caltrans has learned that, in addition to the MSN Project, the Dutra Asphalt and Recycling Facility Project in Sonoma County will likely impact the rookery as well(Please see discussion in Chapter 5 Cumulative Impact Assessment).

In general, trees with active nests will be treated in accordance with the Migratory Bird Treaty Act. This is discussed under the Avoidance, Minimization, and Mitigation section below.

Because the San Antonio mainline will be reconstructed, and the Novato Creek Bridge and the San Antonio Historic Bridge will be left in place, it is anticipated that they will continue to serve as bird nesting habitat.

No Build Alternative. The No Build Alternative would continue existing operations and maintenance of US 101 and would not require tree removal. As a result, the No Build Alternative would not impact nesting bird habitat.

Other Species

Fixed HOV Lane Alternative. As described in the Affected Environment section, above, other animal species are not expected to be present within the project footprint, although the various bird species could roost or forage in the area. The earlier analysis of tree removal and nesting birds could apply to the other bird species that may occur in the project area, due to the potential tree removal under this alternative (Table 3.3-1).

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative, with the same footprint as the Fixed HOV Lane Alternative, would result in the same potential impacts to other animal species as the Fixed HOV Lane Alternative.

Access Options. The presence of other animal species in the footprint of any of the four Access Options is unlikely; however, there is the potential for sensitive bird species to be in the vicinity. The potential impact to other species would, therefore, be similar for each of the Access Options, except for bird species which would be expected to vary in proportion to the amount of tree removal reported in Table 3.3-1.

No Build Alternative. The No Build Alternative, which does not include major construction activities, would not affect other animal species.

3.3.5.4 Avoidance, Minimization, and/or Mitigation Measures

Sacramento Splittail Habitat. The avoidance and protection measures for Central California coast steelhead and green sturgeon in Section 3.3.6.3 would also be protective of Sacramento splittail.

Chinook Salmon Habitat. The avoidance and protection measures for Central California coast steelhead and green sturgeon would also be protective of Chinook salmon (please see Section 3.3.6.4 for more details).

Bat Roosts. Under both of the Build Alternatives, Caltrans would replace the existing southbound San Antonio Creek Bridge along US 101. The northbound section of the bridge would remain in place to serve as a roadway and Class 2 bikeway. Caltrans will conduct demolition during the winter season when bats are not present to avoid impacting the roosting bats due to high sound levels during the demolition phase of the southbound bridge. If it is not possible to demolish the bridge during that time period, Caltrans will install exclusionary netting to prevent bats from roosting beneath the northbound bridge prior to demolition.

A bat structure will be installed as part of the design of the new San Antonio Creek Freeway Bridge to allow bats to roost again once construction is complete.

Nesting Birds. Minimization measure will be employed where feasible to avoid further impacts to the snowy egret, great egret, and great blue heron rookery during final design and during project construction. Prior to the nesting season, Caltrans will use exclusionary netting where possible to prevent birds from nesting in or on structures that will be impacted by the project.

In accordance with the Migratory Bird Treaty Act, the contractor will conduct tree trimming and removal first and foremost outside of the nesting bird season of

February 15-September 1. Under both of the Build Alternatives, Caltrans will conduct surveys for nesting birds prior to beginning construction on any of the culverts or bridge structures in the project area. A qualified biologist will conduct nesting surveys prior to vegetation removal to ensure that no active nests are impacted by the project.

Trees may be identified for removal during the nesting season only if a qualified biologist has surveyed the trees and confirmed that there are no active nests present within the trees identified for removal or immediately adjacent. If any active nests are identified during this period, the trees cannot be disturbed for the duration of the nesting season.

Although it is true that the project will impact a substantial number of trees under the Build Alternatives, many more trees will remain in the project area that can provide alternative nesting habitat. A tree replacement plan will also be implemented, particularly in Segment B wherever it is feasible, but plantings may take 10-20 years to reach maturity. Any temporary or permanent loss of habitat that would serve as potential nesting habitat will be compensated in the riparian and oak woodland tree replacement projects (see Appendix J).

Please also see discussion of further avoidance and minimization efforts in Sections 3.3.2 and 3.1.10.

Other Wildlife Species. Caltrans will restrict work in aquatic areas to the dry season, when water levels would be at their lowest. Caltrans will assign a qualified biologist to be available during construction to remove sensitive aquatic species, including the northwestern pond turtle, out of the project area.

3.3.6 Threatened and Endangered Species

3.3.6.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the FESA: 16 United States Code (U.S.C), Section 1531, et seq. (see also 50 CFR Part 402). This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as FHWA, are required to consult with the USFWS and NOAA Fisheries 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 geographical locations critical to the existence of a threatened or endangered species.

California has enacted a similar law at the state level, the 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 CDFG is the agency responsible for implementing the CESA.

3.3.6.2 Affected Environment

Caltrans obtained a list of species that may potentially occur in the project area from the CNDDB and the USFWS on July 3, 2008. These lists can be found in Appendix H. The sensitive species potentially found within the project area include the federal and state endangered salt-marsh harvest mouse (SMHM), (*Reithrodontomys raviventris*), the federal threatened Central California coast steelhead (CCCS) (*Oncorhynchus mykiss*), the federal threatened southern DPS North American green sturgeon (*Acipenser mediaostris*), the federal threatened and state species of special concern CRLF (*Rana aurora draytonii*), and six listed plant species. These are Sonoma alopecurus (*Alopecurus aequalis var. sonomensis*) (federal endangered), soft bird's beak (*Cordylanthus mollis ssp. mollis*) (federal endangered), Baker's larkspur (*Delphinium bakeri*) (federal endangered), Burke's goldfields (*Lasthenia burkei*) (federal endangered), Contra Costa goldfields (*Lasthenia conjugens*) (federal endangered), and showy Indian clover (*Trifolium amoenum*) (federal endangered).

Similar to the state threatened black rail (discussed in Section 3.3.5), there are known CNDDB records of the federal and state endangered clapper rail (*Rallus longirostris obsoletus*); however, this species is unlikely to be within the project boundaries. Their habitat is very limited in the project area and consists of a small, isolated patch of pickleweed bordered by a parking lot and the SMART railroad tracks. These factors as well as noise disturbance associated with development and the established US 101 and SR 37 roadway facilities preclude the existence of this species within the project boundaries. There is no designated critical habitat for either of these species.

Salt Marsh Harvest Mouse (SMHM)

The SMHM is federal and state listed as endangered, and is also listed by the state as a "fully protected" species. No critical habitat has been designated for this species to date. CDFG Code Sections 3511, 4700, 5050, and 5515 state that "a fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting of species for scientific research and relocation of bird species for the protection of livestock." Due to the "fully protected" status of the SMHM, Caltrans was unable to conduct surveys and, therefore, submitted an Inferred Presence Determination for SMHM to FHWA in May 2005 (see Table 6-3). Field meetings were held with CDFG and USFWS (November 2003 and January 2004, respectively). During the course of these meetings, potential SMHM habitat locations to avoid were discussed and agreed upon by both CDFG and USFWS. There is no critical habitat designated for this species.

Caltrans biologists surveyed the project area for SMHM and its habitat at five locations based upon CNDDB records. Additionally, consultations with CDFG on July 31, 2001, established the potential presence of SMHM in various locations within the project area. The five locations with habitat for SMHM are described below:

- North of Novato Creek and west of US 101 in Novato. The pickleweed is healthy at this location. There is also pickleweed/upland mix nearby that transitions into upland habitat. This transition habitat mix is the most ideal habitat for the SMHM at this site.
- North of Novato, east of US 101and near the Marina driveway. This site contains seasonal wetland habitat. Habitat is marginal due to sparse and fragmented pickleweed along the channel crowded out by other hydrophytic plants. However, there is a direct connection to high quality habitat downstream of the channel.
- A blind-ended tidal channel near San Antonio Creek on the east side of the SMART railway. Although the areas on either side of the bridge structure are devoid of habitat, there is a thin line of pickleweed that borders the channel's ordinary high water mark.
- East of the South Petaluma Boulevard exit on the east side of US 101. The project boundaries are fairly close to the existing highway in this location, and

potential habitat is present approximately 45.5 m (150 ft) from the existing right-of-way line.

- Either side of the existing US 101 bridge structures on the northern bank of the Petaluma River. A patch of pickleweed on the eastern side of the bridge is dense and fairly well established, while a patch on the western side of the bridge is sparse and of very low quality. There is little to no pickleweed habitat along the Petaluma River on the southern bank. Despite its marginal quality, the potential presence of SMHM in the area is high because CNDDB records show populations occur downstream from the Petaluma River Bridge.

California Red Legged Frog (CRLF)

The CRLF, a federal threatened species and CDFG species of concern, is found primarily in wetlands and streams in the coastal drainage channels of central California. A visual survey was conducted in March 2002 that identified over 20 potential CRLF sites along the length of the project.

In 2002, Caltrans biologists coordinated with herpetologists to identify areas requiring potential protocol-level surveys, according to USFWS 1997 Guidelines. In 2005, the USFWS issued new guidelines *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005a), in which it is stated that the results of site assessments and surveys for CRLF will be considered valid for no more than two years. In 2005, the USFWS issued a revised survey protocol for CRLF. According to the *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005), results of site assessments and surveys for CRLF are considered valid for two years. Therefore, Caltrans conducted additional surveys according to the revised 2005 guidance in 2007.

Several areas initially investigated as potential habitat were eliminated from the 2002 surveys due to the fact that there was no appropriate CRLF habitat present. Areas were eliminated either due to heavy tidal influence or lack of any appropriate vegetative cover.

At the remaining locations, no CRLF were observed during surveys conducted by herpetologists, although other aquatic species, including Pacific treefrog (*Hyla regilla*), bullfrog (*Rana catesbeiana*), western toad, Louisiana red-swamp crayfish (*Procambarus clarkii*), and mosquito fish (*Gambusia affinis*) were observed at some locations.

CRLF dispersal habitat was identified by examining aerial photographs, U.S. Geological Survey (USGS) topographic maps and CNDDB information. Ponds within 8 km (5 mi) of the action area were identified and this information was entered into GIS. A few ponds located within areas of heavy, ongoing disturbance (such as at the landfill and gravel processing facility) were considered unsuitable for use by CRLF. All other ponds as well as San Antonio Creek were considered potentially suitable breeding habitat for this species. Caltrans selected 3.2 km (2 mi) as the maximum migration distance between breeding ponds and other habitats. Review of the potential breeding sites, 2003 and 2007 survey data, and the proposed project alignment indicated that the project will not impact breeding habitat for CRLF. Therefore, project-related effects focus on upland dispersal habitat.

A review of the entire project alignment determined that some barriers between potential CRLF breeding ponds and the action area are present in Segments A, B and C. These barriers include the urbanized core areas of Petaluma and Novato, the high salinity areas of the Petaluma River and Petaluma Marsh. The Petaluma River remains tidal and brackish throughout the City of Petaluma.

Although the paucity of CNDDB records of CRLF in the project vicinity or observed by Caltrans biologists may be due in part to limited access in some areas, it is possible that the relatively undeveloped areas of Segment B may be considered low quality CRLF dispersal habitat. This is based on the presence of stock ponds that lie between the CNDDB occurrences and the action area. CRLF are often found in stock ponds in Marin County and these ponds are often very useable habitats for the species, although bullfrogs, a CRLF predator, are also often present. Stock ponds with no vegetation present have been known to be used by CRLF. (Gary Fellers, pers. comm. with CH2M HILL Biologist Corinna Lu. February 22, 2008). Given these factors, the potential for occurrence of CRLF in the unurbanized section of Segment B cannot be completely eliminated.

There are no critical habitat units present within the project limits.

Central California Coast Steelhead (CCCS)

Steelhead are the anadromous form of the rainbow trout, a salmonid species, which is native to western North America and the Pacific Coast of Asia. In North America, steelhead can be found in Pacific Ocean drainages from southern California to Alaska (CDFG 2002). CCCS is a subspecies of steelhead found in

watersheds from the Russian River in Sonoma County, to Soquel Creek in Santa Cruz County, and the San Francisco Bay and San Pablo Bay basins (CDFG 2002).

On February 10 and 11, 2003, biologists conducted reconnaissance-level habitat surveys for special status fish species, including the federal threatened CCCS. Personal communication with Bill Cox at CDFG (May 29, 2002) led to Caltrans identifying potential habitat for CCCS. After consultation with NOAA Fisheries (May 14, 2002 and December 5, 2007), four species were considered to potentially occur within the project area: CCCS, Chinook salmon, southern DPS North American green sturgeon and Sacramento splittail.[8]

Caltrans' surveys and consultations with NOAA Fisheries concerning CCCS have resulted in identifying potential habitat within the project area (see Figures 3.3-1a-d). NOAA Fisheries disclosed that seasonally, migratory adult CCCS are known to pass through the project area at Novato Creek to and from habitat further upstream. In addition NOAA reported that juvenile CCCS may be found seasonally in the lower-most segments of San Antonio Creek, which may provide seasonal rearing habitat as well as provide a migratory channel for adults passing through the project area to and from upstream habitat areas.

A blind-ended tidal channel adjacent to Redwood Landfill may be considered potential seasonal habitat for adult and juvenile CCCS. The Petaluma River near the bridge may also provide migratory habitat to and from upstream habitat.

It is also believed that CCCS may seasonally rear in the lower-most segments of Lynch Creek. Adults may periodically occupy and attempt to spawn within the lower segments, downstream of the project boundaries, although spawning and incubation habitat conditions are poor within the project reach. There is no critical habitat for this species within project limits.

Southern Distinct Population Segment (DPS) North American Green Sturgeon

Green sturgeon is the most widely distributed member of the sturgeon family (NMFS 2007b) in North America. Green sturgeon are found in rivers from British Columbia south to the Sacramento River, California (Moyle 2002). NMFS has

[8] At the time of the surveys, all three species were listed as threatened under the Federal Endangered Species Act (FESA). Since that time, Sacramento splittail has been de-listed and is now considered a "species of special concern" under both FESA and the California (ESA). This discussion is under Section 3.3.5.

determined that this species consists of two distinct population segments along the west coast of the U.S. and Canada: the northern and southern DPS North American green sturgeon. The northern DPS green sturgeon is made up of spawning populations from the Rouge River, Oregon and the Eel and Klamath rivers in California (NMFS 2007b). This species is federally listed as threatened.

No habitat surveys were specifically conducted for green sturgeon for this project. However, evidence of their presence in the action area comes from a letter to Melanie Brent, Office Chief of the Office of Environmental Analysis, Caltrans District 4 from Richard Butler, Area Office Manager, NMFS Santa Rosa (NMFS 2007a). Mr. Butler stated that an acoustically tagged adult green sturgeon was detected in the vicinity of the Port within the Petaluma River during 2007. NMFS also believes that juvenile green sturgeon likely utilize the Petaluma River year-round as rearing habitat.

Chinook Salmon

The waterways identified for Chinook salmon habitat also provide similar habitat values for the federally threatened CCCS. Personal communication with Bill Cox, CDFG, on February 7, 2003 led to Caltrans identifying potential habitat for Chinook salmon in the MSN Project area. Under the Magnuson-Stevens Fishery and Conservation Act, Novato Creek, San Antonio Creek, Petaluma River, and Lynch Creek are all considered essential habitat for these salmon. The blind-ended tidal channel downstream of the flapgate at the Lakeville Channel may provide seasonal rearing habitat, if this species is present in the Petaluma River. NOAA Fisheries reported that the Petaluma River may provide migratory and rearing habitat for Chinook salmon, and the portion of Lynch Creek downstream of the project area may provide seasonal spawning and/or rearing habitat if hydrological conditions and access to the Petaluma River is provided. There is no critical habitat for this species within project limits.

Federal and State Listed Plants

Caltrans biologists conducted plant surveys within the project area in 2002 and 2004. Although appropriate habitat for several special status species or sensitive plants is present in the project area, no special status plant species were observed within the project boundaries. A habitat assessment of rare plant habitat in the project area was conducted in 2008. Surveys conducted according to the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Species* (USFWS 1996) were conducted in

accessible parcels in areas that have been identified as having potential sensitive plant species habitat within the project area in the late summer 2008 and the spring and summer of 2009. Pre-construction surveys following the protocol will be conducted in parcels that were not accessible in 2008 and 2009. Protocol-level surveys will be conducted prior to construction to determine if rare plants are present.

3.3.6.3 Impacts

The two MSN Build Alternatives may impact the following federally listed species and/or their habitat: SMHM, CRLF, green sturgeon, CCCS, Sonoma alopecurus, soft bird's beak, Baker's larkspur, Burke's goldfields, Contra Costa goldfields, and showy Indian clover. Caltrans and FHWA entered into formal consultation with both the USFWS and NOAA Fisheries for potential effects on these species in compliance with the Section 7 process.

Salt Marsh Harvest Mouse (SMHM)

Fixed HOV Lane Alternative. Under the Fixed HOV Lane Alternative, avoidance measures during construction would avert impacts at all the SMHM locations, except habitat near the Petaluma River Bridge. The proposed replacement of the Petaluma River Bridge would impact SMHM habitat by bringing the toe of the embankment closer to the Petaluma River. Placement of abutment fill could impact up to 0.02 ha (0.05 ac) of pickleweed on the eastern side of the bridge structures. Construction would also place abutment fill in the existing channel that currently connects the patches of pickleweed on the east and west sides of the bridges.

The Fixed HOV Lane Alternative may impact the SMHM. A patch of pickleweed on the eastern side of the bridge is dense and fairly well established, while a patch on the western side of the bridge is sparse and of very low quality. There is little to no pickleweed habitat along the Petaluma River on the southern bank. Pursuant to Section 7 of the FESA, Caltrans and FHWA prepared a Biological Assessment (BA) that further discussed potential effects on the SMHM and its habitat and identified additional measures to reduce harm to this federally and state listed endangered species. In the BA, Caltrans and FHWA determined that the project may affect and is likely to adversely affect SMHM. A BO was issued by the USFWS for this project on April 1, 2009 (see Appendix N). In the BO, the

USFWS determined that the project is not likely to result in jeopardy to the continued existence of the SMHM and produced an Incidental Take Statement.

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative would also replace the Petaluma River Bridge, resulting in the same impacts to the SMHM described above. Like the Fixed HOV Lane Alternative, the Reversible HOV Alternative would impact (up to 0.02 ha [0.05 ac]) pickleweed habitat.

Access Options. None of the four Access Options would require construction activities near the SMHM locations. Therefore, none of the four Access Options would affect the SMHM.

No Build Alternative. The No Build Alternative would not propose any improvements near the SMHM locations, and therefore would have no impact on the SMHM or its habitat.

California Red Legged Frog (CRLF)

Fixed HOV Lane Alternative. No aquatic habitat suitable for breeding by CRLF will be affected by the project, and thus, no eggs or larvae will be affected directly. The highly disturbed upland areas along the margin of the roadway do not provide high-quality foraging habitat due to existing development, the presence of disturbed areas and the paucity of vegetation in many areas. If CRLF occur within the affected areas, the primary use of the affected areas by CRLF would be by individuals dispersing away from breeding areas located within 3.2 km (2.0 mi) of the action area. Dispersal through the project action area leads only to the US 101 traffic lanes, where survival of CRLF is unlikely. The roadway margin is characterized by cut and fill slopes or compacted and graveled areas that have few mammal burrows for refugia and as such is of minimal value to CRLF individuals or populations, such that any effects to the species resulting from loss of this habitat would be negligible. Construction within the project area would permanently impact approximately 82.47 ha (203.78 ac) and temporarily impact approximately 1.34 ha (3.16 ac) of upland habitat.

Caltrans and FHWA determined in the BA that the project may affect and is likely to adversely affect the CRLF. The USFWS determined in the BO that the project is not likely to result in jeopardy to the continued existence of the CRLF and has provided an Incidental Take Statement based on habitat impacts.

Reversible HOV Lane Alternative. Direct and indirect impact areas would be identical to the ones discussed for the Fixed HOV Lane Alternative, since the project footprint is the same for both Build Alternatives.

Access Options. The areas of potential CRLF habitat in Segment B, where the Access Options are proposed, include two unnamed drainage channels in the vicinity of Olompali SHP, two unnamed creeks across from the Silveira Dairy, a creek at the Equine Veterinary Clinic, and a pond off San Antonio Road. Other potential areas include a portion of San Antonio Creek, an unnamed creek just north of the Marin/Sonoma County line, a pond just north of Gambini Road, and a pond just off the South Petaluma Road exit. All four of the Access Options propose improvements in these areas, and thus, all have the potential to affect, but not likely to adversely affect, CRLF.

No Build Alternative. The No Build Alternative would continue existing operations and maintenance of US 101, and would not include improvements that could impact the CRLF.

Central California Coast Steelhead (CCCS)

Fixed HOV Lane Alternative. The Fixed HOV Lane Alternative would result in approximately 0.47 ha (1.16 ac) of permanent impacts to salmonid habitat, including the federal threatened CCCS. Table 3.3-4 in Section 3.3.5 lists the effects by water body within the project area.

The Fixed Lane HOV Alternative would involve work in Novato Creek, Petaluma River, San Antonio Creek, Lynch Creek, and Washington Creek. While the Novato Creek and Lynch Creek bridges would be widened, Petaluma River Bridge would be replaced with a new structure. The San Antonio Freeway Bridge would be replaced with a new structure and a second crossing would be constructed just west of the historic San Antonio Creek Bridge for two-way traffic on San Antonio Road.

The Fixed HOV Lane Alternative would not propose work in the blind-ended tidal channel adjacent to the Redwood Landfill; thus, potential impacts would be limited to Novato Creek, San Antonio Creek, Lynch Creek, Washington Creek, and the Petaluma River and could impact the CCCS that could use these waterways for seasonal rearing habitat as well as provide migratory channels for adults passing through the project area to and from upstream habitat areas.

Caltrans and FHWA determined in the BA that the project may affect, but is not likely to adversely affect CCCS. However, in the BO, issued by NOAA Fisheries on January 26, 2009 (see Appendix O), NOAA disagreed with the BA finding and determined that the project may affect and is likely to adversely affect CCCS. NOAA also determined in the BO that the project is not likely to jeopardize the continued existence of the CCCS and has provided an Incidental Take Statement. Critical habitat for this species is present in the project area; however, NOAA concluded in the BO that work would not adversely modify designated habitat.

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative would have identical impacts to the CCCS as the Fixed HOV Lane Alternative, because the Reversible HOV Lane Alternative proposes the same footprint and improvements in the areas around Novato Creek, San Antonio Creek, Lynch Creek, Washington Creek, and the Petaluma River. In total, this alternative would permanently impact approximately 0.47 ha (1.16 ac) of salmonid habitat.

Access Options. Each of the Access Options would have similar, temporary impacts to the CCCS, because the improvements around San Antonio Creek and the Petaluma River are common to all Access Options.

No Build Alternative. Under the No Build Alternative, there would be no impacts to CCCS or their habitat, because this alternative proposes no improvements other than routine maintenance and upkeep of the existing US 101.

Southern Distinct Population Segment (DPS) North American Green Sturgeon

Fixed HOV Lane Alternative. The Fixed HOV Lane Alternative would result in approximately 0.21 ha (0.46 ac) of permanent impacts to green sturgeon habitat.

The Fixed Lane HOV Alternative would involve work in Novato Creek, Petaluma River, San Antonio Creek, and Lynch Creek. While the Novato Creek and Lynch Creek bridges would be widened, Petaluma River Bridge would be replaced with a new structure. The San Antonio Freeway Bridge would be replaced with a new structure and a second crossing would be constructed just west of the historic San Antonio Creek Bridge for two-way traffic on San Antonio Road. Green sturgeon is expected to occur only in the Petaluma River.

Caltrans and FHWA initially determined in the BA that the project may affect, but is unlikely to affect the green sturgeon. Caltrans and FHWA subsequently

modified that determination to may affect and is likely to adversely affect the species. However, NOAA concluded in the BO that the effects are discountable and the chance o encountering green sturgeon during construction activities is very low. NOAA further determined in the BO that the project is not likely to jeopardize the continued existence of green sturgeon. Critical habitat was proposed for this species in September 2008. However, NOAA concluded in the BO that the proposed work would not adversely modify critical habitat.

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative would have identical effects to the green sturgeon as the Fixed HOV Lane Alternative, because the Reversible HOV Lane Alternative proposes the same footprint and improvements in the areas around the Petaluma River. In total, this alternative would temporarily impact approximately 0.21 ha (0.46 ac) of permanent impacts to green sturgeon habitat.

Access Options. Each of the Access Options would have similar, temporary effects to the green sturgeon, because the improvements around the Petaluma River are common to all Access Options.

No Build Alternative. Under the No Build Alternative, there would be no effects to green sturgeon or their habitat, because this alternative proposes no improvements other than routine maintenance and upkeep of the existing US 101.

Rare Plants

Fixed HOV Lane Alternative. At this time, Caltrans and FHWA are inferring that Baker's larkspur, Sonoma alopecurus, Contra Costa goldfields and Burke's goldfields are present in suitable habitat within the project area. This inference will be verified during later surveys prior to construction.

Table 3.3-5 below summarizes the amount of potential impacts to Baker's larkspur, Sonoma alopecurus, Contra Costa and Burke's goldfields. Although suitable habitat for Burke's goldfields is present in the project area, no impacts are currently anticipated from project construction activities.

Table 3.3-5 Potential Impacts to Sonoma Alopecurus, Contra Costa Goldfields and Baker's Larkspur

Permanent Impacts	Total ha/(ac)
Contra Costa goldfields	0.09 (0.22)
Burke's goldfields	0
Sonoma alopecurus	0.35 (0.88)
Baker's larkspur	0.3 (0.7)

Showy Indian clover is only known from one extant population in Marin County, is extremely limited in distribution, and is very unlikely to occur. Showy Indian clover is therefore unlikely to be present within the project area. However, protocol-level surveys will be conducted prior to construction as previously stated.

Reversible HOV Lane Alternative. The Reversible HOV Lane Alternative has the same footprint as the Fixed HOV Lane Alternative. Accordingly, the impacts for the two Build Alternatives would be identical.

Access Options. The project area associated with the Access Options was surveyed along with the mainline project area. The results are the same as those reported under the Fixed and Reversible HOV Lane Alternatives above.

No Build Alternative. The No Build Alternative would involve routine maintenance and upkeep of US 101 and would have no impacts to special status plant species are anticipated.

3.3.6.4 Avoidance, Minimization, and/or Mitigation Measures

The elimination of certain Access Options through the criteria-based evaluation process (see Appendix A) resulted in avoiding or reducing potential impacts to critical habitat protected under federal and state listed threatened and endangered species discussed in this section. Following are specific measures to protect SMHM, CRLF, and rare plants such as the Baker's larkspur, Sonoma alopecurus, Contra Costa and Burke's goldfields.

For a complete list of the avoidance and minimization measures for protecting SMHM, CRLF, and rare plants, please see USFWS's Biological Opinion (Appendix N). For a complete list of avoidance and minimization measures for

protecting green sturgeon and Central California coast steelhead (CCCS), see NOAA Fisheries' Biological Opinion (Appendix O).

Specific Measures to Protect SMHM. Following are measures developed during the project development process to fully protect SMHM.

- The Novato Creek Bridge will be widened under the Preferred Alternative. Caltrans will avoid impacts to the SMHM habitat at this location by restricting construction close to the toe of the embankment and positioning fencing to protect environmentally sensitive areas (ESA), such as pickleweed and the associated upland transition mix.

- Since, the closest potential habitat for SMHM has been found to be approximately 45.5 m (150 ft) from the existing Caltrans right-of-way, Caltrans will minimize effects on potential habitat at Location 4 by restricting construction to within 30.5 m (100 ft) of the existing right-of-way (per direction from CDFG and USFWS).

- Caltrans' consultations with CDFG also resulted in the development of avoidance measures at the Petaluma River Bridge (CDFG letter, January 11, 2006). These measures would be implemented to avoid "take"[9] of SMHM. Caltrans will realign the channel closer to the Petaluma River to maintain connectivity between the two sides of the bridge structures as mitigation. In addition, Caltrans will construct an additional channel between the Petaluma River and the western side of the bridge structures, allowing greater tidal influence to the area and improving the quality of the pickleweed habitat on the western side of the bridge. Caltrans will also expand and improve the pickleweed along the northern bank beneath the Petaluma River Bridge.

- To minimize or avoid the loss of individual SMHM from construction activities in the Petaluma River area, pickleweed vegetation will be hand-removed. A high visibility fence consisting of plastic sheeting will be placed 6.0 m (20 ft) from the boundaries of construction areas in and adjacent to the

[9] The term "take" pertains to mortality, but does not include the taking of habitat alone or the impacts of the taking under the CESA. In addition, the "fully protected" species status prohibits a state agency from issuing a take permit. Federal agencies define take as "to harass, harm, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." The avoidance, minimization, and/or mitigation measures listed above would comply with avoiding "take" as defined by state and federal agencies.

pickleweed areas after the vegetation is removed to prevent mice from pushing under the fence.

Specific measures to protect CRLF. During project development, potential CRLF habitats were excluded from the project, including:

- In Segment A, areas that will be completely avoided in the project include the Ehreth Pond Wildlife Preserve and Scottsdale Marsh.
- Areas in Segment B surveyed for CRLF that will be completely avoided by the MSN Project include a pond off of Airport Road, and two ponds on property belonging to Birkenstock® Footprint Sandals, Inc.
- Other areas that will be completely avoided include Corona Creek (owned by Sonoma County Water Agency) and Corona Ditch (owned by the City of Petaluma).

General Construction Measures to Protect Salt Marsh Harvest Mouse (SMHM) and California Red Legged Frog (CRLF). Consultations between Caltrans, the CDFG, and the USFWS (see Table 6-3) have resulted in the development of these additional avoidance and protection measures at potential SMHM and CRLF habitat locations within the MSN Project area. For a complete list of the avoidance and minimization measures for protecting SMHM, CRLF, and rare plants, please see USFWS's Biological Opinion (Appendix N).

1. Qualified biologist(s) will be designated to monitor on-site project construction activities that may have adverse effects to SMHM or CRLF. Biologist(s) will coordinate through the Resident Engineer, to stop any work that may result in take of these listed animal species. In the event that SMHM or CRLF gain access to a construction zone, work will halt immediately and the biologist and the USFWS (concerning SMHM and CRLF) and CDFG (concerning SMHM) will be contacted. Work will be suspended until the animal(s) leaves the site voluntarily or is removed by the biologist to a release site using USFWS (for SMHM and CRLF) and CDFG (SMHM) approved handling techniques.

2. Prior to working on the project site, all supervisory construction personnel working in areas of potential endangered species habitat will attend environmental education programs delivered by a qualified biologist. Emphasis will be placed on the importance of the habitat and life stage

requirements within the context of project maps showing areas where minimization and avoidance measures are being implemented, and an explanation of appropriate federal and state laws protecting endangered species as well as the importance of compliance with Caltrans and various resource agency conditions.

3. To minimize temporary disturbances in areas of potential SMHM and CRLF habitat, project-related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. Off-road traffic outside of designated action areas will be prohibited.

4. To eliminate attraction of predators of the SMHM and CRLF, all food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a day from the project construction area.

5. To avoid injury or death of the SMHM and CRLF, firearms will not be allowed in the project construction area except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials.

6. To prevent harassment, injury or mortality of SMHM or CRLF or destruction of their refuge/nesting areas, canine or feline pets will not be permitted in the construction area.

7. Rodenticides and herbicides in the action area will be used in such a manner to prevent primary or secondary poisoning of SMHM or CRLF and the depletion of vegetation upon which they depend. Additional project-related restrictions may be deemed necessary by the USFWS or the CDFG.

8. Dedicated fueling and refueling practices shall be designated as part of the approved Storm Water Pollution Prevention Plan (SWPPP). On site fueling shall only be used when it is impractical to send vehicles and equipment off-site for fueling. When fueling must occur on-site, the contractor will designate an area to be used subject to the approval of the Resident Engineer. Drip pans or absorbent pads will be used during on-site vehicle and equipment fueling.

9. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 45.7 m (150 ft) from any downslope riparian habitat, aquatic habitat, culvert, or drainage feature.

10. Prior to commencing construction work that can have adverse effects to SMHM or CRLF, and to the extent practicable, areas outside of the construction zones containing suitable habitat for SMHM or CRLF will be delineated with high visibility temporary fencing at least 1.2 m (4 ft) in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment onto sensitive areas during construction. The fencing will be removed only when all construction equipment is removed from the site.

11. If requested, before, during, or upon completion of ground breaking and construction activities, Caltrans shall allow access by USFWS (for SMHM or CRLF) and/or CDFG personnel (for SMHM) to the project site to inspect project effects to the listed animal species and their habitats.

12. For work that could have adverse effects to SMHM or CRLF, a biologist shall be on-site to monitor the initial ground disturbance activities for the road construction. The biologist shall perform a clearance survey immediately prior to the initial ground disturbance. Safety permitting, the biologist(s) shall investigate areas of disturbed soil for signs of listed species within thirty (30) minutes following the initial disturbance of that given area.

13. To prevent entrapment of SMHM or CRLF, all excavated, steep-walled holes or trenches more than 0.61 m (2 ft) deep will be covered at the close of each working day by plywood or similar materials. If it is not feasible to cover an excavation, one or more escape ramps constructed of earth fill or wooden planks shall be installed. Such holes or trenches will be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape.

14. Plastic mono-filament netting (erosion control matting) or similar material will not be used at the project site because CRLF may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

Measures to Protect Central California Coast Steelhead (CCCS) and Green Sturgeon. Caltrans will implement several measures to avoid and minimize impacts to CCCS, green sturgeon and their habitat. For a complete list of avoidance and minimization measures for protecting green sturgeon and Central California coast steelhead (CCCS), see NOAA Fisheries' Biological Opinion

(Appendix O). These measures will also be protective of Chinook salmon (discussed in Section 3.3.5), including:

1. Restricting work in Novato Creek, San Antonio Creek, the Petaluma River and Lynch Creek to low-flow periods between June 15 and October 31 to avoid effects to CCCS during the migratory season. For green sturgeon, work will be restricted in the Petaluma River only. This window can be increased based on creek and river conditions, if approved in writing by NMFS. Work from the banks and from falsework can occur year round.

2. Measures will be taken to minimize the amount and duration of pile driving. For any pile driving occurring in wetted areas that may be occupied by CCCS, sound pressure levels generated from pile driving activities within the Novato Creek, San Antonio Creek, the Petaluma River and Lynch Creek will be restricted. For green sturgeon, sound pressure levels will be restricted in the Petaluma River only. Pile-driving activities will be conducted during daylight hours only to allow movement of juvenile or adult Chinook salmon past the construction vicinity during night time hours. Monitoring of acoustic levels may be necessary to confirm that pile driving activities are not harmful to CCCS life stages.

3. Storing all equipment outside of all waterways, including wetlands. The staging areas will also be situated 15.2 m (50 ft) from existing drainages.

4. Installing ESA fences. The ESA fencing will be delineated on the final plans and the fence will be installed and remain on-site until the project is completed.

5. Using appropriate temporary coffer dams to dewater the construction sites and divert water through the project area during the construction period to prevent impeding creek flow or water flow through the work areas. If dewatering at a site is required, a qualified Caltrans biologist will be present during the dewatering period to inspect and ensure that sensitive aquatic species will not be trapped within the temporary coffer dams. If CCCS are found within the areas of construction, a qualified biologist will capture, and relocate these fish to an appropriate area away from the construction site. Caltrans will submit for approval the dewatering and fish capture and relocation plans to the appropriate resource agencies once the design plans are finalized.

6. Removing from the streambed at the completion of the construction project all materials used to maintain flow and divert water from the action area during the construction period, including coffer dams, pipes, filter fabric, and gravel.

7. Removing all project-introduced material once the work is complete.

8. Recontouring any disturbed stream channel areas to pre-project conditions or better.

9. Caltrans will utilize reflectors on portable light trees to focus the light on the work area and minimize the amount of light spilling over to adjacent areas during any night work. In addition, noise-reducing enclosures will be used around noise-generating equipment, equipment will be located as far as possible away from noise-sensitive habitat areas, and sound control devices such as mufflers will be used on construction equipment to dampen noise as much as possible.

Specific measures to protect rare plants. The following survey and avoidance measures will be incorporated into the MSN Project. Please see USFWS Biological Opinion (Appendix N) for more details regarding avoidance and minimization measures.

- Surveys will be conducted according to USFWS, CNPS, and CDFG protocols within potentially suitable habitat for the Baker's larkspur, Sonoma alopecurus, Contra Costa and Burke's goldfields, and the showy Indian clover by botanists familiar with the local flora, and surveys will be floristic in nature.

- In adherence with the protocols, surveys will be conducted during the appropriate blooming season for these plants.

- If identified during the preconstruction surveys, consultation with the USFWS will be reinitiated.

- Caltrans will also implement several measures to avoid and minimize impacts to federal listed plants and their habitat including:

  – Making minor design modifications to avoid effects to the species;

  – Designating any area where federally listed plants and/or populations have been observed within the temporary work area as an Environmentally

Sensitive Area (ESA) and mark it in the field with orange construction fencing;

- Showing the location of all ESAs on project construction drawings and monitoring them during construction.

3.3.7 Invasive Species

3.3.7.1 Regulatory Setting

EO 13112 requires federal agencies to prevent 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." The executive order builds on NEPA, the Federal Noxious Weed Act of 1974, the state noxious weed list, and the Endangered Species Act of 1973 to prevent the introduction of invasive species; provide for their control; and take measures to minimize economic, ecological, and human health effects.

3.3.7.2 Affected Environment

Table 3.3-6 lists those species that were noted during the biological surveys in the project area that are designated as exotic pest plants of ecological concern by the California Invasive Plant Council (Cal-IPC).

3.3.7.3 Impacts

Fixed HOV Lane Alternative. Construction activities associated with the Fixed HOV Lane Alternative have the potential to introduce noxious weeds from the project area into uninfested areas. Uninfested areas that are potentially at risk include neighboring wildland areas and other areas where machinery used on the project may be used subsequently. Through the successful implementation of avoidance and minimization efforts, as described below, the Fixed HOV Lane Alternative would have no adverse impact of noxious weeds on the sensitive communities.

Table 3.3-6 Noxious Weeds Noted in Project Area

Scientific Name	Common Name
Avena barbata	slender wild oat
Bellardia trixago	bellardia
Brassica nigra	black mustard
Briza maxima	rattlesnake grass
Bromus diandrus	ripgut brome
Cardus pycnocephalus	Italian thistle
Centaurea solstitialis	yellow star thistle
Conium maculatum	poison hemlock
Cotula coronopifolia	brass buttons
Cytisus scopius	Scotch broom
Daucus carota	Queen Anne's lace
Dipsacus sativus	fuller's teasle
Eucalyptus sp.	eucalyptus
Foeniculum vulgare	fennel
Phalaris aquatica	harding grass
Raphanus sativus	radish
Rubus discolor	Himalayan blackberry
Rumex crispus	curly dock

Reversible HOV Lane Alternative. Impacts associated with the Reversible HOV Lane Alternative related to the introduction of noxious weeds would be identical to those described above for the Fixed HOV Lane Alternative. Both alternatives would have similar construction activities, which could spread noxious weeds into uninfested areas.

Access Options. The Access Options would all have similar impacts related to noxious weeds. As described for the Build Alternatives, above, construction activities associated with any of the Access Options could spread noxious weeds. No single Access Option would have more severe impacts than another, however.

No Build Alternative. The No Build Alternative would include routine maintenance activities which could include minor construction activities that could spread noxious weeds. The potential to spread noxious weeds, however, would be less than under the Build Alternatives.

3.3.7.4 Avoidance, Minimization and Mitigation Measures

Construction BMPs to Avoid Introducing Invasive Species. Caltrans will direct its contractors to include measures such as worker training, avoidance of

sensitive communities, and cleaning construction machinery before use on subsequent projects in sensitive communities to reduce the likelihood that noxious weeds would be spread by the proposed project.

Caltrans will require that disturbed areas be restored and re-vegetated after construction is complete to prevent noxious weeds from colonizing new areas.

Plant Species Selection for Landscaping and Erosion Control. In compliance with the EO on Invasive Species, EO 13112, and subsequent guidance from FHWA, the landscaping and erosion control included in the project will not use species listed as noxious weeds, as identified in Cal-IPC and the state noxious weed list. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

3.4 Irreversible and Irretrievable Commitments

Implementation of either Fixed HOV Lane Alternative or Reversible HOV Lane Alternative would involve a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion would ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous materials would be expended in the construction of either Build Alternative. Additionally, large amounts of labor and natural resources would be used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use would not have an adverse effect upon continued availability of these resources. Any construction would also require a substantial one-time expenditure of both state and federal funds, which are not retrievable.

3.5 Relationship between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Fixed HOV Lanes Alternative. Short-term losses include: construction impacts, such as noise, motorized and non-motorized traffic delays or detours, and recreational impacts such as access inconveniences to Olompali SHP.

Short-term benefits include: increased jobs and revenue generated during construction.

Long-term losses include: permanent loss of plant and wildlife resources, open space, visual impacts, use of construction materials and energy, and archaeological site values lost.

Long-term gains include: Reduced congestion, improved goods movement, improvement in highway operations, safer access to US 101, and net gains in wetlands and wildlife habitat through project mitigation.

Reversible HOV Lane Alternative: The short-term and long-term losses and gains for this alternative would be the same as the Fixed HOV Lane Alternative above.

Access Options. The short-term and long-term losses and gains for the Access Options would be the same as discussed for the Build Alternatives above.

No Build Alternative. This alternative would offer none of the gains or have the losses listed above. It would, however, not resolve worsening congestion on US 101.