

# CALIFORNIA HIGH-SPEED TRAIN

Program Environmental Impact Report/Environmental Impact Statement

## *BAY AREA TO MERCED*

# BIOLOGICAL RESOURCES TECHNICAL EVALUATION

January 2004

*Prepared for:*

California High-Speed Rail Authority

U.S. Department of Transportation  
Federal Railroad Administration



U.S. Department  
of Transportation  
**Federal  
Railroad  
Administration**

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Program Environmental Impact Report/Environmental Impact Statement

CALIFORNIA HIGH-SPEED TRAIN PROGRAM EIR/EIS

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## **BAY AREA TO MERCED Biological Resources Technical Evaluation**

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**January 2004**



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**ACRONYMS**

BCDC	=	Bay Conservation and Development Commission
BCP	=	California Partners in Flight Bird Conservation Plans
BLM	=	Sensitive Species as identified by BLM
CDFG	=	California Department of Fish and Game
CEQA	=	California Environmental Quality Act
CFP	=	Listed as fully protected under California Fish and Game Code
CNDDDB	=	California Natural Diversity Data Base
CSC	=	Species of concern as identified by the California Department of Fish and Game
EIR	=	Environmental Impact Report
EIS	=	Environmental Impact Statement
ESU	=	Evolutionary Significant Unit is a distinctive population of Pacific steelhead salmon
FAA	=	Federal Aviation Administration
FC	=	Candidate for listing (threatened or endangered) under Endangered Species Act
FE	=	Listed as endangered under Endangered Species Act
FHWA	=	Federal Highways Administration
FPT	=	Proposed as threatened under Endangered Species Act
FRA	=	Federal Railroad Administration
FSC	=	Species of Concern identified by USFWS
FT	=	Listed as threatened under Endangered Species Act
FTA	=	Federal Transit Administration
HCP	=	Habitat Conservation Plan
HST	=	High Speed Train
MNBMC	=	Migratory Nongame Bird of Management Concern (USFWS 1995a)
NAWCP	=	North American Waterbird Conservation Plan (Kuslan et al. 2002)
NEPA	=	National Environmental Policy Act
NMFS	=	National Marine Fisheries Service
RTP	=	Regional Transportation Plan
SE	=	Listed as endangered under California Endangered Species Act
SLC	=	Species of local or regional concern or conservation significance
SR	=	Listed as rare under California Endangered Species Act
ST	=	Listed as threatened under California Endangered Species Act
STIP	=	State Transportation Improvement Program
TNC	=	The Nature Conservancy
USACE	=	United States Department of the Army, Corps of Engineers
USEPA	=	United States Environmental Protection Agency
USFWS	=	US Fish and Wildlife Service
USGS	=	United States Geological Survey
USSCP	=	U.S. Shorebird Conservation Plan (U.S. Fish and Wildlife Service 2002c) and Southern Pacific Coast Regional Implementation Plan (Page and Shuford 1999)

## 1.0 INTRODUCTION

The California High-Speed Rail Authority (Authority) was created by the Legislature in 1996 to develop a plan for the construction, operation, and financing of a statewide, intercity high-speed passenger train system.<sup>1</sup> After completing a number of initial studies over the past six years to assess the feasibility of a high-speed train system in California and to evaluate the potential ridership for a variety of alternative corridors and station areas, the Authority recommended the evaluation of a proposed high-speed train system as the logical next step in the development of California's transportation infrastructure. The Authority does not have responsibility for other intercity transportation systems or facilities, such as expanded highways, or improvements to airports or passenger rail or transit used for intercity trips.

The Authority adopted a *Final Business Plan* in June 2000, which reviewed the economic feasibility of a 1,127-kilometer-long (700-mile-long) high-speed train system. This system would be capable of speeds in excess of 321.8 kilometers per hour (200 miles per hour [mph]) on a dedicated, fully grade-separated track with state-of-the-art safety, signaling, and automated train control systems. The system described would connect and serve the major metropolitan areas of California, extending from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego. The high-speed train system is projected to carry a minimum of 42 million passengers annually (32 million intercity trips and 10 million commuter trips) by the year 2020.

Following the adoption of the Business Plan, the appropriate next step for the Authority to take in the pursuit of a high-speed train system is to satisfy the environmental review process required by federal and state laws which will in turn enable public agencies to select and approve a high speed rail system, define mitigation strategies, obtain necessary approvals, and obtain financial assistance necessary to implement a high speed rail system. For example, the Federal Railroad Administration (FRA) may be requested by the Authority to issue a *Rule of Particular Applicability*, which establishes safety standards for the high-speed train system for speeds over 200 mph, and for the potential shared use of rail corridors.

The Authority is both the project sponsor and the lead agency for purposes of the California Environmental Quality Act (CEQA) requirements. The Authority has determined that a Program Environmental Impact Report (EIR) is the appropriate CEQA document for the project at this conceptual stage of planning and decision-making, which would include selecting a preferred corridor and station locations for future right-of-way preservation and identifying potential phasing options. No permits are being sought for this phase of environmental review. Later stages of project development would include project-specific detailed environmental documents to assess the impacts of the alternative alignments and stations in those segments of the system that are ready for implementation.

The decisions of federal agencies, particularly the Federal Railroad Administration (FRA) related to high-speed train systems, would constitute major federal actions regarding environmental review under the National Environmental Policy Act (NEPA). NEPA requires federal agencies to prepare an Environmental Impact Statement (EIS) if the proposed action has the potential to cause significant environmental impacts. The proposed action in California warrants the preparation of a Tier 1 Program-level EIS under NEPA, due to the nature and scope of the comprehensive high-speed train system proposed by the Authority, the need to narrow the range of alternatives, and the need to protect/preserve right-of-way in the future. FRA is the federal lead agency for the preparation of the Program EIS, and the Federal Highway Administration (FHWA), the U.S. Environmental Protection Agency (EPA), the U.S. Corps of Engineers (USACE), the Federal Aviation Administration (FAA), the U.S. Fish and Wildlife Service (USFWS), and the Federal Transit Administration (FTA) are cooperating federal agencies for the EIS.

A combined Program EIR/EIS is to be prepared under the supervision and direction of the FRA and the Authority in conjunction with the federal cooperating agencies. It is intended that other federal, state,

<sup>1</sup> Chapter 796 of the Statutes of 1996; SB 1420, Kopp and Costa.

regional, and local agencies will use the Program EIR/EIS in reviewing the proposed program and developing feasible and practicable programmatic mitigation strategies and analysis expectations for the Tier 2 detailed environmental review process which would be expected to follow any approval of a high speed train system.

The statewide high-speed train system has been divided into five regions for study: Bay Area-Merced, Sacramento-Bakersfield, Bakersfield-Los Angeles, Los Angeles-San Diego via the Inland Empire, and Los Angeles-Orange County-San Diego. This Cultural Resources Technical Evaluation for the Bay Area – Merced Region is one of five such reports being prepared for each of the regions on the topic, and it is one of fifteen technical reports for this region. This report will be summarized in the Program EIR/EIS and it will be part of the administrative record supporting the environmental review of alternatives.

## 1.1 Alternatives

### 1.1.1. No- Project Alternative

The No-Project Alternative serves as the baseline for the comparison of Modal and High-Speed Train alternatives (Figure 1). The No-Project Alternative represents the state's transportation system (highway, air, and conventional rail) as it existed in 1999-2000 and as it would be after implementation of programs or projects currently programmed for implementation and projects that are expected to be funded by 2020. The No-Project Alternative addresses the geographic area serving the same intercity travel market as the proposed high-speed train (generally from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego). The No-Project Alternative satisfies the statutory requirements under CEQA and NEPA for an alternative that does not include any new action or project beyond what is already committed.

The No-Project Alternative defines the existing and future statewide intercity transportation system based on programmed and funded (already in funded programs/financially constrained plans) improvements to the intercity transportation system through 2020, according to the following sources of information:

- State Transportation Improvement Program (STIP)
- Regional Transportation Plans (RTPs) for all modes of travel
- Airport plans
- Intercity passenger rail plans (California Rail Plan 2001-2010, Amtrak Five- and Twenty-year Plans)

As with all of the alternatives, the No-Project Alternative will be assessed against the purpose and need topics/objectives for congestion, safety, air pollution, reliability, and travel times.

**Figure 1:  
No-Project Alternative – California Transportation System**



### 1.1.2 Modal Alternative

There are currently only three main options for intercity travel between the major urban areas of San Diego, Los Angeles, the Central Valley, San Jose, Oakland/San Francisco, and Sacramento: vehicles on the interstate highway system and state highways, commercial airlines serving airports between San Diego and Sacramento and the Bay Area, and conventional passenger trains (Amtrak) on freight and/or commuter rail tracks. The Modal/System Alternative consists of expansion of highways, airports, and intercity and commuter rail systems serving the markets identified for the High-Speed Train Alternative. Figure 2 shows the modal alternative for the Bay Area-to-Merced Corridor. The Modal Alternative uses the same inter-city travel demand (not capacity) assumed under the high-end sensitivity analysis completed for the high-speed train ridership in 2020. This same travel demand is assigned to the highways and airports and passenger rail described under the No-Project Alternative, and the additional improvements or expansion of facilities is assumed to meet the demand, regardless of funding potential and without high-speed train service as part of the system.

The additional improvements or expansion of facilities is assumed to meet the demand, regardless of funding potential and without high-speed train service as part of the system.

The Modal Alternative for the Bay Area-to-Merced region consists of two major sets of proposed improvements (see Figure 2):

- **Improvements to Highways:** Consisting of additional highway lanes to provide sufficient highway capacity and associated interchange reconfiguration, crossing bridge widening, ramp widening, cross street and intersection widening (Figure 1.2-2). Within the region, these improvements, therefore, would occur along proposed portions of Interstate (I) 5, I-880, I-580, I-80, and State Route (SR) 152. Table 1 lists the proposed highway improvements in the Bay Area-to-Merced region.
- **Improvements to Airports:** Primarily consisting of improvements to terminal gates and runways to provide sufficient landside and airside capacity and associated taxiways, ground access, parking, terminal and support facilities and airports that can serve the same geographic area and demand as the proposed High-Speed Train (HST) Alternative. Within the study area corridor, these proposed improvements would occur at San José International Airport and Oakland International Airport (Figure 1.2-3). Table 2 lists the airport improvements associated with the airports.

**Table 1: Proposed Modal Alternative Highway Improvements  
Bay Area to Merced**

Highway Corridor	Segment (From – To)	No. of Additional Lanes <sup>1</sup> (Total – Both Directions)	No. of Existing Lanes (Total - Both Directions)	Type of Improvement
<b>Segment 1: Merced to San José</b>				
SR 152	SR 99 to I-5	2	1-2	widening
SR 152	I-5 to US 101	2	1-2	widening
US 101	SR 152 to Gilroy	2	2-3	widening
US 101	Gilroy to I-880	2	2-5	widening
<b>Segment 2: San José to San Francisco</b>				
US 101	I-880 to Redwood City	2	4-5	widening
US 101	Redwood City to SFO	2	4-5	widening
US 101	San Francisco International Airport (SFO) to San Francisco	2	4-6	widening
<b>Segment 3: San José to Oakland</b>				
I-880	US 101 to Fremont/Newark	2	3-4	widening
I-880	Fremont/Newark to I-238	2	3-4	widening
I-880	I-238 to I-80	2	2-4	widening
<b>Segment 4: I-580 to I-5 (via I-238)</b>				
I-580	I-880 to I-5 (via I-238)	2	4-6	widening
<b>Segment 5: San Francisco to Sacramento</b>				
I-80	San Francisco to I-880	2	5-6	widening
I-80	I-880 to I-5 (Sacramento)	2	4-6	widening

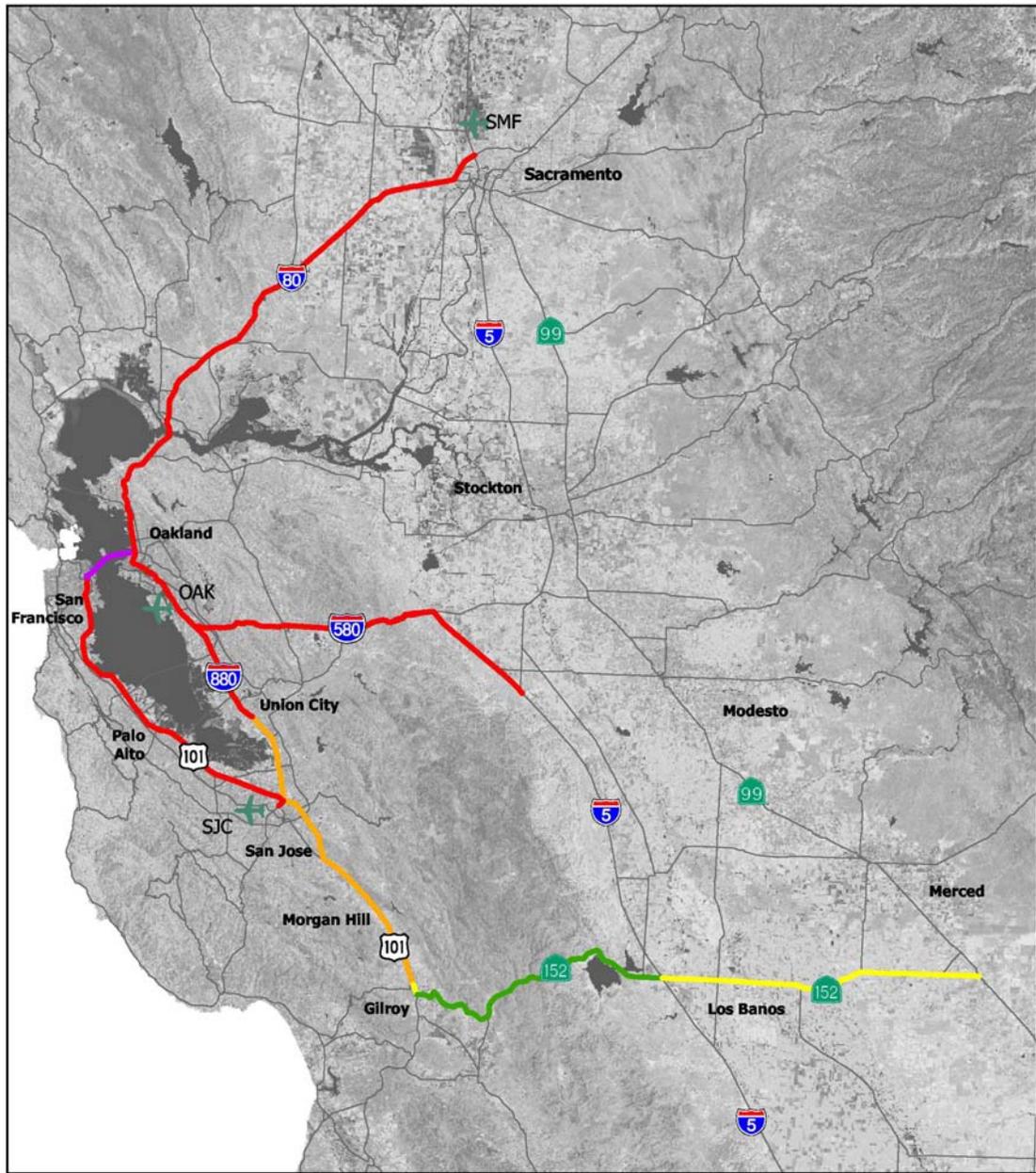
<sup>1</sup> Represents the number of through lanes in addition to the total number of existing lanes that approximate an equivalent level of capacity to serve the representative demand.

**Table 2: Proposed Modal Alternative Airport Improvements – Year 2020  
Bay Area to Merced**

Airport Name	Additional Gates	Additional Runways
San José International Airport	14	one
Oakland International Airport	19	one

Source: Parsons Brinckerhoff, November 2002

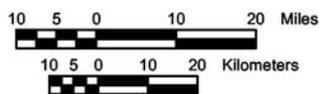
**Figure 2:  
Modal Alternative – Bay Area-to-Merced Region**



Source: Landsat 1985

March 11, 2003

California High Speed Train Program EIR/EIS



**Legend**

Existing Number of Lanes (both dir.)

- 12 Lanes
- 10 Lanes
- 8 Lanes
- 6 Lanes
- 4 Lanes

Modal Alignment Airports



**Modal Alternative  
Bay Area to Merced Region**

Figure 1

### 1.1.3 High Speed Train Alternative

The Authority has defined a statewide high speed train (HST) system capable of speeds in excess of 200 miles per hour (mph) (320 kilometers per hour [km/h]) on dedicated, fully grade-separated tracks, with state-of-the-art safety, signaling, and automated train control systems. State of the art high speed steel-wheel-on-steel-rail technology is being considered for the system that would serve the major metropolitan centers of California, extending from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego. Figure 3 shows the High Speed Train Alternative for the Bay Area-to-Merced Corridor.

The High-Speed Train Alternative includes several corridor and station options. A steel-wheel on steel-rail, electrified train, primarily on exclusive right-of-way with small portions of the route on shared track with other rail is planned. Conventional "non-electric" improvements are also being considered along the existing LOSSAN rail corridor from Los Angeles to San Diego. The train track would be either at-grade, in an open trench or tunnel, or on an elevated guideway, depending on terrain and physical constraints.

For purposes of comparative analysis, the HST corridors will be described from station-to-station within each region, except where a by-pass option is considered when the point of departure from the corridor will define the end of the corridor segment.

The Bay Area-to-Merced corridor can be broadly divided into three regional segments. Each segment has several alternative alignments for all or a portion of the length of the segment. Each segment may be further subdivided for analyzing and reporting potential impacts. The various segment options, along with station locations, are described below.

#### 1.1.3.1 Segment 1 – Merced to San José

In this segment, all alignments would be on an exclusive guideway with separate tracks for high-speed trains and would connect to the Sacramento-to-Bakersfield high-speed train corridor. Two separate corridors are being studied:

Corridor 1A. This corridor would run between Merced and San José, via Pacheco Pass and Gilroy. Two options for the alignment are being considered:

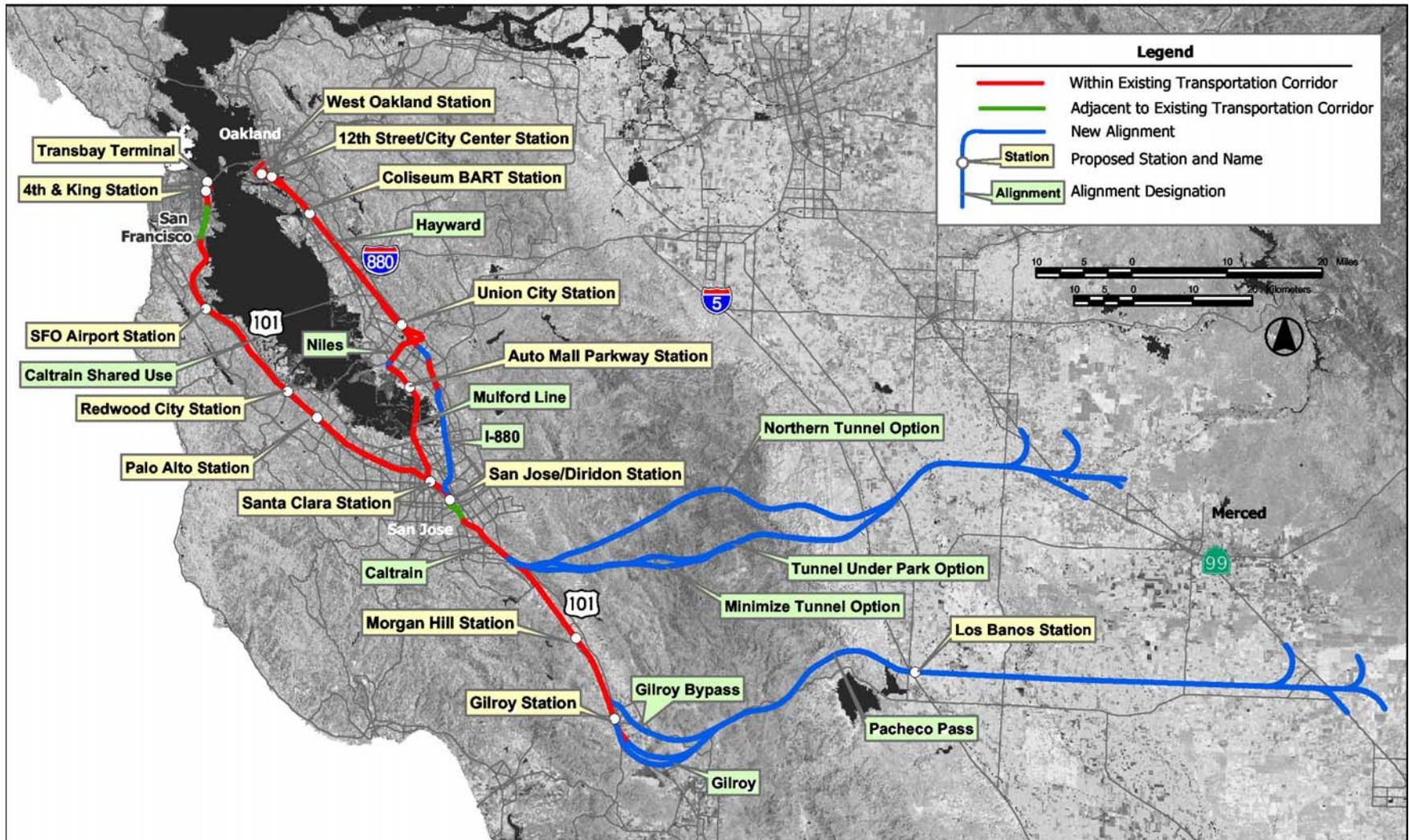
- Gilroy Option: This alignment would extend from Merced through the San Joaquin Valley and Pacheco Pass, through Gilroy, and then north along the Caltrain/Union Pacific Railroad (UPRR) rail corridor. Within this option, two suboptions are under consideration – the alignment of each is a reflection of the design speed.

Stations would include Los Baños (near I-5) in the San Joaquin Valley, Gilroy (near the existing Caltrain Station), and the existing San José (Diridon) Station.

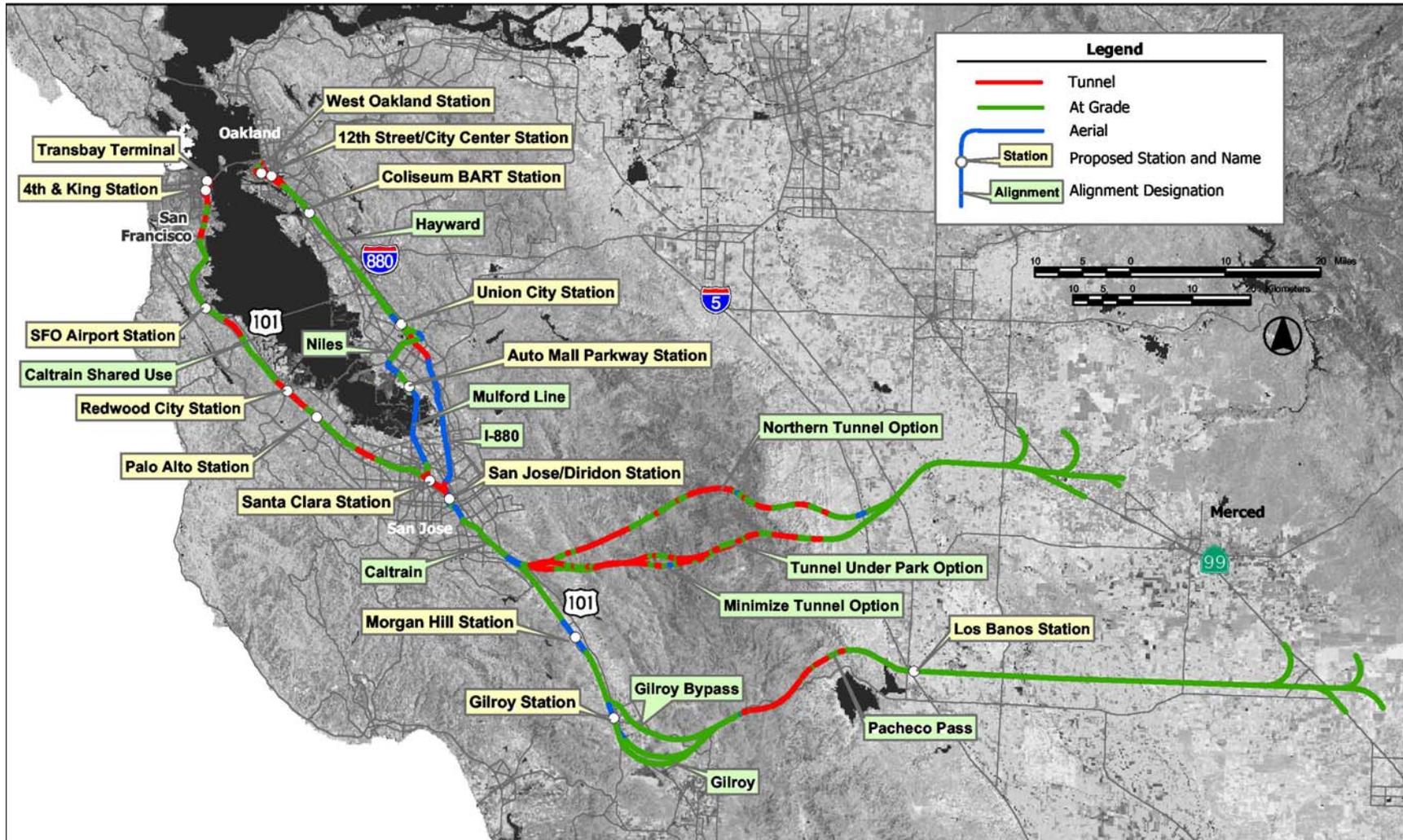
- Gilroy Bypass Option: This alignment would extend from Merced through the San Joaquin Valley and Pacheco Pass and then north along the Caltrain/UPRR rail corridor.

Stations would include Los Baños (near I-5) in the San Joaquin Valley, Morgan Hill (near the existing Caltrain Station), and the existing San José (Diridon) Station.

**Figure 3a:**  
**High Speed Rail Alternative – Bay Area-to-Merced Region**



**Figure 3b:**  
**High Speed Rail Alternative – Bay Area-to-Merced**



**Corridor 1B.** This corridor would run between Merced and San José, via Atwater and across the Diablo Mountain Range and would include one station – at the existing San José (Diridon) Caltrain Station. Three options for the alignment are being considered:

- **Northern Tunnel Option:** This alignment would emanate from the BNSF rail corridor or the UPRR corridor near the town of Atwater, north of Merced. The alignment would extend west across the San Joaquin Valley passing north of the town of Newman. The tracks would cross the Diablo Mountain Range in a series of tunnels, passing north of Henry Coe State Park. The alignment then would connect with the Caltrain/UPRR rail corridor north of SR 85.
- **Tunnel Under Park Option:** This alignment is similar to the Northern Tunnel Option except that the segment through the Diablo Mountain Range would cross Henry W. Coe State Park primarily in tunnel. The alignment then would connect with the Caltrain/UPRR rail corridor north of SR 85.
- **Minimize Tunnel Option:** This alignment is similar to the Tunnel Under Park Option except that the segment through the Diablo Mountain Range would cross Henry W. Coe State Park primarily at-grade. The alignment then would connect with the Caltrain/UPRR rail corridor north of SR 85.

#### 1.1.3.2 Segment 2 – San José to San Francisco

There is one alignment being considered in this segment; it would provide for high-speed trains sharing tracks with Caltrain commuter trains. The entire alignment would be grade-separated, and all Caltrain stations would have four tracks or by-pass tracks.

Stations would include an optional station at Santa Clara; a station in either Palo Alto or Redwood City; a station in Millbrae near the San Francisco International Airport; and in San Francisco, a station at Fourth and King streets and at the lower level of the proposed new Transbay Terminal.

#### 1.1.3.3 Segment 3 – San José to Oakland

There are two options under consideration for the alignment in this segment.

- **I-880 Option:** From San José, this alignment would follow north along I-880 and then transition to UPRR's Hayward rail line.

Stations would include the planned Warm Springs Bay Area Rapid Transit (BART) Station in Fremont or the Union City BART Station; the Oakland Airport/Coliseum BART Station; and either the West Oakland Station or the 12th Street/City Center Station in Oakland.

- **Mulford Line Option:** From San José, this alignment would travel north along UPRR's Mulford rail line to the UPRR's Niles Line and then onto UPRR's Hayward line.

Stations would include the Auto Mall Parkway Station or the Union City BART Station; the Oakland Airport/Coliseum BART Station; and in Oakland, either the West Oakland Station or the 12th Street/City Center Station.

## 2.0 BASELINE/AFFECTED ENVIRONMENT

### 2.1 STUDY AREA

The study area includes central California from the San Francisco Bay Area (San Francisco and Oakland) south to the Santa Clara Valley and east across the Diablo Range to the Great Valley. Several variations (alignments) were studied. Around San Francisco Bay, the proposed project would be built down both sides of the bay from San Francisco and Oakland, respectively meeting in downtown San Jose. The segment on the eastern side of San Francisco Bay (from Oakland to San Jose) has two variations or alignments: one alignment called in this document as the "east alignment" roughly parallels Interstate Highway 880 to San Jose. A second alignment is proposed along the existing UPRR mainline from Niles south to Santa Clara and then to downtown San Jose "west alignment."

From San Jose to the Merced Region of the Great Valley six alignments are proposed. Three of the six alignments known as the "Diablo Range Direct" route would cross the Diablo Range from South San Jose across the divide from Santa Clara County into Stanislaus County, and enter the Great Valley in the vicinity of Newman. These three routes would terminate near Winton just east of State Route 99, in northern Merced County. The three "Diablo Direct" variations include the "Tunnel under Henry Coe Park Alignment", "Minimize Tunnel Option", and "Northern Alignment Option" (Figure 3).

The other three of six alignments follow a more southern route across the Diablo Range, and generally follow State Route 152 (the so-called "State Route 152 Alignment") across the divide into Merced County, passing the San Luis Reservoir and entering the Great Valley at Santa Nella. The southern alignment ends near Chowchilla in northern Madera County. After leaving San Jose, the southern alignment would follow the existing Union Pacific Railroad south to Gilroy, then curve eastward to intersect State Route 152. One variation would avoid Gilroy (the so-called "Gilroy Bypass"), and the two other variations would pass through Gilroy (the so-called "145 kph siding option and Gilroy Station Option"). All of the routes appear in Figure 3.

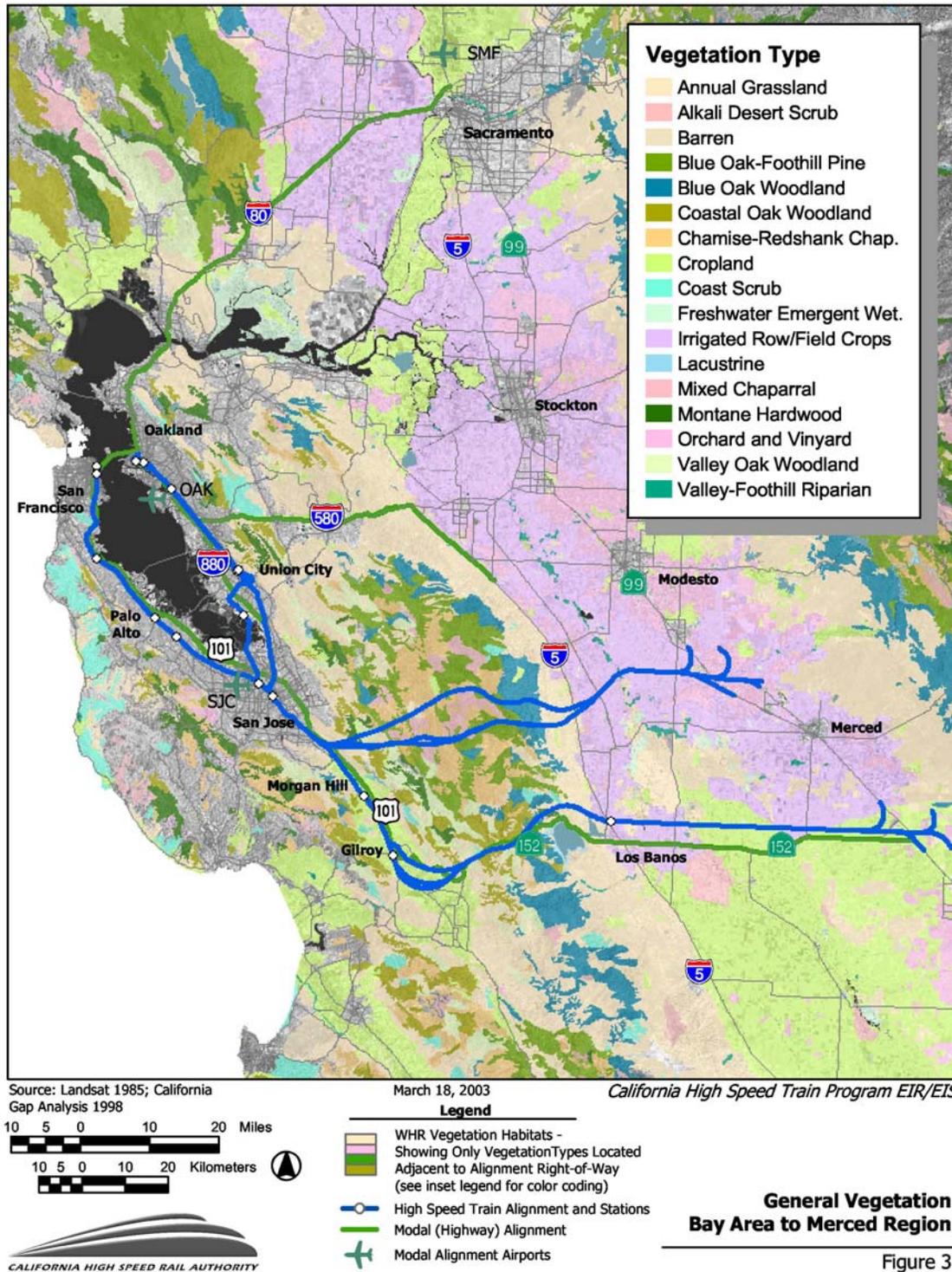
The study area included 1000 feet on either side of all alignments. In addition, a modal project was analyzed, which consisted of the summation of several major Interstate highway, State Highway, and airport expansions.

### 2.2 GENERAL DESCRIPTION OF REGIONAL PHYSICAL CHARACTERISTICS AND VEGETATION COMMUNITIES

The region traversed by the project is dominated by three principal geophysical features: the San Francisco Bay and coastal valleys, including the Santa Clara Valley and The Bolsa; the Diablo Range; and the Great Valley. The three major watersheds which correspond with the three principal geophysical features described above are the San Francisco Bay watershed, Pajaro River watershed, and San Joaquin River watershed. A qualitative description of the numerous stream crossings based on a manual review of USGS quadrangle maps, resource "red-flags", and possible regulatory issues, by segment, is presented in the Appendix as it is too lengthy to appear in this section.

Vegetation communities along the proposed project alignments from the Bay Area to Merced are varied, ranging in elevations from sea level to nearly 5000 feet. Major communities or land uses are briefly described below. These descriptions do not reflect actual field conditions but were collected using remote sensing geospatial data and a manual analysis of USGS 7.5 minute quad maps (Figure 4).

**Figure 4:  
General Vegetation – Bay Area to Merced**



### 2.2.1 Agricultural Lands

Agricultural lands, specifically farmlands cover much of the proposed routes in Great Valley of Madera, Merced and Stanislaus counties, except for those segments in the western foothills and mountains or in the vicinity of sloughs, lakes, rivers and their tributary streams. Relatively smaller areas of farmland occur west of the Diablo Range, in southern areas of Alameda County, and western Santa Clara County. Farmland is also present on the floor of The Bolsa in northern San Benito County. The term agricultural lands includes the Wildlife Habitat Relationships (WHR) classification "cropland", "irrigated row and field crops", and "orchard and vineyard." There is no corresponding terrestrial community based on Holland (Table 3).

Tomatoes (*Lycopersicon esculentum*) are the primary crop, but other crops include alfalfa (*Medicago sativa*), lima beans (*Phaseolus sativus*), melons (*Cucurbita pepo*), beets (*Beta vulgaris*), oats (*Avena sativa*), and safflower (*Carthamus tinctorius*). Apricots (*Prunus armeniaca*) are the principal orchard crop. Vegetation on the edges of fields often consists of invasive annual weeds including cheeseweed (*Malva parviflora*), field bindweed (*Convolvulus arvensis*), riggut brome (*Bromus diandrus*), wild oats (*Avena fatua*), hayfield tarweed (*Hemizonia congesta*), wild radish (*Raphanus sativus*), Russian thistle (*Salsola kal*), and tumble mustard (*Sisymbrium altissimum*). In low-lying heavy soils of the Great Valley (and to a lesser extent The Bolsa and Santa Clara Valley), where farming is difficult, and often only alfalfa can be grown, fallow and unplowed fields may become colonized by weedy plant species such as alkali heath (*Frankenia salina*), alkali mallow (*Malvella leprosa*), and alkali bindweed (*Cressa truxillensis*), adapted to saline and alkaline conditions (see Chenopod Scrub below).

In the foothills of the Diablo Range on the western edge of the Great Valley, agricultural lands transition from apricot orchards to dry farmed fields of wheat (*Triticum aestivum*) and barley (*Hordeum vulgare*), and then to non-native grassland (see Non-native Grassland below). It should be noted that non-native grassland of the foothills and mountains is utilized as rangeland.

### 2.2.2 Blue Oak and/or Foothill Pine Woodlands

The higher ridges and slopes of the Diablo Range are vegetated with a mixed oak and pine woodland, which is dominated by blue oak (*Quercus douglasii*). In those areas where the fire frequency is high, blue oak and mixed chaparral species dominate over foothill pine (*Pinus sabiniana*). Other oak species, which may occur in these mixed oak and pine woodlands include scrub oak (*Quercus berberidifolia*), interior live oak (*Quercus wislizenii*), valley oak (*Quercus lobata*), and California black oak (*Quercus kelloggii*). These woodlands may be open savannas or dense and brushy, depending upon soil type, aspect, and fire frequency. Common shrubs of blue oak woodland include California buckeye (*Aesculus californica*), several manzanita (*Arctostaphylos* spp.) and ceanothus (*Ceanothus* spp.) species, yerba santa (*Eriodictyon californicum*), cascara (*Rhamnus californica*), and buckthorn (*Rhamnus crocea*). The WHR classification of woodlands dominated by blue-oaks and/or foothill pines is "blue-oak-foothill pine" or "blue-oak woodland". The corresponding Holland plant communities include "digger pine woodland", "digger pine-oak woodland", "blue-oak woodland", and "interior live oak woodland". The former three plant communities were most commonly encountered along the proposed corridors.

At higher elevations in the more moist and shaded sites having a lesser frequency of wildfire, blue oak woodland intergrades with stands that are dominated by foothill pine and California black oak. At lower elevations, blue oak woodland merge with coast live oak woodland, Diablan sage scrub, and non-native grassland (see coast live oak woodland, Diablan sage scrub, and non-native grassland below).

### 2.2.3 Chaparrals and Montane Hardwoods

Relatively smaller areas at higher elevations in the Diablo Range, particularly those areas having thin soils on rocky south-facing slopes subject to periodic wildfire, and not dominated by non-native grassland, coastal scrub, and blue oak woodlands, are vegetated with sclerophyll type vegetation known as chaparral. These chaparrals include the WHR classifications of chamise-redshank chaparral (corresponding to Holland's chamise chaparral), mixed chaparral (corresponding to Holland's serpentine chaparral, scrub oak chaparral, interior live oak chaparral, and coastal sage chaparral). The WHR term montane chaparral is equivalent to Holland's montane chaparral. The most prevalent chaparrals of the routes include those chaparrals that are dominated by chamise (*Adenostoma fasciculatum*), scrub oak (*Quercus berberidifolia*), and montane hardwoods such as birch-leaf mountain mahogany (*Cercocarpus betuloides*), chaparral whitethorn (*Ceanothus leucodermis*), deer brush (*Ceanothus intergerrimus*), blue blossom (*Ceanothus thrysiflorus*), and manzanitas such as *Arctostaphylos glandulosa*.

### 2.2.4 Chenopod Scrubs (including Alkali Desert Scrub)

In those areas of the Great Valley within the project alignments that are not developed, converted to agriculture, or represented by riparian woodlands, scrubs, or wetlands, small fragments of chenopod scrub may exist. Chenopod scrub consists of gray or bluish-hued low-growing shrubs including allscale (*Atriplex polycarpa*), spinescale (*Atriplex spinifera*), arrowscale (*A. phyllostegia*), bush seepweed (*Suaeda moquinii*), iodine bush (*Allenrolfea occidentalis*), and pale-leaf goldenbush (*Isocoma [Haplopappus] acradenia* var. *bracteosa*),

Common grasses and herbs of the chenopod scrub and contiguous agricultural areas include saltgrass (*Distichlis spicata*), red brome (*Bromus madritensis* ssp. *rubens*), alkali heath, alkali mallow, alkali bindweed, hayfield tarweed, pickleweed (*Salicornia subterminalis*) and common spikeweed (*Hemizonia pungens*).

### 2.2.5 Coastal Oak Woodlands

The WHR category of coastal oak woodlands includes the Holland categories of central coast live oak riparian forest, coastal live oak woodland, coast live oak forest, and mixed evergreen forest (Table 3). The former Holland plant community is discussed in the section on riparian woodlands.

In the Diablo Range, particularly west of the divide between the streams of the Great Valley and the streams bordering San Francisco and Monterey Bays, the most prevalent woodland type is dominated by the evergreen coast live oak (*Quercus agrifolia*). This woodland often forms a closed canopy however, on the edges of patches of woodland where it intergrades with Diablan coastal scrub or non-native grassland, the oaks may become more scattered, resembling a savannah. Secondary woody species of coastal oak woodlands include poison oak (*Toxicodendron diversilobum*), California buckeye (*Aesculus californica*), coffeeberry (*Rhamnus californica*), California bay laurel (*Umbellularia californica*), toyon (*Heteromeles arbutifolia*), blue oak (see above), and valley oak (see below).

### 2.2.6 Coastal Salt Marsh (Northern Coastal Type)

One of the three project alignments, which border San Francisco Bay, traverses coast salt marsh. Coastal salt marsh is a minor component along the Newark to Alviso option where the proposed route would cross tidal flats, salt evaporators, and the estuaries of Coyote Creek and the Guadalupe River. Only tiny fragments of coastal salt marsh not mapped by the GAP database exist along the western edge of the Bay and these correspond with tributary streams and tidal channels, including the Visitacion Basin, Colma Creek, and Sanchez Creek. In the same way, the route on the eastern side of San Francisco Bay encounters coastal salt marsh at only one or two isolated localities bordering Lake Merritt and one or two tidal channels.

Where it exists, coastal salt marsh is dominated by saltgrass, pickleweed (*S. virginica*) alkali heather, spearscale (*Atriplex triangularis*), and cordgrass (*Spartina alterniflora*).

### 2.2.7 Coastal Scrubs (Diablan Coastal Scrub)

Dominating thin soils of rocky south-facing slopes at the lower elevations of the crossings of the Diablo Range are “soft chaparrals” locally known as Diablan coastal scrub. These are similar to other “hard” chaparrals by virtue of their plant adaptations for fire and drought but tend to be dominated by lower-growing species of brush. These species include California sagebrush (*Artemisia californica*), black sage (*Salvia mellifera*), sticky monkey flower (*Mimulus aurantiacus*), and wild buckwheat (*Eriogonum fasciculatum*). Coastal scrubs of the proposed route, especially in the Diablo Range, form complex mosaics with non-native grassland and coast oak woodlands. The mosaics of vegetation polygons are due to fire frequency and variations in geologic substrate and soil type, and disturbance factors such as frequency of land clearing and grazing.

### 2.2.8 Freshwater Marsh (including Freshwater Emergent Wetland and Cismontane Alkali Marsh)

Catalogued along the route as freshwater emergent wetland, freshwater marsh is dominated by plants that tolerate periodic inundation and/or water saturated heavy soils. These plants include tall monocots including cattail (*Typha latifolia*), California bulrush (*Scirpus californicus*), and a variety of lower growing wetland plants including spikerush (*Eleocharis macrostachya*), yellow nutsedge (*Cyperus esculentus*), barnyard grass (*Echinochloa crusgalli*), yerba mansa (*Anemopsis californica*), alkali bulrush (*Scirpus robustus*), and saltgrass (*Distichlis spicata*). The marshes of the various alignments exhibit considerable variation in plant composition; the variations being due to several factors such as level of disturbance, water levels, and alkalinity. More alkaline wetlands of the Great Valley termed valley sink scrubs often transition into chenopod scrub plant communities. In the valleys of the between the coastal ranges a third marsh type, catalogued by the CNDDDB as cismontane alkali marsh, occurs. It is more alkaline than brackish freshwater marshes.

### 2.2.9 Non-native Grasslands (including Annual Grassland and Valley and Foothill Grassland)

Mapped along the route as annual grassland, non-native grassland occurs on clay soils not covered by chaparrals or oak woodlands. The term “non-native grassland” sensu Holland is most commonly use by local planners and land managers to describe and assemblage of non-native annual grasses such as wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), rip-gut brome (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*), Italian ryegrass (*Lolium multiflorum*), and annual fescues such as *Vulpia myuros*). Common forbs include filaree (*Erodium cicutarium*), burclover (*Medicago hispida*), and yellow star-thistle (*Centaurea solstitialis*).

### 2.2.10 Riparian Woodlands

Several woodlands associated with canyons and streamsides are grouped together by the WHR system as “valley-foothill riparian.” Riparian woodlands often form sinuous, but uniform plant communities in the moistest areas of canyons, often on the edges of streams or surrounding springs. In the mountains on the coastal sides of the Diablo Range, riparian woodlands are often dominated by coast live oak, valley oak, blue oak, box elder (*Acer negundo*), white alder (*Alnus rhombifolia*), Oregon ash (*Fraxinus latifolia*), Pacific willow (*Salix lasiolepis*), red willow (*Salix laevigata*), arroyo willow (*Salix exigua*), mule fat (*Baccharis salicifolius*), and a rich understory shrub layer consisting of poison oak, Douglas baccharis (*Baccharis douglasii*), wild rose (*Rosa californica*), and creeping blackberry (*Rubus ursinus*). At other sites such as along Pacheco and Orestimba creeks, where there are relatively broad canyons filled with deep alluvium, western Sycamore (*Platanus racemosa*) dominates over willows, oaks, and alders, in

relatively open groves. Most of the riparian woodlands are considered sensitive by the CNDDDB and should be avoided through project redesign, if possible.

### 2.2.11 Valley Oak Woodland

Valley oak woodland forms an open savannah on the valley bottoms where heavier soils exist. Valley oak (*Quercus lobata*) is the largest of all the California oaks and is deciduous. This plant community often contains blue oak (also deciduous) as a secondary component, but also may contain many of the same shrub species as coastal live oak woodlands and blue oak woodland. Forbs and grasses, including blue wildrye (*Leymus triticoides*) make-up much of the understory of these savannas, but the frequency and cover of shrub species in valley oak woodland is typically less than other woodlands, such as blue oak woodland. Valley oak woodland is considered sensitive by the CNDDDB.

## 2.3 SENSITIVE VEGETATION COMMUNITIES

While all vegetation is sensitive to environmental impacts to some degree, two types of sensitive vegetation communities may be defined on the basis of their relative scarcity in the State (defined in the California Natural Diversity database (CNDDDB) and Holland (1986); or sensitivity due to presence of regulated habitat (such as riparian and/or wetlands). Many sensitive vegetation communities (with the exception of non-native wetland plant communities) are considered natural communities.

Natural communities are vegetation communities documented within Holland (1986) and in the CNDDDB (CDFG, 2002) database. Each community type is classified and priority ranked based on distribution, common or limited, or threats to conservation and preservation. The most sensitive of these plant communities, termed "natural communities of special concern", "high-inventory priority" or "CNDDDB-sensitive" are identified in Holland (1986) with an asterisk (\*) and catalogued by the CNDDDB. Central coast cottonwood-sycamore riparian forest, cismontane alkali marsh, northern coastal saltmarsh, northern hardpan vernal pool, serpentine bunchgrass, sycamore alluvial woodland, valley oak woodland, and valley sink scrub are the natural communities of special concern that occurs within the 1000-foot wide footprints of the various project alignments.

When cross-walked with the Wildlife Habitat Relationships System (Table 3), the sensitive vegetation communities of the project alignments that were identified from the California GAP analysis GIS database included alkali desert scrub (also known as chenopod scrubs), freshwater emergent wetland, lacustrine habitat, valley oak woodland, and valley-foothill riparian woodland. However, GAP is not a precise mapping of vegetation of the State, and additional sensitive vegetation communities not discernable at this level of analysis, should be expected. These will be identified during the course of field surveys as part of the Tier 2 process.

While hydric soils are one of three indicators of sensitive wetland habitat and are necessary to support sensitive vegetation communities such as cismontane alkali marsh, they are not covered in this section. In a similar way, serpentine soils in northern California often support Special-status plant populations and plant communities however, by themselves, these soils are not sensitive despite their erosive nature (see Appendix, Table 4 and 6).

The California GAP Analysis also tabulates the number of minor inclusions in its vegetation polygons, and some of these inclusions constitute sensitive, regulated habitat. Specific examples include riparian woodlands and scrubs, seeps, springs, and wetlands. As before, additional sensitive vegetation communities not discernable at this level of analysis, should be expected as detailed field surveys are conducted.

### 2.3.1 Sensitive Plant Species

Special-status plant species are those plants listed as threatened or endangered under state and/or federal Endangered Species Acts, candidate species, California Department of Fish & Game Species of Concern, and California Native Plant Society listed species. State species are identified as protected under the State of California Endangered Species Act, California Administrative Code, Title 14, Section 670.5; and plants that are considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered in California. The Federal Endangered Species Act provides regulations regarding plants (50 CFR 17.12). Special-status species also include sensitive species. Sensitive species are those plants identified by the California Department of Fish and Game (CDFG) as species of special concern, plants identified under the CDFG Plant Protection Act considered to be sensitive due to their declining numbers or habitats in California, and oak trees worthy of protection under the Santa Clara County General Plan and local Tree Protection Ordinances. Possible impacts to oak trees of the proposed alignments are listed in the Appendix, Tables 5 and 6.

Sensitive plant species of the Merced to Bay Area High-Speed Rail alternatives were determined from occurrences in the California Natural Diversity Data Base (CNDDDB, 2002) of Special-status Plant Species coupled with lists by USGS quadrangles that were retrieved from the California Native Plant Society's Electronic database (CNPS, 1999), the CNPS Inventory (CNPS, 2001), and county lists available on the United States Fish & Wildlife Service's website (Figure 4).

In addition, the project contacted federal and state resource agencies by mail or electronic medium, to develop a list of TES and special-status species potentially occurring along the proposed ROW. The resulting composite list of plant species is provided Table 4a. Each species' habitat preference is briefly described with annotations regarding the likelihood of occurring based on the availability of suitable habitat and GAP vegetation communities.

The project has the potential to affect nearly 70 Special-status plant species (Figure 4, Table 4a), including those indigenous to vernal pools (including clay depressions), chenopod scrubs, cismontane woodlands (including valley and foothill grasslands and broadleaved forests), coastal saltmarsh, and serpentine substrates. Vernal pools occur in heavy clay soils (so-called playa pools) adjacent to the Modal Alternative in the Great Valley in Solano County, and along the eastern edge of San Francisco Bay, principally in Alameda County. Vernal pools also occur on the western end of the Great Valley in western Stanislaus and Merced counties, in the cemented hardpan of terrace deposits. Rare plant habitat in cismontane woodland (including valley and foothill grasslands and broadleaved forests), is principally located in the Diablo Range. Most of the chenopod scrubs occur in remnant patches along the southern alignment on the floor of the Great Valley in Merced County. Coastal salt marsh habitat (including brackish marsh) for rare plants occurs along the eastern edge of San Francisco Bay in Alameda County. Serpentine outcrops, which support rare plant populations, are located along the northern alignment in Santa Clara and Stanislaus counties.

Several of these rare plants are State and federally listed. State and federally listed vernal pool (and clay depression) plants likely to occur along the project alignments include succulent owl's clover (*Castilleja campestris* ssp. *succulenta*), Hoover's spurge (*Chamaesyce hooveri*), Delta button-celery (*Eryngium racemosum*), Bogg's Lake hedge-hyssop (*Gratiola heterosepala*), Contra Costa goldfields (*Lasthenia conjugens*), Colusa grass (*Neostapfia colusana*), San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*), hairy Orcutt grass (*Orcuttia pilosa*), and Greene's tuctoria (*Tuctoria greenei*). The palmate-bracted bird's-beak (*Cordylanthus palmatus*), a State and federally listed species, is indigenous to chenopod scrubs. State and federally listed species known to occur in cismontane woodlands (including valley and foothill grasslands and broadleaved forests) include large-flowered fiddleneck (*Amsinckia grandiflora*), Hartweg's golden sunburst (*Pseudobahia bahiifolia*), and rock sanicle (*Sanicula saxatilis*). California seablite (*Suaeda californica*), a federally listed species, is known from coastal salt marsh and Mason's lilaepsis (*Lilaeopsis masonii*) is known from brackish swamps. Several State and federally listed species, which

are endemic to serpentine soils and ultramafic rock outcrops (serpentinite), are known from the vicinity of the northern alignments. These include the Coyote ceanothus (*Ceanothus ferrisae*), Santa Clara Valley dudleya (*Dudleya setchellii*), Metcalf Canyon jewelflower (*Streptanthus albidus* ssp. *albidus*), and showy Indian clover (*Trifolium amoenum*).

**Table 3. Comparison of Community Classifications Identified in High-speed Railroad Alignment Corridors**

WHR Code	Wildlife Habitat Relationships (WHR) Classification <sup>1,3</sup>	Terrestrial Community <sup>2,3</sup>				
AGS	Annual Grassland	Valley and Foothill Grassland				
ASC	Alkali Desert Scrub	Chenopod Scrub				
BAR	Barren	No corresponding series				
BOP	Blue Oak-Foothill Pine	Digger pine woodland		Digger pine-oak woodland		
BOW	Blue Oak Woodland	Blue oak woodland			Interior live oak woodland	
COW	Coastal Oak Woodland	Central Coast live oak riparian forest	Coast live oak woodland	Coast live oak forest	Mixed Evergreen Forest	
CRC	Chamise-Redshank Chaparral	Chamise chaparral				
CRP	Cropland	No corresponding series				
CSC	Coastal Scrub	Coastal Scrub				
FEW	Freshwater Emergent Wetland	Coastal and Valley and Freshwater Marsh				
IRF	Irrigated Row and Field Crops	No corresponding series				
LAC	Lacustrine	No corresponding series				
MCH	Mixed Chaparral	Serpentine chaparral	Scrub oak chaparral	Interior live oak chaparral	Coastal sage-chaparral	
MHW	Montane Hardwood	Montane chaparral				
OVN	Orchard and Vineyard	No corresponding series				
URB	Urban	No corresponding series				
VOW	Valley Oak Woodland	Valley Oak Woodland	Blue Oak Woodland		Great Valley oak riparian forest	
VRI	Valley –foothill riparian	Central coast riparian forest	Great valley riparian forest	Sycamore alluvial woodland	Southern riparian scrub	Great Valley riparian scrub

<sup>1</sup> based on Zeiner *et al.* (1988, 1990a, 1990b); Davis (1998).

<sup>2</sup> based on Holland (1986).

<sup>3</sup> rarely is a community uniformly dominated by a single species or structural type (i.e., tree, shrubs, or grasses), rather, each community may have several predominant species or structures. For example, Valley Oak Woodlands may consist of an understory of annual grasslands, or the predominant Valley Oak may have smaller components of Blue Oak or riparian corridors. Smaller components, particularly riparian and wetlands habitats may not appear at landscape-level descriptions such as this analysis.

## 2.4 SENSITIVE WILDLIFE

Sensitive wildlife species of the Merced to Bay Area High-Speed Rail alternatives were determined from occurrences in the California Natural Diversity Data Base (CNDDDB, 2002) of Special-status Animal Species coupled with lists available on the United States Fish & Wildlife Service's website.

In addition, the project contacted federal and state resource agencies by mail or electronic medium, to develop a list of TES and special-status species potentially occurring along the proposed ROW. The resulting composite list of animal species is provided Table 4b. Each species' habitat preference is briefly described with annotations regarding the likelihood of occurring based on the availability of suitable habitat and GAP vegetation communities (Figure 4).

Additional lists should be sought from The Nature Conservancy and federal Bureau of Land Management, during the course of Tier 2 analyses. The Nature Conservancy (TNC) owns considerable acreage in the vicinity of the proposed project, in the Diablo Range. Though they were contacted, the TNC has not yet provided the project with these lists.

### 2.4.1 Invertebrates

More than 20 Special-status invertebrate species have potential habitat in the project area, including vernal pool habitats, moist or water saturated serpentine substrates, woodlands dominated by oak or pine, and interior sand dunes. Of these species, several are federally listed vernal pool shrimp including vernal pool fairy shrimp (*Branchinecta lynchi*), longhorn fairy shrimp (*Branchinecta longiantenna*), conservancy fairy shrimp (*Branchinecta conservatio*), and vernal pool tadpole shrimp (*Lepidurus packardii*). The federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), which frequents mature elderberry bushes (*Sambucus mexicana*) as habitat, also occurs in the area, particularly the Great Valley (Table 4b).

### 2.4.2 Fishes

About a half-dozen Special-status fish species have potential habitat in the project area, which include three federally threatened races of steelhead (*Oncorhynchus mykiss*), and the federally threatened Sacramento splittail (*Pogonichthys macrolepidotus*). Listed steelhead races occur in the watershed of the San Joaquin River, in tributaries to San Francisco Bay, and in the Pajaro River watershed areas of the project. The federally threatened Sacramento splittail is indigenous to the Delta region (Table 4b).

### 2.4.3 Reptiles and Amphibians

A dozen Special-status reptiles and amphibians have the potential to occur along the Merced to Bay Area project alignments including the State endangered California tiger salamander (*Ambystoma californiense*), federally threatened California red-legged frog (*Rana aurora draytonii*); the State and federally threatened blunt-nosed leopard lizard (*Gambelia silus*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), and giant garter snake (*Thamnophis gigas*); and the State and federally endangered San Francisco garter snake (*Thamnophis sirtalis tetrataenia*).

California tiger salamander has the potential to occur in the Diablo Range along all of the proposed alignments, especially where oak woodlands and abandoned burrows (aestivation habitat) occurs in the general vicinity of stock ponds. Likewise, California red-legged frog has the potential to occur in the Diablo Range along all of the proposed alignments, especially where riparian woodlands exist near streams or stock ponds. Critical habitat has been designated in these areas by the USFWS.

In the San Joaquin Valley and in the foothills of the Diablo Range on the west side of the Great Valley, blunt-nosed leopard lizard habitat exists in the vicinity of both the northern (Diablo Direct) and southern

(State Route 152) alignments. Alameda whipsnake habitat exists in the oak woodlands and grasslands on the east side of San Francisco Bay. Giant garter snake habitat is known from the I-80 corridor near Sacramento. San Francisco garter snake occurs in the vicinity of San Francisco International Airport along the existing Caltrain and BART corridor (Table 4b).

#### 2.4.4 Birds

More than 40 Special-status species birds have the potential to occur in the project area (Table 4b). Of these, the following birds are federally and/or State listed:

- California brown pelican (*Pelecanus occidentalis californicus*) – resident of the San Francisco Bay area;
- Greater sandhill crane (*Grus canadensis*) – winters in Central Valley agricultural fields;
- Bald eagle (*Haliaeetus leucocephalus*) – winter migrant in the San Francisco Bay area;
- Swainson's hawk (*Buteo swainsoni*) – Neotropical migrant to Great Valley riparian forests;
- American peregrine falcon (*Falco peregrinus anatum*) – seasonal migrant to the San Francisco Bay area;
- California black rail (*Laterallus jamaicensis coturniculus*) – resident of the San Francisco Bay area;
- California clapper rail (*Rallus longirostris obsoletus*) – resident of the San Francisco Bay area;
- Western snowy plover (*Charadrius alexandrinus nivosus*) – resident of the San Francisco Bay area;
- California least tern (*Sterna antillarum brownii*) – summer nesting in the San Francisco Bay area;
- Little willow flycatcher (*Empidonax traillii brewsteri*) – seasonal migrant in the San Francisco Bay area, also indigenous to riparian woodlands of the Diablo Range);
- Least Bell's vireo (*Vireo bellii pusillus*) – summer nesting in the San Francisco Bay area; and
- Bank swallow (*Riparia riparia*) – summer nesting in vertical banks and cliffs in riparian and other lowland habitats of the Diablo Range.

#### 2.4.5 Mammals

More than twenty Special-status mammals have potential habitat in the project area (Table 4b). The principal species include salt marsh harvest mouse (*Reithrodontomys raviventris*) and San Joaquin kit fox (*Vulpes macrotis mutica*). Salt marsh harvest mouse habitat would be impacted along the Oakland to San Jose Segment's western alignment. Most of the San Joaquin kit fox habitat conflicts are on the west side of the Great Valley where the six alignments leave the Diablo Range and encounter non-native grasslands.

Table 4a. California High-Speed Train: Bay Area to Gilroy to Merced Special Status Plant Species\*

Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Acanthomintha duttonii</i> <b>San Mateo thorn-mint</b>	FE	SE	1B	Chaparral, valley and foothill grassland often on serpentinite.	Apr–Jun 50–300m	No; the project is outside the elevational range of the species within the region of occurrence.
<i>Allium peninsulare</i> var. <i>franciscanum</i> <b>Franciscan onion</b>	--	--	1B	Cismontane woodland, valley and foothill grassland; clay, often on serpentinite.	May–Jun 100–300m	No; the project is outside the elevational range of the species within the region of occurrence.
<i>Amsinckia grandiflora</i> <b>large-flowered fiddleneck</b>	FE	SE	1B	Cismontane woodland; valley and foothill grasslands.	Apr–May 275–305m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Amsinckia lunaris</i> <b>bent-flowered fiddleneck</b>	--	--	1B	Coastal bluff scrub, cismontane woodland, valley and foothill grassland.	Mar–Jun 3–500m	No; the project is outside of the known range of the species.
<i>Arctostaphylos andersonii</i> <b>Santa Cruz manzanita</b>	--	--	1B	Broadleaved upland forest, chaparral, north coast coniferous forest; in openings and along edges.	Nov–Apr 60–700m	No; the project is outside of the known range of the species.
<i>Arctostaphylos hookeri</i> ssp. <i>franciscana</i> <b>Franciscan manzanita</b>	--	--	1A	Coastal scrub on serpentinite.	Feb–Apr 60–300m	No; suitable habitat is not present on any of the project alignments.
<i>Arctostaphylos hookeri</i> ssp. <i>ravenii</i> <b>Presidio manzanita</b>	FE	SE	1B	Chaparral, coastal prairie, coastal scrub on serpentinite.	Feb–Mar 45–215m	No; the project is outside of the known range of the species.
<i>Arctostaphylos imbricata</i> <b>San Bruno Mountain manzanita</b>	--	CE	1B	Chaparral, coastal scrub; rocky substrates.	Feb–May 275–365m	No; the project is outside of the known range of the species.

Table 4a. California High-Speed Train: Bay Area to Gilroy to Merced Special Status Plant Species\*

Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Arctostaphylos montaraensis</i> <b>Montara manzanita</b>	--	--	1B	Maritime chaparral and coastal scrub.	Jan–Mar 150–500m	No; the project is outside of the known range of the species.
<i>Arctostaphylos pallida</i> <b>pallid manzanita</b>	FT	SE	1B	Broadleaved upland forest; closed-cone coniferous forest; chaparral; cismontane woodland; coastal scrub with sandy or gravelly siliceous shale.	Dec–Mar 185–465m	No; the project is outside of the known range of the species.
<i>Arctostaphylos regismontana</i> <b>Kings Mountain manzanita</b>	--	--	1B	Broadleaved upland forest, chaparral, north coast coniferous forest; granitic or sandstone substrates.	Jan–April 305–730 m	No; the project is outside of the known range of the species.
<i>Arenaria paludicola</i> <b>marsh sandwort</b>	FE	SE	1B	Bogs and fens, marshes and swamps in freshwater.	May–Aug 3–170m	No; the project is outside of the known range of the species.
<i>Astragalus tener</i> var. <i>tener</i> <b>alkali milk-vetch</b>	--	--	1B	Playas, valley and foothill grassland on adobe clay; vernal pools; alkaline substrates.	Mar–Jun 1–60m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Atriplex cordulata</i> <b>heartscale</b>	--	--	1B	Chenopod scrub, meadows, sandy valley and foothill grassland; saline or alkaline substrates.	April–Oct 1–375m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Atriplex depressa</i> <b>brittlescale</b>	--	--	1B	Chenopod scrub, meadows, playas, sandy valley and foothill grassland, vernal pools; alkaline clay substrates.	May–Oct 1–320m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Atriplex joaquiniana</i> <b>San Joaquin spearscale</b>	--	--	1B	Chenopod scrub, meadows, playas, sandy valley and foothill grassland; alkaline substrates.	Apr–Oct 1–320m	Yes; suitable habitat is present and preconstruction surveys are recommended.

Table 4a. California High-Speed Train: Bay Area to Gilroy to Merced Special Status Plant Species\*

Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Atriplex minuscula</i> <b>lesser saltscale</b>	--	--	1B	Chenopod scrub, playas, sandy valley and foothill grassland; alkaline and sandy substrates.	May–Oct 15–200m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Atriplex persistens</i> <b>heartscale</b>	--	--	1B	Vernal pools, alkaline substrates.	Jun–Oct 10–115m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Atriplex subtilis</i> <b>subtle orache</b>	--	--	1B	Valley and foothill grassland.	Jun–Oct 40–100m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> <b>big-scale balsamroot</b>	--	--	1B	Chaparral, cismontane woodland, valley and foothill grassland; sometimes on serpentinite.	Mar–Jun 90–1400m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Calyptridium parryi</i> var. <i>hesseae</i> <b>Santa Cruz Mountains pussypaws</b>	--	--	1B	Chaparral and cismontane woodland.	May–Jul 305–1115m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Calyptridium pulchellum</i> <b>Mariposa pussypaws</b>	FT	--	1B	Chaparral; cismontane woodland on sandy or gravelly granite.	Apr–Aug 400–1220m	No; the project is outside of the known range of the species.
<i>Camissonia benitensis</i> <b>San Benito evening-primrose</b>	FT	--	1B	Chaparral; cismontane woodland on serpentine alluvium.	May–Jun 600–1280m	No; the project is outside of the known range of the species.
<i>Campanula exigua</i> <b>chaparral harebell</b>	--	--	1B	Chaparral; rocky, usually on serpentinite.	May–Jun 275–1250m	Yes; suitable habitat is present and preconstruction surveys are recommended.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Carpenteria californica</i> <b>Carpenteria (=tree-anemone)</b>	--	ST	1B	Chaparral; cismontane woodland usually on granitic substrate.	May–Jul 340–1340m	No; the project is outside of the known range of the species.
<i>Castilleja affinis</i> ssp. <i>neglecta</i> <b>Tiburon Indian paintbrush</b>	FE	ST	1B	Rocky serpentine sites of valley and foothill grasslands.	Apr–Jun 45–400m	No; the project is outside of the known range of the species.
<i>Castilleja campestris</i> ssp. <i>succulenta</i> <b>succulent (=fleshy) owl's-clover</b>	FT	SE	1B	Vernal pools, often acidic.	Apr–May 50–750m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Ceanothus ferrisae</i> <b>Coyote ceanothus</b>	FE	--	1B	Serpentine chaparral, coastal scrub, valley and foothill grasslands.	Jan–May 120–460m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Centromadia parryi</i> ssp. <i>congdonii</i> <b>Congdon's tarplant</b>	--	--	1B	Valley and foothill grassland; alkaline substrates.	Jun–Nov 1–230 m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Chamaesyce hooveri</i> <b>Hoover's spurge</b>	FT	--	1B	Vernal pools.	Jul–Aug 25–250m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i> <b>San Francisco Bay spineflower</b>	--	--	1B	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub; sandy substrates.	Apr–Aug 3–215m	No; suitable habitat is not present on any of the project alignments.
<i>Chorizanthe robusta</i> var. <i>robusta</i> <b>robust spineflower</b>	FE	--	1B	Openings in cismontane woodland, on coastal dunes, and on sandy or gravelly substrates of coastal scrub.	Apr–Sep 3–300m	No; suitable habitat is not present on any of the project alignments.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Cirsium andrewsii</i> <b>Franciscan thistle</b>	--	--	1B	Broadleaved upland forest, coastal bluff scrub, coastal prairie, coastal scrub; mesic sites sometimes on serpentinite.	Mar–Jul 0–135m	No; suitable habitat is not present on any of the project alignments.
<i>Cirsium fontinale</i> var. <i>campylon</i> <b>fountain thistle</b>	--	--	1B	Chaparral, cismontane woodland, valley and foothill grassland; serpentinite seeps.	Feb–Oct 100–890m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Cirsium fontinale</i> var. <i>fontinale</i> <b>fountain thistle</b>	FE	SE	1B	Chaparral openings; valley and foothill grassland; serpentine seeps.	Jun–Oct 90–175m	No; the project is outside of the known range of the species.
<i>Cirsium occidentale</i> var. <i>compactum</i> <b>compact cobwebby thistle</b>	--	--	1B	Chaparral, coastal dunes, coastal prairie, coastal scrub.	Apr–Jun 5–150m	No; the project is outside of the known range of the species.
<i>Cirsium praeterians</i> <b>lost thistle</b>	--	--	1B	Unknown.	Jun–Jul 0–100m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Clarkia franciscana</i> <b>Presidio clarkia</b>	FE	SE	1B	Coastal scrub and valley and foothill grassland on serpentinite.	May–Jul 25–335m	No; the project is outside of the known range of the species.
<i>Collinsia corymbosa</i> <b>round-headed Chinese houses</b>	--	--	1B	Coastal dunes.	Apr–Jun 0–20m	No; suitable habitat is not present on any of the project alignments.
<i>Collinsia multicolor</i> <b>San Francisco collinsia</b>	--	--	1B	Closed-cone coniferous forest, coastal scrub; sometimes on serpentinite.	Mar–May 30–250m	No; suitable habitat is not present on any of the project alignments.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Cordylanthus maritimus</i> ssp. <i>palustris</i> <b>Point Reyes bird's-beak</b>	--	--	1B	Coastal salt marshes and swamps.	Jun–Oct 0–10m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i> <b>hispid bird's-beak</b>	--	--	1B	Meadows, playas, valley and foothill grassland; alkaline substrates.	Jun–Sep 1–155m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Cordylanthus palmatus</i> <b>palmate-bracted bird's-beak</b>	FE	SE	1B	Chenopod scrub, valley and foothill grassland (alkaline).	May–Oct 5–155m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Coreopsis hamiltonii</i> <b>Mt. Hamilton coreopsis</b>	--	--	1B	Cismontane woodland; rocky substrates.	Mar–May 550–1300m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Cupressus abramsiana</i> <b>Santa Cruz cypress</b>	FE	SE	1B	Closed cone coniferous forest, chaparral, lower montane coniferous forest on sandstone or granite.	N/A 280–800m	No; the project is outside the elevational range of the species within the region of occurrence.
<i>Delphinium californicum</i> ssp. <i>interius</i> <b>Hospital Canyon larkspur</b>	--	--	1B	Openings in chaparral, mesic cismontane woodland.	Apr–Jun 230–1095m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Dirca occidentalis</i> <b>western leatherwood</b>	--	--	1B	Broadleaved upland forest, north coast coniferous forest, riparian forest, riparian woodland; mesic sites.	Jan–Apr 50–395m	No; the project is outside of the known range of the species.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Dudleya setchellii</i> <b>Santa Clara Valley dudleya</b>	FE	--	1B	Rock outcrops of serpentinite in valley and foothill grassland and cismontane woodland.	Apr–Jun 60–365m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Equisetum palustre</i> <b>marsh horsetail</b>	--	--	3	Marshes and swamps.	N/A 45–1000m	No; the project is outside of the known range of the species.
<i>Eriastrum brandegeae</i> <b>Brandegge's eriastrum</b>	--	--	1B	Chaparral and cismontane woodland on volcanic substrates.	Apr–Aug 305–1030m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Eriastrum hooveri</i> <b>Hoover's woolly-star (=eriastrum)</b>	FT	--	4	Chenopod scrub, pinyon and juniper woodland, valley and foothill grassland.	Mar–July 50–915m	No; the project is outside of the known range of the species.
<i>Eriastrum tracyi</i> <b>Tracy's eriastrum</b>	--	--	1B	Chaparral and cismontane woodland.	Jun–July 315–760m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Eriogonum luteolum</i> var. <i>caninum</i> <b>Tiburon buckwheat</b>	--	--	3	Chaparral, coastal prairie, valley and foothill grassland on serpentinite.	Jun–Sep 10–500m	No; the project is outside of the known range of the species.
<i>Eriogonum nudum</i> var. <i>decurrens</i> <b>Ben Lomond buckwheat</b>	--	--	1B	Chaparral, cismontane woodland, lower montane coniferous forest in maritime ponderosa pine sandhills; sandy substrates.	Jun–Oct 50–800m	No; the project is outside of the known range of the species.
<i>Eriophyllum latilobum</i> <b>San Mateo woolly sunflower</b>	FE	SE	1B	Cismontane woodland on serpentinite.	May–Jun 45–150m	No; the project is outside of the known range of the species.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Erodium macrophyllum</i> <b>round-leaved filaree</b>	--	--	2	Cismontane woodland, valley and foothill grassland; on clay substrates.	Mar-May 15-1,200m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Eryngium aristulatum</i> var. <i>hooveri</i> <b>Hoover's button-celery</b>	--	--	1B	Vernal pools.	July 3-45m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Eryngium racemosum</i> <b>Delta button-celery</b>	--	SE	1B	Riparian scrub in vernal mesic clay depressions.	Jun-Sep 3-30m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Fritillaria biflora</i> var. <i>ineziana</i> <b>Hillsborough chocolate lily</b>	--	--	1B	Cismontane woodland, valley and foothill grassland; on serpentinite.	Mar-Apr 150m	No; the project is outside the elevational range of the species within the region of occurrence.
<i>Fritillaria liliacea</i> <b>fragrant fritillary</b>	--	--	1B	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland; often on serpentinite.	Feb-Apr 3-410m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Gilia capitata</i> ssp. <i>chamissonis</i> <b>dune gilia</b>	--	--	1B	Coastal dunes, coastal scrub.	Apr-Jul 2-200m	No; suitable habitat is not present on any of the project alignments.
<i>Gilia millefoliata</i> <b>dark-eyed gilia</b>	--	--	1B	Coastal dunes.	Apr-Jul 2-20m	No; suitable habitat is not present on any of the project alignments.
<i>Gratiola heterosepala</i> <b>Boggs Lake hedge-hyssop</b>	FSC	SE	1B	Marshes and swamps on lake margins; vernal pools underlain by clay.	Apr-Aug 10-2375m	Yes; suitable habitat is present and preconstruction surveys are recommended.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Grindelia hirsutula</i> var. <i>maritima</i> <b>San Francisco gumplant</b>	--	--	1B	Coastal bluff scrub, coastal scrub, valley and foothill grassland; often on sandy or serpentinite substrates.	Aug-Sep 15-400m	No; the project is outside of the known range of the species.
<i>Helianthella castanea</i> <b>Diablo helianthella</b>	--	--	1B	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland.	Apr-Jun 60-1300m	No; the project is outside the elevational range of the species within the region of occurrence.
<i>Hesperovax sparsiflora</i> var. <i>brevifolia</i> <b>short-leaved evax</b>	--	--	2	Coastal bluff scrub and coastal dunes.	Mar-Jun 0-215m	No; suitable habitat is not present on any of the project alignments.
<i>Hesperolinon congestum</i> <b>Marin western flax</b>	FT	ST	1B	Chaparral and valley and foothill grassland on serpentinite.	Apr-Jul 5-370m	No; the project is outside of the known range of the species.
<i>Hesperolinon serpentinum</i> <b>Napa western flax</b>	--	--	1B	Chaparral on serpentinite.	May-Jul 50-800m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Hoita strobilina</i> <b>Loma Prieta hoita</b>	--	--	1B	Chaparral, cismontane woodland, riparian woodland; mesic sites on serpentinite.	May-Oct 30-600m	Yes; suitable habitat is present and preconstruction surveys are recommended.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Holocarpha macradenia</i> <b>Santa Cruz tarplant</b>	FT	SE	1B	Coastal prairies and valley and foothill grasslands. Often on clay soils.	Jun–Oct 10-220m	No; the project is outside of the known range of the species.
<i>Horkelia cuneata</i> ssp. <i>sericea</i> <b>Kellogg's horkelia</b>	--	--	1B	Closed-cone coniferous forest, maritime chaparral, coastal scrub; in openings on sandy substrates.	Apr–Sep 10-200m	No; suitable habitat is not present on any of the project alignments.
<i>Horkelia marinensis</i> <b>Point Reyes horkelia</b>	--	--	1B	Coastal dunes, coastal prairie, coastal scrub; sandy substrates.	May–Sep 5-350m	No; suitable habitat is not present on any of the project alignments.
<i>Lasthenia conjugens</i> <b>Contra Costa goldfields</b>	FE	--	1B	Alkaline substrates in valley and foothill grassland, vernal pools, playas, and cismontane woodland.	Mar–Jun 0-470m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i> <b>Delta tule pea</b>	--	--	1B	Marshes and swamps in both freshwater and brackish water.	May–Sep 0-4m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Layia carnosa</i> <b>beach layia</b>	FE	SE	1B	Coastal dunes and scrub on sandy substrates.	Mar–Jul 0–60m	No; suitable habitat is not present on any of the project alignments.
<i>Lessingia arachnoidea</i> <b>Crystal Springs lessingia</b>	--	--	1B	Cismontane woodland, coastal scrub, valley and foothill grassland on serpentinite often along roadsides.	Jul–Oct 60-200m	No; the project is outside the elevational range of the species within the region of occurrence.
<i>Lessingia germanorum</i> <b>San Francisco lessingia</b>	FE	SE	1B	Coastal scrub on remnant dunes.	Jun–Nov 25–90m	No; suitable habitat is not present on any of the project alignments.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Lessingia hololeuca</i> <b>woolly-headed lessingia</b>	--	--	3	Broadleaved upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland; on clay and serpentinite.	Jun-Oct 15-305m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Lessingia micradenia</i> var. <i>glabrata</i> <b>smooth lessingia</b>	--	--	1B	Chaparral, cismontane woodland; on serpentinite often along roadsides.	Jul-Nov 120-420m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Lewisia congdonii</i> <b>Congdon's lewisia</b>	--	Rare	1B	Chaparral, cismontane woodland, lower montane coniferous forest, upper montane coniferous forest on granites or metamorphics.	Apr-Jun 500-2800m	No; the project is outside of the known range of the species.
<i>Lilaeopsis masonii</i> <b>Mason's lilaeopsis</b>	FSC	Rare	1B	Marshes and swamps, both brackish and freshwater, and riparian scrub.	Apr-Oct 0-10m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Lilium maritimum</i> <b>coast lily</b>	--	--	1B	Broadleaved upland forest, closed cone coniferous forest, coastal prairie, coastal scrub, marshes and swamps, north coast coniferous forest.	May-Jul 5-335m	No; suitable habitat is not present on any of the project alignments.
<i>Linanthus croceus</i> <b>coast yellow linanthus</b>	--	--	1B	Coastal bluff scrub and coastal prairie.	May 10-150m	No; suitable habitat is not present on any of the project alignments.
<i>Linanthus rosaceus</i> <b>rose linanthus</b>	--	--	1B	Coastal bluff scrub.	Apr-Jun 0-100m	No; suitable habitat is not present on any of the project alignments.
<i>Lomatium observatorium</i> <b>Mt. Hamilton lomatium</b>	--	--	1B	Cismontane woodland.	Mar-May 1219-1330m	Yes; suitable habitat is present and preconstruction surveys are recommended.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Lupinus eximius</i> <b>San Mateo tree lupine</b>	--	--	3	Chaparral and coastal scrub.	Apr-Jul 90-550m	No; the project is outside of the known range of the species.
<i>Malacothamnus arcuatus</i> <b>arcuate bush mallow</b>	--	--	1B	Chaparral.	Apr-Sep 15-355m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Malacothamnus hallii</i> <b>Hall's bush mallow</b>	--	--	1B	Chaparral and coastal scrub.	May-Sep 10-760m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Meconella oregana</i> <b>Oregon meconella</b>	--	--	1B	Coastal prairie and coastal scrub.	Mar-Apr 250-500m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Micropus amphibolus</i> <b>Mt. Diablo cottonweed</b>	--	--	3	Broadleaved upland forest, chaparral, cismontane woodland, valley and foothill grassland; on rocky substrates.	Mar-May 45-825m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Microseris paludosa</i> <b>marsh microseris</b>	--	--	1B	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland.	Apr-Jun 5-300m	No; the project is outside of the known range of the species.
<i>Monardella antonina</i> ssp. <i>antonina</i> <b>San Antonio Hills monardella</b>	--	--	3	Chaparral and cismontane woodland.	Jun-Aug 500-1000m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Monardella leucocephala</i> <b>Merced monardella</b>	--	--	1A	Valley and foothill grassland on sandy substrates.	May-Aug 35-100m	Yes; suitable habitat is present and preconstruction surveys are recommended.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
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<i>Monardella villosa</i> ssp. <i>globosa</i> <b>robust monardella</b>	--	--	1B	Chaparral openings, cismontane woodland, and coastal scrub.	Jun-Jul 185-600m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Monolopia congdonii</i> (= <i>Lembertia congdonii</i> ) <b>San Joaquin woollythreads</b>	FE	--	1B	Chenopod scrub, valley and foothill grassland often on sandy substrates.	Feb-May 60-800m	No; the project is outside of the known range of the species.
<i>Myosurus minimus</i> ssp. <i>apus</i> <b>little mousetail</b>	--	--	3	Valley and foothill grassland, alkaline vernal pools.	Mar-Jun 20-640m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Navarretia prostrata</i> <b>prostrate navarettia</b>	--	--	1B	Coastal scrub, alkaline valley and foothill grassland, vernal pools.	Apr-Jul 15-700m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Neostapfia colusana</i> <b>Colusa grass</b>	FT	SE	1B	Vernal pools on adobe clay.	May-Aug 5-200m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Orcuttia inaequalis</i> <b>San Joaquin Valley Orcutt grass</b>	FT	SE	1B	Vernal pools.	Apr-Sep 30-755m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Orcuttia pilosa</i> <b>hairy Orcutt grass</b>	FE	SE	1B	Vernal pools.	May-Sep 55-200m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Penstemon rattanii</i> var. <i>kleei</i> <b>Santa Cruz Mountains beardtongue</b>	--	--	1B	Chaparral, lower montane coniferous forest, north coast coniferous forest.	May-Jun 400-1100m	No; the project is outside of the known range of the species.

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Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
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<i>Pentachaeta bellidiflora</i> <b>white-rayed pentachaeta</b>	FE	SE	1B	Valley and foothill grassland often on serpentinite.	Mar–May 35–620m	No; the project is outside of the known range of the species.
<i>Phacelia phacelioides</i> <b>Mt. Diablo phacelia</b>	--	--	1B	Chaparral, cismontane woodland on rocky substrates.	Apr–May 500–1370m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i> <b>Choris's popcorn-flower</b>	--	--	1B	Chaparral, coastal prairie, coastal scrub; mesic sites.	Mar–Jun 15–100m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Plagiobothrys diffusus</i> <b>San Francisco popcorn-flower</b>	--	SE	1B	Coastal prairie, valley and foothill grassland.	Mar–Jun 60–360m	No; the project is outside of the known range of the species.
<i>Plagiobothrys glaber</i> <b>hairless popcorn-flower</b>	--	--	1B	Alkaline meadows and coastal salt marshes and swamps.	Mar–May 15–180m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Potamogeton filiformis</i> <b>slender-leaved pondweed</b>	--	--	2	Marshes and swamps.	May–Jul 300–2150m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Potentilla hickmanii</i> <b>Hickman's cinquefoil</b>	FE	SE	1B	Coastal bluff scrub, closed-cone coniferous forest, meadows and seeps (vernally mesic), and freshwater marshes and swamps.	Apr–Aug 10–135m	No; the project is outside of the known range of the species.
<i>Pseudobahia bahiifolia</i> <b>Hartweg's golden sunburst</b>	FE	SE	1B	Cismontane woodland and valley and foothill grassland on clay.	Mar–Apr 15–150m	Yes; suitable habitat is present and preconstruction surveys are recommended.

Table 4a. California High-Speed Train: Bay Area to Gilroy to Merced Special Status Plant Species\*

Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Sagittaria sanfordii</i> <b>Sanford's arrowhead</b>	--	--	1B	Marshes and swamps.	May-Oct 0-610m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Sanicula maritima</i> <b>adobe sanicle</b>	FSC	Rare	1B	Chaparral, coastal prairie, meadows and seeps, valley and foothill grassland/clay serpentine.	Feb-May 30-240m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Sanicula saxatilis</i> <b>rock sanicle</b>	--	Rare	1B	Chaparral, valley and foothill grasslands and broadleaved upland forests.	Apr-May 900-1100m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Senecio aphanactis</i> <b>rayless ragwort</b>	--	--	2	Chaparral, cismontane woodland; alkaline substrates.	Jan-Apr 15-800m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Silene verecunda</i> ssp. <i>verecunda</i> <b>San Francisco campion</b>	--	--	1B	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland; sandy substrates.	Mar-Aug 30-645m	No; the project is outside the elevational range of the species within the region of occurrence.
<i>Stebbinsoseris decipiens</i> <b>Santa Cruz microseris</b>	--	--	1B	Broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland; open areas sometimes on serpentinite.	Apr-May 10-500m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Streptanthus albidus</i> ssp. <i>albidus</i> <b>Metcalf Canyon jewel-flower</b>	FE	--	1B	Valley and foothill grassland on serpentinite.	Apr-Jul 45-800m	Yes; suitable habitat is present and preconstruction surveys are recommended.

Table 4a. California High-Speed Train: Bay Area to Gilroy to Merced Special Status Plant Species\*

Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Streptanthus albidus</i> ssp. <i>peramoenus</i> <b>most beautiful jewel-flower</b>	--	--	1B	Chaparral, cismontane woodland, valley and foothill grassland; on serpentinite.	Apr-June 110-1000m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Streptanthus callistus</i> <b>Mt. Hamilton jewel-flower</b>	--	--	1B	Chaparral and cismontane woodland.	Apr-May 600-790m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Suaeda californica</i> <b>California seablite</b>	FE	--	1B	Coastal salt marshes and swamps	Jul-Oct <5m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Trichocoronis wrightii</i> var. <i>wrightii</i> <b>Wright's trichocoronis</b>	--	--	2	Meadows, marshes and swamps, riparian forest, vernal pools; alkaline substrates.	May-Sep 5-435m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Trifolium amoenum</i> <b>showy Indian clover</b>	FE	--	1B	Valley and foothill grassland, coastal bluff scrub; sometimes on serpentine soil, open sunny sites, swales, eroding cliff faces	Apr-Jun 5-415m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Trifolium depauperatum</i> var. <i>hydrophilum</i> <b>saline clover</b>	--	--	1B	Meadows, marshes and swamps, valley and foothill grassland, vernal pools; alkaline substrates.	Apr-Jun 0-300m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Triphysaria floribunda</i> <b>San Francisco owl's clover</b>	--	--	1B	Coastal prairie, coastal scrub, valley and foothill grassland; usually on serpentinite.	Apr-Jun	No; the project is outside of the known range of the species.
<i>Triquetrella californica</i> <b>coastal triquetrella moss</b>	--	--	1B	Coastal bluff scrub and coastal scrub on soil.	N/A	No; the project is outside of the known range of the species.

**Table 4a. California High-Speed Train: Bay Area to Gilroy to Merced Special Status Plant Species\***

Species	Status			Habitat Description	Flowering Period and Elevational Range	Potential Habitat in Project Area
	Federal	State	CNPS			
<i>Tropidocarpum capparideum</i> <b>caper-fruited tropidocarpum</b>	--	--	1A	Alkaline hills in valley and foothill grassland.	Mar-Apr 1-455m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Tuctoria greenei</i> <b>Greene's tuctoria</b>	FE	Rare	1B	Vernal pools.	May-Sep 30-1070m	Yes; suitable habitat is present and preconstruction surveys are recommended.
<i>Usnea longissima</i> <b>Long-beard lichen</b>	--	--	--	Epiphytic lichen on trees.	N/A	No; the project is outside of the known range of the species.

\* Note: Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus counties; a list of topographic quadrangle maps appears in the Appendix; Source: USFWS 2002, CDFG 2002, CNPS 2001.

**Federal status:**

- FE = Listed as endangered under Endangered Species Act.
- FT = Listed as threatened under Endangered Species Act.
- FC = Candidate for listing (threatened or endangered) under Endangered Species Act.
- FSC = Species of Concern identified by USFWS.

**State Status:**

- SE = Listed as endangered under California Endangered Species Act.
- ST = Listed as threatened under California Endangered Species Act.
- CSC = Species of concern as identified by the California Department of Fish and Game.
- Rare = Species identified as rare by the California Department of Fish and Game.

**California Native Plant Society Listing Categories (CNPS 2001)**

- 1A = Plant species that are presumed extinct in California.
- 1B = Plant species that are rare, threatened, or endangered in California and elsewhere.
- 2 = Plant species that are rare, threatened, or endangered in California, but are more common elsewhere.
- 3 = Plant species that lack the necessary information to assign them to a listing status.
- 4 = Plant species that have a limited distribution or that are infrequent throughout a broader area in California.

**Other Abbreviations**

- APE = area of potential effects, or proposed project area
- m = meters
- SL = sea level

<b>Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)</b>				
Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>INVERTEBRATES</b> (butterfly scientific nomenclature and common names conform with Miller 1992)				
<b>vernal pool fairy shrimp</b> <i>Branchinecta lynchi</i>	FT	--	Small, clear-water sandstone pools and grassy swales, earth slumps, or basalt-flow pools; endemic to grasslands of Central Valley, Central Coast Mountains, South Coast Mountains, and southern Oregon. Critical habitat proposed (U.S. Fish and Wildlife Service 2002a).	Yes
<b>longhorn fairy shrimp</b> <i>Branchinecta longiantenna</i>	FE	--	Clear-turbid vernal pools in grasslands; clear water pools in sandstone depressions. Its known distribution extends along the eastern margin of the central coast range from Contra Costa County to San Luis Obispo County (USFWS 1994). Critical habitat proposed (U.S. Fish and Wildlife Service 2002a).	Yes
<b>midvalley fairy shrimp</b> <i>Branchinecta mesovallensis</i>	FSC (E)		Newly-described species inhabiting vernal pools in Central Valley (Sacramento, Solano, Merced, Madera, San Joaquin, Fresno, and Contra Costa counties); closely related to federally listed species; poorly understood species; (see U.S. Fish and Wildlife Service 2002a).	Yes
<b>conservancy fairy shrimp</b> <i>Branchinecta conservatio</i>	FE		Inhabits relatively large, cool-water vernal pools with moderately turbid water; critical habitat proposed (U.S. Fish and Wildlife Service 2002a).	No
<b>vernal pool tadpole shrimp</b> <i>Lepidurus packardii</i>	FE	--	Vernal pools and swales in Sacramento Valley with clear-highly turbid water; Pools are commonly found in grass-bottomed swales of unplowed grasslands. Critical habitat proposed (U.S. Fish and Wildlife Service 2002a).	No
<b>California linderiella fairy shrimp</b> <i>Linderiella occidentalis</i>	FSC	--	Seasonal pools in unplowed grasslands with alluvial soils underlain by hardpan or sandstone depressions. Conservation measures addressed under proposed critical habitat (U.S. Fish and Wildlife Service 2002a).	Yes
<b>Bridge's Coast Range shoulderband snail</b> <i>Helminthoglypta nickliniana bridgesi</i>	FSC		Little information available regarding this species.	Yes
<b>Wawona riffle beetle</b> <i>Atractelmis wawona</i>	FSC		Small beetle with larvae and adult life stages are entirely aquatic; occurs in rapid-moving streams 2000-5000 ft elevation; prefers aquatic mosses.	No

<b>Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)</b>				
Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>curved-foot hygrotus diving beetle</b> <i>Hygrotus curvipes</i>	FSC	--	Aquatic beetle inhabiting vernal pools of Sacramento River delta; occurs in shallow, muddy pools of Contra Costa County.	No
<b>Leech's skyline diving beetle</b> <i>Hydroporus leechi</i>	FSC		Initially thought to occur only in San Francisco Bay area, now found widespread throughout western states; proposed to remove from potential federal listing action	Yes
<b>Ricksecker's water scavenger beetle</b> <i>Hydrochara rickseckeri</i>	FSC	--	Known only from ponds scattered around the San Francisco Bay area, including Marin, Sonoma, Alameda, and Contra Costa Counties	No
<b>Edgewood blind harvestman</b> <i>Calicina minor</i>	FSC	--	Open grassland with serpentine bedrock; undersides of moist serpentine rocks near permanent springs;	Yes
<b>Hom's microblind harvestman</b> <i>Microcina homi</i>	FSC	--	Inhabits seeps and spring areas; require moist shaded microsites; occurs only in Santa Clara County.	Yes
<b>Jung's microblind harvestman</b> <i>Microcina juni</i>	FSC	--	Inhabits seeps and spring areas; require moist shaded microsites; occurs only in Santa Clara County.	Yes
<b>Edgewood microblind harvestman</b> <i>Microcina edgewoodensis</i>	FSC		Inhabits seeps and spring areas; require moist shaded microsites; only known from San Mateo County.	No
<b>Fairmont (=Lum's) microblind harvestman</b> <i>Microcina lumi</i>	FSC	--	Little information available regarding this species.	Yes
<b>Molestan blister beetle</b> <i>Lytta molesta</i>	FSC		Vernal pool species; little information available regarding this species.	Yes
<b>Valley elderberry longhorn beetle</b> <i>Desmocerus californicus dimorphus</i>	FT		Riparian forests, riparian woodlands, elderberry savannas and other Central Valley habitats that contain host plant, elderberry ( <i>Sambucus mexicana</i> ) (U.S. Fish and Wildlife Service 1984).	Yes

**Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)**

Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>Cicero agrarian scarab beetle</b> <i>Regalia concinna</i>	FSC		Small flightless beetle that lives in sand dunes; little known about life history or habitat requirements; known only from Contra Costa, Fresno, San Benito, and San Joaquin Counties.	Yes
<b>Bumblebee scarab beetle</b> <i>Lichgate ursina</i>	FSC		Little information available regarding this species.	Yes
<b>Globose dune beetle</b> <i>Coelus globosus</i>	FSC		Resides in coastal sand dunes; beetle is common but habitat is at risk and declining.	No
<b>San Joaquin dune beetle</b> <i>Coelus gracilis</i>	FSC		Resides in sand dunes; little information available regarding this scavenging species; formerly common in San Joaquin Valley now limited to extreme western edge of valley.	Yes
<b>sandy beach tiger beetle</b> <i>Cicindela hirticollis gravida</i>	FSC		Little information available regarding this species.	Yes
<b>Ohlone tiger beetle</b> <i>Cicindela ohlone</i>	FE		Predatory species considered beneficial to agriculture; coastal terraces with remnant stands of open native grasslands in Santa Cruz County; conservation measures addressed associated species Recovery Plans (U.S. Fish and Wildlife Service 1997b, 1998c)	No
<b>San Joaquin tiger beetle</b> <i>Cicindela tranquebarica ssp</i>	FSC		Formerly San Joaquin Valley; most likely extinct.	Yes
<b>Opler's longhorn moth</b> <i>Adela oplerella</i>	FSC	--	Occurs in serpentine grasslands of Oakland area, Marin County on inner coast ranges south to Santa Clara County; single record from Santa Cruz County. Larvae feed on cream cups ( <i>Platystemon californicus</i> ).	No
<b>Bay checkerspot butterfly</b> <i>Euphydryas editha bayensis</i>	FT	--	Restricted to native grasslands on serpentine soil outcrops in San Francisco Bay area. Plantain ( <i>Plantago erecta</i> ) is primary host plant. USFWS designated Critical Habitat (U.S. Fish and Wildlife Service 1998a; 2001a)	No
<b>San Francisco lacewing</b> <i>Nothochrysa californica</i>	FSC	--	Coastal sage scrub to riparian and oak woodlands (wooded sites have higher moisture and humidity); historically ranged from Mendocino to Los Angeles Counties.	Yes
<b>Bohart's blue butterfly</b> <i>Philotiella speciosa bohartorum</i>	FSC		Occurs in hardwood forest stream edges in foothills; little additional information.	Yes

<b>Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)</b>				
Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>Mission blue butterfly</b> <i>Icaricia icarioides missionensis</i>	FE		Occurs in coastal scrub and grasslands restricted to three locations in the San Francisco Bay area: Twin Peaks (San Francisco), Fort Baker (Marin County), and San Bruno Mountain (San Mateo County).	No
<b>Marin elfin butterfly</b> <i>Incisalia mossii marinensis</i>	FSC		Little information available regarding this species.	Yes
<b>San Bruno elfin butterfly</b> <i>Incisalia mossii bayensis</i>	FE		Extirpated in San Mateo County (U.S. Fish and Wildlife Service 2001)	No
<b>unsilvered fritillary butterfly</b> <i>Speyeria adiastrae adiastrae</i>	FSC	--	Meadows and seeps in redwood/coniferous forests, oak woodlands, and chaparral.	Yes
<b>Callippe silverspot butterfly</b> <i>Speyeria callippe callippe</i>	FE	--	Presently known only from San Bruno Mountain; formerly Richmond to Castro Valley, Alameda County. Also isolated population in undisclosed city park in Alameda (U.S. Fish and Wildlife Service 1997a).	No
<b>FISH</b> (scientific nomenclature and common names conform with Robins <i>et al.</i> 1991)				
<b>river lamprey</b> <i>Lampetra ayresi</i>	FSC	CSC	Anadromous species occurring in Sacramento-San Joaquin Delta region; spawns Apr-May in gravels of small tributary streams/creeks; young burrow in sediments; may spend entire life-cycle in freshwater; young free-living, adults parasitic on other river fishes (Wang 1986; Moyle 2002).	Yes
<b>Pacific lamprey</b> <i>Lampetra tridentata</i>	FSC	--	Anadromous species occurring in Sacramento-San Joaquin Delta region; spawns Apr-Jul in gravels, occasionally sands, of upper river reaches; young burrow in sediments; may spend entire life-cycle in freshwater; young free-living, adults parasitic on other river fishes; adults may be found from Monterey north to Bering Sea, along Sacramento River to Red Bluff Dam (Wang 1986; Moyle 2002).	No
<b>Kern brook lamprey</b> <i>Lampetra hubbsi</i>	FSC		Anadromous species occurring in Sacramento-San Joaquin Delta region (Moyle 2002)	Yes
<b>Green sturgeon</b> <i>Acipenser medirostris</i>	FSC	CSC	Bottom-feeding fish, primarily marine but may migrate inland beyond the estuaries of large rivers, including upper Sacramento River and its tributaries; spawns Apr-Jun; occurs from Mexico along Pacific Rim and Russia (Wang 1986; Moyle 2002).	No

<b>Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)</b>				
Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>Central California coast coho salmon</b> <i>Oncorhynchus kisutch</i>	FT ESU	SE	Found in many of the short, coastal drainages from the Oregon border south to Monterey Bay. In the larger coastal drainages, it is found primarily in the lower sections. The Federal listing is limited to naturally spawning populations in streams between Punta Gorda, Humboldt County and the San Lorenzo River, Santa Cruz County (National Marine Fisheries Service 2002a). The State listing is limited to Coho south of San Francisco Bay.	No
<b>Central Valley steelhead</b> <i>Oncorhynchus mykiss</i>	FT ESU	--	Critical habitat was designated to include all river reaches accessible to listed steelhead in the Sacramento and San Joaquin Rivers and tributaries in California (National Marine Fisheries Service 2002a). The river reaches and estuarine areas of the Sacramento-San Joaquin delta are also included.	Yes
<b>Central California coast steelhead</b> <i>Oncorhynchus mykiss</i>	FT ESU	--	Central coastal basins from the Russian River, south to Soquel Creek, including San Francisco and San Pablo Bay basins, but excludes the Sacramento-San Joaquin River basins (National Marine Fisheries Service 2002a).	Yes
<b>South Central California steelhead</b> <i>Oncorhynchus mykiss</i>	FT ESU	--	Inhabits tributaries with outlet to the Pacific Ocean south of San Francisco Bay (National Marine Fisheries Service 2002a).	Yes
<b>Sacramento River winter-run Chinook salmon</b> <i>Oncorhynchus tshawytscha</i>	FE ESU	SE	Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel (Moyle 2002). Spawning occurs in the Sacramento River, up to the Keswick Dam. Requires clean, cold water over gravel beds with water temperatures between 6-14° C for spawning (National Marine Fisheries Service 2002a).	No
<b>Central Valley spring-run Chinook salmon</b> <i>Oncorhynchus tshawytscha</i>	FT ESU	ST	Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel (Moyle 2002). Critical habitat includes Sacramento River and its tributaries, river reaches and estuarine areas of the Sacramento-San Joaquin Delta, waters from Chipps Island westward to Carquinez Bridge, and waters of the San Francisco Bay (North of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge (National Marine Fisheries Service 2002a, 2002b, 2002c).	No
<b>Central Valley fall/late fall-run Chinook salmon</b> <i>Oncorhynchus tshawytscha</i>	FC ESU	CSC	Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel (Moyle 2002). Breeding runs occur in the Sacramento River and its tributaries, river reaches and estuarine areas of the Sacramento-San Joaquin Delta are also utilized (National Marine Fisheries Service 2002a).	No

**Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)**

Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>Delta smelt</b> <i>Hypomesus transpacificus</i>	FT	ST	This species inhabits the Sacramento-San Joaquin Delta and seasonally inhabits the Suisun Bay, Carquinez Strait, and San Pablo Bay. This species is seldom found at salinities > 10 PPT, and is most often found at salinities < 2 PPT (Wang 1986). Spawning appears to occur in side channels and sloughs in the middle reaches of the Delta (Moyle 2002). Critical Habitat designated and Recovery Plan available (U.S. Fish and Wildlife Service 1995b).	No
<b>Longfin smelt</b> <i>Spirinchus thaleichthys</i>	FSC	CSC	This semi-anadromous species prefers moderately saline water and may be found in major bays and estuaries from San Francisco Bay north to Prince William Sound; lives in the Bay waters throughout summer, moving into the lower river reaches in fall to spawn, including Sacramento and San Joaquin Rivers (Wang 1986; Wernette 2000; Moyle 2002).	No
<b>Sacramento splittail</b> <i>Pogonichthys macrolepidotus</i>	FT	CSC	Inhabits slow moving river sections and dead end sloughs. Requires flooded vegetation for spawning and foraging for young. Endemic to lakes and rivers of the Central Valley. Now confined to the Delta, Suisun Bay, and associated marshes (Sommer 2000; Moyle 2002).	Yes
<b>Tidewater goby</b> <i>Eucyclogobius newberryi</i>	FE FPD	--	Prefers semi-closed estuaries or lagoons of coastal streams that are low in salinity (Moyle 2002).	No
<b>AMPHIBIANS</b> (scientific nomenclature and common names conform to Committee on Standard English and Scientific Names 2001).				
<b>California tiger salamander</b> <i>Ambystoma californiense</i>	FC (FE)	SE	Central and northern California annual grasslands and oak woodland understory, usually below 1000 ft (305 m) elevation; remains near water yearlong; requires ponds for breeding, Dec-Feb and generally dependent on local rainfall patters; burrows for summer dormancy; may occur up to 600 ft (180 m) from breeding sites; home range ca 1 ac (0.4 ha) (Stebbins 1951, 1972; Gehlbach 1967; Verner and Boss 1980). Distinct Vertebrate Population (DPS) listed as USFWS Endangered (FE) for Sonoma and Santa Barbara Counties.	Yes
<b>Mount Lyell salamander</b> <i>Hydromantes platycephalus</i>	FSC	--	Seeps along edges of snowfields, wet meadows in all successional stages and all types of conifer forests; 4000-11,600 ft (1220-3540 m); relict, endemic species limited only to high Sierra Nevada (Stebbins 1972; Verner and Boss 1980).	No
<b>foothill yellow-legged frog</b> <i>Rana boylei</i>	FSC	CSC	Valley foothills streams the entire length of Sierra Nevada, 1000-6000 (305-1850 m) elevation; eggs laid in streams with riffles and rocky substrate during increased runoff Apr-May and reduced flows negatively impact reproduction (Stebbins 1972).	No

<b>Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)</b>				
Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>California red-legged frog</b> <i>Rana aurora draytonii</i>	FT	CSC	Mariposa County northward in lowland-foothill deciduous riparian habitats, about sea level-5200 ft (1500 m) elevation; prefer permanent, still pools for breeding at least 3 ft ( m) deep, but may include stock ponds or any other permanent water source; eggs laid in Feb-Mar (Stebbins 1972). Recovery Plan identifies core areas for focused recovery efforts (U.S. Fish and Wildlife Service 2002b).	Yes
<b>western spadefoot toad</b> <i>Scaphiopus hammondi</i>	FSC	CSC	Slow moving streams associated with low elevation grasslands but may also use hardwood woodlands, rarely above 1000 ft (305 m) elevation; eggs laid in vernal ponds Feb-Apr (Stebbins 1972).	Yes
<b>REPTILES</b> (scientific nomenclature and common names conform to Committee on Standard English and Scientific Names 2001).				
<b>northwestern pond turtle</b> <i>Clemmys marmorata marmorata</i>	FSC	CSC	Aquatic turtle found in permanent, still or slow moving waters; surrounding habitat variable; San Francisco area north to Washington and Canada (Stebbins 1972).	No
<b>southwestern pond turtle</b> <i>Clemmys marmorata pallidus</i>	FSC	CSC	Aquatic turtle found in permanent, still or slow moving waters; surrounding habitat variable; San Francisco south to Baja California (Stebbins 1972).	Yes
<b>silvery legless lizard</b> <i>Anniella pulchra pulchra</i>	FSC	CSC	Occurs in well-drained, sandy or loose loamy soils under sparse vegetation; soil moisture is essential, with the species showing a preference towards soils with high moisture content. (Stebbins 1972).	Yes
<b>blunt-nosed leopard lizard</b> <i>Gambelia silus</i>	FE	SE	San Joaquin Valley and adjacent foothills; prefer arid areas with scattered vegetation such as alkali flats, grasslands, washes, arroyos, and canyon floors; hibernates in abandoned ground squirrel and kangaroo rat burrows; may excavate its own burrow (Stebbins 1972). Included in multiple species Recovery Plan for San Joaquin Valley (U.S. Fish and Wildlife Service 1985a, 1998b).	Yes
<b>northern sagebrush lizard</b> <i>Sceloporus graciosus graciosus</i>	FSC	--	Widespread; variety of relatively open habitats including hardwood and (early successional stage) coniferous forests, shrub/steppe; at mid-elevations, rarely above 5000 ft (1830 m); prefers rocky outcrops and friable soils for breeding; breeds Jun-Jul (Stebbins 1972). Major threat to species conservation is livestock grazing.	Yes
<b>California horned lizard</b> <i>Phrynosoma coronatum frontale</i>	FSC	CSC	Found in a variety of habitats including scrubland, grassland, coniferous forest, and broadleaved forests. Common in lowlands along sandy washes where low shrubs provide cover (Stebbins 1972).	Yes

<b>Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)</b>				
Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>San Joaquin whipsnake</b> (=San Joaquin coachwhip) <i>Masticophis flagellum ruddocki</i>	--	CSC	Inhabits open, dry environments with little or No tree cover. Found in valley grassland and saltbush scrub in the San Joaquin Valley. Mammal burrows are used for refuge and oviposition sites.	Yes
<b>Alameda whipsnake</b> <i>Masticophis lateralis euryxanthus</i>	FT	ST	Restricted to valley-foothill hardwood habitat of the coast ranges between Monterey and San Francisco Bay. Inhabits shrubby south-facing slopes and ravines ecotone with oak trees and grasses (U.S. Fish and Wildlife Service 1997). Critical Habitat identified by U.S. Fish and Wildlife Service (2000).	Yes
<b>giant garter snake</b> <i>Thamnophis gigas</i>	FT	ST	Freshwater marshes, sloughs, and adjacent low-elevation reaches of streams of the Central Valley; will also utilize well vegetated agricultural irrigation canals and associated levees (Stebbins 1972; U.S. Fish and Wildlife Service 1999).	Yes
<b>San Francisco garter snake</b> <i>Thamnophis sirtalis tetrataenia</i>	FE	SE CFP	Vicinity of freshwater marshes, ponds and slow moving streams in San Mateo County and n. Cruz County (U.S. Fish and Wildlife Service 1985b). Prefers dense cover and water depths of at least one foot. Upland areas near water are also very important; observed at low elevations near the San Francisco airport (Jennings 2000).	Yes
<b>BIRDS</b> (scientific nomenclature and common names conforms with American Ornithologists' Union 1983, 1998)				
<b>common loon</b> <i>Gavia immer</i>	FSC MNBMC	CSC	Winter migrant in Bay Area; estuarine and sub-tidal marine habitats; uncommon on inland lakes; feeds on fish (McIntyre and Barr 1997).	Yes
<b>California brown pelican</b> <i>Pelecanus occidentalis californicus</i>	FE MNBMC	SE CFP	Resident in Bay Area; colonial ground-nester in isolated, undisturbed coast beaches, offshore islands, and interior lake margins; forages for fish in fresh, brackish, or marine waters (Ainley 2000; Shields 2002).	Yes
<b>American bittern</b> <i>Botaurus lentiginosus</i>	FSC MNBMC	--	Resident and winter migrant in Bay Area; nests and forages in fresh or saline emergent wetlands (Gibbs <i>et al.</i> 1992).	Yes
<b>western least bittern</b> <i>Ixobrychus exilis hesperis</i>	FSC MNBMC	CSC	Summer/nesting in Bay Area; nests and forages in fresh or saline emergent wetlands (Gibbs <i>et al.</i> 1992).	Yes
<b>white-faced ibis</b> <i>Plegadis chihi</i>	FSC MNBMC	CSC	Primarily winter migrant with isolated nesting colonies in Bay Area – population center for US is Great Basin with Central Valley marginal occupation; fresh water emergent wetlands, meadows, irrigated/flooded pastures and croplands (Ryder and Manry 1994).	Yes

Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)				
Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>greater sandhill crane</b> <i>Grus canadensis</i>	--	ST	Winters in Central Valley agricultural fields, fallow croplands and irrigated and subirrigated pastures (Tacha <i>et al.</i> 1992, 1994).	Yes
<b>Aleutian Canada goose</b> <i>Branta canadensis leucoparia</i>	Delisted	--	Entire population winters in Central Valley; forages in pasture and grain fields near lakes and ponds. Population delisted as fully recovered (USFWS 2001b).	Yes
<b>California condor</b> <i>Gymnogyps californianus</i>	FE	SE	Resident; far-ranging scavenger; foraging area 965-1080 mi <sup>2</sup> (2500-1800 km <sup>2</sup> ), travel up to 139 mi (225 km) in single sortie; home range to 2730 mi <sup>2</sup> (7000 km <sup>2</sup> in San Joaquin Valley); recovery efforts still in progress, non-sustainable population in California; lead toxicity still problematic for free-ranging individuals (U.S. Fish and Wildlife Service 1975; Snyder and Snyder 2000, Snyder and Schmitt 2002). Increasing wild population may require extensive retrofit of power lines (Avian Power Line Interaction Committee 1996).	No
<b>white-tailed kite</b> (formerly Black-shouldered kite) <i>Elanus leucurus</i>	MNBMC	CFP	Resident in Sacramento Valley; forages for small mammals and invertebrates in open grasslands, meadows, or marshes; Nest and perches in isolated, densely-foliaged trees (Dunk 1995).	Yes
<b>northern goshawk</b> <i>Accipiter gentilis</i>	FSC	CSC	Species requires large relatively pristine forests with minimum disturbance and abundant prey base (Squires and Reynolds 1997).	No
<b>bald eagle</b> <i>Haliaeetus leucocephalus</i>	FT	SE CFP	Winter migrant in Bay Area; roosts in large trees near rivers, streams, lakes, reservoirs with little human disturbance (Buehler 2000).	Yes
<b>Swainson's hawk</b> <i>Buteo swainsoni</i>	--	ST	Neotropical migrant (winters in Argentina); riparian semi-obligate species; typically nests in riparian gallery forests adjacent to croplands with abundant small mammals and insects; preys on small mammals when breeding, remainder of year principally on grasshoppers (England <i>et al.</i> 1997).	Yes
<b>ferruginous hawk</b> <i>Buteo regalis</i>	FSC MNBMC	CSC	Winter migrant in Central Valley; prefers foraging in grasslands, prairies, and brushy open country; nomadic any time outside the breeding season and may occur in atypical habitats (Bechard and Schmutz 1995).	Yes
<b>American peregrine falcon</b> <i>Falco peregrinus anatum</i>	Delisted MNBMC	SE CFP	Seasonal migrant in Bay Area; open country near water where shorebirds feed. May nest in high cliffs near rivers, wetlands, lakes, and human-made structures.	Yes

**Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)**

Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>California black rail</b> <i>Laterallus jamaicensis coturniculus</i>	FSC MNBMC	ST CFP	Resident in Bay Area; nests and forages in salt marshes adjacent to bays, often associated with pickleweed-dominated marshes, or fresh water and brackish marshes (Eddleman <i>et al.</i> 1994; Trulio and Evens 2000).	Yes
<b>California clapper rail</b> <i>Rallus longirostris obsoletus</i>	FE	SE CFP	Resident in Bay Area; nests and forages in salt water and brackish marshes with tidal sloughs; often associated with pickleweed and cordgrass (Eddleman and Conway 1998; Albertson and Evens 2000). Recovery Plan (U.S. Fish and Wildlife Service 1984).	Yes
<b>western snowy plover</b> <i>Charadrius alexandrinus nivosus</i>	FT MNBMC	CSC	Resident in Bay Area, isolated summer/nester inland; prefers undisturbed sandy marine or estuary beaches, shores of large alkali lakes; may use road shoulders or salt pond levees; nests on fine gravel (Page <i>et al.</i> 1995, 2000).	Yes
<b>mountain plover</b> <i>Charadrius montanus</i>	FPT MNBMC	CSC	Winter migrant in Bay Area; roosts and forages in short grass environments, tilled or fallow fields, sprouting grain fields; preference for sparse, low vegetation with bare or disturbed soils (Knopf and Rupert 1995; Knopf 1996).	Yes
<b>long-billed curlew</b> <i>Numenius americanus</i>	MNBMC	CSC	Winter solitary or flocking migrant along California coast, and Central and Imperial Valleys; prefers large coastal estuaries, upland herbaceous areas, and croplands (Dugger and Dugger 2002).	Yes
<b>black tern</b> <i>Chlidonias niger</i>	FSC MNBMC	CSC	Summer/nesting and seasonal migrant in Bay Area; nests primarily along inland fresh waters; during migration may occur at salt ponds, coast, and pelagic waters (Dunn and Argo 1995).	Yes
<b>California least tern</b> <i>Sterna antillarum browni</i>	FE MNBMC	SE CFP	Summer/nesting in Bay Area; isolated colony in San Francisco Bay on sandy beaches bordering shallow water in estuaries; bulk of distribution in southern California coast (Thompson <i>et al.</i> 1997; Feeney 2000).	Yes
<b>elegant tern</b> <i>Sterna elegans</i>	FSC MNBMC	--	Colonial nesting species with relatively restricted distribution; ca 90% of total population breeds in 5 southern California sites; (Burgess <i>et al.</i> 1999)	No
<b>marbled murrelet</b> <i>Brachyramphus marmoratus</i>	FT MNBMC	SE	Resident and winter migrant in Bay Area; feeds in marine waters and salt water bays; nests in old-growth coniferous forest near coast, also inland up to 50-miles (Nelson 1997).	No

**Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)**

Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>short-eared owl</b> <i>Asio flammeus</i>	FSC MNBMC	CSC	Summer/nesting with isolated wintering populations; may occur yearlong in fresh and saltwater marshes, lowland meadows, and irrigated alfalfa fields; nests on ground; nesting territories may be as small as 70 ac (28 ha) - average 410 ac (164 ha); roosts in colonies during winter (Holt and Leasure 1993; Dechant <i>et al.</i> 2001).	Yes
<b>western burrowing owl</b> <i>Athene cunicularia hypugaea</i>	FSC MNBMC	CSC	Open, dry annual or perennial grasslands, deserts, and scrublands with low-growing vegetation; subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel; home range averages 1 mi <sup>2</sup> (2.41 km <sup>2</sup> ) (Haug <i>et al.</i> 1993; Trulio 2000; Dechant <i>et al.</i> 2001).	Yes
<b>western yellow-billed cuckoo</b> <i>Coccyzus americanus occidentalis</i>	FC (FT)	ST	Neotropical migrant; nests in dense cottonwood/willow galleries along upper Sacramento River where species is at northern limits of its distribution (Gaines and Laymon 1984; Hughes 1999). There are no recent records of this species along the Sacramento River (California Dept Fish and Game 2002). Species remains Candidate (U.S. Fish and Wildlife Service 2001c).	No
<b>Vaux's swift</b> <i>Chaetura vauxi</i>	FSC MNBMC	CSC	Migratory in Bay Area; prefers redwood and Douglas-fir communities; nests are typically placed in large hollow trees and snags. Forages high over canopy and low above rivers and lakes (Bull and Collins 1993).	No
<b>black swift</b> <i>Cypseloides niger</i>	FSC MNBMC	CSC	Summer/nesting in Bay Area with specific requirements; nests in small colonies in moist environments adjacent to or behind waterfalls in narrow, high-walled canyons; montane or sea-bluffs above surf (Lowther and Collins 2002).	Yes
<b>Costa's hummingbird</b> <i>Calypte costae</i>	FSC	--	Summer/nesting in Bay Area; typically associated with arid and semiarid habitats including coastal scrub, desert scrub, chaparral, desert and valley foothill riparian ecotones (Baltosser and Scott 1996).	Yes
<b>rufous hummingbird</b> <i>Selasphorus rufus</i>	FSC MNBMC	--	Neotropical transient migrant in Central Valley (does not nest locally); occupies wide variety of habitats with nectar-producing flowers, valley foothill hardwood and coniferous forests, chaparral, and riparian habitats (Calder 1993).	Yes
<b>Allen's hummingbird</b> <i>Selasphorus sasin</i>	FSC	--	Summer/nesting and seasonal migrant along coast and coastal mountains, including Bay Area; requires nectar-producing flowers in coastal scrub, valley foothill hardwoods and riparian habitats (Mitchell 2000).	Yes
<b>Lewis' woodpecker</b> <i>Melanerpes lewis</i>	FSC	--	Erratic resident and winter migrant occurrence in Bay Area; oak savannah parklands, open deciduous or coniferous forests (Tobalske 1997).	Yes

<b>Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)</b>				
Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>Nuttall's woodpecker</b> <i>Picoides nuttallii</i>	FSC (local)	--	Resident; riparian hardwood galleries and oak woodlands (Lowther 2000).	Yes
<b>white-headed woodpecker</b> <i>Picoides albolaratus</i>	FSC (local)	--	Prefers open coniferous (Ponderosa, Jeffery, Coulter) forests; 4000-9000 ft elevation; pine seeds make up bulk of diet (Garrett <i>et al.</i> 1996).	No
<b>olive-sided flycatcher</b> <i>Conoptus cooperi</i>	MNBMC	--	Summer/nesting and seasonal migrant in Bay Area; may use any densely wooded habitat; may nest in mixed conifer, montane hardwood-conifer, Douglas fir, redwood, red fir, and lodgepole forests (Altman and Sallabanks 2000).	No
<b>little willow flycatcher</b> <i>Empidonax traillii brewsteri</i>	FSC	SE	Seasonal migrant in Bay Area; lower elevation central/coastal willow-dominated riparian habitats, with permanent water near moist meadows or spring-fed or boggy areas (Sedgewick 2000).	Yes
<b>loggerhead shrike</b> <i>Lanius ludovicianus</i>	FSC MNBMC	CSC	Resident in Bay Area; open areas with sparse shrubs, trees, and other perches (Yosef 1996). Territories in North America 15-22 ac (6-9 ha), from 7 ac (2.7 ha)-63 ac (25 ha); in Alberta, 20 territories along railroad ROW averaged 21 ac (8.5 ha) each (Dechant <i>et al.</i> 2001).	Yes
<b>least Bell's vireo</b> <i>Vireo bellii pursillus</i>	FE MNBMC	SE	Summer/nesting in Bay Area; primary distribution extreme southwestern California; occupies low elevation dense willow or similarly structured riparian habitats (Brown 1993); nearest viable nesting population located along upper Santa Ynez River, Santa Barbara County (Roberson and Tenney 1993).	Yes
<b>bank swallow</b> <i>Riparia riparia</i>	--	ST	Summer/colonial nesting species, nests primarily in riparian and other lowland habitats. Vertical banks/cliffs composed of fine textured/sandy soils near streams, rivers, lakes, or the ocean are required to excavate nesting hole (Garrison 1999).	Yes
<b>American dipper</b> <i>Cinclus mexicanus</i>	FSC (local)	--	(Kingery 1996)	Yes
<b>oak titmouse</b> <i>Baeolophus inornatus</i>	FSC	--	Resident; distribution complex and discontinuous in California; breeds along Sacramento River; territory size average 6.3 ac, range 3.3-12.5 ac in Alameda Co; prefer a woodland habitat in which oaks predominate, rarely above 3500 ft (105 m) elevation (Cicero 2000).	Yes

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Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>California thrasher</b> <i>Toxostoma redivivum</i>	FSC	--	A common resident of foothills and lowlands in cismontane California. Occupies moderate to dense chaparral habitats and, to a lesser extent, thickets in young or open valley foothill riparian habitat (Cody 1998).	Yes
<b>hermit warbler</b> <i>Dendroica occidentalis</i>	--	--	A summer visitor and migrant, breeds in mature ponderosa pine, montane hardwood-conifer, mixed conifer, redwood, Douglas fir, red fir, and Jeffrey pine communities (Pearson 1997).	No
<b>salt marsh common yellowthroat</b> <i>Geothlypis trichas sinuosa</i>	FSC	CSC	Resident of the San Francisco Bay region, inhabiting fresh and salt water marshes. Utilizes tall grasses, tule patches, and willows for nesting (Marshall and Dedrick 1994; Guzy and Ritchison 2000; Terrill 2000).	Yes
<b>grasshopper sparrow</b> <i>Ammodramus savannarum</i>	MNBMC	--	Summer resident and breeder in foothills and lowlands west of the Cascade-Sierra Nevada crest from Mendocino and Trinity counties, south to San Diego County. Occurs in dry, dense grasslands (Vickery 1996).	Yes
<b>Brewer's sparrow</b> <i>Spizella breweri</i>	FSC	--	(Rotenberry <i>et al.</i> 1999)	Yes
<b>Bell's sage sparrow</b> <i>Amphispiza belli belli</i>	FSC MNBMC	CSC	Inhabits dense chaparral (often dominated by chamise), coastal sagebrush, and dry foothills (Martin and Carlson 1998).	Yes
<b>Alameda (South Bay) song sparrow</b> <i>Melospiza melodia pusillula</i>	FSC	CSC	Resident of the South Bay, inhabiting salt and brackish marshes with cordgrass, pickleweed, and gumplant (Marshall and Dedrick 1994; Cogswell 2000).	Yes
<b>tricolored blackbird</b> <i>Agelaius tricolor</i>	FSC MNBMC	CSC	Inhabits dense cattail marshes, marshy meadows and rangeland. A highly colonial species, it is most numerous in the Central Valley and vicinity of California (Beedy and Hamilton 1999).	Yes
<b>Lawrence's goldfinch</b> <i>Carduelis lawrencei</i>	MNBMC	--	Uncommon in foothills surrounding the Central Valley. Breeds in open oak or other arid woodland and chaparral, near water. Typical habitats include valley foothill hardwood, and valley foothill hardwood-conifer (Davis 2000).	Yes
<b>MAMMALS</b> (scientific nomenclature follows Wilson and Cole 2000).				
<b>Salt marsh vagrant shrew</b> <i>Sorex vagrans halicoetes</i>	FSC	CSC	Salt marshes of the south arm of the San Francisco Bay where abundant driftwood is scattered among pickleweed (Schellhammer 1982, 2000a).	Yes

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Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>Mount Lyell shrew</b> <i>Sorex lyelli</i>	FSC		Willow riparian habitats in central Sierra Nevada including Yosemite NP (Ingles 1965).	No
<b>Alameda Island mole</b> <i>Scapanus latimanus parvus</i>	FSC		Soft mesic soils in valleys and mountain meadows throughout state (Ingles 1965)	Yes
<b>Berkeley kangaroo rat</b> <i>Dipodomys heermanni berkeleyensis</i>	FSC	--	Inhabits open, grassy hilltops and open areas within chaparral and blue oak/foothill pine woodlands (Williams 1986). Likely occur in suitable habitat throughout the mountain ranges east of San Francisco Bay and west of the San Joaquin Valley (Kelt 1988; Williams 1986).	Yes
<b>Merced kangaroo rat</b> <i>Dipodomys heermanni dixonii</i>	FSC		(Kelt 1988)	Yes
<b>giant kangaroo rat</b> <i>Dipodomys ingens</i>	FE		(Williams and Kilburn 1991)	Yes
<b>Fresno kangaroo rat</b> <i>Dipodomys nitratoides exilis</i>	FE		(Best 1991)	Yes
<b>short-nosed kangaroo rat</b> <i>Dipodomys nitroides brevinasus</i>	FSC		(Best 1991)	Yes
<b>San Joaquin pocket mouse</b> <i>Perognathus inornatus inornatus</i>	FSC BLM	--	Typically found in grasslands and blue oak savannahs with friable soils (Best 1993).	Yes
<b>salt-marsh harvest mouse</b> <i>Reithrodontomys raviventris</i>	FE	SE CFP	Only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat. Requires higher areas in order to escape floods (Schellhammer 1982; 1989; 2000b). Recovery Plan (U.S. Fish and Wildlife Service 1984).	Yes
<b>southern grasshopper mouse</b> <i>Onychnomys torridus ramona</i>	FSC	--	Naturally occurs in low densities; primary distribution is southern California, southwestern Nevada, and south into western Texas-central Mexico; prefers hot, dry desert scrub; territories may vary from 5.9-7.8 ac (McCarty 1975)	Yes
<b>San Joaquin Valley riparian woodrat</b> <i>Neotoma fuscipes riparia</i>	FE	CSC	Riparian floodplain in San Joaquin, Stanislaus, and Tuolumne Rivers; requires riparian habitat with a mixture of trees and a dense brush understory (Carraway and Verts 1991).	Yes

<b>Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)</b>				
Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>San Francisco dusky-footed woodrat</b> <i>Neotoma fuscipes annectens</i>	FSC	CSC	Oak and riparian woodlands with moderate canopy and dense understory; chaparral (Carraway and Verts 1991).	Yes
<b>San Joaquin antelope squirrel</b> (=Nelson's antelope squirrel) <i>Ammospermophilus nelsoni</i>	FSC		(Best <i>et al.</i> 1990)	Yes
<b>Pacific western big-eared bat</b> <i>Plecotus townsendii townsendii</i>	FSC	CSC	Occupies the humid, coastal regions of Northern and central California, in a wide variety of habitats. Roosts in caves, buildings, and mine tunnels. This species is highly sensitive to human disturbance at roosting, maternity, and hibernacula sites (Kunz and Martin 1982).	Yes
<b>pale Townsend's big-eared bat</b> <i>Plecotus townsendii pallescens</i>	FSC	CSC	(Kunz and Martin 1982).	Yes
<b>greater western mastiff bat</b> <i>Eumops perotis californicus</i>	FSC	CSC	This species utilizes a wide range of open habitats including coastal scrub, annual grasslands, and conifer woodlands. Roosts in or on buildings, crevices in cliffs, trees, and in tunnels (Best <i>et al.</i> 1996).	Yes
<b>small-footed myotis</b> <i>Myotis ciliolabrum</i>	FSC	--	Inhabits relatively arid wooded and brushy uplands in close proximity to water, from sea level to about 8,900 feet. Maternity colonies may occur in buildings, caves and mines (Holloway and Barclay 2001).	Yes
<b>long-eared myotis</b> <i>Myotis evotis</i>	FSC	--	May be found in a variety of brush, woodland, and forest communities, from sea level to about 9,000 feet; shows a preference toward coniferous woodlands and forests. Nursery colonies located in buildings, crevices, spaces under bark, snags; night roosting in caves (Manning 1989).	Yes
<b>fringed myotis</b> <i>Myotis thysanodes</i>	FSC	--	May be found in a variety of environments; valley and foothill hardwood, hardwood-conifer and pinyon-juniper woodland provide optimal habitat. Maternity colonies and roosts located in caves, mines, buildings, and crevices (O'Farrell and Studier 1980).	Yes

**Table 4b. California High-Speed Train: Bay Area to Gilroy to Merced Special-Status Wildlife Species (Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus Counties)**

Species	Status		Habitat Association	Potential Habitat in Project Area
	Federal	State		
<b>long-legged myotis</b> <i>Myotis volans</i>	FSC	--	This species is most commonly associated with woodland and forest communities above 4,000 feet. However, may also forage in chaparral, coastal scrub, Great Basin shrub habitats, and in early successional stages of woodlands and forests. Occurrence records ranges from sea level to 11,400 feet. Roosts in rock crevices, buildings, under tree bark, in snags, mines, and caves (Warner and Czaplewski 1984).	Yes
<b>Yuma myotis</b> <i>Myotis yumanensis</i>	FSC	--	Optimal environments include open forests and woodlands in proximity to bodies of water used for foraging; maternity colonies in caves, mines, crevices, and buildings.	Yes
<b>Riparian brush rabbit</b> <i>Sylvilagus bachmani riparius</i>	FE	SE	Habitat is valley floor riparian and floodplain - only in San Joaquin and Stanislaus counties (Chapman 1974).	Yes
<b>San Joaquin kit fox</b> <i>Vulpes macrotis mutica</i>	FE	ST	Open, level, sandy ground preferred. Sagebrush scrub, creosote bush scrub, and valley grasslands (McCrew 1979).	Yes

**Federal status:**

- ESU = Evolutionary Significant Unit is a distinctive population of Pacific steelhead salmon.
- FE = Listed as endangered under Endangered Species Act.
- FT = Listed as threatened under Endangered Species Act.
- FC = Candidate for listing (threatened or endangered) under Endangered Species Act.
- FPT = Proposed as threatened under Endangered Species Act.
- FSC = Species of Concern identified by USFWS.
- Delisted = Delisted in accordance with Endangered Species Act.
- MNBMC= Migratory Nongame Bird of Management Concern (USFWS 1995a).
- BLM = Sensitive Species as identified by BLM.

**State Status:**

- SE = Listed as endangered under California Endangered Species Act.
- ST = Listed as threatened under California Endangered Species Act.
- CSC = Species of concern as identified by the California Department of Fish and Game.
- SLC = Species of local or regional concern or conservation significance.
- CFP = Listed as fully protected under California Fish and Game Code.
- Rare = Species identified as rare by the California Department of Fish and Game.

**Other:**

- ac = acre(s)
- C = degrees Celsius
- ca = about, more or less
- ha = hectare(s)

Neotropical migrant = birds that nest in the United States or Canada but wintering in the highlands of Mexico, Central, or South America, including the Caribbean Islands. Alternately defined as *long distance migrants*, or those species that nest north of the Tropic of Cancer and winter south of that line. There are 361 species that fit this definition, over half the 722 terrestrial species occurring in Canada, United States, and Mexico. At least 68 winter as far south as continental South America. Most Neotropical migrants spend the majority of the year in the tropics, 6-9 months, and are in the temperate latitudes (Nearctic) only for breeding and nesting. These birds have status as MNBMC (U.S. Fish and Wildlife Service 1995a).

#### 2.4.6 Wildlife Movement Corridors

While there are no concrete data on wildlife movement corridors, all of the major riparian and stream corridors of the canyons of the Diablo Range constitute wildlife movement corridors. In addition, the many streams and major rivers of the project area are fish migration corridors used by anadromous species and freshwater species.

On the west side of the Great Valley the relatively extensive strip of annual (non-native) grassland, which lies between the irrigated fields and orchards of the valley floor and the oak and pine woodlands of the Diablo Range, constitutes a major movement corridor for San Joaquin kit fox.

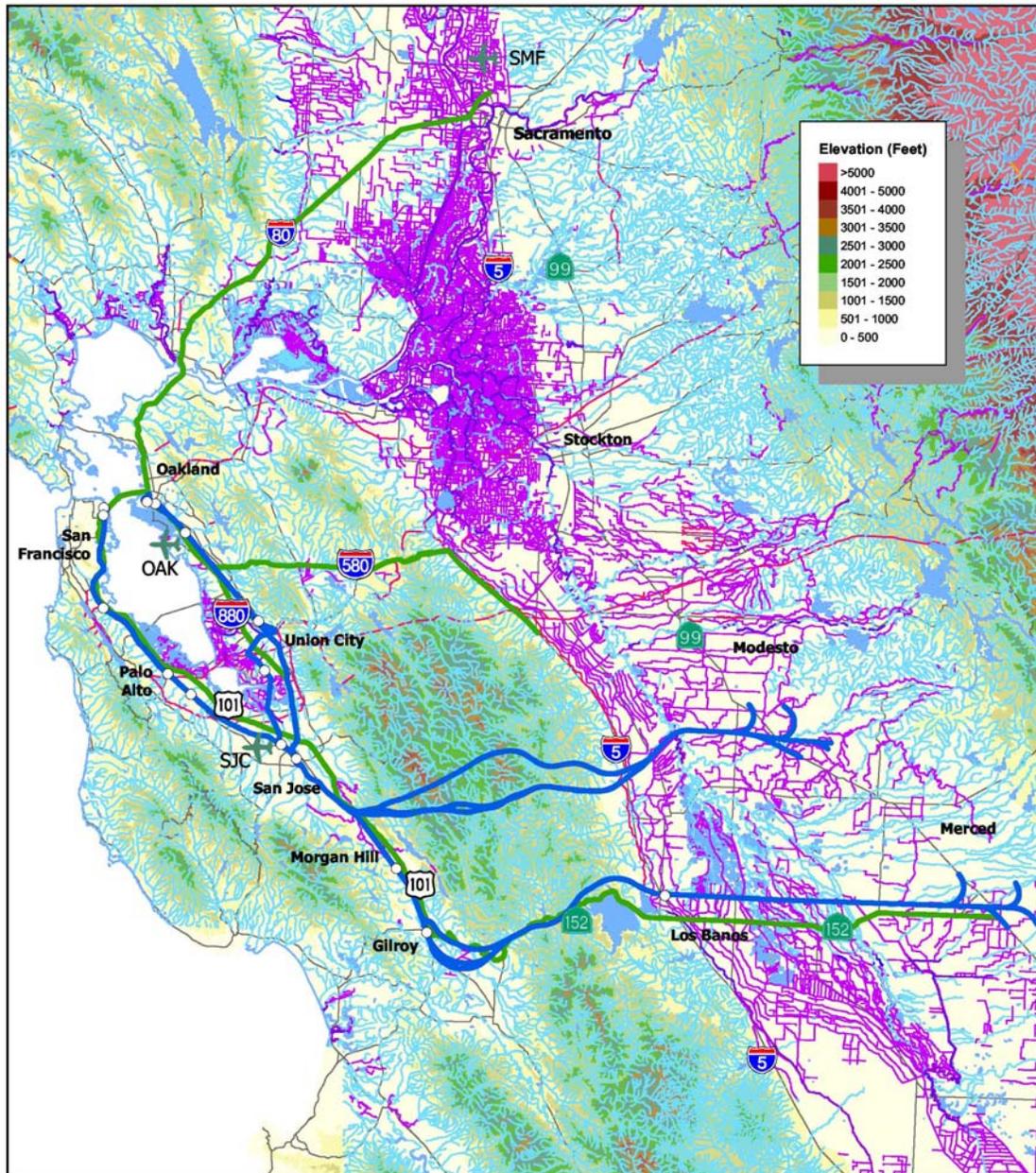
### 2.5 JURISDICTIONAL WATERS AND WETLANDS

Wetlands and waters of the United States of the project alignments include most of the major ecological types found in California. To the layperson these are known as bays, rivers, streams, lakes, ponds, springs, seeps, and marshes (Figure 5). Following the ecologically based Cowardin system of wetland classification, the main types of wetlands along the project alignments include estuarine, lacustrine, palustrine, and riverine systems. Vernal pools may be present, specifically on Clear Lake soils fringing the San Francisco Bay region, or on Great Valley terrace deposits.

The habitat based Wildlife Habitat Relationship (WHR) system catalogues both freshwater emergent wetland and lacustrine wetland types. Following the floristically based Holland system of classification the major wetland types of the project are cismontane alkali marsh, freshwater emergent marsh, northern coastal salt marsh, and northern hardpan vernal pool.

Wetland data obtained from GIS or from an office review of USGS quadrangle maps and soils surveys may also be found in several of the summary tables presented in the Appendix of this document. A full and accurate account of wetlands and waters of the United States, based on the regulatory definition, must await a complete field wetland delineation and waters of the United States determination of the project area as part of the Tier 2 process (or a later Clean Water Act process), following the methodology of the Department of the Army, Corps of Engineers.

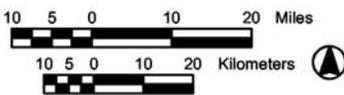
**Figure 5:  
Jurisdictional Waters – Bay Area to Merced**



Source: U.S. Geological Survey 1994

March 17, 2003

California High Speed Train Program EIR/EIS



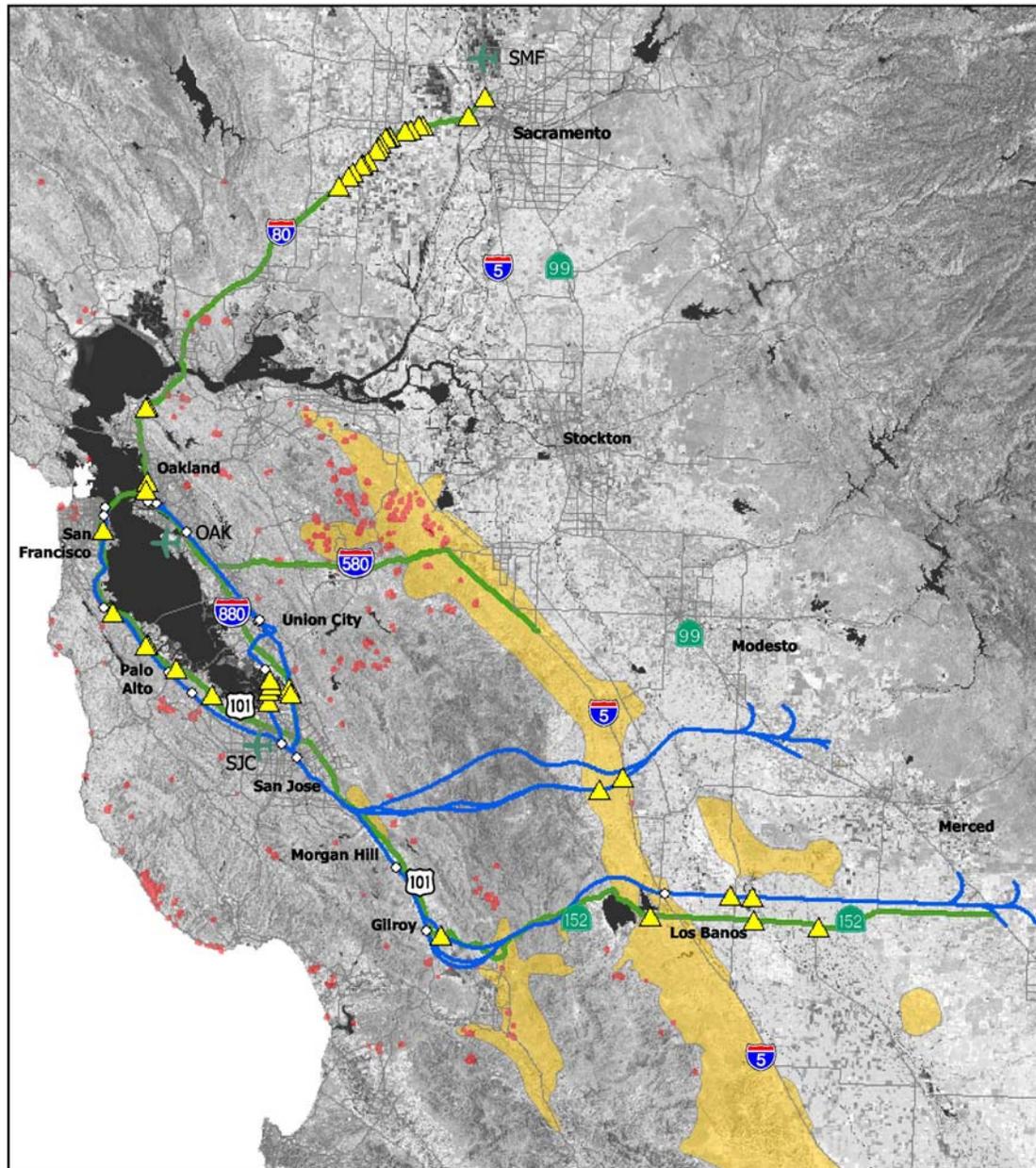
- Legend**
- Stream
  - Ditch or Canal
  - Dam or Weir
  - Lake, Pond or Ocean Shoreline
  - Lake or Pond
  - High Speed Train Alignment and Stations
  - Modal (Highway) Alignment
  - Modal Alignment Airports

Note: this is not a federal jurisdictional determination

**Jurisdictional Waters  
Bay Area to Merced Region**

Figure 4

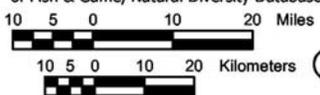
**Figure 6:  
Special-status Species – Bay Area to Merced**



Source: Landsat 1985; California Department of Fish & Game, Natural Diversity Database 2002

March 17, 2003

California High Speed Train Program EIR/EIS



- Legend**
- California Threatened and Endangered Species (found within 1000 feet of alignment centerline)
  - San Joaquin Kit Fox Habitat
  - California Red-Legged Frog Habitat
  - High Speed Train Alignment and Stations
  - Modal (Highway) Alignment
  - Modal Alignment Airports

**Special Status Species  
Bay Area to Merced Region**

Figure 5

## 3.0 METHODS FOR BIOLOGICAL RESOURCES ANALYSIS

### 3.1 DATA COLLECTION

The proposed California High-Speed Train would cross a variety of biotic communities and potentially influence many plant and wildlife species. In order to develop existing conditions for subsequent analysis in relation to the proposed project, data was collected and compiled from federal and state resource agencies, published sources, and electronic databases. No field or on-site visits were made for this initial, planning-level review.

Natural resource data was gathered within a 1000 foot-wide corridor along both sides, i.e., 2000 foot-wide total from center line alignment of the proposed right-of-way (ROW). Additionally, 1000 foot-wide corridors were used in data collection for the no project and modal build-up alternatives. We did not analyze 0.25 mile buffers around stations and alignments in undeveloped areas (or 0.50 acres in the vicinity of estuaries and lagoons) since engineering data were not available for stations or tunnels at the time of writing of this document. The 1,000-foot wide corridor (on the bay-ward side of the alignments) along San Francisco Bay was reduced to 100-feet on the basis that no additional fills in the Bay will be permitted by the local, State, and federal agencies including the Bay Conservation and Development Commission (BCDC), State Lands Commission, and USACE.

Specifically, natural resource data collection efforts focused on vegetation communities, jurisdictional wetlands, other sensitive habitats including stream crossing and riparian zones, hydric soils, and serpentine (ultramafic) soils; wildlife movement corridors, and threatened, endangered, and sensitive (TES) species and their habitat requirements. TES species are also termed special-status species, particularly those not identified under the Endangered Species Act or California Endangered Species Act.

For the following discussion, plant taxonomy and nomenclature follows Abrams (1923, 1944, 1951), Abrams and Ferris (1960), Buckingham *et al.* (1995), Munz (1959), Hickman (1993), and Hitchcock *et al.* (1969). Scientific nomenclature and common names for wildlife follows: butterflies, Miller (1992); fish (Robins *et al.* (1991); herpetofauna (amphibians and reptiles), Committee on Standard English and Scientific Names (2001); birds, American Ornithologists' Union (1983, 1998); and mammals, Wilson and Cole (2000).

Geospatial data (GIS) based on the California GAP analysis (Davis 1998), which uses the California Department of Fish and Game (CDFG) wildlife habitat relationship (WHR) classification (Zeiner *et al.* 1988; 1990a; 1990b), was used as the primary source for delineation of vegetation communities along the project ROW and alternatives. However, the preferred analysis classification is based on Holland (1986). For a comparison of vegetation classifications, see Table 3. The most recent vegetation classification for California (Sawyer and Keeler-Wolf 1995) was not used as this data has is not available in geospatial contexts.

Geospatial data for TES and special-status species was obtained from the California Natural Diversity Database (CNDDDB) (California Department of Fish and Game 2002). There were no data other than occurrence records in the CNDDDB, available from the California Native Plant Society (CNPS) (California Native Plant Society 2001), or species-specific publications.

Jurisdictional waters is a regulatory term that applies to regulated water bodies and wetlands under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The U.S. Corps of Engineers (USACE) has final authority over the identification of wetlands and other waters of the United States (U.S.) including their jurisdiction, determination of area affected by the project, and type of

permits and conditions required. A delineation of wetlands and other waters of the U.S. was not conducted for this analysis. Data regarding wetlands was obtained from National Wetlands Inventory maps (U.S. Fish and Wildlife Service, St. Petersburg, FL) which were used as overlays on U.S. Geological Survey (USGS) 7.5 minute quad maps.

There were no geospatial data available for riparian corridors pursuant to Section 1601 of the California Department of Fish and Game. However, the presence of streams (with corresponding indeterminate riparian vegetation) was determined from a manual review of USGS quadrangle maps, and was inferred from geospatial results of California GAP Analysis and CNDDDB for specific riparian vegetation polygons.

Several NWI maps (based on USGS 7.5 minute quads) have not been digitized yet and are unavailable for baseline input or subsequent environmental analysis. These (quad) maps are Eylar Mountain, Isabel Valley, Lick Observatory, Loma Prieta, Morgan Hill, Mount Sizer, Mount Madonna, and Santa Teresa Hills.

Geographical Information System data was exported to EXCEL spreadsheets. These spreadsheets were sorted using the desired parameter in ascending order, and the acreages of like attributes were arithmetically summed using EXCEL. Attributes and EXCEL sums were transferred to the summary tables.

### **3.2 SIGNIFICANCE CRITERIA FOR BIOLOGICAL RESOURCES**

The significance criteria for biological resources would be based on thresholds stated or implied in federal, State, and local laws and ordinances, including NEPA, CEQA, the federal Clean Water Act, the federal Endangered Species Act, the State Endangered Species Act, California Department of Fish & Game Code, General Plan goals and policies, and ordinances of water districts and cities.

For example, any project impact that would cause loss of individuals or occupied habitat of endangered, threatened, or rare wildlife or plant species would be considered significant. In addition any impact that would cause permanent loss of sensitive wildlife habitat, raptor nests, and permanent loss of sensitive native plant communities would be a significant impact to the environment. Project components that would result in the loss of oak trees would also have a significant effect on the environment. Disruption and/or blockage major fish or wildlife migration or travel corridors would also constitute a significant impact. Finally any project component that would cause permanent loss of aquatic habitat, and/or wetlands and Waters of the United States would also constitute a significant impact.

## 4.0 IMPACTS TO BIOLOGICAL RESOURCES AND JURISDICTIONAL WATERS

### 4.1 NO-PROJECT ALTERNATIVE

The No-Project Alternative assumes that others would complete projects (both public works and private development) including local, state, and interstate transportation system improvements designated in existing plans and programs. No additional biological resources impacts would occur beyond those addressed in environmental documents for those projects.

### 4.2 MODAL ALTERNATIVE

The following narrative discussion supplements the manual and GIS analysis of biological resource data in the Appendix for the Modal Alternative, but without analysis of individual modal components. Those data may be available at a later date. The target list of Special-status plants (Table 4a) and wildlife (Table 4b) is a project wide list. Impacts to individual Special-status species habitat of the Modal Alternative may be found in the Appendix, Table 6. It is not possible to predict impacts beyond the level of detail presented in Table 8, until field surveys are conducted as part of the Tier 2 process.

The Modal Alternative has the potential to significantly impact natural resources including sensitive vegetation communities, wildlife habitat, wildlife movement corridors, Special-status species, jurisdictional waters including wetlands, and anadromous fish resources.

#### 4.2.1 Sensitive Vegetation

The GIS Analysis using GAP and the CNDDDB indicates that the Modal Alternative has the potential to impact the following sensitive vegetation and habitats:

- 297 acres of alkali desert scrub (by GAP)
- 459 acres of lacustrine habitat (by GAP)
- valley oak woodland (293 acres determined by GAP, 120 acres by CNDDDB)
- 138 acres of valley-foothill riparian (by GAP)
- 5 acres cismontane alkali marsh (by CNDDDB)
- 14 acres coastal salt marsh (by CNDDDB)
- 6 acres northern hardpan vernal pools (by CNDDDB)
- 1,176 acres of sycamore alluvial woodland (by CNDDDB)
- 2 acres of valley sink scrub (by CNDDDB)

In addition, 45 GAP Analysis polygons not included above contain sensitive riparian and/or wetland inclusions (see Appendix).

#### 4.2.2 Sensitive Plants and Wildlife

The Modal Alternative has the potential to impact 72,246 acres of Special-status species habitat, including 22,226 acres of California red-legged frog habitat (by CNDDDB; Appendix, Table 15). Key impacts include

those to California red-legged frog, Swainson's hawk, western burrowing owl, giant garter snake, and a whole host of other species (Table 4a, Table 4b; Appendix, Table 15).

#### 4.2.3 Jurisdictional Waters

The modal alternative would impact more than 2 million lineal feet of streams and more than 660 acres of other waterbodies; 2,222 acres of estuarine, 568 acres of lacustrine, 2,581 acres of palustrine, and 1,013 acres of riverine wetlands (Appendix). This is a significant impact. In addition, the Modal Alternative has the potential to impact hydric soils (one of the three indicators of wetlands), serpentine soils (substrate for several Special-status species), and oak trees protected by local ordinances and General Plan policies.

Existing infrastructure (bridges, culverts, abutments, and fill) would be extended to accommodate additional travel lanes, and EIR level mitigation is possible. However, the efficacy of Clean Water Act mitigation for impacts to wetlands and waters of the United States is a problem. For example, along the Interstate Highway 880 corridor between Oakland and San Jose, almost all onsite wetland mitigation sites have been taken for recent freeway widening projects. Mitigation along the I-880 corridor would need to be undertaken offsite to the detriment of biotic resources. In other areas, there is simply no more room for expanding freeways unless resources, homes, and businesses are relocated. It is also unlikely that the federal, State, and local regulatory agencies would permit any more fill in San Francisco Bay except for reconstruction of the major suspension bridges, which is already underway. The impacts to surface waters by the Modal Alternative are more than twice as great as the HST alternatives.

### 4.3 HIGH-SPEED TRAIN ALTERNATIVE

The following narrative discussion supplements the manual and GIS analysis of biological resource data summarized in the Appendix for the HST Alternative, but without analysis of stations or tunnel locations (tunnel entrances, shafts, and haul roads). Those data may be available at a later date. The HST Alternative (all segments and alternatives) has the potential to significantly impact natural resources including sensitive vegetation communities, wildlife habitat, wildlife movement corridors, Special-status species, jurisdictional waters including wetlands, and anadromous fish resources.

The target list of Special-status plants (Table 4a) and wildlife (Table 4b) is a project wide list. Impacts to individual Special-status species habitat by alternative and segment may be found in the Appendix. It is not possible to predict impacts beyond the level of detail presented in the Appendix, until field rare plant and wildlife surveys are conducted as part of the Tier 2 process.

#### 4.3.1 Impacts to Biological Resources from the San Francisco to San Jose Segment

This San Francisco to San Jose Segment corresponds to the Caltrain rail corridor, which has been well-studied for biological resources.

##### 4.3.1.1 Sensitive Vegetation

While the GAP Analysis and CNDDDB do not reveal any acreage of sensitive vegetation communities, three of the GAP polygons contain sensitive riparian and wetland inclusions. Sensitive vegetation communities exist in small patches along the route with the hot spots being at the Colma Creek estuary, the South Lomita Canal in the vicinity of San Francisco Airport, San Francisquito Creek, and Stevens Creek.

##### 4.3.1.2 Sensitive Wildlife

The San Francisco to San Jose Segment has the potential to impact 8,269 acres of Special-status species habitat (Table 11). The key impact is to California tiger salamander habitat (2,359 acres) (Table 4b; Appendix).

#### 4.3.1.3 Jurisdictional Waters

The San Francisco to San Jose Segment has the potential to impact 73,026 lineal feet of surface waters and 79 acres of other waterbodies; 150 acres of estuarine, 29 acres of lacustrine, and 9,448 acres of riverine wetlands. The surface waters and waterbodies, including stream crossings are listed in the Appendix.

#### 4.3.2 Impacts to Biological Resources from the Oakland to San Jose Segment, East Branch

The HST Alternative has the potential to significantly impact natural resources including sensitive vegetation communities, wildlife habitat, wildlife movement corridors, Special-status species, jurisdictional waters including wetlands, and anadromous fish resources.

##### 4.3.2.1 Sensitive Vegetation

The GIS Analysis using GAP and the CNDDDB indicates that the Oakland to San Jose Segment, East Branch has the potential to impact the following sensitive vegetation:

- 70 acres of lacustrine habitat (by GAP)

Though technically not a category of sensitive vegetation, the lacustrine habitat consists of percolation ponds of an abandoned gravel quarry (locally known as the Quarry Lakes) managed by the Alameda County Water District for groundwater recharge. In addition, 5 of the GAP polygons of the Oakland to San Jose Segment, East Branch contain sensitive riparian and/or wetland inclusions. These are probably connected with fringing riparian woodlands of the major creeks of the alignment, including Coyote Creek.

##### 4.3.2.2 Sensitive Wildlife

The HST Alternative, Oakland to San Jose Segment, East Branch, has the potential to impact 6,327 acres of Special-status species habitat (Table 11). The most important possible impact is to California tiger salamander habitat (2,600 acres).

##### 4.3.2.3 Jurisdictional Waters

The HST Alternative, Oakland to San Jose Segment, East Branch has the potential to impact 121,255 lineal feet of surface waters and 119 acres of other waterbodies; 17 acres of estuarine, 151 acres of lacustrine, and 296 acres of palustrine wetlands. The surface waters and waterbodies, including stream crossings are listed in the Appendix.

#### 4.3.3 Impacts to Biological Resources from the Oakland to San Jose Segment, West Branch (via Newark and Santa Clara)

The HST Alternative Oakland to San Jose Segment, West Branch has the potential to significantly impact natural resources including sensitive vegetation communities, wildlife habitat, wildlife movement corridors, Special-status species, jurisdictional waters including wetlands, and anadromous fish resources. Manual review of soils surveys also reveals the presence of hydric soils along this alignment, which are indicators of jurisdictional wetlands (see Appendix).

##### 4.3.3.1 Sensitive Vegetation

The GIS Analysis using GAP and the CNDDDB indicates that the Oakland to San Jose Segment, West Branch has the potential to impact the following sensitive vegetation and habitats:

- 70 acres of lacustrine habitat (by GAP)
- 104 acres of northern coastal salt marsh (by CNDDDB)

The coastal salt marsh is mainly associated with the crossing of the southeastern end of San Francisco Bay across the salt evaporators and estuaries of Coyote Creek and the Guadalupe River between Newark and Alviso. Impacts to lacustrine habitat are discussed in the previous section.

#### **4.3.3.2 Sensitive Wildlife**

The HST Alternative, Oakland to San Jose Segment, West Branch, has the potential to impact 7,129 acres of Special-status species habitat (Table 11). The most important possible impact is to California tiger salamander habitat (2,412 acres); however salt marsh harvest mouse habitat is also a problem (325 acres (see Appendix).

#### **4.3.3.3 Jurisdictional Waters**

The HST Alternative, Oakland to San Jose Segment, West Branch has the potential to impact 197,031 lineal feet of surface waters and 95 acres of other waterbodies; 259 acres of estuarine, 705 acres of lacustrine, 393 acres of palustrine wetlands, and 5 acres of riverine habitat. The surface waters and waterbodies, including stream crossings are listed in the Appendix.

### **4.3.4 Impacts to Biological Resources from the San Jose to Winton (Diablo Direct) Segment, Northern Alignment Option**

The HST Diablo Direct Alternative, Northern Alignment Option has the potential to significantly impact natural resources including sensitive vegetation communities, wildlife habitat, wildlife movement corridors, Special-status species, jurisdictional waters including wetlands, and anadromous fish resources.

In addition, this alignment crosses hydric soils units (indicators of jurisdictional wetlands) and serpentine outcrops (habitat for Special-status plant and animal species), and would impact oak trees (see Appendix).

#### **4.3.4.1 Sensitive Vegetation**

The GIS Analysis using GAP and the CNDDDB indicates that the Northern Alignment Option has the potential to impact the following sensitive vegetation and habitats:

- 493 acres of valley oak woodland (by GAP)
- 62 acres of valley-foothill riparian (by GAP)
- 455 acres of serpentine bunchgrass (by CNDDDB)

In addition, 22 of the GAP polygons of the Northern Alignment Option contain sensitive riparian and/or wetland inclusions, which are probably associated with the myriad of streams, wetlands, and seeps of the Diablo Range.

#### **4.3.4.2 Sensitive Wildlife**

The Northern Alignment Option has the potential to impact 7,378 acres of Special-status species habitat (Table 11). Key impacts include those to California tiger salamander (2,926 acres) and San Joaquin kit fox (2,019 acres) (Table 4b and Appendix).

#### **4.3.4.3 Jurisdictional Waters**

The HST Alternative, Northern Alignment Option, has the potential to impact 249,364 lineal feet of surface waters and 1 acre of other waterbodies; 59 acres of palustrine wetlands, and 53 acres of riverine habitat. The surface waters and waterbodies, including stream crossings are listed in the Appendix. There are no digitized data available for the following USGS NWI quadrangles--Eylar Mountain, Isabel

Valley, Lick Observatory, Loma Prieta, Morgan Hill, Mount Sizer, Mount Madonna, Santa Teresa Hills, therefore these data are incomplete.

#### **4.3.5 Impacts to Biological Resources from the San Jose to Winton (Diablo Direct) Segment, Minimize Tunnel Option**

The HST Diablo Direct Alternative, Minimize Tunnel Option has the potential to significantly impact natural resources including sensitive vegetation communities, wildlife habitat, wildlife movement corridors, Special-status species, jurisdictional waters including wetlands, and anadromous fish resources.

In addition, this alignment crosses hydric soils units (indicators of jurisdictional wetlands) and serpentine outcrops (habitat for Special-status plant and animal species), and would impact oak trees (see Appendix).

##### **4.3.5.1 Sensitive Vegetation**

The GIS Analysis using GAP and the CNDDDB indicates that the Minimize Tunnel Option has the potential to impact the following sensitive vegetation and habitats:

- 128 acres of valley oak woodland (by GAP)
- 62 acres of valley-foothill riparian (by GAP)
- 466 acres of serpentine bunchgrass (by CNDDDB)
- 147 acres of sycamore alluvial woodland (by CNDDDB)

In addition, 27 of the GAP polygons of Minimize Tunnel Option contain sensitive riparian and/or wetland inclusions, which are probably associated with the myriad of streams, wetlands, and seeps of the Diablo Range.

##### **4.3.5.2 Sensitive Wildlife**

The Minimize Tunnel Option has the potential to impact 7,762 acres of Special-status species habitat (Table 11). Key impacts include those to California tiger salamander (2,926 acres) and San Joaquin kit fox (2,110 acres) (Table 4b and Appendix).

##### **4.3.5.3 Jurisdictional Waters**

The HST Alternative, Minimize Tunnel Option, has the potential to impact 296,446 lineal feet of surface waters and 3 acres of other waterbodies; 81 acres of palustrine wetlands, and 53 acres of riverine habitat. The surface waters and waterbodies, including stream crossings are listed in the Appendix.

There are no digitized data available for the following USGS NWI quadrangles--Eylar Mountain, Isabel Valley, Lick Observatory, Loma Prieta, Morgan Hill, Mount Sizer, Mount Madonna, Santa Teresa Hills, therefore the wetland data are incomplete.

#### **4.3.6 Impacts to Biological Resources from the San Jose to Winton (Diablo Direct) Segment, Tunnel under Henry Coe State Park Option**

The HST Diablo Direct Alternative, Tunnel under Henry Coe State Park Option has the potential to significantly impact natural resources including sensitive vegetation communities, wildlife habitat, wildlife movement corridors, Special-status species, jurisdictional waters including wetlands, and anadromous fish resources.

In addition, this alignment crosses hydric soils units (indicators of jurisdictional wetlands) and serpentine outcrops (habitat for Special-status plant and animal species), and would impact oak trees (see Appendix).

#### 4.3.6.1 Sensitive Vegetation

The GIS Analysis using GAP and the CNDDDB indicates that the Tunnel under Henry Coe State Park Option has the potential to impact the following sensitive vegetation and habitats:

- 78 acres of valley oak woodland (by GAP)
- 62 acres of valley-foothill riparian (by GAP)
- 337 acres of serpentine bunchgrass (by CNDDDB)
- 141 acres of sycamore alluvial woodland (by CNDDDB)

In addition, 26 of the GAP polygons of the Tunnel under Henry Coe State Park Option contain sensitive riparian and/or wetland inclusions, which are probably associated with the myriad of streams, wetlands, and seeps of the Diablo Range.

#### 4.3.6.2 Sensitive Wildlife

The Tunnel under Henry Coe State Park Option has the potential to impact 7,793 acres of Special-status species habitat (Table 11). Key impacts include those to California tiger salamander (2,974 acres) and San Joaquin kit fox (2,225 acres) (Table 4b and Appendix).

#### 4.3.6.3 Jurisdictional Waters

The HST Alternative, Tunnel under Henry Coe State Park Option, has the potential to impact 312,359 lineal feet of surface waters; 81 acres of palustrine wetlands, and 131 acres of riverine habitat. The surface waters and waterbodies, including stream crossings are listed in the Appendix.

There are no digitized data available for the following USGS NWI quadrangles--Eylar Mountain, Isabel Valley, Lick Observatory, Loma Prieta, Morgan Hill, Mount Sizer, Mount Madonna, Santa Teresa Hills, therefore the wetland data are incomplete.

### 4.3.7 Impacts to Biological Resources from the San Jose to Chowchilla (State Route 152) Segment, Gilroy Bypass Option

In addition, this alignment would impact oak trees (see Appendix) and has the potential to significantly impact natural resources including sensitive vegetation communities, wildlife habitat, wildlife movement corridors, Special-status species, jurisdictional waters including wetlands, and anadromous fish resources.

Serpentine soils are inferred from the CNDDDB report that serpentine bunchgrass occurs along the alignment, however, the only serpentine along the route is located at Communications Hill near downtown San Jose. Hydric soils units, which may support wetlands, are prevalent on the floor of The Bolsa and in the Great Valley.

#### 4.3.7.1 Sensitive Vegetation

The GIS Analysis using GAP and the CNDDDB indicates that the Gilroy Bypass Option has the potential to impact the following sensitive vegetation and habitats:

- 158 acres of alkali desert scrub (by GAP)
- 80 acres of freshwater emergent wetland (by GAP)

- 4 acres of valley oak woodland (by GAP)
- 639 acres of cismontane alkali marsh (by CNDDDB)
- 39 acres of serpentine bunchgrass (by CNDDDB)
- 26 acres of sycamore alluvial woodland (by CNDDDB)

In addition, 15 of the GAP polygons of the Gilroy Bypass Option contain sensitive riparian and/or wetland inclusions, which are probably associated with the Pacheco and Romero Creek watersheds of the Diablo Range.

#### 4.3.7.2 Sensitive Wildlife

The Gilroy Bypass Option has the potential to impact 10,236 acres of Special-status species habitat (Table 11). Key impacts include those to California tiger salamander (3,415 acres) and San Joaquin kit fox (3,010 acres) (Table 4b and Appendix).

#### 4.3.7.3 Jurisdictional Waters

The HST Alternative, Gilroy Bypass Option, has the potential to impact 436,560 lineal feet of surface waters including 107 acres of other waterbodies; 37 acres of lacustrine wetlands, 993 acres of palustrine wetlands, and 64 acres of riverine habitat. The surface waters and waterbodies, including stream crossings are listed in the Appendix.

There are no digitized data available for the following USGS NWI quadrangles--Eylar Mountain, Isabel Valley, Lick Observatory, Loma Prieta, Morgan Hill, Mount Sizer, Mount Madonna, Santa Teresa Hills, therefore the wetland data are incomplete.

### 4.3.8 Impacts to Biological Resources from the San Jose to Chowchilla (State Route 152) Segment, 145 kph Siding Option

The HST Alternative, 145 kph Siding Option has the potential to significantly impact natural resources including sensitive vegetation communities, wildlife habitat, wildlife movement corridors, Special-status species, jurisdictional waters including wetlands, and anadromous fish resources.

Serpentine soils are inferred from the CNDDDB report that serpentine bunchgrass occurs along the alignment, however, the only serpentine along the route is located at Communications Hill near downtown San Jose. Hydric soils units, which may support wetlands, are prevalent on the floor of The Bolsa and in the Great Valley.

#### 4.3.8.1 Sensitive Vegetation

The GIS Analysis using GAP and the CNDDDB indicates that the 145 kph Siding Option has the potential to impact the following sensitive vegetation and habitats:

- 158 acres of alkali desert scrub (by GAP)
- 80 acres of freshwater emergent wetland (by GAP)
- 247 acres of valley oak woodland (by GAP)
- 639 acres of cismontane alkali marsh (by CNDDDB)
- 39 acres of serpentine bunchgrass (by CNDDDB)
- 30 acres of sycamore alluvial woodland (by CNDDDB)

In addition, 15 of the GAP polygons of the 145 kph Siding Option contain sensitive riparian and/or wetland inclusions, which are probably associated with the Pacheco and Romero Creek watersheds of the Diablo Range.

#### 4.3.8.2 Sensitive Wildlife

The 145 kph Siding Option has the potential to impact 10,344 acres of Special-status species habitat (Table 11). Key impacts include those to California tiger salamander (3,405 acres) and San Joaquin kit fox (3,124 acres) (Table 4b and Appendix).

#### 4.3.8.3 Jurisdictional Waters

The HST Alternative, 145 kph Siding Option, has the potential to impact 453,042 lineal feet of surface waters including 60 acres of other waterbodies; 10 acres of lacustrine wetlands, 981 acres of palustrine wetlands, and 66 acres of riverine habitat. The surface waters and waterbodies, including stream crossings are listed in the Appendix.

There are no digitized data available for the following USGS NWI quadrangles--Eylar Mountain, Isabel Valley, Lick Observatory, Loma Prieta, Morgan Hill, Mount Sizer, Mount Madonna, Santa Teresa Hills, therefore the wetland data are incomplete.

#### 4.3.9 Impacts to Biological Resources from the San Jose to Chowchilla (State Route 152) Segment, Gilroy Station Option

The HST Alternative, Gilroy Station Option has the potential to significantly impact natural resources including sensitive vegetation communities, wildlife habitat, wildlife movement corridors, Special-status species, jurisdictional waters including wetlands, and anadromous fish resources.

Serpentine soils are inferred from the CNDDDB report that serpentine bunchgrass occurs along the alignment, however, the only serpentine along the route is located at Communications Hill near downtown San Jose. Hydric soils units, which may support wetlands, are prevalent on the floor of The Bolsa and in the Great Valley.

##### 4.3.9.1 Sensitive Vegetation

The GIS Analysis using GAP and the CNDDDB indicates that the Gilroy Station Option has the potential to impact the following sensitive vegetation and habitats:

- 158 acres of alkali desert scrub (by GAP)
- 80 acres of freshwater emergent wetland (by GAP)
- 247 acres of valley oak woodland (by GAP)
- 639 acres of cismontane alkali marsh (by CNDDDB)
- 39 acres of serpentine bunchgrass (by CNDDDB)
- 30 acres of sycamore alluvial woodland (by CNDDDB)

In addition, 15 of the GAP polygons of the Gilroy Station Option contain sensitive riparian and/or wetland inclusions, which are probably associated with the Pacheco and Romero Creek watersheds of the Diablo Range.

#### 4.3.9.2 Sensitive Wildlife

The Gilroy Station Option has the potential to impact 10,331 acres of Special-status species habitat (Table 11). Key impacts include those to California tiger salamander (3,405 acres) and San Joaquin kit fox (3,122 acres) (Table 4b and the Appendix).

#### 4.3.9.3 Jurisdictional Waters

The HST Alternative, Gilroy Station Option, has the potential to impact 451,960 lineal feet of surface waters including 60 acres of other waterbodies; 10 acres of lacustrine wetlands, 985 acres of palustrine wetlands, and 64 acres of riverine habitat. The surface waters and waterbodies, including stream crossings are listed in the Appendix.

There are no digitized data available for the following USGS NWI quadrangles--Eylar Mountain, Isabel Valley, Lick Observatory, Loma Prieta, Morgan Hill, Mount Sizer, Mount Madonna, Santa Teresa Hills, therefore the wetland data are incomplete.

## 5.0 REFERENCES

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Dr. Cattell has eighteen years of experience in providing a wide range of environmental services related to NEPA and CEQA type projects with a focus on water quality and watershed assessment and management. His experience includes assessment of wastewater and thermal discharges, surface water runoff, storm drainage, dredge spoil disposal, TMDLs and impacts from land and shoreline development.

John W. Martin, Principal Biologist

Mr. Martin has extensive experience in producing complex, integrated landscape-oriented environmental analyses, baseline biological inventories including application of GIS methodology, and wildlife-habitat studies inclusive of mitigation strategies to offset significant impacts under NEPA and ESA. Spanning 23-years, his federal career has included tenure with Bureau of Reclamation, US Fish and Wildlife Service and US Army in Colorado, Idaho, Montana, and Utah.

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Dr. Miller possesses expertise in environmental analysis and ecosystem restoration, with a particular focus on botany, wetland ecology, and permitting. He has developed broad knowledge of the California flora and general knowledge of the cordilleran and desert floras of the southwest and northwest United States during the past 23 years. John has served on teams of consultants creating wetlands in the Pacific Northwest, assessing resources on lands owned by California's major utility companies, and building the largest natural gas transmission line in western North America.

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Ms. Owen has seven years of experience performing detailed field studies, including GIS data analysis and reporting on environmental impacts. She has designed and implemented protocols and methodologies for both plant and wildlife surveys. Ms. Owen has taken part in a variety of projects including habitat and vegetation mapping for the Coast Highway Management Plan, multiple Biological Assessments, and wetland delineations in the Bay Area and Natural Environment Study reports for Caltrain and Caltrans.

## 7.0 APPENDIX - SUMMARY OF MANUAL AND GEOSPATIAL DATA

### 7.1 SUMMARIZED DATA FROM MANUAL STUDY OF USGS QUADRANGLE AND SOIL SURVEY MAPS

A manual study of the USGS topographic quadrangle maps revealed important impacts to resources such as blue-line streams and marsh; and gross patterns of vegetation. Blue-line streams were determined from the blue patterns of intermittent and perennial waterbodies (streams, rivers, ponds, lakes, and playas) on hard copies of the USGS quadrangle maps with the proposed alignments printed upon them. Gross vegetation patterns were defined by the green shading on the USGS quadrangles (e.g. solid green = woodland, stippled green = brush, and no pattern = grassland). Each time that the route intersected a feature on a USGS map, a table entry was generated.

A manual review of the county soil survey maps, which cover the proposed alignments, provided important clues on the presence of sensitive habitat, specifically hydric soils as one of the three indicators of wetlands, and ultramafic (serpentine) soils as indicators of Special-status plant habitat. Soil surveys were studied from Alameda, Madera, Merced, San Benito, San Francisco, San Mateo, Santa Clara, and Stanislaus counties including Arkley (1962), Arkley (1964), Ferrari & McElhiney (2002), Helseth (1968), Hokholt & Kashiwagi (1993), Isgrig (1969), Lindsey (1974), Nazar (1990), Stromberg et al. (1962), and Welch (1981).

The following tables contain a column of data of soil types for the various project alignments. Hydric soils and ultramafic soils are **bold-typed** in each of the tables. Serpentine soils of the proposed alignments included the Henneke and Montara series soils. Hydric soils along the proposed routes belonged to the Agnal, Alros, Bisgani, Bolfar, Britto, Clear Lake, Columbia, Dello, Dosamigos, Dospalos, Elnido, Fluvaquents, Foster, Henmel, Metz, Mollic Xerofluvents, Pacheco, Palazzo, Pedcat, Pozo, Riverwash, Tidal Flat, and Willows series. Those crossings that have **bold-typed** soils data have a high probability of supporting either wetlands and/or Special-status plant populations.

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
<b>San Francisco to San Jose Alignment</b>						
0.53	China Basin tidal channel	Aquatic surrounded by urban landscape	134	E2RSN	Tidal basin edge	Section 10, BCDC
1.5	Tunnel No. 1	Urban landscape	N/A	No rating	Nesting swallows	CDFG Code
2.25	Islais Creek	Aquatic surrounded by urban landscape	134	E2USN	Tidal basin edge	Section 10, BCDC
6.57	Unnamed tidal channel	Aquatic surrounded by urban landscape	134	E2SBNx PEMCh	Tidal channel & possible wetland	Section 10, Section 404
6.60	Unnamed marsh	Aquatic surrounded by swamp	134	No rating	Possible wetland	Section 404
6.68	Visitacion Tidal Basin "A"	Aquatic surrounded by swamp	131	E2USN	Tidal basin edge & saltmarsh	Section 10, Section 404, BCDC
7.00	Visitacion Tidal Basin "B"	Aquatic surrounded by swamp	131	E2EMP	Tidal basin edge	Section 10, Section 404, BCDC
7.61	Unnamed marsh	Aquatic surrounded by swamp	131	E2EMP	Tidal basin edge & saltmarsh	Section 10, Section 404, BCDC
7.68	Unnamed marsh	Aquatic surrounded by swamp	131	No rating	Possible wetland	Section 404
8.16	San Francisco Bay (Oyster Point Tidal Basin)	Aquatic surrounded by swamp	131	E2USN	Bay edge	Section 10, Section 404, BCDC
8.50	Unnamed marsh	Aquatic surrounded by swamp	131	No rating	Tidal basin edge & saltmarsh	Section 10, Section 404, BCDC
9.72	Colma Creek	Aquatic surrounded by swamp	134, 131, 132	R1UBVx	Tidal estuary	Section 10, Section 404, CDFG 1601

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
11.29	Unnamed tidal channel	Aquatic surrounded by swamp	131	No rating	Tidal channel	Section 404
11.50	Unnamed tidal channel	Aquatic surrounded by swamp	134, 131, 132	No rating	Tidal channel	Section 404
11.80-11.90	Upland	Urban landscape	134, 131, 132	UPL	San Francisco Garter Snake habitat	FESA, CESA (San Francisco Garter Snake); and CDFG Code
11.92	South Lomita Canal & adjacent wetlands	Aquatic surrounded by swamp	131	No rating	CRLF/SFGS habitat & channelized stream	Section 404, FESA, CESA, CDFG 1601 & CDFG Code
12.69	Unnamed tidal channel	Aquatic surrounded by swamp	131	No rating	Tidal channel	Section 404
13.51	Unnamed tidal channel	Aquatic surrounded by swamp	131	No rating	Tidal channel	Section 404
13.90	Unnamed tidal channel	Aquatic surrounded by swamp	131	No rating	Tidal channel	Section 404
14.31	Mills Creek	Aquatic surrounded by urban landscape	132, 134	PFOA	Tidal channel & riparian	Section 404 & CDFG 1601
14.83	Easton Creek	Aquatic surrounded by urban landscape	132, 134	E2SBNx	Tidal channel & riparian	Section 404 & CDFG 1601
15.37	Sanchez Creek	Aquatic surrounded by urban landscape	134	No rating	Tidal channel, ditch & saltmarsh	Section 404 & CDFG 1601
15.50	Sanchez Creek tributary and wetlands	Aquatic surrounded by urban landscape	134	No rating	Channelized tributary stream & jurisdictional wetlands	Section 404 & CDFG 1601
17.68	San Mateo Creek	Aquatic surrounded by riparian scrub and urban landscape	131	PSSR	Tidal channel & riparian	Section 404 & CDFG 1601

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
18.87	Seal Slough tributary "A"	Aquatic surrounded by urban landscape	131	PEMCx	Tidal channel & woodland	Section 404 & CDFG 1601
19.45	Seal Slough tributary "B"	Aquatic surrounded by urban landscape	131 134	R1UBVx	Tidal channel & woodland	Section 404 & CDFG 1601
20.88	Laurel Creek	Aquatic surrounded by urban landscape	131	PFOA	Tidal channel & woodland	Section 404 & CDFG 1601
22.30	Belmont Creek	Aquatic surrounded by urban landscape	131	PEMCx	Tidal channel	Section 404 & CDFG 1601
24.00	Pulgas Creek	Aquatic surrounded by urban landscape	131	E2EMN	Tidal channel	Section 404 & CDFG 1601
24.51	Cordilleras Creek	Aquatic surrounded by urban landscape	131	PFOA	Tidal channel & riparian	Section 404 & CDFG 1601
25.49	Arroyo Ojo de Agua	Aquatic surrounded by urban landscape	131	PEMC	Tidal channel	Section 404 & CDFG 1601
25.75	Redwood Creek	Aquatic surrounded by urban landscape	131	No rating	Tidal channel	Section 404 & CDFG 1601
26.60	Hetch Hetchy Aqueduct	Urban landscape	131	No rating	Aqueduct	SFPUC
29.69	San Francisquito Creek	Aquatic surrounded by woodland	132, YaA	R4SBF	Perennial stream	Section 404 FESA, CESA CDFG 1601 & CDFG Code, SCVWD
32.21	Matadero Creek	Aquatic surrounded by urban landscape	Ch	R4SBFrX	Perennial stream	Section 404, CDFG 1601, SCVWD
32.76	Barron Creek	Aquatic surrounded by urban landscape	ZbA	No rating	Perennial stream	Section 404, CDFG 1601, SCVWD
33.55	Adobe Creek	Aquatic surrounded by urban landscape	PoA	R4SBFrX	Perennial stream	Section 404, CDFG 1601, SCVWD
35.00	Hetch Hetchy Aqueduct	Urban landscape	Cd	No rating	Aqueduct	SFPUC

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
35.12	Permanente Creek	Aquatic surrounded by urban landscape	Cd	No rating	Perennial stream	Section 404, CDFG 1601, SCVWD
36.50	Stevens Creek	Aquatic surrounded by woodland	GbB	PFOA	Perennial stream	Section 404, FESA, CDFG 1601, CDFG Code, SCVWD
41.25	Calabazas Creek	Aquatic surrounded by urban landscape	Cf	R4SBCx	Perennial stream	Section 404, CDFG 1601, SCVWD
42.24	Saratoga Creek	Aquatic surrounded by urban landscape	Cc, Pf	No rating	Perennial stream	Section 404, CDFG 1601, SCVWD
42.43	San Tomas Aquino Creek	Aquatic surrounded by urban landscape	Ch	R2UBHx	Perennial stream	Section 404, CDFG 1601, SCVWD
47.95	Los Gatos Creek	Aquatic surrounded by woodland	Ch	PFOA	Perennial stream	Section 404, CDFG 1601, SCVWD, City of San Jose Riparian Policy
48.89	Guadalupe River	Aquatic surrounded by woodland	Ch	PFOA	Perennial stream	FESA, 404, CDFG 1601, CDFG Code, SCVWD, City of San Jose Riparian Policy
<b>State Highway 152 Alignment (San Jose to Chowchilla) [and Northern end of the Diablo Direct]</b>						
50.37	Canoas Creek	Ruderal/disturbed	Sv	No rating	Ditch/pipe	Section 404, CDFG 1601, SCVWD
51.00	Communications Hill (N)	Grassland	<b>Mw-F2</b>	No rating	Special status species habitat in serpentine soils	FESA (Metcalf Canyon Jewelflower, Santa Clara Valley Dudleya) CDFG Code, City of San Jose Riparian Policy
52.00	Communications Hill (S)	Grassland	<b>Mw-F2</b>	No rating	Special status species habitat in serpentine soils	FESA (Metcalf Canyon Jewelflower, Santa Clara Valley Dudleya) CDFG Code, City of San Jose Riparian Policy

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
<b>Diablo Range Direct (Via San Jose to Winton)</b>						
<i>Northern Alignment Option</i>						
	Coyote Creek	Aquatic surrounded by woodland	Mk	PFOA	Perennial stream and woodland	FESA (Steelhead and Salmon), Section 404, CDFG 1601, CDFG Code, SCVWD, City of San Jose Riparian Policy
	Evergreen Canal	Abandoned canal surrounded by grassland	<b>MyE</b>		Special status species habitat in serpentine soils	FESA (Metcalf Canyon Jewelflower, Santa Clara Valley Dudleya) CDFG Code, City of San Jose Ordinance
	Metcalf Canyon	Grassland	RnG	No rating	Intermittent stream	Section 404, CDFG 1601
	Proposed Tunnel	Grassland	<b>Mw-F2</b>		Special status species habitat in serpentine soils	FESA (Metcalf Canyon Jewelflower, Santa Clara Valley Dudleya) CDFG Code, City of San Jose Ordinance Section 404 & CDFG 1601
	Las Animas Creek	Aquatic surrounded by woodland and brush	GmF, LhG		Intermittent stream and woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Proposed Tunnel	Grassland woodland	GcD2		Woodland	Santa Clara County Oak Protection Guidelines
	San Felipe Creek	Aquatic surrounded by woodland and brush	GmF		Perennial stream and woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Cow Creek	Aquatic surrounded by woodland and brush	CoB		Perennial stream and woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Proposed Tunnel	Woodland and brush	LhG		Woodland	Santa Clara County Oak Protection Guidelines
	Isabel Creek	Aquatic surrounded by woodland	<b>Rg</b>		Perennial stream and woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Tributary to Isabel Valley reservoir	Aquatic surrounded by grassland	Cg		Intermittent stream	Section 404, CDFG 1601
	Proposed Tunnel	Woodland and brush	GhG2		Woodland	Santa Clara County Oak Protection Guidelines
	Tributary to Arroyo Bayo	Aquatic surrounded by woodland	GcE, GhG2		Intermittent stream and woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Arroyo Bayo	Aquatic surrounded by brush	GhG2		Intermittent stream	Section 404, CDFG 1601
	Tributary to Jumpoff Creek	Aquatic surrounded by woodland	GbB, GkE2		Intermittent stream and woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Jumpoff Creek	Aquatic surrounded by woodland and grassland	CoB, GbB		Intermittent stream and woodland	Section 404, CDFG 1601
	Tributary to Jumpoff Creek	Aquatic surrounded by woodland and brush	GcG		Intermittent stream and woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Proposed Tunnel	Woodland and brush	GhG2		Woodland	Santa Clara County Oak Protection Guidelines
	San Antonio Creek	Aquatic surrounded by woodland and grassland	Rg		Intermittent stream and woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Tributary to San Antonio Creek	Aquatic surrounded by woodland	GcD2, GkE2		Intermittent stream and woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Proposed Tunnel	Woodland and brush	611, 682		Special status species habitat in serpentine soils; woodland	Santa Clara County Oak Protection Guidelines

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	North Fork Orestimba Creek	Aquatic surrounded by brush and grassland	144		Intermittent stream	Section 404, CDFG 1601
	Long Canyon	Aquatic surrounded by woodland and brush	506, 521		Intermittent stream and woodland	Section 404, CDFG 1601, Stanislaus County Oak Protection Guidelines
	Proposed Tunnel	Brush	521			
	Tributary to North Fork Orestimba Creek	Aquatic surrounded by woodland and brush	506		Intermittent stream and woodland	Section 404, CDFG 1601, Stanislaus County Oak Protection Guidelines
	Tributary to North Fork Orestimba Creek	Aquatic surrounded by woodland and brush	506		Intermittent stream and woodland	Section 404, CDFG 1601, Stanislaus County Oak Protection Guidelines
	Tributary to North Fork Orestimba Creek	Aquatic surrounded by woodland and brush	506		Intermittent stream and woodland	Section 404, CDFG 1601, Stanislaus County Oak Protection Guidelines
	Proposed Tunnel	Woodland and brush	505		Woodland	Stanislaus County Oak Protection Guidelines
	Crow Creek	Aquatic surrounded by grassland	505		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Tributary to Crow Creek	Aquatic surrounded by grassland	505		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Crow Creek	Aquatic surrounded by grassland	145		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Tributary to Crow Creek	Aquatic surrounded by grassland	145		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Crow Creek	Aquatic	145,		Intermittent	CESA (San Joaquin Kit

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
		surrounded by grassland	505		stream and San Joaquin kit fox foraging habitat	Fox) Section 404 & CDFG 1601
	Tributary to Crow Creek	Aquatic surrounded by grassland	145		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Proposed Tunnel	Woodland and grassland	145, 510		Woodland and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)
	Tributary to Oso Creek	Aquatic surrounded by grassland	145		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Tributary to Oso Creek	Aquatic surrounded by grassland	145		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Tributary to Oso Creek	Aquatic surrounded by grassland	145		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Proposed Tunnel	Grassland	145, 500		San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)
	California Aqueduct	Grassland	304		San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)
	Interstate Highway 5	Grassland	304		San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)
	Delta Mendota Canal	Grassland	301, 304		San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Orestimba Creek	Aquatic surrounded by grassland	155, 270		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
<i>Minimize Tunnel Option</i>						
	Coyote Creek	Aquatic surrounded by woodland	Mf	PFOA	Perennial stream and woodland	FESA (Steelhead and Salmon), Section 404, CDFG 1601, CDFG Code, SCVWD, City of San Jose Ordinance
	Evergreen Canal	Abandoned canal surrounded by grassland	MyE		Special status species habitat in serpentine soils	FESA (Metcalf Canyon Jewelflower, Santa Clara Valley Dudleya) CDFG Code, City of San Jose Ordinance
	Proposed tunnel	Grassland	Mw-F2		Special status species habitat in serpentine soils	FESA (Metcalf Canyon Jewelflower, Santa Clara Valley Dudleya) CDFG Code
	Las Animas Creek	Aquatic surrounded by woodland	LhG		Perennial stream, woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Proposed tunnel	Woodland	GcD2		Woodland	Santa Clara County Oak Protection Guidelines
	Carlin Canyon	Aquatic surrounded by woodland	GhG2 LhG		Perennial stream, woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Brushy Canyon	Aquatic surrounded by woodland	GhG2		Perennial stream, woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Proposed tunnel	Woodland	GhG2 LhG		Woodland	Santa Clara County Oak Protection Guidelines
	Grizzley Creek	Aquatic surrounded by woodland, woodland and brush	LhG		Intermittent stream, woodland	Section 404 & CDFG 1601, Santa Clara County Oak Protection Guidelines

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Proposed tunnel	Woodland and brush	GhG3 LhG		Woodland	Santa Clara County Oak Protection Guidelines
	East Fork Coyote Creek	Aquatic surrounded by woodland and brush	<b>Rg</b>		Perennial stream, woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Skunk Hollow Gulch	Aquatic surrounded by woodland and brush	<b>Rg</b>		Perennial stream, woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Proposed tunnel	Woodland and brush	610, 611		Woodland	Santa Clara County Oak Protection Guidelines
	Tributary to Red Creek	Aquatic surrounded by woodland and brush	611		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Red Creek	Aquatic surrounded by woodland and brush	220		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Robinson Creek	Aquatic surrounded by woodland and brush	601, 611		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Robinson Creek	Aquatic surrounded by woodland and brush	611		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Tributary to Robinson Creek	Aquatic surrounded by woodland and brush	601, 611		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Tributary to Robinson Creek	Aquatic surrounded by woodland and brush	601		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Proposed tunnel	Woodland and brush	600		Woodland	Stanislaus County Oak Protection Guidelines
	Tributary to Robinson Creek	Aquatic surrounded by woodland and brush	600		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Tributary to Robinson Creek	Aquatic surrounded by woodland and brush	600, 601		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Robinson Creek	Aquatic surrounded by woodland and brush	304, 611		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Tributary to Robinson Creek	Aquatic surrounded by woodland and brush	304, 611		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Tributary to South Fork Orestimba Creek	Aquatic surrounded by woodland and brush	611		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Tributary to South Fork Orestimba Creek	Aquatic surrounded by woodland and brush	611		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Tributary to South Fork Orestimba Creek	Aquatic surrounded by woodland and brush	611		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	South Fork Orestimba Creek	Aquatic surrounded by woodland and brush	601, 611		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Proposed tunnel	woodland and brush	601		Woodland	Stanislaus County Oak Protection Guidelines
	South Fork Orestimba Creek	Aquatic surrounded by woodland and brush	601, 611, 660		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	South Fork Orestimba Creek	Aquatic surrounded by woodland and brush	601, 660, <b>682</b>		Special status species habitat in serpentine soils; intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	South Fork Orestimba Creek	Aquatic surrounded by woodland and brush	304, <b>682</b>		Special status species habitat in serpentine soils; intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	North Fork Orestimba Creek	Aquatic surrounded by woodland and grassland	144		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines, CESA (San Joaquin Kit Fox)
	Proposed tunnel	Woodland and grassland	501, 506		Woodland and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)
	Tributary to Orestimba Creek	Woodland and grassland	501		Woodland and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)
<b><i>Tunnel Under Henry Coe State Park Option</i></b>						
	Coyote Creek	Aquatic surrounded by woodland	Mf	PFOA	Perennial stream and woodland	FESA (Steelhead and Salmon), Section 404, CDFG 1601, CDFG Code, SCVWD, City of San Jose Ordinance
	Evergreen Canal	Abandoned canal surrounded by grassland	<b>MyE</b>		Special status species habitat in serpentine soils	FESA (Metcalf Canyon Jewelflower, Santa Clara Valley Dudleya) CDFG Code, City of San Jose Ordinance
	Metcalf Canyon	Grassland	RnG		Intermittent stream	Section 404, CDFG 1601
	Proposed Tunnel	Grassland	<b>Mw-F2</b>		Special status species habitat in serpentine soils	FESA (Metcalf Canyon Jewelflower, Santa Clara Valley Dudleya) CDFG Code, Section 404 & CDFG 1601
	Shingle Valley Creek	Aquatic surrounded by woodland and brush	PoC		Perennial stream, woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines

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MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Las Animas Creek	Aquatic surrounded by woodland and brush	PoC		Perennial stream, woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	San Felipe Creek	Aquatic surrounded by woodland and brush	Rg, ZaC		Perennial stream, woodland	Section 404, CDFG 1601, Santa Clara County Oak Protection Guidelines
	Proposed tunnel	Woodland and brush	Gh-G2, LhG		Woodland	Santa Clara County Oak Protection Guidelines
	East Fork Coyote Creek (Long Canyon)	Aquatic surrounded by woodland and brush	GcG, Gh-G2		Perennial stream, woodland	Section 404, CDFG 1601
	Proposed tunnel	Woodland and brush	GcG, Gh-G2		Woodland	Stanislaus County Oak Protection Guidelines
	South Fork Orestimba Creek	Aquatic surrounded by woodland and brush	304		Intermittent stream, woodland	Section 404 & CDFG 1601, Stanislaus County Oak Protection Guidelines
	Proposed Tunnel	Woodland and brush	506		Woodland	Stanislaus County Oak Protection Guidelines
	Orestimba Creek	Aquatic surrounded by woodland	145, 506		Intermittent stream and woodland	Section 404, CDFG 1601
	Proposed tunnel	Woodland and grassland	501		San Joaquin kit fox foraging habitat and woodland	CESA (San Joaquin Kit Fox)
	Tributary to Orestimba Creek	Aquatic surrounded by woodland and grassland	501		Intermittent stream, San Joaquin kit fox foraging habitat, and woodland	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Tributary to Orestimba Creek	Aquatic surrounded by grassland	505		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Tributary to Orestimba Creek	Aquatic surrounded by grassland	521		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Orestimba Creek	Aquatic surrounded by grassland	144		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Tributary to Orestimba Creek	Aquatic surrounded by brush and grassland	144, 506		Intermittent stream and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Orestimba Creek	Aquatic surrounded by woodland, brush and grassland	145, 401		Intermittent stream, woodland, and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Proposed tunnel	Grassland	500		San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)
	Orestimba Creek	Aquatic surrounded by woodland and grassland	220		Intermittent stream, woodland, and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Woodland along Orestimba Creek	Woodland surrounded by grassland	145, 220		Woodland and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) CDFG 1601
	Orestimba Creek	Aquatic surrounded by woodland and grassland	220		Intermittent stream, Woodland and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 & CDFG 1601
	Woodland along Orestimba Creek	Woodland and grassland	220		Woodland and San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox) CDFG 1601

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MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	California Aqueduct	Aqueduct surrounded by grassland	271, 430		San Joaquin kit fox foraging habitat	DWR CESA (San Joaquin Kit Fox)
	Interstate Highway 5	Grassland	122, 401		San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)
	Delta Mendota Canal	Aqueduct surrounded by grassland and farmland	122, 271		San Joaquin kit fox foraging habitat	SLDMWA CESA (San Joaquin Kit Fox)
	Main Canal	Aqueduct surrounded by farmland	271		San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)
	Unnamed ditch at Kilburn Road	Ditch surrounded by farmland	274		Ditch	Section 404, CDFG 1601
	Old oxbow of the San Joaquin River	Wetland surrounded by woodland and farmland	<b>128</b>		Wetland and woodland	Section 404, CDFG 1601
	San Joaquin River between Mile 110 and Mile 111	Aquatic surrounded by woodland and farmland	<b>180, CsB</b>		Wetland and woodland	Section 404, CDFG 1601
	West branch unnamed slough south of August Road	Wetland surrounded by farmland	RkA, TcA		Wetland	Section 404, CDFG 1601
	East branch unnamed slough south of August Road	Wetland surrounded by farmland	ThA		Wetland	Section 404, CDFG 1601
	Horse Drain	Wetland surrounded by farmland	DyA		Wetland	Section 404, CDFG 1601
	Lateral No. 6 Ditch	Wetland surrounded by farmland	HoA		Wetland	Section 404, CDFG 1601
	Lateral No. 7 Ditch	Wetland surrounded by farmland	DfA		Wetland	Section 404, CDFG 1601

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MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Highline Canal	Canal surrounded by farmland	DkA, DfA		Canal	MID
	Merced River between Mile 21 and Mile 22	Aquatic surrounded by woodland and ponds	GbA		Wetland and woodland	Section 404, CDFG 1601
	Livingston Canal	Canal surrounded by farmland	DfB		Canal	MID
	Livingston Canal	Canal surrounded by farmland	DfA		Canal	MID
	Livingston Canal	Canal surrounded by farmland	AfA		Canal	MID
	North Bloom Lateral Ditch	Ditch surrounded by farmland	AfA		Ditch	Section 404, CDFG 1601
	South Bloom Lateral Ditch	Ditch surrounded by farmland	AnA		Ditch	Section 404, CDFG 1601
<b>State Route 152 Route (Via Gilroy to Chowchilla) [continued from Page 99, Table 4]</b>						
59.00	Tulare Hill (N)	Grassland	<b>Mw-F2</b>	No rating	Special status species habitat in serpentine soils	FESA, CDFG Code, City of San Jose Ordinance
59.20	Tulare Hill (S)	Grassland	<b>Mw-F2</b>	No rating	Special status species habitat in serpentine soils	FESA, CDFG Code, City of San Jose Ordinance
59.24	Fisher Creek (former Laguna Seca overflow channel)	Aquatic surrounded by woodland	<b>Mw-F2</b> , YeA, Sv	PEMY	Intermittent stream	Section 404, CDFG 1601, SCVWD
66.34	Unnamed ditch	Farmland	SdA, PoA	No rating	ditch	Section 401, Section 404, CDFG 1601
69.71	East Llagas Creek	Aquatic surrounded by woodland and farmland	<b>Rg</b>	PSSc	Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601 SCVWD
70.55	Llagas Creek	Aquatic surrounded by farmland	ArA, SdA, PpA	PEMCx	Intermittent stream	FESA (Steelhead) Section 404 SCVWD CDFG 1601

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
70.55	Llagas Creek	Aquatic surrounded by farmland	ArA, SdA, PpA	PEMCx	Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601 SCVWD
76.16	West Fork Llagas Creek	Aquatic surrounded by farmland and urban	PoA	R4SBAx	Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601 SCVWD
76.46	Miller Slough	Aquatic surrounded by farmland and urban	PoA	No rating	Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601
<b><i>Gilroy Bypass Option [see also above]</i></b>						
	Llagas Creek	Aquatic surrounded by farmland	YaA, YeA, Ca		Intermittent stream	FESA (Steelhead) Section 404 SCVWD CDFG 1601
	Dexter Creek	Aquatic surrounded by farmland	Ce		Intermittent stream	Section 404 CDFG 1601 SCVWD
	Jones Creek	Aquatic surrounded by farmland	Ch		Intermittent stream	Section 404 CDFG 1601 SCVWD
	San Ysidro Creek	Aquatic surrounded by farmland	Ch		Intermittent stream	Section 404 CDFG 1601 SCVWD
	San Felipe Lake	Aquatic surrounded by woodland and farmland	Wc		Lake	FESA (Steelhead) Section 404
	Ortega Creek	Aquatic surrounded by farmland	Pb		Stream	Section 404 CDFG 1601
<b><i>Alternative Alignment for 145 kph Station Siding Speed Option [see also above]</i></b>						
	Unnamed tributary to Llagas Creek	Aquatic surrounded by farmland and urban	YaA		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601

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MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Uvas Creek	Aquatic surrounded by farmland	Rg		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601 SCVWD
	Carnadero Creek	Aquatic surrounded by farmland	Rg		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601 SCVWD
	Unnamed ditch	Aquatic surrounded by farmland	Pa		Ditch	Section 404 & CDFG 1601
	Pajaro River	Aquatic surrounded by farmland	Rg		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601 SCVWD
	Unnamed ditch	Aquatic surrounded by farmland	GuE		Ditch	Section 404 & CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	Ww2		Ditch	Section 404 & CDFG 1601
	Tequisquita Slough	Aquatic surrounded by farmland	Ww2		Intermittent stream	Section 404 & CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	Pa		Ditch	FESA (Steelhead) Section 404 CDFG 1601
	Pacheco Creek	Aquatic surrounded by farmland	Rw		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601
	Tributary to Ortega Creek	Aquatic surrounded by farmland	Pa		Intermittent stream	Section 404 & CDFG 1601
	Proposed Tunnel	Grassland	YeC		San Joaquin Kit Fox foraging habitat	CESA (San Joaquin Kit Fox)

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
<i>Gilroy Station Option [see also above]</i>						
	Unnamed tributary to Llagas Creek	Aquatic surrounded by farmland and urban	YaA		Ditch	FESA (Steelhead) Section 404 CDFG 1601
	Gilroy Sewage Disposal Ponds	Managed aquatic	Ca, Pb		Constructed ponds	City of Gilroy
	Unnamed ditch	Aquatic surrounded by farmland	Cc, Pa		Ditch	Section 404 & CDFG 1601
	Pajaro River	Aquatic surrounded by farmland	<b>Rg</b>		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601 SCVWD
	Millers Canal	Aquatic surrounded by farmland	<b>Wc</b>		Ditch	Section 404 & CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>Wc</b>		Ditch	Section 404 & CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>Wc</b>		Ditch	Section 404 & CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>Ww2</b>		Ditch	Section 404 & CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>Ww2</b>		Ditch	Section 404 & CDFG 1601
	Tequisquita Slough	Aquatic surrounded by farmland	<b>Ww2</b>		Intermittent stream	Section 404 & CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>Ww2</b>		Ditch	Section 404 & CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>Ww2</b>		Ditch	Section 404 & CDFG 1601
	Pacheco Creek	Aquatic surrounded by farmland	<b>MhA</b>		Intermittent stream	Section 404 & CDFG 1601

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Tributary to Ortega Creek	Aquatic surrounded by farmland	Pa		Intermittent stream	Section 404 & CDFG 1601
	Proposed Tunnel	Grassland	YeC		San Joaquin kit fox foraging habitat	CESA (San Joaquin Kit Fox)
	Tributary to Pacheco Creek	Aquatic surrounded by grassland	YaA		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601
	Tributary to Pacheco Creek	Aquatic surrounded by grassland	GbB		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601
	Elephant Head Creek	Aquatic surrounded by grassland	Rg		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601
	Tributary to Pacheco Creek	Aquatic surrounded by grassland	YaB		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601
	Tributary to Pacheco Creek	Aquatic surrounded by grassland	GbB, GcD2		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601
	Pacheco Creek	Aquatic surrounded by woodland	Rg		Intermittent stream and woodland	FESA (Steelhead) Section 404 CDFG 1601
	Proposed Tunnel	Woodland	VaE2		Woodland	Santa Clara County Oak Protection Guidelines
	Tributary to Pacheco Creek	Aquatic surrounded by woodland	VaE2 VaG2		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601
	Proposed Tunnel	Woodland	VaE2 VaG2		Woodland	Santa Clara County Oak Protection Guidelines
	South Fork Pacheco Creek	Aquatic surrounded by woodland	VaG2		Perennial stream	FESA (Steelhead) Section 404 CDFG 1601 Santa Clara County Oak Protection Guidelines

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Proposed Tunnel	Woodland	VaG2		Woodland and possible woodland	Santa Clara County Oak Protection Guidelines
	Pacheco Creek	Aquatic surrounded by grassland and woodland	VaG2		Intermittent stream	FESA (Steelhead) Section 404 CDFG 1601
	Proposed Tunnel	Grassland, brush, and woodland	VaE2		San Joaquin Kit Fox foraging habitat	CESA (San Joaquin Kit Fox)
	Tributary to San Luis Reservoir	Aquatic surrounded by grassland, brush, and woodland	191, 195		San Joaquin Kit Fox foraging habitat	CESA (San Joaquin Kit Fox)
	Tributary to San Luis Reservoir	Aquatic surrounded by grassland, brush, and woodland	215		San Joaquin Kit Fox foraging habitat	CESA (San Joaquin Kit Fox)
	Proposed Tunnel	Grassland, brush, and woodland	196		San Joaquin Kit Fox foraging habitat	CESA (San Joaquin Kit Fox)
	Cottonwood Creek	Aquatic surrounded by grassland and woodland	184		Intermittent stream	CESA (San Joaquin Kit Fox) Section 404 CDFG 1601
	Proposed Tunnel	Grassland and brush	217		San Joaquin Kit Fox foraging habitat	CESA (San Joaquin Kit Fox)
	Romero Creek	Aquatic surrounded by grassland	284		San Joaquin Kit Fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 CDFG 1601
	Tule Lake	Aquatic surrounded by grassland	284		San Joaquin Kit Fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 CDFG 1601
	Tributary to Romero Creek	Aquatic surrounded by grassland	102		San Joaquin Kit Fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 CDFG 1601

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Romero Creek	Aquatic surrounded by grassland	107, <b>220</b>		San Joaquin Kit Fox foraging habitat	CESA (San Joaquin Kit Fox) Section 404 CDFG 1601
	California Aqueduct	Aquatic surrounded by farmland	106, 163		Aqueduct	DWR
	Delta Mendota Canal	Aquatic surrounded by farmland	106, 163		Aqueduct	SLDMWA
	Outside Canal	Aquatic surrounded by farmland	116		Canal	
	Tributary to San Luis Wasteway	Aquatic surrounded by farmland	116		Intermittent stream	Section 404 CDFG 1601
	Main Canal	Aquatic surrounded by farmland	<b>168</b>		Canal	
	Marsh east of Main Canal	Marsh surrounded by farmland	<b>236</b>		Marsh	Section 404
	Playa west of San Luis Wasteway	Playa surrounded by farmland	<b>234</b>		Playa	Section 404
	San Luis Wasteway	Aquatic surrounded by farmland	<b>234</b>		Intermittent stream	Section 404 CDFG 1601
	Outlet of lake west of Volta	Aquatic surrounded by farmland	<b>234</b>		Lake and marsh	Section 404 CDFG 1601
	Unnamed ditch in Volta	Aquatic surrounded by farmland	<b>236</b>		Ditch	Section 404 CDFG 1601
	Unnamed ditch east of Volta	Aquatic surrounded by farmland	<b>236</b> , 279		Ditch	Section 404 CDFG 1601
	Unnamed ditch west of Los Banos Creek	Aquatic surrounded by farmland	<b>236</b>		Ditch	Section 404 CDFG 1601
	Los Banos Creek	Aquatic surrounded by farmland	274		Intermittent stream	Section 404 CDFG 1601

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Unnamed ditch east of Los Banos Creek	Aquatic surrounded by farmland	274		Ditch	Section 404 CDFG 1601
	Unnamed creek east of Los Banos Creek	Aquatic surrounded by farmland	<b>236</b> , 274		Intermittent stream	Section 404 CDFG 1601
	Unnamed ditch at Mexican Lane	Aquatic surrounded by farmland	<b>192</b> , <b>236</b>		Ditch	Section 404 CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	253		Ditch	Section 404 CDFG 1601
	Unnamed ditch at North Mercey Springs Road	Aquatic surrounded by farmland	<b>192</b>		Ditch	Section 404 CDFG 1601
	Arroyo Canal	Aquatic surrounded by farmland	<b>141</b>		Canal	
	San Luis Canal	Aquatic surrounded by farmland	<b>141</b>		Canal	
	Marsh west of Mud Slough	Wetland surrounded by farmland	<b>186</b>		Marsh	Section 404
	Mud Slough	Aquatic surrounded by farmland	<b>101</b>		Slough	Section 404 CDFG 1601
	San Pedro Canal	Aquatic surrounded by farmland	<b>101</b>		Canal	
	Marsh and playa east of Mud Slough	Wetland surrounded by farmland	<b>101</b>		Marsh and playa	Section 404
	Boundary Drain	Aquatic surrounded by farmland	<b>178</b>		Slough	Section 404 CDFG 1601
	Devon Drain	Aquatic surrounded by farmland	<b>103</b>		Slough	Section 404 CDFG 1601
	Marsh west of West Delta Canal	Aquatic surrounded by farmland	<b>103</b>		Marsh	Section 404

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	West Delta Canal	Aquatic surrounded by farmland	<b>103</b>		Canal	
	Unnamed ditch	Aquatic surrounded by farmland	<b>103</b>		Ditch	Section 404 CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>139</b>		Ditch	Section 404 CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>139</b>		Ditch	Section 404 CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>139</b>		Ditch	Section 404 CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>178</b>		Ditch	Section 404 CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>178</b>		Ditch	Section 404 CDFG 1601
	Delta Canal	Aquatic surrounded by farmland	<b>103</b>		Canal	
	East Delta Canal	Aquatic surrounded by farmland	<b>103</b>		Canal	
	Belmont Drain	Aquatic surrounded by farmland	<b>170</b>		Slough	Section 404 CDFG 1601
	Poso Drain	Aquatic surrounded by farmland	<b>170</b>		Slough	Section 404 CDFG 1601
	Delta No. 1 Canal	Aquatic surrounded by farmland	<b>170</b>		Canal	
	Unnamed ditch	Aquatic surrounded by farmland	<b>170</b>		Ditch	Section 404 CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>170</b>		Ditch	Section 404 CDFG 1601

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Unnamed ditch	Aquatic surrounded by farmland	<b>170</b>		Ditch	Section 404 CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>103</b>		Ditch	Section 404 CDFG 1601
	West San Juan Drain	Aquatic surrounded by farmland	<b>170</b>		Slough	Section 404 CDFG 1601
	West San Juan Drain No. 1	Aquatic surrounded by farmland	<b>103</b>		Slough	Section 404 CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>180</b>		Ditch	Section 404 CDFG 1601
	San Juan Canal	Aquatic surrounded by farmland	<b>137</b>		Canal	
	San Juan Drain	Aquatic surrounded by farmland	<b>139</b>		Slough	Section 404 CDFG 1601
	O'Banion Duck Ponds	Aquatic surrounded by farmland	<b>139</b>		Constructed ponds	
	Playa east of O'Banion Duck Ponds	Aquatic surrounded by marsh	<b>139</b>		Playa	Section 404
	Temple Santa Rita Canal	Aquatic surrounded by farmland	<b>103</b>		Canal	
	West Santa Rita Drain	Aquatic surrounded by farmland	<b>139, 178</b>		Slough	Section 404 CDFG 1601
	Unnamed ditch	Aquatic surrounded by farmland	<b>103, 139</b>		Ditch	Section 404 CDFG 1601
	Tributary ditch to the Escano Ditch	Aquatic surrounded by farmland	<b>103, 139</b>		Ditch	Section 404 CDFG 1601
	Diary Field Ditch No. 1	Aquatic surrounded by farmland	<b>139, 186</b>		Ditch	Section 404 CDFG 1601

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Salt Slough	Aquatic surrounded by farmland	<b>186</b>		Slough	Section 404 CDFG 1601
	Tributary to Wood Slough	Aquatic surrounded by farmland	<b>103, 139</b>		Slough	Section 404 CDFG 1601
	Wood Slough	Aquatic surrounded by farmland	<b>139</b>		Slough	Section 404 CDFG 1601
	Tributary to Wood Slough	Aquatic surrounded by farmland	<b>228</b>		Slough	Section 404 CDFG 1601
	Riverside Canal	Aquatic surrounded by farmland	<b>283</b>		Canal	
	San Joaquin River North of Mile 170	Aquatic surrounded by farmland	<b>283</b>		Intermittent stream	Section 404 CDFG 1601
	Mariposa Slough	Aquatic surrounded by farmland	<b>CeA, PxA</b>		Slough	Section 404 CDFG 1601
	Eastside Bypass	Aquatic surrounded by farmland	<b>FbA</b>		Canal	Section 404 (if wetlands are present in the hydric soils onsite)
	Chowchilla River	Aquatic surrounded by farmland	PdA		Intermittent stream	Section 404 CDFG 1601
	Chowchilla River	Aquatic surrounded by farmland	HaA, PdA		Intermittent stream	Section 404 CDFG 1601
	Chowchilla River	Aquatic surrounded by farmland	HaA, PdA		Intermittent stream	Section 404 CDFG 1601
	Chowchilla River	Aquatic surrounded by farmland	HaA		Intermittent stream	Section 404 CDFG 1601
	Justin Canal	Aquatic surrounded by farmland	CfA		Canal	
	Ash Slough	Seasonal wetland surrounded by farmland	<b>Rh</b>		Wash	Section 404 CDFG 1601

**Table 5. Results of the Manual Analysis of USGS and Soil Survey Maps and Regulatory Constraints of the High-Speed Rail Project Proposed Resource Crossings, San Francisco to Merced (Chowchilla) Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Berenda Slough	Seasonal wetland surrounded by farmland	<b>Rh</b>		Wash	Section 404 CDFG 1601
	Califa Canal	Aquatic surrounded by farmland	AtA, SaA		Canal	

1 = Milepost based on Caltrain PCJPB right-of-way; MP 0.0 is downtown San Francisco.

2 = Hydric soils are in **bold type** which denotes one of three conditions (hydric soils, hydrology, hydrophytic vegetation) characteristic of wetlands; soil codes are from Arkley (1962), Arkley (1964), Ferrari & McElhiney (2002), Helseth (1968), Hokholt & Kashiwagi (1993), Isgrig (1969), Lindsey (1974), Nazar (1990), Stromberg et al. (1962), and Welch (1981); soil series are discussed in the text.

Serpentine soils, derived from ultramafic rocks are in **bold type** which denotes Special-status species habitat for several rare plants that are indigenous to ultramafic substrates.

3 = NWI is the National Wetland Inventory; habitats are classified by the Cowardin system; "E" is estuarine, "P" is palustrine, and "R" is riverine.

4 = ACFC & WCD (Alameda County Flood Control and Water Conservation District); BCDC (Bay Conservation & Development Commission); CDFG (California Department of Fish & Game); CESA (California State Endangered Species Act); FESA (Federal Endangered Species Act), MID (Merced Irrigation District), SCVWD (Santa Clara Valley Water District), SLDMWA (San Luis-Delta Mendota Water Authority), Section 401 and 404 (Clean Water Act), Section (CDFG) 1601 (Streambed Alteration Agreement).

5 = NOTE: for planning purposes only; based on a manual review of USGS quads.

**Table 6. Results of the Manual Analysis of USGS and Soil Survey Maps of the Proposed High-Speed Rail Project Proposed Resource Crossings, Oakland to San Jose Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Lake Merritt Tidal Channel (North Segment)		146	E2USN	Tidal basin	Section 10, Section 404, BCDC
	Lake Merritt Tidal Channel (South Segment)	Aquatic surrounded by urban landscape	146	E2USN	Tidal basin	Section 10, Section 404, BCDC
	Unnamed Tidal Channel	Aquatic surrounded by urban landscape	146	E1UBL	Tidal basin edge	Section 10
	Lion Creek	Aquatic surrounded by urban landscape	146	E2SBNx	Tidal channel & possible wetland	Section 10, Section 404
	Unnamed Tidal Channel	Aquatic surrounded by urban landscape	146	E2EMNx	Tidal channel & possible wetland	Section 10, Section 404
	Arroyo Viejo Creek	Aquatic surrounded by urban landscape	146		Creek	Section 10, Section 404, Section 1601, ACFC & WCD
	Unnamed Tidal Channel	Aquatic surrounded by urban landscape	146		Tidal channel & possible wetland	Section 10, Section 404
	San Leandro Creek	Aquatic surrounded by urban landscape	111		Creek	Section 404, Section 1601, ACFC & WCD
	Estudillo Canal	Aquatic surrounded by urban landscape	111		Creek	Section 404, Section 1601, ACFC & WCD
	San Lorenzo Creek	Aquatic surrounded by urban landscape	161		Creek	Section 404, Section 1601, ACFC & WCD
	Ward Creek	Aquatic surrounded by urban landscape	107		Creek	Section 404, Section 1601, ACFC & WCD
	Tributary to Alameda Creek	Aquatic surrounded by urban landscape	140		Creek	Section 404, Section 1601, ACFC & WCD

**Table 6. Results of the Manual Analysis of USGS and Soil Survey Maps of the Proposed High-Speed Rail Project Proposed Resource Crossings, Oakland to San Jose Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Dry Creek (West Reach)	Aquatic surrounded by urban landscape	136		Creek	Section 404, Section 1601, ACFC & WCD
	Tributary to Alameda Creek (West Reach)	Aquatic surrounded by urban landscape	140		Creek	Section 404, Section 1601, ACFC & WCD
	Quarry Lakes	Aquatic surrounded by urban landscape	135		Several lakes in an abandoned gravel quarry	CDFG Code (Western Pond Turtle), Alameda County Water Resources
	Alameda Creek (West Reach)	Aquatic surrounded by urban landscape	141		Creek	Section 404 Section 1601 CDFG Code FESA (Steelhead), ACFC & WCD
	Tule Pond	Aquatic surrounded by urban landscape	161		Two man-made ponds	CDFG Code (Western Pond Turtle)
	Ponds in Fremont Central Park	Aquatic surrounded by urban landscape	154		Man-made pond	CDFG Code (Western Pond Turtle)
	Mission Creek	Aquatic surrounded by urban landscape	154		Creek	Section 404, Section 1601, ACFC & WCD
	Hetch Hetchy Aqueduct	Urban landscape	154	N/A	Aqueduct	SFPUC
	Tributary to Mission Creek	Aquatic surrounded by urban landscape	112		Creek	Section 404, Section 1601, ACFC & WCD
	Cañada del Aliso Creek	Aquatic surrounded by urban landscape	111		Creek	Section 404, Section 1601, ACFC & WCD
	Unnamed Creek south of Grimmer Boulevard	Aquatic surrounded by urban landscape	107		Creek	Section 404, Section 1601, ACFC & WCD
	Agua Caliente Creek	Aquatic surrounded by urban landscape	112		Creek	Section 404, Section 1601, ACFC & WCD

**Table 6. Results of the Manual Analysis of USGS and Soil Survey Maps of the Proposed High-Speed Rail Project Proposed Resource Crossings, Oakland to San Jose Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Agua Fria Creek	Aquatic surrounded by urban landscape	107		Creek	Section 404, Section 1601, ACFC & WCD
	Toroges Creek	Aquatic surrounded by urban landscape	107		Creek	Section 404, Section 1601, ACFC & WCD
	Unnamed Ditch N of Kato Road	Aquatic surrounded by urban landscape and grassland	107		Creek	Section 404, Section 1601, ACFC & WCD
	Unnamed Creek N of Kato Road	Aquatic surrounded by urban landscape	134		Creek	Section 404, Section 1601, ACFC & WCD
	Lower Penitencia Creek	Aquatic surrounded by swamp	Pf		Tidal channel	Section 404, Section 1601, SCVWD
	Hetch Hetchy Aqueduct	Urban landscape	Of		Aqueduct	SFPUC
	Coyote Creek	Aquatic surrounded by woodland	Mk		River	Section 404, Section 1601, SCVWD, City of San Jose Ordinance
	Guadalupe River	Aquatic surrounded by woodland	Mh		River	Section 404, Section 1601, SCVWD, City of San Jose Ordinance
<b>Via Newark and Santa Clara (West Branch)</b>						
	Dry Creek (East Reach)	Aquatic surrounded by urban landscape	136		Creek	Section 404, Section 1601, ACFC & WCD
	Tributary to Alameda Creek (East Reach)	Aquatic surrounded by urban landscape	140		Creek	Section 404, Section 1601, ACFC & WCD
	Alameda Creek (East Reach)	Aquatic surrounded by urban landscape	141		Creek	Section 404, Section 1601, ACFC & WCD CDFG Code FESA (Steelhead)

**Table 6. Results of the Manual Analysis of USGS and Soil Survey Maps of the Proposed High-Speed Rail Project Proposed Resource Crossings, Oakland to San Jose Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Unnamed Creek at I-880	Aquatic surrounded by urban landscape	111		Creek	Section 404, Section 1601, ACFC & WCD CDFG Code FESA (Steelhead)
	Hetch Hetchy Aqueduct	Urban landscape	125	N/A	Aqueduct	SFPUC
	Plummer Creek	Aquatic surrounded by swamp	125		Tidal channel	Section 404, Section 1601, ACFC & WCD
	Mowry Slough	Aquatic surrounded by swamp	133		Tidal channel	Section 404, Section 1601, ACFC & WCD
	Tributary to Mowry Slough	Aquatic surrounded by swamp	132		Tidal channel	Section 404, Section 1601, ACFC & WCD
	Albrae Slough	Aquatic surrounded by swamp	154		Tidal channel	Section 404, Section 1601, ACFC & WCD
	Salt Evaporators North of Mud Slough	Aquatic surrounded by swamp	138		Salt evaporators	CDFG Code, CESA, FESA (Clapper Rail)
	Mud Slough	Aquatic surrounded by swamp	137		Tidal channel	Section 404, Section 1601, CDFG Code, CESA, FESA (Clapper Rail)
	Coyote Creek	Aquatic surrounded by swamp	137		Tidal channel	Section 404, Section 1601, CDFG Code, SCVWD, CESA, FESA (Clapper Rail, Salmon, Steelhead)
	Saltmarsh S of Coyote Creek	Aquatic surrounded by swamp	<b>Tf</b>		Tidal marsh	CDFG Code, CESA, FESA (Clapper Rail, Salt Marsh Harvest Mouse)
	Salt Evaporators South of Coyote Creek	Aquatic surrounded by swamp	<b>Tf</b>		Salt evaporators	CDFG Code, CESA, FESA (Clapper Rail)

**Table 6. Results of the Manual Analysis of USGS and Soil Survey Maps of the Proposed High-Speed Rail Project Proposed Resource Crossings, Oakland to San Jose Segment<sup>5</sup>**

MP <sup>1</sup>	Site Name	Vegetation	Soil <sup>2</sup>	NWI <sup>3</sup>	Resource	Regulatory Constraints <sup>4</sup>
	Alviso Salt Marsh	Aquatic surrounded by swamp	<b>Tf</b>		Tidal marsh	CDFG Code, CESA, FESA (Clapper Rail, Salt Marsh Harvest Mouse)
	Guadalupe River	Aquatic surrounded by swamp	<b>Tf</b>		Tidal channel	Section 404, Section 1601, CDFG Code, SCVWD, CESA, FESA (Salmon, Steelhead)

1 = Mileposts for this segment are unavailable.

2 = Hydric soils are in **bold type** which denote one of three conditions (hydric soils, hydrology, hydrophytic vegetation) characteristic of wetlands having been met for the site; soil codes are from Helseth (1968), Hokholt & Kashiwagi (1993), Isgrig (1969), Lindsey (1974), Nazar (1990), and Welch (1981); soil series are discussed in the text.

3 = NWI is the National Wetland Inventory; habitats are classified by the Cowardin system; "E" is estuarine, "P" is palustrine, and "R" is riverine.

4 = ACFC & WCD (Alameda County Flood Control and Water Conservation District); BCDC (Bay Conservation & Development Commission); CDFG (California Department of Fish & Game); CESA (California State Endangered Species Act and CDFG Section 2081); FESA (Federal Endangered Species Act), MID (Merced Irrigation District), SCVWD (Santa Clara Valley Water District), Section 401 and 404 (Clean Water Act), Section 1601 (Streambed Alteration Agreement).

5 = NOTE: for planning purposes only; based on a manual review of USGS quads.

## 7.2 SUMMARY OF RAW DATA FROM GEOGRAPHICAL INFORMATION SYSTEM (GIS) DATA LAYERS

The results of the excerpts from EXCEL spreadsheet-based GIS output based on 1,000 foot wide corridors of the various alignments are presented in Tables 7-9. Table 7 presents to total acreages of WHR plant communities extracted from the GIS Analysis of the California GAP Analysis data layer, which is arranged in columns by alignment. Table 8 reports on the acreage of sensitive plant and wildlife species, and plant communities of special concern "hits" of the proposed route with the California Natural Diversity Data Base (CNDDB) GIS layer. Table 9 presents acreages of Cowardin class wetlands intersecting the proposed alternatives, from the National Wetland Inventory (NWI) GIS layer. Table 10 presents the summary of USGS geospatial data of blue-line streams that are intersected by the proposed alignments (based on 1,000-foot wide corridors, as above). Finally, Table 11 summarizes the total acreage of Special-status Species habitat intersected by each alignment including manual corrections for tunnels (geospatial data on the tunnels was not available at the time of the writing of this document).

**Table 7: Summary of vegetation types (in acres) based on GAP Data by right-of-way alignments, including the modal build-up alternative.**

GENERAL VEGETATION TYPE <sup>1</sup>	Modal	San Francisco to San Jose	Oakland to San Jose East Branch	Oakland to San Jose West Branch	Merced to San Jose North Line	Merced to San Jose North Line Minimize Tunnel	Merced to San Jose North Line Tunnel Under Henry Coe	Merced to San Jose South Line SR 152 Gilroy Bypass	Merced to San Jose South Line 145 kph Siding	Merced to San Jose South Line Gilroy Station
AGS	20124			111	2494	3038	3280	4109	3794	3794
<b>ASC</b>	297							158	158	158
BAR						315	315	225	225	225
BOP					2523	2967	2560			
BOW	585				1198	609	620	542	542	542
COW	1334					326	447	1621	1562	1562
CRC					2006	671	1150			
CRP	24671				251	197	197	15176	16462	16206
CSC	1120	98						314	314	314
<b>FEW</b>								80	80	80
DOR	1									
IRF	35341				5719	5493	5493	4626	4626	4626
<b>LAC</b>	459		70	70						
MCH					402	1225	1102			
MHW	100				370	263	4	247	247	247
OVN	12821				529	565	565	631	631	631
PAS	610									
RIV	299									
URB	53929	11724	10983	11908	2919	2936	2905	3101	3101	3101
<b>VOW</b>	293				493	128	78	4	247	247
<b>VRI</b>	138				62	62	62			

GENERAL VEGETATION TYPE <sup>1</sup>	Modal	San Francisco to San Jose	Oakland to San Jose East Branch	Oakland to San Jose West Branch	Merced to San Jose North Line	Merced to San Jose North Line Minimize Tunnel	Merced to San Jose North Line Tunnel Under Henry Coe	Merced to San Jose South Line SR 152 Gilroy Bypass	Merced to San Jose South Line 145 kph Siding	Merced to San Jose South Line Gilroy Station
Number of GAP polygons with sensitive community elements <sup>2</sup> (Holland 1986)	6	0	0	1	3	3	3	2	2	2
Number of polygons with sensitive riparian or wetland elements <sup>2</sup>	39	3	5	7	19	24	23	13	13	13
<sup>1</sup> Codes defined in Table 3; sensitive WHR habitat types appear in <b>bold type</b> : AGS = annual grassland <b>ASC</b> = alkali desert scrub BAR = barren BOP = blue oak-foothill pine BOW = blue oak woodland COW = coastal oak woodland CRC = chamise-redshank chaparral CRP = cropland  <sup>2</sup> Holland (1986).  <sup>3</sup> Zeiner <i>et al.</i> (1988, 1990a, 1990b).					CSC = coast scrub <b>FEW</b> = freshwater emergent wetland IRF = irrigated row and field crops <b>LAC</b> = lacustrine MCH = mixed chaparral MHW = montane hardwood OVN = orchard and vineyard <b>VOW</b> = valley oak woodland <b>VRI</b> = valley-foothill riparian					

**Table 8: Special-status Species Acreage based on GIS Data by right-of-way alignments and the CNDDDB, Bay Area to Merced Region.**

Common Name of Special-status Species <sup>1</sup> or Sensitive Plant Community <sup>2</sup>	Modal	San Francisco to San Jose	Oakland to San Jose East Branch	Oakland to San Jose West Branch	Merced to San Jose North Line Northern Alignment Option	Merced to San Jose North Line Minimize Tunnel Option	Merced to San Jose North Line Tunnel Under Henry Coe Option	Merced to San Jose South Line State Route 152 Gilroy Bypass Option	Merced to San Jose South Line 145 kph Siding Option	Merced to San Jose South Line Gilroy Station Option
ALKALI MILK-VETCH	3277	1506	129	156		324				
BAY CHECKERSPOT BUTTERFLY	504				552		957			
BEACH LAYIA	1	2002								
BIG TARPLANT	24									
BLUNT-NOSED LEOPARD LIZARD	544									
BRITTLESCALE	2537									
BURROWING OWL (BURROW SITES)	3214		19	15	10	10	10	13	13	13
CALIFORNIA BLACK RAIL	128									
CALIFORNIA CLAPPER RAIL	822	390								
CALIFORNIA HORNED LARK	114									
CALIFORNIA HORNED LIZARD	65									
CALIFORNIA LEAST TERN	4									
CALIFORNIA LINDERIELLA	2225									
CALIFORNIA RED-LEGGED FROG	22226	65		4				13	4	4
CALIFORNIA SEABLITE	3446									
CALIFORNIA TIGER SALAMANDER	2479	2359	2600	2412	2926	2926	2974	3415	3405	3405



Common Name of Special-status Species <sup>1</sup> or Sensitive Plant Community <sup>2</sup>	Modal	San Francisco to San Jose	Oakland to San Jose East Branch	Oakland to San Jose West Branch	Merced to San Jose North Line Northern Alignment Option	Merced to San Jose North Line Minimize Tunnel Option	Merced to San Jose North Line Tunnel Under Henry Coe Option	Merced to San Jose South Line State Route 152 Gilroy Bypass Option	Merced to San Jose South Line 145 kph Siding Option	Merced to San Jose South Line Gilroy Station Option
CALLIPPE SILVERSPOT BUTTERFLY	2	73								
CAPER-FRUITED TROPIDOCARPUM	79									
CARQUINEZ GOLDENBUSH	35									
<b>CISMONTANE ALKALI MARSH</b>	5							639	639	639
CONGDON'S TARPLANT	148	1510		553	2016	2016	2016	2016	2016	2016
CONTRA COSTA GOLDFIELDS				384						
DELTA BUTTON-CELERY	22									
DELTA TULE PEA	7									
DIABLO HELIANTHELLA	79									
DIAMOND-PETALED CALIFORNIA POPPY	529									
DOUBLE-CRESTED CORMORANT	69									
DWARF DOWNINGIA	49									
EDGEWOOD BLIND HARVESTMAN								300	300	300
FERRIS'S MILK-VETCH	27									
FOOTHILL YELLOW-LEGGED FROG	8									
FRAGRANT FRITILLARY	381						1			
GIANT GARTER SNAKE	1533							699	699	699
GIANT KANGAROO RAT	3									
GREAT BLUE HERON			11	28				3	3	3



Common Name of Special-status Species <sup>1</sup> or Sensitive Plant Community <sup>2</sup>	Modal	San Francisco to San Jose	Oakland to San Jose East Branch	Oakland to San Jose West Branch	Merced to San Jose North Line Northern Alignment Option	Merced to San Jose North Line Minimize Tunnel Option	Merced to San Jose North Line Tunnel Under Henry Coe Option	Merced to San Jose South Line State Route 152 Gilroy Bypass Option	Merced to San Jose South Line 145 kph Siding Option	Merced to San Jose South Line Gilroy Station Option
HAIRLESS POPCORN-FLOWER	81			320						
HALL'S BUSH MALLOW	3474		39		58	56		108	108	108
HEARTSCALE	67							351	351	351
HISPID BIRD'S BEAK								86	86	86
KELLOGG'S HORKELIA	26		1812	1812						
LEAST BELL'S VIREO	435							6		
LEGENERE	478									
MADERA LINANTHUS	55									
MERCED MONARDELLA	3446				818	818	818			
METCALF CANYON JEWEL-FLOWER	2649				3	3	3	71	71	71
MISSION BLUE BUTTERFLY	1									
MONARCH BUTTERFLY	656									
MOST BEAUTIFUL JEWEL-FLOWER	452			352						
MT. HAMILTON COREOPSIS					4	1				
MT. HAMILTON THISTLE	57				27	49	1			
MYRTLES SILVERSPOT	98									
NAPA WESTERN FLAX						48	48			
<b>NORTHERN COASTAL SALT MARSH</b>	14			104						
<b>NORTHERN HARDPAN VERNAL POOL</b>	6									
NORTHWESTERN POND TURTLE	1333									
POINT REYES BIRD'S-BEAK	123			372						



Common Name of Special-status Species <sup>1</sup> or Sensitive Plant Community <sup>2</sup>	Modal	San Francisco to San Jose	Oakland to San Jose East Branch	Oakland to San Jose West Branch	Merced to San Jose North Line Northern Alignment Option	Merced to San Jose North Line Minimize Tunnel Option	Merced to San Jose North Line Tunnel Under Henry Coe Option	Merced to San Jose South Line State Route 152 Gilroy Bypass Option	Merced to San Jose South Line 145 kph Siding Option	Merced to San Jose South Line Gilroy Station Option
ROBUST SPINEFLOWER	22		104	104						
ROSE-MALLOW	381									
SACRAMENTO SPLITTAIL	14									
SALTMARSH COMMON YELLOWTHROAT	347		11	5						
SALT-MARSH HARVEST MOUSE			17	325						
SALT-MARSH HARVEST MOUSE	719			35						
SALT-MARSH WANDERING SHREW										
SAN FRANCISCO OWL'S-CLOVER	5	109								
SAN JOAQUIN KIT FOX	90				2019	2110	2225	3010	3124	3122
SAN JOAQUIN POCKET MOUSE	532									
SAN JOAQUIN SALTBUSH	12									
SAN JOAQUIN WHIPSNAKE	68									
SANFORD'S ARROWHEAD	44									
SANTA CLARA VALLEY DUDLEYA	5				73	92	38	4	4	4
SANTA CRUZ TARPLANT	944									
<b>SERPENTINE BUNCHGRASS</b>					455	466	337	39	39	39
SLENDER-LEAVED PONDWEED		1335								



Common Name of Special-status Species <sup>1</sup> or Sensitive Plant Community <sup>2</sup>	Modal	San Francisco to San Jose	Oakland to San Jose East Branch	Oakland to San Jose West Branch	Merced to San Jose North Line Northern Alignment Option	Merced to San Jose North Line Minimize Tunnel Option	Merced to San Jose North Line Tunnel Under Henry Coe Option	Merced to San Jose South Line State Route 152 Gilroy Bypass Option	Merced to San Jose South Line 145 kph Siding Option	Merced to San Jose South Line Gilroy Station Option
SMOOTH LESSINGIA	1				49	47	16		<1	<1
STEELHEAD-CENTRAL CALIFORNIA COAST ESU	5		34	82						
SUBTLE ORACHE	68									
SUISUN SHREW	537									
SWAINSON'S HAWK	8424					79	80			
<b>SYCAMORE ALLUVIAL WOODLAND</b>	1176					147	141	26	30	30
TIDEWATER GOBY	116		42	42						
VALLEY ELDERBERRY LONGHORN BEETLE	608				16	16	16			
<b>VALLEY OAK WOODLAND</b>	120									
<b>VALLEY SINK SCRUB</b>	2									
VERNAL POOL FAIRY SHRIMP	264									
VERNAL POOL TADPOLE SHRIMP	502									
WESTERN POND TURTLE	662				27	32	25	43	43	43
WESTERN SNOWY PLOVER	2			26						
WHITE-TAILED KITE	13									
WRIGHT'S TRICHOCORONIS	75							260	260	260
YELLOW RAIL	454									

1 = See Tables 4 and 5

2 = Sensitive Plant Communities appear in **bold-type**



**Table 9: Analysis/Comparison Table – National Wetland Inventory Acreage from GIS Data, Bay Area to Merced Region**

National Wetland Inventory Cowardin Wetland System Attribute	Modal	San Francisco to San Jose	Oakland to San Jose East Branch	Oakland to San Jose West Branch	Merced to San Jose North Line Northern Alignment Option	Merced to San Jose North Line Minimize Tunnel Option	Merced to San Jose North Line Tunnel Under Henry Coe Option	Merced to San Jose South Line State Route 152 Gilroy Bypass Option	Merced to San Jose South Line 145 kph Siding Option	Merced to San Jose South Line Gilroy Station Option
ESTUARINE	2222	150	17	259	0	0	0	0	0	0
LACUSTRINE	568	0	151	705	0	0	0	37	10	10
PALUSTRINE	2581	29	296	393	59	81	81	993	981	985
RIVERINE	1013	9448	0	5	53	131	131	64	66	64
UPLAND	140460	0	10590	10729	19056	19117	19064	24829	25764	25506
POLYGONS WITH NO DATA <sup>1</sup>	3989	2224	0	0	0	0	0	1865	1877	1877

1 = NOTE: There are no digitized data available for the following USGS NWI quadrangles--Eylar Mountain, Isabel Valley, Lick Observatory, Loma Prieta, Morgan Hill, Mount Sizer, Mount Madonna, Santa Teresa Hills.

**Table 10: Analysis/Comparison Table – United States Geological Survey (USGS) Surface Waters and Water bodies from GIS Data 1000-ft Buffer, Bay Area to Merced Region**

Features	Modal	San Francisco to San Jose	Oakland to San Jose East Branch	Oakland to San Jose West Branch	Merced to San Jose North Line Northern Alignment Option	Merced to San Jose North Line Minimize Tunnel Option	Merced to San Jose North Line Tunnel Under Henry Coe Option	Merced to San Jose South Line State Route 152 Gilroy Bypass Option	Merced to San Jose South Line 145 kph Siding Option	Merced to San Jose South Line Gilroy Station Option
Streams (lineal feet)	2,039,748	73,026	121,255	197,031	249,364	296,446	312,359	436,560	453,042	451,960
Waterbody area (acres) <sup>1</sup>	663	79	119	95	1	3	0	107	60	60

1 = Excludes 1,000-foot overlap into San Francisco Bay

**Table 11. Analysis/Comparison Table – Total Special-status Species Habitat Acreage within the 1000 –foot Buffer, Bay Area to Merced Region**

Features	Modal	San Francisco to San Jose	Oakland to San Jose East Branch	Oakland to San Jose West Branch	Merced to San Jose North Line Northern Alignment Option	Merced to San Jose North Line Minimize Tunnel Option	Merced to San Jose North Line Tunnel Under Henry Coe Option	Merced to San Jose South Line State Route 152 Gilroy Bypass Option	Merced to San Jose South Line 145 kph Siding Option	Merced to San Jose South Line Gilroy Station Option
Total Special-status Species Habitat Acreage	74,246	8,269	6,327	7,129	9,053	9,241	9,705	11,101	11,195	11,193
Total Special-status Species Habitat Acreage Corrected for Tunnels	74,246	8,269	6,327	7,129	7,378	7,762	7,793	10,236	10,344	10,331

### 7.3 List of USGS Quadrangle Maps

The following is a list of USGS Quadrangle Maps studied for the HST Alternative, Merced to Bay Area.

- Winton
- Cressey
- Turlock
- Hatch
- Crows Landing
- Newman
- Orestimba Peak
- Wilcox Ridge
- Mt. Stakes
- Isabel Valley
- Lick Observatory
- Morgan Hill
- Santa Teresa Hills
- San Jose East
- San Jose West
- Berenda
- Chowchilla
- Bliss Ranch
- Santa Rita Bridge
- Delta Ranch
- Los Banos
- Volta
- San Luis Dam
- Pacheco Peak
- Pacheco Pass
- Gilroy Hot Springs
- Gilroy
- Mt. Madonna
- Cupertino
- Mt. Sizer
- Chittenden
- San Felipe
- Crevison Peak
- Howard Ranch
- Milpitas
- Niles
- Newark
- Hayward
- San Leandro
- Oakland East
- Oakland West
- Mountain View
- Palo Alto
- San Francisco North
- San Francisco South
- Montara Mountain
- San Mateo
- Mississippi Creek
- Mustang Ranch