

3 Affected Environment, Environmental Consequences, and Mitigation Measures

3.7 Biological Resources and Wetlands

3.7.1 Introduction

Section 3.7, Biological Resources and Wetlands, of this *Merced to Fresno Section: Central Valley Wye Final Supplemental Environmental Impact Report (EIR)/Environmental Impact Statement (EIS)* (Final Supplemental EIR/EIS) updates the *Merced to Fresno Section California High-Speed Train Final Project EIR/EIS* (Merced to Fresno Final EIR/EIS) (California High-Speed Rail Authority [Authority] and Federal Railroad Administration [FRA] 2012a) with new and revised information relevant to biological and aquatic resources (including wetlands), analyzes the potential impacts of the Central Valley Wye alternatives and the No Project Alternative, and describes impact avoidance and minimization features (IAMF) that would avoid, minimize, or reduce these impacts. Where applicable, mitigation measures are proposed to further reduce, compensate for, or offset impacts of the Central Valley Wye alternatives. Section 3.7 also defines the biological resources and wetlands within the region and describes the affected environment in the resource study areas (RSA). For the purposes of this section, biological resources also include all other aquatic resources (i.e., riparian areas), regardless of whether they are waters of the United States, including wetlands under Section 404 of the Clean Water Act (CWA).

The analysis herein is consistent with the analysis conducted in the Merced to Fresno Final EIR/EIS. Both analyses examine potential impacts on biological resources and wetlands and use the same methods for evaluating impacts within the RSAs. The analyses use the same information sources, including state and regional databases and national topographic maps and elevation datasets. Where information has changed or new information has become available since the Merced to Fresno Final EIR/EIS was prepared in 2012, the analysis of the Central Valley Wye alternatives uses the updated versions of these sources or datasets. Relevant portions of the Merced to Fresno Final EIR/EIS that remain unchanged are summarized and referenced in this section.

The *Merced to Fresno Section: Central Valley Wye Biological Resources and Wetlands Technical Report* (Biological Resources and Wetlands Technical Report) (Authority and FRA 2016a) and the *Merced to Fresno Section: Central Valley Wye Second Supplemental Wetlands Delineation Report* (Second Supplemental Wetlands Delineation Report) (Authority and FRA 2018a) provide additional technical details on biological resources, and wetlands.¹ These technical reports are available via the Authority's website:

https://www.hsr.ca.gov/programs/environmental/eis_eir/draft_supplemental_merced_fresno.aspx.

Additional details on biological resources and wetlands, are provided in the following appendices in Volume II of this Final Supplemental EIR/EIS:

- Appendix 2-C, Applicable Design Standards, provides the list of relevant design standards for the Central Valley Wye alternatives.

¹ The Biological Resources and Wetlands Technical Report was finalized in 2016; however, the content of the Draft Supplemental EIR/EIS continued to evolve to incorporate the most current data and other sources of information relevant to the environmental analyses, some of which were not available at the time that the technical report was prepared. As a result, some of the information presented in the Draft Supplemental EIR/EIS was more current than the information presented in the technical report. To provide clarity on any information and data differences between the Draft Supplemental EIR/EIS and the technical report and the location of the most current information, a Central Valley Wye Technical Report Memorandum of Updates had been produced and included in Appendix 3.1-D, Central Valley Wye Technical Report Memorandum of Updates. Further changes between the Draft and Final Supplemental EIR/EIS are not recorded in that memorandum.

- Appendix 2-D.4, Biological Resources Survey Summary, provides a summary of the existing condition and potential impacts on biological resources.
- Appendix 3.7-A, U.S. Fish and Wildlife Service and National Marine Fisheries Service Species Lists, provides lists of threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat in the region and under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). Dated December 21, 2017 and January 25, 2018.
- Appendix 3.7-B, California Natural Diversity Database Search Results, provides a table of all special-status plant and animal species reported as occurring in the region by the California Department of Fish and Wildlife (CDFW). Dated December 18, 2014.
- Appendix 3.7-C, Special-Status Species with Potential to Occur in the Resource Study Area, provides a table with all special-status plant species with potential to occur in the Special-Status Plant RSA and a table with all special-status wildlife species with potential to occur in the Core Habitat RSA.

Biological and aquatic resources, including the living landscape (plants, animals, and other aspects of nature), present in the project vicinity and surrounding San Joaquin Valley are important to society for maintaining balance of the local and global ecosystem; agricultural productivity as food source; the provision of natural goods, medicines, and services; and for their social benefits (e.g., scenic beauty, recreational use, cultural value and education and research). Despite the dominance of agricultural land use, the San Joaquin Valley supports many special-status plant and animal species that depend on plant communities or wetlands that are increasingly rare (e.g., vernal pools, alkali sink scrub, riparian) (CDFW 2016a; 2016b). Four other resource sections in this Final Supplemental EIR/EIS provide additional information related to biological resources and wetlands:

- **Section 3.4, Noise and Vibration**—Impacts of the Central Valley Wye alternatives from operational noise and vibration on wildlife
- **Section 3.8, Hydrology and Water Resources**—Impacts of the Central Valley Wye alternatives on water resources including surface water hydrology, water quality, groundwater, and floodplains
- **Section 3.14, Agricultural Resources**—Impacts of the Central Valley Wye alternatives on agricultural lands that may overlap with biological resources
- **Section 3.18, Regional Growth**—Impacts of the Central Valley Wye alternatives on regional growth that could reduce available habitat for special-status species

The following topic is not included in this Final Supplemental EIR/EIS because it would not result in an impact as a result of implementing the Central Valley Wye alternatives:

- Impacts on biological resources during operation and maintenance of Pacific Gas and Electric (PG&E) facilities are not included in this Final Supplemental EIR/EIS because there would be no change from baseline conditions. Moreover, all operational and maintenance activities are addressed under the *PG&E San Joaquin Valley Operation & Maintenance Habitat Conservation Plan* (PG&E 2007).

Since publication of the Draft Supplemental EIR/EIS, in addition to the global issues described at Section S.1.2, Global Changes in the Final Supplemental EIR/EIS, of the Summary, the following substantive changes have been made to this section:

- In response to comments from CDFW, revisions in this section are primarily focused on mitigation measures, including the reclassification of several measures previously identified as IAMFs to mitigation measures. See also Section S.1.2.3, Crotch Bumble Bee and Revised Draft Supplemental EIR/Second Draft Supplemental EIS, concerning the Revised/Second Draft Supplemental EIR/EIS, Biological Resources Analysis.

Definition of Resources

The following are definitions for biological resources and wetlands analyzed in this Final Supplemental EIR/EIS. These definitions are the same as those used in the Merced to Fresno Final EIR/EIS (Authority and FRA 2012a).

- **Special-Status Species**—*Special-status species* are plants or animals that are legally protected under the federal Endangered Species Act (FESA), California Endangered Species Act (CESA), California Native Plant Protection Act, or other regulations as defined in Section 3.7.2 Laws, Regulations, and Orders. This includes species that meet the definitions of rare, threatened, or endangered under California Environmental Quality Act (CEQA) Guidelines Sections 15380 and 15125.
- **Special-Status Plant Communities**—*Special-status plant communities* (also referred to as sensitive natural communities) are plant communities that are of limited distribution statewide or within a county or region, and that are often vulnerable to the environmental impacts of projects (California Department of Fish and Game [CDFG] 2009).
- **Jurisdictional Aquatic Resources**—Aquatic resources regulated by the federal government (U.S. Army Corps of Engineers [USACE]), the State of California (State Water Resources Control Board [SWRCB], or CDFW) are collectively termed *jurisdictional aquatic resources*. Wetlands and other waters as identified during the aquatic resources delineation (see the *Merced to Fresno Section Wetlands Delineation Report, California High-Speed Train Project Final EIR/EIS* [Primary Wetlands Delineation Report] [Authority and FRA 2012b] and the Second Supplemental Wetlands Delineation Report [Authority and FRA 2018a]) have been determined as potentially jurisdictional under a Preliminary Jurisdictional Determination, issued by the USACE on April 27, 2018. Confirmation of the aquatic resources as jurisdictional by the SWRCB or the CDFW will occur through applicable regulatory processes. These are definitions of the categories that are included in the jurisdictional aquatic resources sections:
 - **Waters of the United States.** The federal CWA (33 United States Code [U.S.C.] § 1251 et seq.) defines *waters of the United States* as follows: (1) all waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide; (2) all interstate waters including interstate wetlands; (3) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce; (4) all impoundments of waters otherwise defined as waters of the United States; (5) tributaries to the foregoing types of waters; (6) the territorial sea; and (7) wetlands adjacent to the foregoing waters (33 Code of Federal Regulations [C.F.R.] § 328.3(a)). Wetlands are a sub-classification of waters of the United States. The term *other waters of the United States* is used to describe waters of the United States exclusive of wetlands.
 - **Wetlands.** According to the *Corps of Engineers Wetland Delineation Manual* (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008a), three criteria must be satisfied to classify an area as a wetland. These criteria are: (1) a predominance of plant life that is adapted to life in wet conditions (hydrophytic vegetation); (2) soils that saturate, flood, or pond long enough during the growing season to develop anaerobic conditions in the upper part (hydric soils); and (3) permanent or periodic inundation or soils saturation, at least seasonally (wetland hydrology).

- **Waters of the State.** *Waters of the state* are broadly defined by the Porter-Cologne Water Quality Control Act (Cal. Water Code, § 13050(e)) to mean any surface water or groundwater, including saline waters within the boundaries of the state. Under this definition, isolated wetlands that may not be subject to regulation under federal law are considered waters of the state and regulated accordingly.

Some regional water quality control boards have adopted a wetland definition in their basin plans. The Central Valley Regional Water Quality Control Board, which has jurisdiction over all drainage basins that could be affected by the Central Valley Wye alternatives, has not yet adopted a wetland definition within its basin plan. On June 17, 2016, the SWRCB released a preliminary draft of its proposed *Procedures for Regulation of Dredged or Fill Material to Waters of the State*, which includes a proposed wetland definition. Under this definition, an area is a wetland if, under normal circumstances: (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation. Because this definition is still in draft form and has not formally adopted, the term *wetland* as used in this Final Supplemental EIR/EIS refers to the USACE definition (see the second category of this list titled Wetlands).

- **California Fish and Game Code Section 1600 et seq. Rivers, Lakes, and Streams.** Pursuant to California Fish and Game Code Section 1600 et seq., CDFW regulates activities of an applicant's project that would substantially alter the flow, bed, channel, or bank of streams or lakes if such activity may substantially adversely affect an existing fish and wildlife resource. Under California Fish and Game Code Section 1602, the CDFW takes jurisdiction over rivers, streams, and lakes. The state's jurisdiction generally includes the streambed/lakebed to tops of bank. Although not specifically defined in California Fish and Game Code Section 1602, jurisdiction in some instances may include adjacent riparian vegetation. A riparian area consists of the transitional habitat between terrestrial and aquatic ecosystems, specifically the vegetated areas between a riverine feature and the outer drip line of the adjacent vegetation. In practice, CDFW has extended its authority to the top of a bank of a stream, the bank of a lake, or outer edge of the riparian vegetation, whichever is wider. The term *stream* is commonly understood as a watercourse having a source and terminus as well as banks and channel through which waters flow, at least periodically. A *streambed* under Section 1602 includes the channel of a watercourse, which is generally defined to include the depression between the banks worn by the regular and usual flow of the water.
- **Critical Habitat**—Designated critical habitat consists of geographic areas that contain physical or biological features essential to the conservation of a federally listed threatened or endangered species and that may require special management considerations or protection. Critical habitat may include areas that are not currently occupied by the species but that are essential for the conservation of the species.
- **Essential Fish Habitat**—Essential fish habitat (EFH) is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 U.S.C. § 1802[10]). *Waters* include aquatic areas and their associated physical, chemical, and biological properties. *Substrate* includes sediment underlying the waters. *Necessary* means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. *Spawning, breeding, feeding, or growth to maturity* cover all habitat types used by a species throughout its life cycle.
- **Wildlife Movement Corridors/Habitat Linkages**—*Wildlife movement corridors* are areas that are used by wildlife for movement on varying scales (e.g., daily foraging, seasonal migration, dispersal) and include areas that have been modeled for specific species (e.g., San Joaquin kit fox) based on different physical and biological parameters published in statewide reports. For the purposes of this section, the term habitat linkage is used

synonymously with wildlife movement corridor. *Habitat linkages* are areas of land used for a variety of purposes that potentially serve as a corridor for movement or migration of wildlife. Habitat linkages aid in the dispersal and distribution of wildlife and are crucial for maintaining healthy populations of multiple species.

3.7.2 Laws, Regulations, and Orders

This section identifies laws, regulations, and orders that are relevant to the analysis of biological resources and wetlands in this Final Supplemental EIR/EIS. Also provided are summaries of new or updated laws, regulations, and orders that occurred since publication of the Merced to Fresno Final EIR/EIS.

3.7.2.1 Federal

The following laws, regulations, orders, and plans are the same as those described in Section 3.7.2, Laws, Regulations, and Orders, of the Merced to Fresno Final EIR/EIS (Authority and FRA 2012a; pages 3.7-2 through 3.7-4):

- FESA (16 U.S.C. § 1531 et seq.)
- Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.)
- CWA (33 U.S.C. § 1251 et seq.)
- Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403)
- U.S. Fish and Wildlife Coordination Act (16 U.S.C. §§ 661–666c)
- Protection of Wetlands (U.S. Executive Order [USEO] 11990)
- Protection of Migratory Bird Populations (USEO 13186)
- Invasive Species (USEO 13112)
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703–712)
- Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d, 50 C.F.R. § 22)

New, additional, or updated federal laws, regulations, and orders follow.

Omnibus Public Land Management Act of 2009 (16 U.S.C. §§ 10001-10203)

The Omnibus Public Land Management Act (Public Law 111-11) was signed into law by President Obama on March 30, 2009, and includes the San Joaquin River Restoration Settlement Act (16 U.S.C. §§ 10001–10011), which authorizes implementation of the San Joaquin River Restoration Settlement (*Natural Resources Defense Council, et al., v. Kirk Rodgers, et al. Settlement Agreement* (Settlement)). The San Joaquin River Restoration Program (SJRRP) was initiated in accordance with the terms and conditions of the Settlement.

The SJRRP is a comprehensive long-term effort to restore flows to a 153-mile-long portion of the San Joaquin River from Friant Dam to the confluence of the Merced River. The SJRRP goals are to restore a self-sustaining Chinook salmon fishery while reducing or avoiding adverse water supply effects from restoration flows. The implementing agencies of the SJRRP include the U.S. Bureau of Reclamation (USBR); USFWS; NMFS; California Department of Water Resources (DWR); and CDFW (USBR and DWR 2011).

3.7.2.2 State

The following laws, regulations, orders, and plans are the same as those described in Section 3.7.2 of the Merced to Fresno Final EIR/EIS (Authority and FRA 2012a; pages 3.7-4 through 3.7-5):

- California Native Plant Protection Act (Cal. Fish and Game Code, §§ 1900–1913)
- California Fish and Game Code:
 - CESA (Cal. Fish and Game Code, §§ 2050-2085)
 - Fully Protected Species (Cal. Fish and Game Code, §§ 3511, 4700, 5050, and 5515)
 - Bird Protections (Cal. Fish and Game Code, §§ 3503, 3503.5)
 - Lake and Streambed Alteration (Cal. Fish and Game Code, § 1600 et seq.)

- Porter-Cologne Water Quality Control Act (Cal. Water Code, § 13260 et seq.)

New, additional, or updated state laws, regulations, and orders follow.

Bird Protections (Cal. Fish and Game Code, § 3513)

Section 3513 prohibits the take or possession of any migratory nongame bird or part thereof, as designated in the MBTA. To avoid violation of the take provisions, it is generally required that project-related disturbance at active nesting territories be reduced or eliminated during the nesting cycle.

3.7.2.3 Regional and Local

The policies from the *Madera County General Plan (1995)* and *Fresno County General Plan (2000)* are the same as those plans summarized in Section 3.7.2.3, Regional and Local, of the Merced to Fresno Final EIR/EIS and is fully discussed in the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a). New, additional, or updated regional and local laws, regulations, and orders follow.

General Plan Policies and Ordinances

Table 3.7-1 lists local, county, and regional plans, policies, and objectives relevant to the Central Valley Wye alternatives. Refer to Section 3.1.1.3, Regional and Local, of the Merced to Fresno Section Project EIR/EIS Biological Resources and Wetlands Technical Report (Authority and FRA 2016a) for more information.

Table 3.7-1 Regional and Local Plans and Policies

Policy Title	Summary
Merced County	
<p><i>2030 Merced County General Plan (2013)</i></p>	<p>Merced County adopted the <i>2030 Merced County General Plan</i> on December 10, 2013, updating the previous version of the general plan that was included in Section 3.1.1.3 of the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a) (page 3-5). The general plan includes the following policies:</p> <ul style="list-style-type: none"> ▪ Policy NR-1.1 Habitat Protection: Identify areas that have significant long-term habitat and wetland values, including riparian corridors, wetlands, grasslands, rivers and waterways, oak woodlands, vernal pools, and wildlife movement and migration corridors, and provide information to landowners. ▪ Policy NR-1.2 Protected Natural Lands: Identify and support methods to increase the acreage of protected natural lands and special habitats, including but not limited to, wetlands, grasslands, vernal pools, and wildlife movement and migration corridors, potentially through the use of conservation easements. ▪ Policy NR-1.4 Important Vegetative Resource Protection: Minimize the removal of vegetative resources which stabilize slopes, reduce surface water runoff, erosion, and sedimentation. ▪ Policy NR-1.5 Wetland and Riparian Habitat Buffer: Identify wetlands and riparian habitat areas and designate a buffer zone around each area sufficient to protect them from degradation, encroachment, or loss. ▪ Policy NR-1.6 Terrestrial Wildlife Mobility: Encourage property owners within or adjacent or designated habitat connectivity corridors that have been mapped or otherwise identified by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service to manage their lands in accordance with such mapping programs. ▪ Policy NR-1.8 Use of Native Plant Species for Landscaping: Encourage the use of native plant species in landscaping, and, where the County has discretion, require the use of native plant species for landscaping.

Policy Title	Summary
	<ul style="list-style-type: none"> ▪ Policy NR-1.10 Aquatic and Waterfowl Habitat Protection: Cooperate with local, State, and Federal water agencies in their efforts to protect significant aquatic and waterfowl habitats against excessive water withdrawals or other activities that would endanger or interrupt normal migratory patterns or aquatic habitats. ▪ Policy NR-1.11 On-Going Habitat Protection and Monitoring: Cooperate with local, State, and Federal agencies to ensure that adequate on-going protection and monitoring occurs adjacent to rare and endangered species habitats or within identified significant wetlands. ▪ Policy NR-1.12 Wetland Avoidance: Avoid or minimize loss of existing wetland resources by careful placement and construction of any necessary new public utilities and facilities, including roads, railroads, high speed rail, sewage disposal ponds, gas lines, electrical lines, and water/wastewater systems. ▪ Policy NR-1.13 Wetland Setbacks: Require an appropriate setback, to be determined during the development process, for developed and agricultural uses from the delineated edges of wetlands. ▪ Policy NR-1.17 Agency Coordination: Consult with private, local, State, and Federal agencies to assist in the protection of biological resources and prevention of degradation, encroachment, or loss of resources managed by these agencies. ▪ Policy NR-1.20 Conservation Easements: Encourage property owners to work with land trusts and State and Federal agencies to pursue voluntary conservation easements. ▪ Policy NR-1.21 Special-Status Species Surveys and Mitigation: Incorporate the survey standards and mitigation requirements of state and federal resource management agencies for use in the County's review processes for both private and public projects.
City of Chowchilla	
<p><i>City of Chowchilla 2040 General Plan, Open Space and Conservation Element, Biological Resources Section (2011)</i></p>	<p>The City of Chowchilla adopted the general plan <i>City of Chowchilla 2040 General Plan</i> on May 2, 2011, updating the previous version of the general plan that was included in Section 3.1.1.3 (page 3-6) of the Merced to Fresno Section Project EIR/EIS Biological Resources and Wetlands Technical Report (Authority and FRA 2016a):</p> <ul style="list-style-type: none"> ▪ Objective OS-13 encourages the provision of open-space areas throughout the Planning Area through the preservation and enhancement of natural features or the joint use of other public facilities and/or rights-of-ways. ▪ Policy OS 13.1: To the extent feasible, maintain sloughs within the Chowchilla Planning Area as components of a possible recreational trail system. Public access within sensitive habitat areas of the sloughs or waterways shall be considered individually to ensure protection of the habitat resource. ▪ Policy OS 13.3: Where appropriate and feasible, establish permanent mechanisms to protect wetlands and riparian corridors. ▪ Policy OS 13.6: Support the management of riparian scrub and aquatic environments of Ash Slough, Berenda Slough and of the Chowchilla River for passive recreation, groundwater recharge, and wildlife habitat. The riparian and aquatic environment of Ash and Berenda Sloughs, and the Chowchilla River shall be restored and expanded, where feasible and appropriate. ▪ Policy OS 13.7: New and redevelopment projects adjacent to Ash Slough or Berenda Slough are to be carefully planned and, where possible, designed to avoid existing riparian scrub vegetation and aquatic wildlife habitat.

Policy Title	Summary
	<ul style="list-style-type: none"> ▪ Policy OS 13.8: Lighting associated with new and redevelopment projects adjacent to Ash Sough or Berenda Slough shall be designed to prevent artificial lighting from illumination adjacent natural areas at a level greater than one candle foot above ambient conditions. ▪ Policy OS 13.10: On development sites with the potential to contain wetland resources, a wetlands delineation shall be prepared by a qualified biologist using the protocol defined by the U. S. Army Corps of Engineers. A report on the findings of the wetland delineation shall be submitted to the City of Chowchilla as part of the project application process. ▪ Policy OS 13.11: The City of Chowchilla shall maintain a no net loss of wetlands on a project-by-project basis. For the purpose of identifying wetlands, the City will accept a wetlands delineation map that has been accepted by the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act of 1972. No net loss may include mitigation implementation through participation in an off-site mitigation bank or similar mitigation mechanism acceptable to the City and permit agencies.
Stanislaus County (for a portion of a network upgrade component only)	
<i>Stanislaus County General Plan (2016)</i>	<p>The <i>Stanislaus County General Plan</i> was adopted on August 23, 2016. The Stanislaus General Plan includes the following policies:</p> <ul style="list-style-type: none"> ▪ Policy 2: Assure compatibility between natural areas and development. ▪ Policy 3: Areas of sensitive wildlife habitat and plant life (e.g., vernal pools, riparian habitats, flyways and other waterfowl habitats, etc.) including those habitats and plant species listed in the General Plan Support Document or by state or federal agencies shall be protected from development and/or disturbance. ▪ Policy 4: Protect and enhance oak woodlands and other native hardwood habitat. ▪ Policy 6: Preserve vegetation to protect waterways from bank erosion and siltation. ▪ Policy 29: Habitats of rare and endangered fish and wildlife species shall be protected.
City of Merced	
<i>Merced Vision 2030 General Plan (2015)</i>	<p>The <i>Merced Vision 2030 General Plan</i> was adopted by the City Council on January 3, 2012 and includes the following policies in the Open Space Conservation and Recreation Element.</p> <ul style="list-style-type: none"> ▪ Policy OS-1-1: Identify and mitigate impacts to wildlife habitats which support rare, endangered, or threatened species. ▪ Policy OS-1-2: Preserve and enhance creeks in their natural state throughout the planning area.
City of Waterford (for a portion of a network upgrades component only)	
<i>Waterford Vision 2025 General Plan (2006)</i>	<p>The Waterford City Council adopted the <i>Waterford Vision 2025 General Plan</i> on October 26, 2006, and includes the following policies in the Open Space and Conservation Element, Goal Area A: Open Space for the Preservation of Natural Resources.</p> <ul style="list-style-type: none"> ▪ Policy OS-A-1: Identify and Preserve Wildlife Habitats Which Support Rare, Endangered, or Threatened Species. ▪ Policy OS-A-2: Preserve and Enhance Tuolumne River and Dry Creek in Their Natural State Throughout the Planning Area. ▪ Policy OS-A-5: Preserve and Enhance Water Quality.

Sources: Merced County, 2013; Stanislaus County, 2016; City of Chowchilla, 2011; City of Waterford, 2006; City of Merced, 2015

3.7.3 Compatibility with Plans and Laws

As indicated in Section 3.1.5.3, Compatibility with Plans and Laws, CEQA and NEPA regulations² require a discussion of inconsistencies or conflicts between a proposed undertaking and federal, state, regional, or local plans and laws. As such, this Final Supplemental EIR/EIS describes the inconsistency of the Central Valley Wye alternatives with federal, state, regional, and local plans and laws to provide planning context.

There are a number of federal and state laws and implementing regulations, listed in Section 3.7.2.1, Federal, and Section 3.7.2.2, State, that protect biological resources and wetlands. A summary of the federal and state requirements considered in this analysis follows:

- Federal and state acts and laws that protect jurisdictional wetlands and other waters. Applicable acts and laws include the federal CWA, the Rivers and Harbors Act, and the state Porter-Cologne Water Quality Act.
- Federal and state acts and laws that provide comprehensive requirements for protection and management of special-status species and their habitats and communities. Applicable acts and laws include FESA, the Magnuson-Stevens Fishery Conservation and Management Act, the U.S. Fish and Wildlife Coordination Act, the MBTA, the Bald and Golden Eagle Protection Act, the Omnibus Public Land Management Act, the California Native Plant Protection Act, and California Fish and Game Code (including CESA, Fully Protected Species, Bird Protections, and Lake and Streambed Alteration).
- Management plans such as the Omnibus Public Management Act, which includes the SJRRP.

Section 3.7.2 lists each federal and state law and plan that was reviewed for compatibility with the Central Valley Wye alternatives. The Authority, as the NEPA and CEQA lead agency proposing to construct and operate the high-speed rail (HSR) system, is required to comply with all federal and state laws and regulations, and to secure all applicable federal and state permits prior to initiating construction on the selected alternative. Therefore, there would be no inconsistencies between the Central Valley Wye alternatives and these federal and state laws and regulations.

The Authority is a state agency and therefore is not required to comply with local land use and zoning regulations; however, it has endeavored to design and construct the HSR project so that it is compatible with land use and zoning regulations. For example, the Central Valley Wye alternatives incorporate IAMFs that would avoid or minimize impacts on biological resources and wetlands. Seven plans, 31 policies, six goals, and one objective were reviewed (Table 3.7-1) and the Central Valley Wye alternatives are consistent with each of these policies, goals, and objectives.

3.7.4 Coordination with Regulatory Agencies for NEPA and CEQA Compliance

The following sections summarize coordination efforts between the Authority, FRA, and regulatory agencies regarding activities related to NEPA and CEQA compliance. Section 3.7.4.1, Federal Endangered Species Act, specifically addresses consultation with the USFWS and NMFS regarding Section 7 of the FESA. Section 3.7.4.2, Clean Water Act Section 404(b)(1) Guidelines, specifically addresses consultation with the U.S. Environmental Protection Agency (USEPA) and USACE regarding CWA Section 404(b)(1) Guidelines.

3.7.4.1 Federal Endangered Species Act Consultation Summary

The goal of the FESA is to conserve threatened and endangered species (federally listed species) and the ecosystems on which they depend (16 U.S.C. § 1531 et seq.). Section 7 of the FESA, titled *Interagency Cooperation*, establishes the process by which federal action agencies, their designees (e.g., state transportation agencies), and the USFWS and NMFS consult to make

² NEPA regulations refer to the regulations issued by the Council on Environmental Quality (40 C.F.R. Part 1500).

certain that proposed actions are not likely to jeopardize the continued existence of species that are listed or proposed for listing as threatened or endangered or result in the destruction or adverse modification of critical habitat. Both agencies share responsibility for implementing the FESA, with the USFWS managing most terrestrial and freshwater species and the NMFS managing marine and anadromous species (e.g., Pacific salmonids).

The implementing procedures of the FESA are outlined in 50 C.F.R. Part 402. Section 7 consultation is required for discretionary federal agency actions taken directly, through one of its own proposed projects or indirectly, through partial or complete funding for a nonfederal project or through issuing a permit for a nonfederal project. Section 7(a)(2) states:

Each federal action agency shall, in consultation with and with the assistance of the Secretary [of the Interior], insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an 'agency action') is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph, each agency shall use the best scientific and commercial data available.

In addition, Magnuson-Stevens Act Section 305(b)(2) requires federal agencies to consult with the NMFS regarding actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, and which may affect and are likely to adversely affect EFH (50 C.F.R. § 600.920). The Magnuson-Stevens Act requires cooperation among the NMFS, fishery management councils, fishing participants, federal and state agencies, and others in achieving EFH protection, conservation, and enhancement.

Consultation History with the U.S. Fish and Wildlife Service: Wildlife

The Authority and FRA submitted the initial *Merced to Fresno Section Biological Assessment* to the USFWS and NMFS in November 2011 (Authority and FRA 2011). Between February and June 2012, the Authority and FRA provided the USFWS with supplemental memos containing revised analyses and new information about the effects of the Merced to Fresno Section on federally listed species. Information specific to the preferred Merced to Fresno Section: Hybrid Alternative was submitted to the USFWS in April 2012, and included a project description, wildlife crossing information, suggested conservation measures, and a cumulative effects analysis. The USFWS issued the 2012 MF-BO in September 2012 (USFWS 2012). Since issuance of the 2012 MF-BO, the USFWS has issued five amendments to the biological opinion to address various changes to the Merced to Fresno Section.

The 2012 MF-BO presented the USFWS biological opinion on the effects of the entire Merced to Fresno Section (including the Central Valley Wye); however, the Incidental Take Statement was only for a specific portion of the Section identified as Phase 1. Because the Central Valley Wye has changed since 2012 and an Incidental Take Statement was not completed for the Central Valley Wye, a supplemental Biological Assessment addressing the effects of the Central Valley Wye on federally listed species was prepared. Submittal of the biological assessment and a request to re-initiate Section 7 consultation with the USFWS occurred in June 2019, and USFWS issued its Biological Opinion on September 27, 2019.

Consultation History with the National Marine Fisheries Service: Fish

On September 23, 2009, the Authority and FRA requested technical assistance from the NMFS regarding potential effects of the Merced to Fresno Section on federally listed salmonids pursuant to Section 7 of the FESA and effects on EFH under the Magnuson-Stevens Act. At a meeting between the Authority and NMFS on January 5, 2010, the agencies determined that an evaluation of potential effects on California Central Valley steelhead and Central Valley spring-run Chinook salmon might be needed. On October 17, 2011, NMFS received a draft biological assessment for the Merced to Fresno Section. Over the next month, several meetings were held

to discuss findings in the biological assessment and details of the proposed bridge crossing over the San Joaquin River. The NMFS initiated formal consultation for the Merced to Fresno Section on December 1, 2011. After several additional meetings in which the Authority's biological consultant (AECOM, Inc.) responded to information requests, the NMFS issued the *Biological and Conference Opinion, High Speed Train: Merced–Fresno* (NMFS 2012) on April 17, 2012. NMFS has not amended the biological opinion since issuance.

On March 31, 2016, the NMFS (Monica Gutierrez) provided comments on a draft version of this biological assessment that was submitted for agency review on March 22, 2016. Among the comments were recommendations for a shorter work window (June 15 to September 15), installation of a turbidity curtain for in-water work at the San Joaquin River, and requests for additional detail on several fish-related conservation measures.

On June 16, 2016, Authority representative Serge Stanich informally met with NMFS biologists Monica Gutierrez and Katie Schmidt to orient Ms. Schmidt to the Central Valley Wye alternatives while also communicating the NMFS's current understanding of the Authority's progress with planning, construction, permitting, and Section 7 consultation (NMFS 2016). During a January 20, 2017, phone conversation with Mr. Stanich, Ms. Schmidt verbally agreed to extend the work window to October 15.

A supplemental biological assessment addressing the effects of the State Route (SR) 152 (North) to Road 11 Wye Alternative on federally listed fish species was prepared and submitted to NMFS in October 2018. NMFS issued its Biological Opinion on September 3, 2019.

3.7.4.2 Clean Water Act Section 404(b)(1) Guidelines

CWA Section 404(b)(1) Guidelines (Guidelines) (40 C.F.R. § 230.10(a)) establish the requirements for consideration of alternatives when an individual permit under Section 404 is sought. The USACE's memorandum entitled *Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements* describes these requirements as follows:

The fundamental precept of the Guidelines is that discharges of dredged or fill material into waters of the U.S., including wetlands, should not occur unless it can be demonstrated that such discharges, either individually or cumulatively, will not result in unacceptable adverse effects on the aquatic ecosystem. The Guidelines specifically require that 'no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences' (40 C.F.R. § 230.10(a)). Based on this provision, the applicant is required in every case (irrespective of whether the discharge site is a special aquatic site or whether the activity associated with the discharge is water dependent) to evaluate opportunities for use of nonaquatic areas and other aquatic sites that would result in less adverse impact on the aquatic ecosystem. A permit cannot be issued, therefore, in circumstances where a less environmentally damaging practicable alternative for the proposed discharge exists (except as provided for under Section 404(b)(2)).

The term *practicable* means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes (30 C.F.R. § 230.2(q)).

In December 2010, the Authority, FRA, USEPA, and USACE signed a Tier 2 Memorandum of Understanding (MOU) for integrating NEPA (12 U.S.C. § 4321 et seq.), Section 404 of the CWA, and Rivers and Harbors Act Section 14 (33 U.S.C. § 408) (Section 408) processes for the HSR system.

The MOU requires completion of three milestones prior to submittal of project Section 404 permit application:

- Checkpoint A: Purpose and Need

- Checkpoint B: Range of Alternatives for Consideration
- Checkpoint C: Determination of the preliminary Least Environmentally Damaging Practicable Alternative (LEDPA)

The final Checkpoint A submittal was made to the USACE in December 2010, and the USACE agreed with the project purpose in February 2011. The final Checkpoint B submittal was received in April 2011, and the USACE agreed with the range of alternatives for consideration in the Draft EIR/EIS in February 2012. A supplemental Checkpoint C document addressing the Central Valley Wye alternatives, was prepared and submitted to the USEPA and USACE for review in 2018. In July 2018, the USACE and USEPA concurred that the Authority's Preferred Alternative is the preliminary LEDPA.

3.7.5 Methods for Evaluating Impacts

The evaluation of impacts on biological and aquatic resources is a requirement of NEPA and CEQA. The following sections summarize the RSAs and the methods used to analyze impacts on biological resources and wetlands.

3.7.5.1 Definition of Resource Study Areas

As defined in Section 3.1, Introduction, RSAs are the geographic boundaries in which the environmental investigations specific to each resource topic were conducted. The RSAs for biological resources encompass the project footprint for each of the Central Valley Wye alternatives where plant and animal habitat and aquatic resources occur (direct impacts). The RSAs also include habitat buffers where biological resources could be indirectly affected (indirect impacts). The RSAs for indirect impacts differ based on resource type and include several distances from the edge of the project footprints described in Table 3.7-2.

To address regulatory requirements and assess potential impacts on biological resources, the *High-Speed Train Central Valley Biological Resources and Wetlands Survey Plan* (Authority and FRA 2010) established several habitat resource study areas for biological resources (Table 3.7-2). To aid in the visualization of the various resource study areas, a schematic is provided as Figure 3.7-1.

Table 3.7-2 Definitions of Resource Study Areas

Resource Study Area	Area of Impact	General Description
Habitat Study Area¹		
Core Habitat Study Area		
Direct Impacts	Project footprints (includes permanent and temporary impacts)	Evaluate potential direct and indirect impacts on habitats and the special-status wildlife species that use them.
Indirect Impacts	Project footprints plus 250 feet	This area was physically surveyed, if access was available.
Indirect Bisected Impacts ² (vernal pool species)	Project footprints plus the entirety of vernal pool coverage	If a portion of the vernal pool or swale is within the project footprints and therefore directly affected, then the whole vernal pool or swale is considered directly affected for purposes of impact and mitigation methodology.
Auxiliary Habitat Study Area³		
Indirect Impacts	250-1,000-foot buffer outside core habitat study area	Surveyed through extrapolation of observations made in the core habitat study area from aerial photograph interpretation and windshield surveys ³ .
Supplemental Habitat Study Area³		

Resource Study Area	Area of Impact	General Description
Indirect Impacts	Extends up to 10 miles outward from the project footprints	Identifies species-specific habitats based on aerial photograph interpretation and documented occurrences of the species, and on observations of special-status species and their habitats made in the field.
Wetland Study Area		
Direct Impacts	Project footprints	Evaluate potential direct and indirect impacts on aquatic resources and special-status wildlife using vernal pools and swales.
Indirect Impacts	Project footprints plus 250-foot buffer outside project footprint	
Indirect Bisected Impacts ⁴	Project footprints plus the entirety of vernal pool coverage	If a portion of the vernal pool or swale is within the project footprints and therefore directly affected, then the whole vernal pool or swale is considered directly affected for purposes of impact and mitigation methodology.
Special-Status Plant Study Area⁴		
Direct Impacts	Project footprints	Evaluate potential direct and indirect impacts on upland sensitive plant resources (including special-status plants, special-status plant communities, protected trees, and elderberry shrubs). For vernal pool plant species, the wetland study area and auxiliary study area (if applicable) are used to evaluate impacts.
Indirect Impacts	Project footprints plus 100-foot buffer outside project footprint	
Wildlife Movement Study Area		
Direct and Indirect Impacts	20-mile buffer outside project footprints	Determined based on agency regulations and guidance, literature, and best professional judgment, and in consultation with appropriate regulatory agencies.

Source: Authority, 2018

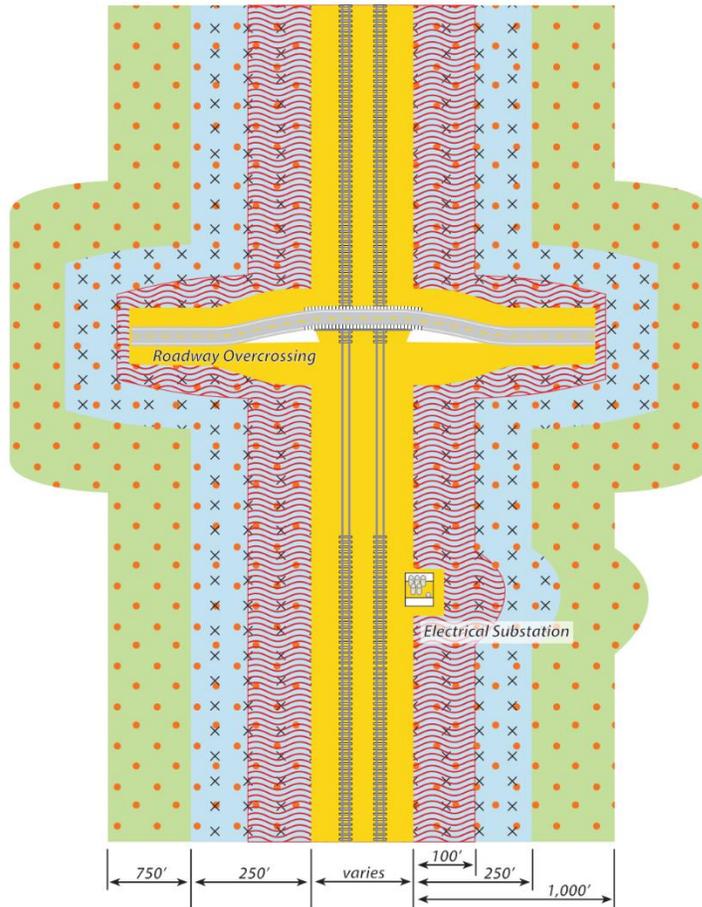
¹ The RSA for the habitat study area generally includes the project footprints plus a 1,000-foot buffer to evaluate direct and indirect impacts on habitats and the special-status wildlife species that use them. The habitat study area was divided into two areas: a core habitat study area and an auxiliary habitat study area. A third, or supplemental, habitat study area was identified for select species that required further analysis based on agency- or protocol-recommended species-specific buffers.

² Indirect bisected impacts apply in circumstances where a vernal pool falls partially within the project footprints and extends into adjacent areas, including areas beyond 250 feet, and includes impacts on regulated waters as well as vernal pool wildlife and plant species.

³ Not applicable to electrical interconnections and network upgrade (EINU) components because of the temporary and minor permanent nature of associated impacts.

⁴ Impacts on special-status plant species occurring in vernal pools are also considered in the context of the wetland study area and the auxiliary habitat study area (as applicable).

MERCED TO FRESNO SECTION:
CENTRAL VALLEY WYE



LEGEND	
	Project footprint
	Special-status plant study area (100')
	Wetland study area (250')
	Habitat study area (1,000')
	Core habitat study area (250')
	Auxiliary habitat study area (250' - 1,000')

Not to scale

6/13/17

Source: Authority, 2017

JUNE 13, 2017

Note: The Supplemental Habitat and Wildlife Movement RSAs are 10 miles and 20 miles outside of the project footprints, respectively. The resource study areas specific to electrical interconnection and network upgrade components are limited to the Core Habitat, Wetland, Special-Status Plant and Wildlife Movement RSAs because of the temporary and minor permanent nature of associated impacts'

Figure 3.7-1 Central Valley Wye Schematic of Biological Resource Study Areas

3.7.5.2 Impact Avoidance and Minimization Features

As noted in Section 2.2.3.7, Impact Avoidance and Minimization Features, the Central Valley Wye alternatives would incorporate standardized IAMFs to avoid and minimize impacts. The Authority would implement IAMFs during project design and construction, and, as such, the analysis of impacts of the Central Valley Wye alternatives in this section factors in all applicable IAMFs. Appendix 2-B, California High-Speed Rail: Impact Avoidance and Minimization Features, provides a detailed description of IAMFs that are included as part of the Central Valley Wye alternatives design. Several adjustments have been made to the IAMFs to improve clarity. Additionally, several of the IAMFs have been reclassified as mitigation measures. Final IAMFs applicable to biological resources and wetlands include:

- BIO-IAMF#1, Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors
- BIO-IAMF#2, Facilitate Agency Access
- BIO-IAMF#3, Prepare Worker Environmental Awareness Program (WEAP) Training Materials and Conduct Construction Period WEAP Training
- BIO-IAMF#4, Conduct Operation and Maintenance Period Worker Environmental Awareness Program (WEAP) Training
- BIO-IAMF#5, Prepare and Implement a Biological Resources Management Plan
- BIO-IAMF#6, Prepare and Implement an Annual Vegetation Management Plan
- BIO-IAMF#7, Prepare and Implement a Weed Control Plan
- BIO-IAMF#8, Establish Monofilament Restrictions
- BIO-IAMF#9, Prevent Entrapment in Construction Materials and Excavations
- BIO-IAMF#10, Delineate Equipment Staging Areas and Traffic Routes
- BIO-IAMF#11, Dispose of Construction Spoils and Waste
- BIO-IAMF#12, Clean Construction Equipment
- BIO-IAMF#13, Maintain Construction Sites
- BIO-IAMF#14, Dewatering and Water Diversion
- BIO-IAMF#15, Vehicle Traffic and Construction Site Speed Limits
- HYD-IAMF#1, Stormwater Management
- HYD-IAMF#2, Flood Protection
- HYD-IAMF#3, Prepare and Implement a Construction Stormwater Pollution Prevention Plan
- HYD-IAMF#4, Prepare and Implement an Industrial Stormwater Pollution Prevention Plan
- HMW-IAMF#3, Environmental Management System
- HMW-IAMF#10, Hazardous Materials Plans

3.7.5.3 Methods for NEPA and CEQA Impact Analysis

This section describes the sources and methods the Authority used to analyze potential impacts from implementing the Central Valley Wye alternatives on biological resources and wetlands. These methods apply to both NEPA and CEQA unless otherwise indicated. Refer to Section 3.1.3.4, Methods for Evaluating Impacts, for a description of the general framework for evaluating impacts under NEPA and CEQA. As described in Section 3.7.1, Introduction, and in the following discussions, the Authority has applied the same methods and many of the same data sources from the Merced to Fresno Final EIR/EIS to this Final Supplemental EIR/EIS. Refer to the

Biological Resources and Wetlands Technical Report (Authority and FRA 2016a) for more information regarding the methods and data sources used in this analysis. Laws, regulations, and orders (see Section 3.7.2) that regulate biological resources and wetlands were also considered in the evaluation of impacts.

Biological Resources and Wetlands

The potential for impacts on biological resources and wetlands depends largely on the presence of suitable habitat, species, and wetlands in and adjacent to areas that would be affected by implementing the Central Valley Wye alternatives.

Biological Resources—The data presented in this section on habitat presence and species occurrence is based on the literature review and field surveys. On-site field surveys were conducted where permission to enter was granted and/or along existing electrical line rights-of-way. The survey team was granted access to and conducted surveys on approximately 13 percent of the property, by acreage, within or adjacent to the project footprints of the Central Valley Wye alternatives. Where permission to enter was not granted, field crews used public roads and adjacent parcels to characterize and map biological resources. These visual surveys were conducted to compare background information with existing data and the aerial signatures identified in high-resolution aerial imagery to map inaccessible areas.

Using geographic information system (GIS) spatial data on plant communities and habitat types collected through literature review and field surveys, analysts performed a quantitative assessment of the potential impacts that could result from implementing the Central Valley Wye alternatives. Potential impacts on biological resources associated with implementing the Central Valley Wye alternatives were analyzed for direct impacts (i.e., impacts which result in the immediate removal or disturbance of the resource), and for indirect impacts (i.e., impacts which are separated from the activity in space or time). The areas where direct and indirect impacts could occur are defined in Section 3.7.5.1, Definition of Resource Study Area. Analysts also qualitatively assessed how construction and operations activities could affect plant and animal habitat and individual species, based on species preference, behavior, and other biological considerations. For example, species that prefer aquatic habitat would be more sensitive to HSR stream crossings that temporarily disrupt flows and remove riparian vegetation than construction in upland areas or agricultural land.

Calculations of potential direct and indirect impact areas included the following assumptions and limitations:

- *Temporary direct impacts* would occur in areas within the project footprints that can be fully restored to pre-disturbance conditions following construction (e.g., staging areas, construction laydown, relocation of underground utilities, and other workspace that would not be occupied by facilities of the Central Valley Wye alternatives during HSR operations). Temporary direct impacts on biological resources were calculated in GIS based on the acreage of a given resource (e.g., jurisdictional water feature or other land cover type that provides habitat for special-status species) within the boundaries of temporary construction easements as delineated in current engineering drawings provided by the Authority and in work areas identified in coordination with PG&E.
- *Permanent direct impacts* would occur in the project footprints and would have lasting impacts beyond the Central Valley Wye construction period. Permanent direct impacts include habitat loss from construction of rights-of-way for at-grade track segments, elevated structure track segments (everything under the aerial extent of the structure), road crossings, electrical substations, and facilities for maintenance-of-way. Permanent direct impacts were calculated in GIS based on the acreage of a given resource that would be replaced by permanent facilities, utility easements, or access easements of the Central Valley Wye alternatives.
- *Indirect impacts* would occur later in time (after construction or operations activities are conducted) or farther removed in distance (outside the project footprints) but are still

reasonably foreseeable. Indirect impacts on biological resources were evaluated based on the resource-specific study areas outside the project footprints:

- 100-foot buffer for special-status plants, special-status plant communities, and riparian habitat for valley elderberry longhorn beetle (special-status plant study area)
 - 250-foot buffer for jurisdictional waters (wetland study area) and most special-status wildlife species (core habitat study area)
 - 1,000-foot buffer for wide-ranging special-status wildlife species (e.g., San Joaquin kit fox) for rights-of-way for track segments.
- *Indirect bisected impacts* apply in circumstances where a vernal pool falls partially within the project footprints and extends into adjacent areas, including areas beyond 250 feet, and includes impacts on jurisdictional waters as well as special-status vernal pool plant and wildlife species. All impacts on vernal pools were considered permanent and were calculated using GIS resource layers.

Because habitat assessments were used in lieu of protocol-level surveys in most cases, and the presence of special-status species is assumed in the absence of surveys, this analysis likely overestimates the magnitude and severity of most impacts.

Potential impacts on aquatic resources associated with implementing the Central Valley Wye alternatives were analyzed for direct, indirect, and indirect bisected impacts. Existing datasets were collected and examined in a literature review, and field surveys were conducted to determine areas where aquatic resources occur. Where property access was granted, field surveys involved formal delineations within the wetland study area to identify aquatic resources boundaries, which were mapped using handheld global positioning system devices. The USACE concurred with the findings of the delineation of waters of the United States on February 28, 2018, and issued a revised verification on April 27, 2018. Where property access was not granted, aquatic resources were identified through interpretation of aerial photography and existing GIS data. The areas where direct and indirect impacts may occur are defined in Section 3.7.5.1. For indirect impacts, analysts qualitatively assessed how construction and operations activities could affect aquatic resources in the Wetlands RSA, defined in Section 3.7.5.1.

To determine potential impacts on biological resources and wetlands, analysts performed background literature review and field surveys to identify potential biological resources and wetlands within the project footprints of the proposed Central Valley Wye alternatives that could be affected by construction or operations activities.

Literature Review

Before conducting field surveys, existing background information was reviewed to identify the locations of special-status plant and wildlife species, jurisdictional waters, special-status plant communities, protected (heritage) trees, wildlife movement areas, natural lands, and federally designated or proposed critical habitat units recorded or potentially occurring in the vicinity of the Central Valley Wye alternatives. This section summarizes the background information that was reviewed. Database queries included all reported occurrences within 10 miles of the Central Valley Wye alternatives in the California Natural Diversity Database (CNDDDB) or within the following U.S. Geological Survey 7.5-minute quadrangles (quads) (22-quad search area):³

- | | | |
|---------------------|---------------|-------------------|
| • Madera | • Bliss Ranch | • Firebaugh NE |
| • El Nido | • Chowchilla | • Bonita Ranch |
| • Plainsburg | • Berenda | • Merced |
| • Le Grande | • Dos Palos | • Planada |
| • Delta Ranch | • Oxalis | • Owens Reservoir |
| • Santa Rita Bridge | • Poso Farm | • Turner Ranch |

³ The first nine quads overlap with the Central Valley Wye alternatives, the remaining quads are adjacent to these quads.

- Sandy Mush
- Raynor Creek
- Daulton
- Kismet
- Oakdale
- Waterford
- Paulsell
- Montpelier
- Winton
- Turlock Lake
- Cressey
- Yosemite Lake
- Chaney Ranch
- Broadview Farms
- Hammonds Ranch

Plant Communities

Prior to field surveys, biologists created preliminary maps of plant communities and land cover types in the Core Habitat RSA by reviewing National Agriculture Imagery Program 2014 imagery using ArcGIS 10.3 software. A mapping scale of 1 inch = 200 feet (1:2,400) was used. A minimum mapping unit of 1.0 acre was used for wetland complexes, and a minimum mapping unit of 0.25 acre was used for stand-alone wetlands. A minimum mapping unit of 10 acres was used for all other land cover types, with smaller units used when discrete boundary and types could be discerned. Scale and minimum mapping units were selected based on best professional judgment of the analysts regarding the scale at which the floristic and structural details used to delineate the resources potentially present would be reliably perceptible given the resolution of the aerial imagery available. Natural and constructed watercourses were mapped as line features, attributed with their approximate average width. Features wider than 40 feet were mapped as polygons. Terrestrial plant communities and land cover types were classified in accordance with the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a) or identified using the CDFW *Hierarchical List of Natural Communities with Holland Types* (CDFG 2010) or California Wildlife Habitat Relationships Habitat Classification Scheme (CWHR System) (CDFG 1988). Aquatic plant communities and land cover types were classified in accordance with the USFWS' *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). Table 3.7-3 provides a list of the wildlife habitat types.⁴

Table 3.7-3 Wildlife Habitat Types, Land Uses, and Typical Vegetation in the Habitat Study Area of All Central Valley Wye Alternatives

Wildlife Habitat Type/Land Use Type	Typical Vegetation/Land Use Type (or Land Cover)
Tree-Dominated Habitats	
Mixed Riparian (MIR)	Fremont cottonwood, western sycamore, valley oak, white alder, California blackberry, elderberry, poison oak, button bush, willows, rushes, mugwort, poison hemlock, stinging nettle (i.e., large tree dominated)
Other Riparian (OTR)	Willows, rushes, mugwort (i.e., small tree or shrub dominated)
Eucalyptus Woodlands (EUC)	Eucalyptus trees
Palustrine Forested Wetland (PFW)	Fremont cottonwood, western sycamore, valley oak
Herbaceous-Dominated Habitats	
California Annual Grassland (AGS)	Wild oats, brome species, barley, annual fescues,
Freshwater Marsh (FRM)	Cattail, bulrush
Pasture (PAS)	Bermuda grass, rye grass, tall fescue
Ruderal (RUD)	Brome species, barley, star thistle
Seasonal Wetland (SEW)	Curly dock, rushes, grasses
Vernal Pool (VP)	Annual and perennial vernal pool obligate species

⁴ For the purposes of this document, the terms “wildlife habitat type” and “land cover type” are interchangeable.

Wildlife Habitat Type/Land Use Type	Typical Vegetation/Land Use Type (or Land Cover)
Valley Sink Scrub (VSS)	Low, open to dense succulent shrublands characterized by alkali-tolerant plants in the Chenopodiaceae family, especially iodine bush
Aquatic Habitats	
Natural Watercourse (NAW)	Unvegetated, rushes
Open Water (OPW)	Unvegetated, willows, rushes
Developed Habitats	
Commercial/Industrial (COI)	Warehouses, industrial facilities
Constructed Basin (COB)	Detention basins
Constructed Watercourse (COW)	Canals, drainage ditches
Transportation Corridor (TRC)	Roads, highways
Urban (URB)	Unvegetated pavement, grass lawns, hedges
Agricultural Habitats	
Dairy (DAI)	Dairy
Fallow Field (FAF)	Agricultural land that is not currently planted in a crop but that is estimated to have been in cultivation during the past 3 years
Field Crops (FIC)	Wheat, alfalfa
Inactive Agriculture (INA)	Agricultural land not cropped the current or previous crop season
Orchard (ORC)	Almonds, apricots, citrus
Rice Field (RIC)	Flooded rice field
Row Crop (ROC)	Onions, tomatoes, corn
Vineyards (VIN)	Grapes
Nonvegetated Habitats	
Barren (BAR)	Unvegetated, rock, gravel, soil

Source: Authority, 2018

The wildlife habitat type/land use type acronyms in parenthesis are from the CWHR System.

Special-Status Plant Species

The following list of sources were used to identify special-status plant species known or potentially occurring in the Special-Status Plant RSA based on existing federal, state, and private databases and agency information.

- USFWS Species List**—An official list of federal candidate, proposed, threatened, and endangered plant species for the habitat study area was obtained from the USFWS Information for Planning and Conservation (IPaC) website. The list was generated on March 29, 2016 and updated on November 22, 2016 and December 21, 2017 (USFWS 2017) and is provided in Appendix 3.7-A.

- **CNDDDB**—A list of special-status plant species was prepared through a two-fold inquiry of the CNDDDB via a standard quad search using the RareFind program (CDFW 2014a) and a GIS mapping exercise of all occurrences within a 10-mile radius of the Central Valley Wye alternatives track alignment centerlines (CDFW 2016a). This two-fold inquiry was performed so that all special-status plant species with the potential to occur in the alignment were captured in the query. Appendix 3.7-B, California Natural Diversity Database, provides the results of the initial RareFind quad search conducted in December 2014. To identify any additional species that have been recorded within 10 miles of the Central Valley Wye alternatives since the initial 2014 query, the 10-mile-radius GIS query is updated every 4–6 months; the most recent query was conducted on September 15, 2016, and confirmed that the 2014 species list is still accurate. Additionally, a GIS query of the CNDDDB for occurrences of special-status plant species within a 10-mile radius of the electrical interconnections and network upgrade (EINU) components was conducted on August 5, 2016 (CDFW 2016b).
- **California Native Plant Society Online Inventory of Rare and Endangered Plants of California (CNPS Online Inventory)**—A list of California Native Plant Society (CNPS) special-status plant species was obtained by querying the CNPS Online Inventory for special-status plants within the 22 U.S. Geological Survey 7.5-minute quads identified in Literature Review (CNPS 2016). The CNPS Online Inventory is a credible and widely recognized resource used by conservationists, consultants, planners, researchers, and resource managers to obtain information about California’s rare plants.

Special-Status Wildlife

The following sources were reviewed to identify special-status wildlife species potentially occurring in the Core Habitat RSA.

- **USFWS and NMFS Species Lists**—An official list of federal candidate, proposed, threatened, and endangered wildlife species for the habitat study area was obtained from the USFWS IPaC website. The list was generated on March 29, 2016 and updated on November 22, 2016 as well as on December 21, 2017 (USFWS 2017) and is provided in Appendix 3.7-A. An official list of federal candidate, proposed, threatened, and endangered fish species for the habitat study area was obtained from NMFS on January 25, 2018 and is provided in Appendix 3.7-A.
- **CNDDDB**—A list of special-status wildlife species was prepared through a two-fold inquiry of the CNDDDB via a standard 22-quad search area in RareFind and a GIS query of all occurrences within 10 miles of the Central Valley Wye alternatives track alignment centerlines and EINU components (CDFW 2014a, CDFW 2016a). The list of CNDDDB-reported special-status species is provided in Appendix 3.7-B and Appendix 2.D-4. An additional GIS query of the CNDDDB specifically for Crotch bumble bee (not tracked by CNDDDB prior to its candidacy for listing under CESA) was conducted in October 2019 (CDFW 2019).
- **CWHR System**—GIS data of special-status wildlife species whose known geographic ranges occur within a 10-mile radius of the Central Valley Wye alternatives (CDFW 2014b) were obtained through the CWHR System. These species range data were used to augment data acquired from the CNDDDB to identify additional special-status wildlife species with a known geographic range within the regional area but for whom no occurrence data have been reported in the CNDDDB.
- **USFWS Birds of Conservation Concern for Region 8 (California and Nevada)**—A list of Birds of Conservation Concern (BCC) species was obtained and considered for evaluation (USFWS 2008). The list of BCC is found in the USFWS’ list of BCC for the Bird Conservation Region that covers the Core Habitat RSA. BCC are migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the FESA.
- **Additional Sources for Special-Status Fish Species**—Moyle (2002), CalFish (2014), and University of California (2015) were consulted to identify special-status fish species in the

habitat study area. These documents were used to identify known barriers to the upstream and downstream migrations of anadromous species and fish species that could occur in the habitat study area.

- California Fish and Game Commission Petitions** (including relevant evaluation and findings reports) **to List Species Under the California Endangered Species Act**—The petition to list four bumble bee species; (Crotch bumble bee [*Bombus crotchii*], Franklin’s bumble bee [*Bombus franklini*], Suckley cuckoo bumble bee [*Bombus suckleyi*], and western bumble bee [*Bombus occidentalis occidentalis*]) as endangered under CESA (Xerces Society et al. 2018) and the CDFW evaluation of the petition (CDFW 2019) were reviewed to identify whether any of the species had the potential to occur in the habitat study area.

Jurisdictional Aquatic Resources

The wetland study area encompasses a total area specific to and surrounding the project footprints. The wetland study area includes the project footprints and in general, a 250-foot buffer surrounding the project footprints on all sides. The project footprints include all elements of the Central Valley Wye alternatives (i.e., alternative rights-of-way, construction staging, laydown areas, and borrow sites). All direct impacts associated with the Central Valley Wye alternatives are anticipated to occur within the project footprints. Indirect impacts may occur adjacent to the project footprints. The wetland study area for the Second Supplemental Wetlands Delineation Report (Authority and FRA 2018a) also includes an update to the portion of the Central Valley Wye alternatives previously delineated in the Primary Wetlands Delineation Report (Authority and FRA 2012b).

The following resources were reviewed prior to field investigations to obtain information on aquatic resources that may occur in the wetland study area:

- U.S. Geological Survey 7.5-minute topographic quadrangles that occur within the wetland study area (Delta Ranch, Santa Rita Bridge, Bliss Ranch, Chowchilla, Plainsburg, Le Grand, and Berenda quads are specific to the wetland study area)
- National Wetland Inventory maps (USFWS 2014a)
- National Hydrography Dataset; BIOS Central Valley Vernal Pool Habitat dataset (CDFW 2014c)
- National Agriculture Imagery Program 2010, 2012, and 2014 aerial photographs (USDA Farm Service Agency 2010, USDA Farm Service Agency 2012, USDA Farm Service Agency 2014), the imagery available at the time of the assessments.
- Soil survey map units (NRCS 2012)
- Google Earth Pro aerial photographs from 1998, 2003–2006, and 2009–2014
- Climate and precipitation data (Western Regional Climate Center 2016)
- Merced to Fresno Project Section: Central Valley Wye Hydrology and Hydraulics Engineering Report* (Authority and FRA 2016b)

Special-Status Plant Communities

A list of special-status plant communities known or potentially occurring in the Special-Status Plant RSA was generated based on a review of present plant communities. The following data sources were used:

- A detailed land cover and wetland delineation map was created based on the National Agriculture Imagery Program (NAIP) imagery using ArcGIS 10 software using a mapping scale of 1 inch = 200 feet. A minimum mapping unit of 1.0 acre was used for wetland complexes, and a minimum mapping unit of 0.25 acre was used for standalone wetlands. A minimum mapping unit of 10 acres was used for all other land cover types, with smaller units used when discrete boundary and types could be discerned. Scale and minimum mapping

units were selected based on best professional judgment of the analysts regarding the scale at which the floristic and structural details used to delineate the resources potentially present would be reliably perceptible given the resolution of the aerial imagery available. Natural and constructed watercourses were mapped as line features, attributed with their approximate average width. Features wider than 40 feet were mapped as polygons. Jurisdictional area boundaries along water features were mapped to the landward drip line for mixed riparian, other riparian, and palustrine forested wetlands.

- The CDFW *Hierarchical List of Natural Communities with Holland Types* for California (CDFG 2010), which indicates whether natural communities are of special status, given the current state of the California classification
- CNDDDB query for special-status natural communities occurring within 10 miles of the Central Valley Wye alternative track alignment centerlines (CDFW 2016a).

Habitat Conservation Plans

Habitat conservation plans (HCP) overlapping with the Central Valley Wye alternatives supplemental habitat study area were determined by accessing the USFWS Conservation Plans and Agreements Database (USFWS 2016) and reviewing adopted HCPs within the USFWS' Region 8. To date, 157 HCPs have been approved in Region 8; however, only one plan area, the *PG&E San Joaquin Valley Operations & Maintenance HCP* (PG&E 2007), overlaps with the Central Valley Wye alternatives. The PG&E HCP is applicable to the operation and maintenance of the PG&E facilities proposed to be modified to support the Central Valley Wye alternatives. The HCP does not include preserve systems, and lands being used by PG&E for mitigation under the HCP would not be affected by the Central Valley Wye alternatives. The baseline conditions in regarding operation and maintenance of PG&E facilities supporting the HSR system in this HCP plan area would reflect a constructed Central Valley Wye alternative; therefore, the HCP is not discussed further in this section.

Protected Trees

To identify the requirements for protected trees, county and city ordinances and codes were reviewed, as well as available general plans and HCPs. No ordinances or codes identifying special protection for specific species of trees were identified. Consequently, protected trees are not discussed further in this section.

Essential Fish Habitat

EFH, the core habitat study area for the Central Valley Wye alternatives was determined by accessing the National Oceanic and Atmospheric Administration Habitat Conservation page at <http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html>. The San Joaquin River in the proposed Central Valley Wye alternatives is within the core habitat study area for all alternatives and is included as EFH for Pacific salmon. The Merced River and Tuolumne River are within the core habitat study area of the SR 152 (North) to Road 19 Wye Alternative, specifically the Site 7—Le Grand Junction/Sandy Mush Road, Warnerville—Wilson 230 kV Transmission Line and are included as EFH for Pacific salmon.

Critical Habitat

Critical habitat designated for species listed under the FESA that could occur in any of the RSAs was identified by accessing the USFWS critical habitat portal (<http://ecos.fws.gov/crithab/>).

Wildlife Movement Corridors

Known wildlife movement corridors were identified through a review of published technical reports, previous reports prepared for the Merced to Fresno Final EIR/EIS, and information available from regulatory agencies. The following data sources were used as a guide to understand the location and species-specific requirements of the wildlife movement corridors that have been identified in the San Joaquin Valley:

- The wildlife movement corridors identified in *Missing Linkages: Restoring Connectivity to the California Landscape* (Penrod et al. 2001), which was prepared in response to the 2000 Missing Linkages conference
- *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998); *Habitat Suitability and Potential Corridors for San Joaquin Kit Fox in the San Luis Unit—Fresno, Kings, and Merced Counties, California* (Cypher et al. 2007); *Conservation of San Joaquin Kit Foxes in Western Merced County, California* (Constable et al. 2009); and *San Joaquin Kit Fox (Vulpes macrotis mutica) 5-Year Review: Summary and Evaluation* (USFWS 2010), which identified core, satellite, and linkage areas
- *California Essential Habitat Connectivity Project* (Spencer et al. 2010), which identifies *Natural Landscape Blocks* (Rustigian-Rosmos 2010) and *Essential Connectivity Areas* (ECA) (Gogol-Prokurat 2014)
- Modeled wildlife corridors in the San Joaquin Valley region, prepared by the Information Center for the Environment, University of California, Davis (Huber 2007)
- *Merced to Fresno Section Landscape Permeability Analysis* (Authority and FRA 2012c), which provided information on the proposed crossing structures for one alternative of the Merced to Fresno Section to facilitate wildlife movement
- *Dedicated Wildlife Crossings for the Merced to Fresno Section of the California High-Speed Train System*, April 13, 2012 Memorandum (Authority and FRA 2012d), which describes dedicated wildlife crossings proposed for the Merced to Fresno Section
- *Biological Opinion on the California High-Speed Train System: Merced to Fresno Section Project, Merced, Madera, and Fresno Counties* (USFWS 2012), which provides design measures for proposed dedicated wildlife crossings for the Merced to Fresno Section

Field Surveys

Biologists conducted field surveys to determine the presence or absence of biological resources and to document the location of any biological resources through habitat characterization and mapping. Habitat characterization and mapping were conducted throughout the biological resource RSAs. At the time of preparation of this document, permission to enter has been granted for some properties, but access to most properties has not been granted, and therefore most surveys have not yet been completed. The survey team was granted access to and conducted surveys on approximately 13 percent of the property, by acreage, within or adjacent to the project footprints of the Central Valley Wye alternatives. However, the majority of the project footprints are located near to or immediately adjacent to public rights-of-way such as county and state roads. Thus, as noted below, additional areas were assessed where visible from public rights-of-way, and in most instances, the majority of the core habitat RSA was assessed. Some limited surveys (e.g., special-status plants) are expected to be completed as permission to enter becomes available prior to construction.

Reconnaissance Field Survey

Biologists conducted a reconnaissance field survey on November 18 and 19, 2014. The purpose of the reconnaissance surveys was to ground-truth the preliminary plant community/land cover maps for the Core Habitat RSA and collect qualitative information on land cover and habitat quality in the Auxiliary Habitat RSA. Additionally, parcels that supported moderate- to high-quality habitat for special-status plant and wildlife species were identified so that access could be requested to conduct presence/absence surveys for these species on those parcels in the future.

Biologists conducted a reconnaissance field survey of the electrical interconnections and network upgrades components on April 12, 13, 14, and 26, 2016, and November 12, 2018. The purpose of the reconnaissance survey was to define existing land cover types within the study area. Biologists drove along publicly accessible roadways and existing PG&E right-of-way to conduct windshield surveys of the study area. Portions of the study area that were not entirely visible from public roadways, including the Site 6—El Nido, El Nido Substation, were confirmed via review of

2016 aerial imagery on Google Earth. The biologists conducted pedestrian surveys at all stream and riparian crossings and sensitive natural communities that were adjacent to public roadways.

Botanical Surveys

On April 30, 2015, botanists conducted a vernal pool habitat assessment and aquatic resource delineation on four parcels (i.e., Cementina property) in the northeastern portion of the Central Valley Wye alternatives special-status plant study area. On August 8, 2015, botanists conducted a follow-up assessment and late-season special-status plant surveys on the four Cementina parcels and 11 additional parcels with potential vernal pool habitat. The properties that were surveyed for botanical resources comprise approximately 13 percent of the total acreage of property within and adjacent to the project footprints of the Central Valley Wye alternatives. The surveys were conducted by the botanists walking transects across each parcel while searching vernal pools for special-status plant species. Surveys were timed to coincide with the peak blooming period for target species, and conducted in accordance with the CDFW's *Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities* (CDFG 2009) and the USFWS's *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 1996). Surveys were conducted during a long-term drought in the region; it is worth noting that drought conditions may preclude the presence or identification of annual plants, which account for most special-status plant species potentially present in the RSAs. Five properties with vernal pools have not been surveyed as of the time of preparation of this document.

Biologists evaluated 61 special-status plant species, including 12 federally and state-listed species, for their potential to occur in the special-status plant study area. The evaluation was based on the species range, the presence of known occurrences near the Central Valley Wye alternatives, and the presence of potential habitat within the special-status plant study area.

Wildlife Surveys

Presence of special-status wildlife species was presumed if potentially suitable habitat was identified within the Core Habitat RSA, based on the vegetation map and land cover type.

Biologists conducted a preliminary survey for nesting Swainson's hawks in the habitat study area April 13–15 and June 29–30, 2015, which corresponds with the nest-building and nestling stages of this species' nesting season when nests are detectable. Each survey visit consisted of four biologists (two 2-person teams) systematically driving available public roads and searching potential nesting habitat (i.e., trees, utility and transmission towers) for nest structures and raptor activity. Observations were made from public roadsides with binoculars and spotting scopes. Where property access was limited, active nests were identified through the observation of adult Swainson's hawks sitting on or flying to nest structures, carrying food into and out of dense trees, or nest-building. The survey focused on potential nesting habitat within 1,000 feet of the Central Valley Wye alternatives and was not considered a complete census of all Swainson's hawk nesting territories within 0.5 mile of the Central Valley Wye alternatives, as typically required by the CDFW). Although access to private property was limited as a result of property owners denying access to the survey team, the survey team was able to conduct a comprehensive assessment of the majority of the core habitat RSA from public rights-of-way. Additional information regarding the survey is provided in the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a).

Wildlife Habitat Assessment

Wildlife habitat assessments were conducted according to the methods described in the *High-Speed Train Central Valley Biological Resources and Wetlands Survey Plan* (Authority and FRA 2010), which was prepared in part for the Merced to Fresno Section. Wildlife habitat assessment field surveys were conducted throughout the core and auxiliary habitat study areas to identify and map CWHR wildlife habitat types using the wildlife habitat descriptions presented in *A Guide to Wildlife Habitats of California* (CDFG 1988) and the CWHR (CDFW 2014b).

In the field, a team of biologists conducted mapping of wildlife habitat and general wildlife surveys on November 18 and 19, 2014. The wildlife habitat assessment consisted of a visual assessment while driving along existing public roads, updating existing habitat types, and noting sensitive natural communities and the location of any observed special-status wildlife species. The majority of the core habitat RSA was assessed during this effort. As noted above, access to private property was limited as a result of property owners denying access to the survey team. However, the survey team was able to conduct a comprehensive assessment of the majority of the core habitat RSA because the majority of the core habitat RSA is visible from public rights-of-way. The team stopped at all drainage crossings, areas that were noted as having a moderate to high potential for special-status wildlife species, and at the location of CNDDDB records that could be assessed from the road. Observations were made only from public rights-of-way.

Following the listing of four bumble bees as candidates for endangered status under CESA in June 2019, biologists conducted an assessment of potential habitat for each species. The range of Franklin's bumble bee is limited to a small area in southern Oregon and extreme northern California. The range of the Suckley cuckoo bumble bee within California is limited to the Klamath Mountain region in northern California. The range of the western bumble bee within California is generally located in northern California.⁵ Therefore, of the four candidate species, only the Crotch bumble bee has a range with any likelihood to overlap with the Central Valley Wye alternatives.

There are two published range maps for Crotch bumble bee. The Petition includes both a recent (2002–2012) and historic (pre-2002) range (Xerces Society et al. 2018, Figure 1 page 10) based on sampling efforts for the species. The IUCN Red List of Threatened Species (Hatfield et al. 2015) provides the geographic range for two areas: one within which the species is considered extant and one within which the species is possibly extinct (generally, areas to the north of Sacramento are within the possibly extinct area). Both range maps indicate that Crotch bumble bee occurs primarily in California (with a small part of the range in Baja California, Mexico), through the Mediterranean region, from along the Pacific Coast, through the inner coast ranges and Great Central Valley into the Sierra foothills, and including the western portion of the Mohave Desert (Hatfield et al. 2015, Williams et al. 2014). Both range maps also overlap completely with the Great Central Valley from generally Sacramento south, and entirely overlap with the Central Valley Wye and associated EINU.

The CNDDDB and iNaturalist⁶ both contain records documenting the distribution of Crotch bumble bee. There are no CNDDDB occurrences or iNaturalist observations of Crotch bumble bee in the project footprint for the Central Valley Wye alternatives (including EINU Sites 6 and 7). The CNDDDB⁷ includes three records for Crotch bumble bee within 15 miles of the Central Valley Wye alternatives and EINU (7 miles to the closest project footprint and 4 miles to the closest EINU project footprint). However, all three records are historical and based on collections from 1899, 1949 and 1952. iNaturalist includes two observations within 15 miles of the Central Valley Wye alternatives and EINU (4 miles to the closest EINU project footprint and 15 miles to the closest project footprint). These observations include a May 2019 occurrence located slightly north and west of Wood Ranch and west of Interstate 5 (O'Brien 2020); and a May 2019 occurrence between the cities of Fresno and Rolling Hills, west of Yosemite Freeway and just south of the San Joaquin River (Johnson 2020). Both of the occurrences are considered "research grade" by iNaturalist. A research grade occurrence is one where the date, location and proper photographic evidence have been submitted and accepted and two thirds of the identifiers agree with the identification using the provided photographic evidence.

⁵ In California, populations of western bumble bee are largely restricted to high elevation sites in the Sierra Nevada, with some observations in the northern California coast (Xerces Society et al. 2018).

⁶ iNaturalist is a crowdsourced species identification system and an organism occurrence recording tool. iNaturalist includes a data quality assessment which evaluates an observation's accuracy. iNaturalist was consulted for this assessment because: (1) records in CNDDDB are few and the records are mostly very old based on historical collections, (2) it provides additional information on the potential range of this newly listed species.

⁷ Note that Crotch bumble bee was not previously considered a "special-status species" by the CNDDDB and so records appear to be recently added based on historical collections.

All bumble bees have three basic habitat requirements: suitable nesting sites for the colonies, availability of nectar and pollen from floral resources, and suitable overwintering sites for the queens. Crotch bumble bee inhabits open grassland and scrub habitats and primarily nests underground (Williams et al. 2014). Little is known about the nesting and overwintering sites for Crotch bumble bee; however, similar species typically overwinter in soft, disturbed soil (Goulson 2010), or under leaf litter or other debris (Williams et al. 2014). Nests are often located underground in abandoned holes made by ground squirrels, mice, and rats, or occasionally abandoned bird nests. Additionally, Crotch bumble bee is classified as a short-tongued species and is primarily associated with the following plant families: Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, Boraginaceae (Xerces Society et al. 2018), including plants in the genera *Asclepias*, *Chaenactis*, *Lupinus*, *Medicago*, *Phacelia*, and *Salvia* (Williams et al. 2014).

On the basis of the information available, as well as previous field reconnaissance and habitat assessments, areas with native or relatively undisturbed soils were determined to potentially support colonies or overwintering sites. Additional field habitat assessments were not performed to make this determination. Within the habitat study area, these areas are generally limited to annual grassland and scrub land cover types which can provide concentrations of flowering plants, especially those known to be used by the species. Consequently, areas with these habitat types, and within the entire range of the project, were characterized as potential habitat for Crotch bumble bee. Areas potentially affected were calculated in GIS using identical methods used for other wildlife species.

Aquatic Resource Delineations and California Rapid Assessment Method for Wetlands and Riparian Areas

Wetlands in the wetland study area were delineated using the methods described in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008a). All wetlands are described by using the classification system adopted by the 2012 Primary Wetlands Delineation Report (Authority and FRA 2012b). Wetland boundaries were determined by using paired data points in wetland and adjacent upland areas. Potential wetland areas located on inaccessible properties were reviewed by analysts using available GIS data, and other data sources including aerial photography, topographic mapping, and soil survey data. The characteristic vegetation at each sample point was recorded, and soil test pits were hand excavated at each point to determine any groundwater hydrology and soil conditions. For large complexes of features, or repeated features of the same type, paired points were recorded at representative features, but not at each individual feature. After evaluating the hydrology, soils, and vegetation, all of the data points were recorded on Wetland Determination Data Form-Arid West Region data sheets (USACE 2008a). All areas determined to be wetlands were recorded as line, point, or polygon features using a geographic positioning system unit or aerial photographs. The boundaries of wetlands were extrapolated by following topographic contours, wetland vegetation boundaries, and clear hydrologic boundaries.

Non-wetland waters in the wetland study area were delineated using the methods described in *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (USACE 2008b) and *USACE Regulatory Guidance Letter No. 05-05: Ordinary High Water Mark Identification* (USACE 2005), where appropriate. These manuals provide an approach for identifying the lateral limits of jurisdictional waters using stream geomorphology and vegetation response to the dominant stream discharge (USACE 2008b). Indicators of ordinary high water mark that were evaluated in the field include, but are not limited to, natural lines impressed on banks, stain lines, depositional features, shelving, changes in soil character, changes in vegetation, destruction of terrestrial vegetation, and the presence of litter and debris.

Generally, wetlands under state jurisdiction are delineated in the same manner as federal waters (including *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008a)) because no formal guidelines have been approved for the identification of waters under

Central Valley Regional Water Quality Control Board (Central Valley RWQCB) jurisdiction. However, no guidance or policy is in place with respect to the identification or mapping of waters of the state. The extent of these regulated areas in some instances extends beyond that of waters of the United States (above the ordinary high water mark). For example, isolated waterbodies and stream channels up to the top of the streambank or to the drip line of riparian vegetation may qualify as waters of the state. Additional information regarding the wetland delineation surveys is provided in the Second Supplemental Wetlands Delineation Report (Authority and FRA 2018a) and the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a).

The California Rapid Assessment Method (CRAM) for wetlands was employed to assess the conditions of aquatic resources within the Central Valley Wye alternatives of the HSR system. The methods for conducting CRAM are described in the California Rapid Assessment Method for Wetlands User’s Manual, Version 6.1 (California Wetlands Monitoring Workgroup [CWMW] 2013a). The CRAM uses a wetland classification system derived primarily from the functional classification described in the Hydrogeomorphic Method (Brinson 1993). The CRAM typology includes five wetland types: riverine wetlands, depressional wetlands, estuarine wetlands, lacustrine wetlands, and slope wetlands. All but lacustrine wetlands have been divided into sub-types. Riverine wetlands and depressional wetlands and their sub-types were used in the CRAM assessment for the Central Valley Wye alternatives. In CRAM, the conditions attributed to wetland areas in a site or region are based on the conditions sampled in assessment areas, which, in the case of all four Central Valley Wye alternatives, were identified by the CRAM team and GIS staff in areas that were accessible to the survey team. Twenty-eight assessment areas were accessible and evaluated through this assessment, each corresponding to a different natural or constructed aquatic resource feature.

CRAM evaluates wetlands by scoring four key attributes: (1) buffer and landscape context; (2) hydrology; (3) physical structure; and (4) biotic structure and averages these four attribute scores to calculate the CRAM Index Score. The condition assessment of wetlands for the Central Valley Wye alternatives used CRAM according to the most recent field books for the four modules: riverine, depressional, individual vernal pool, and vernal pool systems (CWMW 2013a, 2013b, 2013c, 2013d, 2013e). Data from the 28 assessment areas were extrapolated to all wetlands that intersected the affected areas of the four Central Valley Wye alternatives: of 187 wetland features intersected by the SR 152 (North) to Road 13 Wye Alternative, 11 were surveyed; of 166 wetland features intersected by the SR 152 (North) to Road 19 Wye Alternative, 11 were surveyed; of the 162 wetland features intersected by the Avenue 21 to Road 13 Wye Alternative, 16 were surveyed; and of the 156 wetland features intersected by the SR 152 (North) to Road 11 Wye Alternative, nine were surveyed. (Some assessment areas were within the footprint of more than one alternative.)

The Second Supplemental Wetlands Delineation Report (Authority and FRA 2018a) submitted for the Central Valley Wye alternatives described Aquatic Resource types identified in the wetland study area using the Cowardin system. This system is similar but not equivalent to the standard CRAM typology. In Table 3.7-4, for each aquatic resource type in the Second Supplemental Wetlands Delineation Report, the corresponding CRAM type is provided.

Table 3.7-4 Standard Terms Used for Wetland Condition Assessment of All Central Valley Wye Alternatives

Second Supplemental Wetlands Delineation Report Aquatic Resource Types (Cowardin Type)	CRAM Type
Constructed Basin	Depressional wetlands (subtype: depressional)
Constructed Watercourse	Riverine wetlands (subtype: confined and nonconfined riverine)
Freshwater Marsh	Depressional wetlands (subtype: depressional)
Mixed Riparian	Riverine wetlands (subtype: confined and nonconfined riverine)

Second Supplemental Wetlands Delineation Report Aquatic Resource Types (Cowardin Type)	CRAM Type
Other Riparian	Riverine wetlands (subtype: confined and nonconfined riverine)
Palustrine Forested Wetland	Riverine wetlands (subtype: confined and nonconfined riverine)
Seasonal Wetland	Depressional wetlands (subtype: depressional)
Vernal Pool	Depressional wetlands (subtypes: individual vernal pools and vernal pool systems)

Source: Authority and FRA, 2018a

Wildlife Movement Corridors

Information on wildlife movement corridors in the Wildlife Movement RSA was obtained by reviewing existing data and by conducting reconnaissance-level surveys to field-check existing data. State and federal agencies as well as independent researchers have defined and described wildlife movement corridors. Therefore, the Authority determined additional intensive field efforts to identify wildlife movement corridors were unnecessary. A background review of wildlife movement/migration corridors was conducted by overlaying migration corridor datasets onto the Central Valley Wye alternatives in Google Earth Pro and in GIS, and noting areas that provide suitable movement corridors. The mapped corridors were ground-truthed in the Wildlife Movement RSA during the reconnaissance field survey to ascertain their utility on both a local- and meta-population level. The field evaluation of potential movement corridors addressed the availability and suitability for the movement of wildlife species, and identified changes in corridor quality on a rough landscape level. Data obtained from the field evaluation were supplemented with a review of existing wildlife passages (such as drainage crossings, and automobile and train bridges) in the habitat survey area. Potential movement barriers such as canals and roadways were also noted in the field.

The *Dedicated Wildlife Crossings for the Merced to Fresno Section of the California High-Speed Train System* memorandum (Authority and FRA 2012d) was prepared in 2012 to address potential impacts of the Merced to Fresno Section of the HSR system on federally listed wildlife species. Specifically, the memo describes the dedicated wildlife crossings proposed for the Merced to Fresno Section to minimize impacts on San Joaquin kit fox. The memo presents design features for wildlife-dedicated crossings and proposes the spacing of the wildlife-dedicated crossing along the alignment based on the land cover type and whether the alignment crosses an ECA. The subsequent *Biological Opinion on the California High-Speed Train System: Merced to Fresno Section Project, Merced, Madera, and Fresno Counties*, issued by the USFWS in 2012 (USFWS 2012), also provides design measures applicable to most of the same movement corridors that are within the Wildlife Movement RSA. Based on a review and assessment of the design features identified in the memorandum and biological opinion and information on known wildlife movement corridors that intersect the Central Valley Wye alternatives, project biologists provided project engineers with preliminary locations of potential dedicated wildlife crossings along each of the Central Valley Wye alternatives.

San Joaquin River Restoration Program

The SJRRP (described in Section 3.7.2.1) divides the San Joaquin River into multiple segments, and segment 4A of the river restoration area crosses the project footprints of the Central Valley Wye alternatives in a general north-south direction south of the City of Merced (DWR 2008).

The USBR initiated interim flows in 2009. Interim flows are experimental flows and assist in obtaining data concerning flows, temperatures, fish needs, seepage losses, recirculation, recapture, and reuse. Following the completion of Friant Dam, and prior to interim flows, the reach between Friant Dam and the Mendota Pool rarely sustained flows conducive to the Chinook salmon life cycle (USBR and DWR 2011). Beginning in 2014, the SJRRP initiated full

restoration flows and began releasing hatchery fish into the San Joaquin River just above its confluence with the Merced River to begin restoring a natural spring run of Chinook salmon. These releases have continued on a regular basis and evaluation is ongoing on the progress made to date in reintroducing spring-run Chinook salmon and fall-run Chinook salmon to the San Joaquin River (NMFS 2015).

During the initial design of the Merced to Fresno Section of the HSR, the Authority took part in a coordination meeting on June 6, 2011 with the USBR and DWR. During this meeting, it was determined that the project design would not conflict with the SJRRP. As the design has progressed, the Authority has continued working with the implementing agencies of the SJRRP to avoid any project-related impacts on the goals of the SJRRP.

This analysis builds on the analysis presented in the 2012 Merced to Fresno Final EIR/EIS and the Record of Decision, which included information relevant to the goals of the SJRRP. The 2012 Merced to Fresno Final EIR/EIS evaluates direct and indirect impacts for special-status fish and EFH through the construction period. Direct impacts evaluated for special-status fish include physical disturbance; Interruptions to fish passage, sedimentation, turbidity, altered water temperatures, oxygen depletion, and contaminants. Specific information regarding implementation of SJRRP goals in relation to species or resource area for the analysis of the Central Valley Wye alternatives is provided, where applicable, in Section 3.7.6, Affected Environment.

3.7.5.4 Determining Significance under CEQA

CEQA requires that an EIR identify the significant environmental impacts of a project (CEQA Guidelines § 15126). One of the primary differences between NEPA and CEQA is that CEQA requires a significance determination for each impact using a threshold-based analysis (see 3.1.3.4 for further information). By contrast, under NEPA, significance is used to determine whether an EIS will be required; NEPA requires that an EIS is prepared when the proposed federal action (project) as a whole has the potential to “significantly affect the quality of the human environment.” Accordingly, Section 3.7.10, CEQA Significance Conclusions, summarizes the significance of the environmental impacts on biological resources and wetlands for each Central Valley Wye alternative. The Authority is using the following thresholds to determine if a significant impact on biological resources and wetlands would occur as a result of the Central Valley Wye alternatives. A significant impact is one that would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS.
- Have a substantial adverse effect on state or federally protected aquatic resources as defined by CWA Section 404 (including seasonal wetlands, canals, ditches, lacustrines, retention and detention basins, riparian, and seasonal riverine) through direct removal, filling, hydrological interruption, indirect or cumulative effects, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted HCP, natural community conservation plan, or other approved local, regional, state, or federal HCP

Mandatory findings of significance within CEQA Guidelines Section 15065 require the lead agency to determine whether a project may have a significant impact on the environment where substantial evidence indicates that negative impacts may occur on biological resources. The negative conditions are defined as: (1) the project has the potential to substantially degrade the

quality of the environment, reduce habitat of wildlife species, cause wildlife populations to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce or restrict the range of a listed species; (2) the project has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals; and (3) the project has environmental effects that are individually limited but cumulatively considerable. Under CEQA mandatory findings of significance, the project would result in a significant impact if it would:

- Substantially reduce the habitat of a fish or wildlife species.
- Cause a fish or wildlife population to drop below self-sustaining levels.
- Threaten to eliminate a plant or animal community.
- Substantially reduce the number or restrict the range of an endangered, rare, or threatened species.

General indicators of an adverse effect, based on guidelines or criteria in NEPA, CEQA, CWA, FESA, CESA, and regulatory guidance from the FRA include:

- Potential modification or destruction of habitat, movement corridors, or breeding, feeding, and sheltering areas for endangered, threatened, rare, or other special-status species.
- Potential measurable degradation of protected habitats, sensitive vegetation communities, wetlands, or other habitat areas identified in plans, policies, or regulations.
- Potential loss of a substantial number of any species that could affect the abundance or diversity of that species beyond the level of normal variability.
- Potential indirect impacts, both temporary and permanent, from excessive noise that elicits a negative response and avoidance behavior.

3.7.6 Affected Environment

This section describes the affected environment for biological resources and wetlands in the Central Valley Wye alternatives project footprints, including biological communities (terrestrial and aquatic), special-status species, habitats of concern, wetlands, and wildlife movement/migration corridors. It also discusses changes to biological resources and wetlands in the San Joaquin Valley since publication of the Merced to Fresno Final EIR/EIS. This information provides the context for the environmental analysis and evaluation of impacts. Where applicable, resource differences among the Central Valley Wye alternatives are discussed at the end of each resource topic. A comprehensive assessment of biological resources and wetlands within each resource study area has been included in this section from the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a), the Second Supplemental Wetlands Delineation Report (Authority and FRA 2018a), and Appendix 2-D.4. The Biological Resources and Wetlands Technical Report evaluates resources within the portions of the Central Valley Wye alternatives project footprints associated with the rail system, whereas Appendix 2-D.4 evaluates resources located only within those areas associated with the EINU. The Second Supplemental Wetlands Delineation Report provides more detailed information specific to potentially jurisdictional waters in the Central Valley Wye alternatives project footprints.

The Central Valley Wye alternatives are in the San Joaquin Valley subregion of the California Floristic Province's Great Central Valley region (Baldwin et.al. 2012). This subregion extends from the northern border of Contra Costa and San Joaquin Counties south to the northern border of Ventura and Santa Barbara Counties. Historically, the San Joaquin Valley was characterized by California prairie, alkali scrub, vernal pools and other seasonal wetlands, marshlands, oak savanna and woodland, and extensive riparian woodlands (Hickman 1993).

Today, the valley is highly disturbed with the majority of land in the project footprints being used for agriculture or urban uses. In these areas, native vegetation is absent, or fragmented and highly disturbed, and the more typical vegetation consists of a variety of planted crop plants, agricultural weeds, and nonnative ornamental vegetation. Distribution of natural vegetation and

aquatic habitats is fragmented because of urban and agricultural land uses and the impoundment and diversion of water from natural watercourses. In a few areas, native vegetation remains relatively undisturbed, although invasive and nonnative plant species are widespread and abundant in these areas. Areas that have not been recently plowed or disked, or that show no sign of having been disturbed in recent decades, are referred to as “natural areas” in this document.

Additional details on biological resources and wetlands are provided in these documents.

3.7.6.1 Plant Communities and Land Cover Types

This section provides a general overview of the broad land cover categories in the Core Habitat RSA. Additional details on plant species composition, land cover characteristics, and wildlife habitat values of each land cover type are provided in Biological Resources and Wetlands Technical Report (Authority and FRA 2016a), the Second Supplemental Wetlands Delineation Report (Authority and FRA 2018a) and Appendix 2-D.4. Plant communities and land cover types in the biological resources RSAs fall under four broad categories: agricultural lands, developed areas, natural and semi-natural areas, and aquatic habitats. Table 3.7-5 provides the area of each land cover type for each of the Central Valley Wye alternatives.

The Central Valley Wye alternatives are located in the San Joaquin Valley subregion of the California Floristic Province’s Great Central Valley region (Baldwin et al. 2012: page 41). This subregion extends from the northern border of Contra Costa and San Joaquin Counties south to the northern border of Ventura and Santa Barbara Counties. The majority of land in the habitat study area is actively used for agriculture. Parcels where agricultural use could not be assigned to CWHR system habitat types (i.e., dryland grain crops, irrigated grain crops, irrigated hayfield, irrigated row and field crops) were designated under the umbrella designation of cropland. Urban areas are the second most common types of land use, including the communities of Merced, Chowchilla, and Madera. Native vegetation in these areas is absent or highly disturbed, and the more typical vegetation consists of a variety of planted trees such as eucalyptus (*Eucalyptus* spp.) and other nonnative or ornamental vegetation.

Vegetation mapping was conducted by using a combination of review of existing GIS wetland mapping data, interpretation of aerial photographs, and limited fieldwork where access was available (see Section 3.7.5.1).

Agricultural Lands

Agricultural lands account for 77.9 percent (SR 152 [North] to Road 19 Wye Alternative) to 86.0 percent (Avenue 21 to Road 13 Wye Alternative) of the project footprints for the Central Valley Wye alternatives. Nine types of agricultural land occur in the habitat study area: dairies, fallow field, field crops, inactive agriculture, orchards, pastures, rice field, row crops, and vineyards. These land uses, along with urban land uses, characterize the majority of land in the habitat study area. Agricultural lands may provide marginal habitat for seasonal forage and refugia (i.e., regions where plant and wildlife species can thrive despite unfavorable conditions) for a limited number of common species and special-status species.

Agricultural lands provide limited plant and wildlife habitat value relative to natural and semi-natural habitats as a result of lower species diversity and uniform vegetation structure. Additionally, wildlife species are often regarded as pests, and some farmers actively deter birds and insects, and poison small mammals to reduce crop damage and loss. Vegetation other than managed crops generally comprises weedy species adapted to high levels of disturbance and is often actively managed with herbicides, mowing, or tilling. Sparse annual grasses and weedy forbs may be present within hay fields and along the crop edges; however, because these weeds decrease crop value, these undesirable plants are often eradicated.

While the types of agricultural land uses have generally remained the same from the Merced to Fresno Final EIR/EIS, cropping patterns have likely caused slight changes in the distribution and amount of agricultural land uses.

Developed Areas

Developed areas account for 10.2 percent (Avenue 21 to Road 13 Wye Alternative) to 16.6 percent (SR 152 [North] to Road 13 Wye Alternative) of the project footprints for the Central Valley Wye alternatives. Developed areas in the habitat study area include urban areas, commercial and industrial buildings, transportation corridors, and barren areas where vegetation has been removed or is absent. In general, the types of developed areas are unchanged from the Merced to Fresno Final EIR/EIS, although there have been changes in the location and extent of transportation corridors as infrastructure updates have been completed.

Table 3.7-5 Land Cover Types in the Habitat Study Area by Central Valley Wye Alternative (acres)

Land Cover Type	SR 152 (North) to Road 13 Wye Alternative			SR 152 (North) to Road 19 Wye Alternative			Avenue 21 to Road 13 Wye Alternative			SR 152 (North) to Road 11 Wye Alternative		
	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area
Agricultural Lands												
Dairies	58.01	54.58	151.72	33.64	68.97	152.54	16.00	34.74	95.49	28.59	51.69	153.23
Fallow Field	18.46	430.23	0.00	57.90	646.60	0.00	18.46	430.23	0.00	18.46	430.23	0.00
Field Crops	1,197.58	1,814.54	4,128.25	1,110.24	2,288.72	3,676.31	904.38	1,855.68	4,461.75	1,170.82 ²	1,885.97 ²	4,142.72
Inactive Agriculture	77.82	161.51	172.85	61.32	185.34	146.92	81.65	179.57	157.15	60.47 ²	216.88 ²	115.63
Orchards	780.85	2,068.45	3,143.24	1,286.50	4,391.68	4,223.55	1,077.26	2,482.39	4,214.44	817.33 ²	2,062.13 ²	2,966.44
Pastures	26.11	84.52	127.29	57.38	383.25	130.84	28.27	69.34	46.09	21.58	77.77 ²	112.32
Rice Field	0.00	12.58	0.00	0.00	12.58	0.00	0.00	12.58	0.00	0.00	12.58	0.00
Row Crops	143.58	427.69	623.11	114.85	296.17	258.08	171.50	395.89	534.11	96.11	346.39	371.37
Vineyards	243.44	423.77	1,205.52	397.30	519.70	1,502.07	195.36	340.72	782.26	285.42	420.33	1,160.65
<i>Subtotal:</i>	<i>2,545.85</i>	<i>5,477.87</i>	<i>9,551.97</i>	<i>3,119.14</i>	<i>8,793.00</i>	<i>10,090.31</i>	<i>2,492.88</i>	<i>5,801.13</i>	<i>10,291.30</i>	<i>2,498.78²</i>	<i>5,503.96²</i>	<i>9,022.37</i>
Developed Area												
Barren	60.79	208.55	38.68	98.18	308.32	49.10	61.78	212.35	35.30	55.61	197.31	25.78
Commercial/Industrial	87.76	135.77	134.06	93.67	199.14	209.54	43.30	91.02	103.31	84.45 ²	149.81 ²	174.91
Transportation Corridor	289.28	272.39	392.64	343.41	398.79	401.93	134.09	254.59	411.83	244.93 ²	201.72	223.07
Urban	104.31	123.03	282.99	148.64	198.49	431.17	57.17	68.31	147.94	80.67	134.31 ²	296.85
<i>Subtotal:</i>	<i>542.14</i>	<i>739.74</i>	<i>848.38</i>	<i>683.91</i>	<i>1,104.75</i>	<i>1,091.74</i>	<i>296.33</i>	<i>626.28</i>	<i>698.38</i>	<i>465.65²</i>	<i>683.14²</i>	<i>720.62</i>

Land Cover Type	SR 152 (North) to Road 13 Wye Alternative			SR 152 (North) to Road 19 Wye Alternative			Avenue 21 to Road 13 Wye Alternative			SR 152 (North) to Road 11 Wye Alternative		
	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area
Natural and Semi-Natural Areas												
California Annual Grassland	99.71	138.10	286.37	130.20	475.99	277.11	33.33	58.85	93.47	78.11	109.48	283.71
Eucalyptus Woodlands	0.00	0.42	0.77	0.00	2.79	5.28	0.00	0.75	0.16	0.00	0.14	0.77
Mixed Riparian ¹	0.36	1.75	21.57	1.06	9.78	30.07	0.42	0.50	3.29	0.68	2.56	27.59
Other Riparian ¹	1.44	4.80	22.32	0.54	19.50	32.72	2.43	7.09	22.18	0.86	3.42 ²	14.38
Ruderal	39.00	122.59	77.58	54.19	177.93	97.07	25.07	100.37	18.27	38.37 ²	124.02 ²	75.44
Valley Sink Scrub	4.26	74.21	0.00	4.26	74.21	0.00	4.26	74.21	0.00	4.26	74.21	0.00
<i>Subtotal:</i>	<i>144.77</i>	<i>341.86</i>	<i>408.61</i>	<i>190.25</i>	<i>760.20</i>	<i>442.25</i>	<i>65.50</i>	<i>241.76</i>	<i>137.36</i>	<i>122.28²</i>	<i>313.83²</i>	<i>401.89</i>
Aquatic Habitats												
Depressional/Palustrine Wetlands												
Freshwater Marsh	0.00	0.01	0.00	0.00	1.23	0.52	0.00	0.01	0.00	0.00	0.01	0.00
Palustrine Forested Wetland	0.12	0.22	1.70	0.00	0.00	2.83	0.12	0.22	0.06	0.00	0.00	2.12
Seasonal Wetland	0.78	3.59	27.57	1.98	11.12	43.98	1.47	0.52	15.75	0.49	3.55	28.19
Vernal Pools	0.18	0.17	0.54	0.19	5.25	0.81	0.10	1.03	1.04	0.19	0.19	0.84
<i>Subtotal:</i>	<i>1.09</i>	<i>3.99</i>	<i>29.80</i>	<i>2.17</i>	<i>17.60</i>	<i>48.15</i>	<i>1.70</i>	<i>1.78</i>	<i>16.85</i>	<i>0.69</i>	<i>3.75</i>	<i>31.15</i>

Land Cover Type	SR 152 (North) to Road 13 Wye Alternative			SR 152 (North) to Road 19 Wye Alternative			Avenue 21 to Road 13 Wye Alternative			SR 152 (North) to Road 11 Wye Alternative		
	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area	Project Footprint	Core Habitat Study Area	Auxiliary Habitat Study Area
Other Waters												
Constructed Watercourses	19.76	149.49	47.61	18.23	173.93	43.88	28.44	156.28	60.32	14.40	151.03 ²	44.47
Natural Watercourses	10.06	30.54	97.76	12.09	52.13	124.19	9.97	22.51	50.39	7.74	25.16	95.93
Open Water	0.00	0.00	0.12	0.00	0.42	0.32	0.00	0.00	0.00	0.00	0.00	0.01
Constructed Basins	8.26	15.64	34.44	5.05	40.26	36.05	4.94	5.99	11.88	7.12	15.86 ²	38.84
<i>Subtotal:</i>	<i>38.09</i>	<i>195.67</i>	<i>179.93</i>	<i>35.36</i>	<i>266.75</i>	<i>204.43</i>	<i>43.34</i>	<i>184.78</i>	<i>122.59</i>	<i>29.26</i>	<i>192.04²</i>	<i>179.25</i>
Total	3,271.93	6,759.14	11,018.69	4,030.84	10,942.31	11,876.88	2,899.75	6,855.74	11,266.49	3,102.21	6,696.74²	10,355.27

Source: Calculations generated using ESRI ArcGIS versions 10.1, 10.2, and 10.3 from data generated by field surveys and aerial photo interpretation during 2010–2018. On April 27, 2018, USACE concurred with the findings of the delineation of waters of the United States.

¹ Mixed Riparian and Other Riparian habitats are placed under Natural and Semi-Natural Areas; however, these habitats are also considered aquatic resources for state regulatory purposes.

² This value has been updated to reflect refinements to the Site 6 electrical interconnection. Refer to Section 2.2.3, Description of the Central Valley Wye Alternatives.

Minor differences in the totals are the result of rounding.

SR = State Route

Natural and Semi-Natural Areas

Natural and semi-natural areas account for 2.3 percent (Avenue 21 to Road 13 Wye Alternative) to 5.1 percent (SR 152 [North] to Road 19 Wye Alternative) of the project footprints for the Central Valley Wye alternatives. Natural and semi-natural cover types are distinguished from agricultural lands and developed areas by the degree of current human influence on the vegetation composition and structure. While the natural and semi-natural vegetation types have been altered by past and present human activities, the composition and structure of these communities is generally not actively managed or controlled. A distinction is also made between cover types largely characterized by native vegetation versus those in which introduced species are dominant. Natural and semi-natural terrestrial cover types in the habitat study area include California annual grassland, riparian areas (mixed riparian and other riparian areas), eucalyptus woodland, ruderal vegetation, and valley sink scrub.

In general, the types of natural and semi-natural areas identified in the Merced to Fresno Final EIR/EIS are also present in the habitat study area. Minor changes in distribution and extent may have occurred over time because of changes in cropping patterns.

Aquatic Habitats

Aquatic habitats account for 0.8 percent (SR 152 [North] to Road 11 Wye Alternative) to 1.5 percent (SR 152 [North] to Road 13 Wye and Avenue 21 to Road 13 Wye Alternatives) of the project footprints for the Central Valley Wye alternatives. A variety of vegetation and land cover types associated with wetlands and other water features occur in the wetland study area, and are largely unchanged from those described in the Merced to Fresno Final EIR/EIS. Aquatic plant communities and land cover types in the wetland study area include the following:

- Depressional/palustrine wetlands (a hydrogeomorphic class of wetlands that occur in topographic depression where the dominant water sources are precipitation, groundwater discharge, and both inflow and overland flow from the adjacent uplands).
 - Vernal pools (a type of seasonal isolated wetland characterized by a low amphibious, herbaceous community dominated by annual forbs and grasses)
 - Seasonal wetlands (wetlands characterized by seasonal inundation that support a variety of native and nonnative wetland plant species and may occur in a variety of landforms where there is seasonal saturation or inundation)
 - Freshwater marsh (semi-permanently flooded areas that typically support perennial emergent vegetation such as cattails, sedges, and rushes)
- Other Waters
 - Constructed basins (highly disturbed, constructed features such as stormwater retention basins and agricultural tailwater ponds)
 - Constructed watercourses (irrigation canals and drainage ditches, which may support emergent vegetation, as well as ruderal wetland species)
 - Natural watercourses, including:
 - Perennial rivers and creeks
 - Intermittent watercourses
 - Intermittent to ephemeral sloughs and creeks
- San Joaquin River
- Fresno River
- Chowchilla River
- Merced River
- Tuolumne River
- Ash Slough
- Berenda Slough

- Eastside Bypass of the San Joaquin River
- Deadman Creek
- Dutchman Creek
- Dry Creek
- Open Waters

With the exception of open waters, which primarily consist of incidental scrapes, tire ruts, or artificial hardpans that do not contain hydric soils or wetland vegetation, all of the aquatic cover types fall under the jurisdiction of USACE, SWRCB, or CDFW. Detailed descriptions of these cover types are provided in the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a), the Second Supplemental Wetlands Delineation Report (Authority and FRA 2018a), and Appendix 2-D, Electrical Interconnections and Network Upgrades.

3.7.6.2 Native Fauna Assemblage

Although the impact analysis in this Final Supplemental EIR/EIS focuses on special-status wildlife species, it is anticipated that impacts would also occur on other native fauna within the project footprints. Typical native fauna occurring in the habitat study area include the western toad (*Anaxyrus boreas*), Sierran treefrog (*Pseudacris sierra*), western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), gopher snake (*Pituophis catenifer*), common garter snake (*Thamnophis sirtalis*), great egret (*Ardea alba*), red-winged blackbird (*Agelaius phoeniceus*), mourning dove (*Zenaidura macroura*), American crow (*Corvus brachyrhynchos*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), American robin (*Turdus migratorius*), western scrub jay (*Aphelocoma californica*), turkey vulture (*Cathartes aura*), Brewer's blackbird (*Euphagus cyanocephalus*), American coot (*Fulica americana*), California ground squirrel (*Otospermophilus beecheyi*), and Botta's pocket gopher (*Thomomys bottae*). These species differ from those listed in the Merced to Fresno EIS/EIR because they are based on those that were observed during field reconnaissance specific to the Central Valley Wye alternatives. However, the same species are anticipated to occur in both areas.

3.7.6.3 Special-Status Species

This section provides a general overview of special-status plant and wildlife species known to occur or potentially occur in the Central Valley Wye special-status plant or habitat study areas, respectively. This section provides a summary of regulatory status, biology, and occurrence potential for each species. Additional information is provided in Appendix 3.7-C.

Special-Status Plant Species

Based on the methods discussed in Section 3.7.5, Methods for Evaluating Impacts, biologists evaluated 61 special-status plant species, including 12 federally and state-listed species, for their potential to occur in the special-status plant study area. The evaluation was based on the species range, the presence of known occurrences near the Central Valley Wye alternatives, and the presence of potential habitat within the special-status plant study area. No habitat is present in the special-status plant study area for eight of the special-status plant species, and they are thus presumed absent. Seven species have low potential to occur because the special-status plant study area is within their known range, but they have never been found within 10 miles of the Special-Status Plant RSA. These seven species are also presumed absent. Eight species have moderate potential to occur. Habitat is present in the special-status plant study area for these species, but either the special-status plant study area is just outside of the species ranges or only historic occurrences are present within 10 miles. Thirty-eight species have high potential to occur. The special-status plant study area is within the range of these species, there are known occurrences of the species within 10 miles, and habitat for the species is present. The 46 species with moderate to high potential to occur in the special-status plant study area are listed in Table 3.7-6.

Table 3.7-6 Special-Status Plant Species with Moderate to High Potential to Occur in the Special-Status Plant Study Area of All Central Valley Wye Alternatives

Common Name	Scientific Name	Federal Status	State Status
Federally and State-Listed Special-Status Species			
Succulent owl's-clover	<i>Castilleja campestris</i> subsp. <i>Succulenta</i>	Threatened	Endangered
Hoover's spurge	<i>Chamaesyce hooveri</i>	Threatened	—
Palmate-bracted bird's-beak	<i>Chloropyron palmatum</i>	Endangered	Endangered
Delta button-celery	<i>Eryngium racemosum</i>	—	Endangered
Boggs Lake hedge-hyssop	<i>Gratiola heterosepala</i>	—	Endangered
San Joaquin wooly-threads	<i>Monolopia congdonii</i>	Endangered	—
Colusa grass	<i>Neostapfia colusana</i>	Threatened	Endangered
San Joaquin Valley Orcutt grass	<i>Orcuttia inaequalis</i>	Threatened	Endangered
Hairy Orcutt grass	<i>Orcuttia pilosa</i>	Threatened	Endangered
Hartweg's golden sunburst	<i>Pseudobahia bahiifolia</i>	Endangered	Endangered
Keck's checkerbloom	<i>Sidalcea keckii</i>	Endangered	—
Greene's tuctoria	<i>Tuctoria greenei</i>	Endangered	—
Other Special-Status Plant Species¹			
Alkali milk-vetch	<i>Astragalus tener</i> var. <i>tener</i>	—	—
Heartscale	<i>Astragalus cordulata</i> var. <i>cordulata</i>	—	—
Crownscale	<i>Astragalus coronata</i> var. <i>coronata</i>	—	—
Lost Hills crownscale	<i>Atriplex coronata</i> var. <i>vallicola</i>	—	—
Lesser saltscale	<i>Atriplex minuscula</i>	—	—
Vernal pool smallscale	<i>Atriplex persistens</i>	—	—
Subtle orache	<i>Atriplex subtilis</i>	—	—
Round-leaved filaree	<i>California macrophylla</i>	—	—
Hoover's calycadenia	<i>Calycadenia hooveri</i>	—	—
Lemmon's jewelflower	<i>Caulanthus lemmonii</i>	—	—
Parry's rough tarplant	<i>Centromadia parryi</i> subsp. <i>rudis</i>	—	—
Hispid bird's-beak	<i>Chloropyron molle</i> subsp. <i>hispidum</i>	—	—
Beaked clarkia	<i>Clarkia rostrata</i>	—	—
Hoover's cryptantha	<i>Cryptantha hooveri</i>	—	—
Peruvian dodder	<i>Cuscuta obtusiflora</i> var. <i>glandulosa</i>	—	—
Hall's tarplant	<i>Deinandra halliana</i>	—	—
Ewan's larkspur	<i>Delphinium hansenii</i> subsp. <i>ewanianum</i>	—	—
Recurved larkspur	<i>Delphinium recurvatum</i>	—	—
Dwarf downingia	<i>Downingia pusilla</i>	—	—
Spiny-sepaled button-celery	<i>Eryngium spinosepalum</i>	—	—
Golden goodmania	<i>Goodmania luteola</i>	—	—

Common Name	Scientific Name	Federal Status	State Status
Hogwallow starfish	<i>Hesperevax caulescens</i>	—	—
Forked hare-leaf	<i>Lagophylla dichotoma</i>	—	—
Ferris' goldfields	<i>Lasthenia ferrisiae</i>	—	—
Munz's tidy-tips	<i>Layia munzii</i>	—	—
Showy golden madia	<i>Madia radiata</i>	—	—
Little mousetail	<i>Myosurus minimus</i> subsp. <i>apus</i>	—	—
Pincushion navarretia	<i>Navarretia myersii</i> ssp. <i>myersii</i>	—	—
Shining navarretia	<i>Navarretia nigelliformis</i> subsp. <i>radians</i>	—	—
Fragile pentachaeta	<i>Pentachaeta fragilis</i>	—	—
Merced phacelia	<i>Phacelia ciliata</i> var. <i>opaca</i>	—	—
California alkali grass	<i>Puccinellia simplex</i>	—	—
Sanford's arrowhead	<i>Sagittaria sanfordii</i>	—	—
Wright's trichocoronis	<i>Trichocoronis wrightii</i>	—	—

Sources: CDFW, 2016a; 2016b; CNPS, 2016; USFWS, 2017

¹ These plants have no federal or state listing status but do have a California Rare Plant Rank.

The special-status plant study area contains natural and semi-natural communities that provide habitat for the 46 special-status plants identified in Table 3.7-6. Although these species have moderate to high potential to occur in the Special-Status Plant RSA, their likelihood of occurrence is very low in most areas because the habitat is fragmented and in most areas. This is because the habitat is fragmented and has been disturbed by disking, cattle grazing, or other activities in most areas.

Special-Status Wildlife Species

Through preparation of the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a) and Appendix 2-D.4, biologists evaluated 93 special-status wildlife species for their potential to occur in the habitat study area. Of the 93 special-status wildlife species initially evaluated, 28 species were ruled out based on lack of suitable habitat, extensive areas converted by human development, extensive water diversions, and local or regional extirpations, or because the habitat study area lies outside of these species' known geographic range. The remaining 65 special-status wildlife species determined to have a moderate or high potential to occur in the habitat study area are listed in Table 3.7-7.

Table 3.7-7 Special-Status Wildlife Species with Moderate to High Potential to Occur in the Habitat Study Area of All Central Valley Wye Alternatives

Common Name	Scientific Name	Federal Status ¹	State Status ²
Federally and State-Listed Species			
Invertebrates			
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	FE, CH	—
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT, CH	—
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FT	—
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE, CH	—

Common Name	Scientific Name	Federal Status ¹	State Status ²
Crotch bumble bee	<i>Bombus crotchii</i>	—	CE
Fish			
Central Valley steelhead	<i>Oncorhynchus mykiss irideus</i>	FT, CH	—
Central Valley spring-run Chinook salmon	<i>Oncorhynchus tshawytscha</i>	FT	ST
Amphibians			
California tiger salamander	<i>Ambystoma californiense</i>	FT	ST
Reptiles			
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	FE	SE/FP
Giant garter snake	<i>Thamnophis gigas</i>	FT	ST
Birds			
Tricolored blackbird	<i>Agelaius tricolor</i>	—	ST
Swainson's hawk	<i>Buteo swainsoni</i>	—	ST
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	FT	CSC
American peregrine falcon	<i>Falco peregrinus anatum</i>	Delisted, BCC	SE/FP
Greater sandhill crane	<i>Grus canadensis tabida</i>	—	ST/FP
Bald eagle	<i>Haliaeetus leucocephalus</i>	Delisted, BGEPA, BCC	SE/FP
Least Bell's vireo	<i>Vireo bellii pusillus</i>	FE	SE
Mammals			
Nelson's antelope squirrel ³	<i>Amмосpermophilus nelsoni</i>	—	ST
Giant kangaroo rat ³	<i>Dipodomys ingens</i>	FE	SE
Fresno kangaroo rat	<i>Dipodomys nitratooides exilis</i>	FE	SE
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE	ST
Other Special-Status Wildlife Species			
Fish			
Hardhead	<i>Mylopharodon conocephalus</i>	--	CSC
Kern brook lamprey	<i>Lampetra hubbsi</i>	--	CSC
San Joaquin roach	<i>Lavinia symmetricus</i>	--	CSC
Chinook salmon—Central Valley fall/late-fall run evolutionarily significant unit	<i>Oncorhynchus tshawytscha</i>	FSC	CSC

Common Name	Scientific Name	Federal Status ¹	State Status ²
Amphibians			
Western spadefoot	<i>Spea hammondi</i>	—	CSC
Reptiles			
Western pond turtle	<i>Actinemys marmorata</i>	—	CSC
Silvery legless lizard ³	<i>Anniella pulchra</i>	—	CSC
San Joaquin coachwhip ³	<i>Masticophis flagellum ruddocki</i>	—	CSC
Blainville's horned lizard	<i>Phrynosoma blainvillii</i>	—	CSC
Birds			
Grasshopper sparrow	<i>Ammodramus savannarum</i>	BCC	CSC
Golden eagle	<i>Aquila chrysaetos</i>	BGEPA	FP
Short-eared owl	<i>Asio flammeus</i>	—	CSC
Long-eared owl	<i>Asio otus</i>	—	CSC
Western burrowing owl	<i>Athene cunicularia</i>	BCC	CSC
Redhead	<i>Aythya americana</i>	—	CSC
Barrow's goldeneye ³	<i>Bucephala islandica</i>	—	CSC
Red knot	<i>Calidris canutus roselaari</i>	BCC	—
Costa's hummingbird	<i>Calypte costae</i>	BCC	—
Lawrence's goldfinch	<i>Carduelis lawrencei</i>	BCC	—
Mountain plover	<i>Charadrius montanus</i>		CSC
Black tern	<i>Chlidonias niger</i>	—	CSC
Northern harrier	<i>Circus cyaneus</i>	—	CSC
Fulvous whistling-duck	<i>Dendrocygna bicolor</i>	—	CSC
Yellow warbler	<i>Dendroica petechia brewsteri</i>	BCC	CSC
White-tailed kite	<i>Elanus leucurus</i>	—	FP
Lesser sandhill crane	<i>Grus canadensis</i>	—	CSC
Yellow-breasted chat	<i>Icteria virens</i>	—	CSC
Least bittern	<i>Ixobrychus exilis</i>	—	CSC
Loggerhead shrike	<i>Lanius ludovicianus</i>	BCC	CSC
Marbled godwit ³	<i>Limosa fedoa</i>	BCC	—
Song sparrow ("Modesto" population) ³	<i>Melospiza melodia</i>	—	CSC
Long-billed curlew	<i>Numenius americanus</i>	BCC	—

Common Name	Scientific Name	Federal Status ¹	State Status ²
Whimbrel	<i>Numenius phaeopus</i>	BCC	—
American white pelican	<i>Pelecanus erythrorhynchos</i>	—	CSC
Yellow-billed magpie	<i>Pica nuttalli</i>	BCC	—
Nuttall's woodpecker	<i>Picoides nuttallii</i>	BCC	—
Spotted towhee ³	<i>Pipilo maculatus</i>	BCC	—
Oregon vesper sparrow	<i>Pooecetes gramineus affinis</i>	—	CSC
Purple martin	<i>Progne subis</i>	—	CSC
Yellow-headed blackbird	<i>Xanthocephalus</i>	—	CSC
Mammals			
Pallid bat	<i>Antrozous pallidus</i>	—	CSC
Ringtail	<i>Bassariscus astutus</i>	—	FP
Western mastiff bat	<i>Eumops perotis californicus</i>	—	CSC
Western red bat	<i>Lasiurus blossevillii</i>	—	CSC
American badger	<i>Taxidea taxus</i>	—	CSC

Sources: CDFW, 2016a; 2019; USFWS, 2017

This table incorporates information from the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a) and Appendix 2-D.4

¹Federal status

BCC = Birds of Conservation Concern designated by the U.S. Fish and Wildlife Service.

BGEPA = Protected under the Bald and Golden Eagle Protection Act

CH = Critical Habitat

FE = Endangered

FT = Threatened

FSC = Federal Species of Concern

²State status

CSC = California Species of Special Concern designated by the California Department of Fish and Wildlife

CE = Candidate for Endangered listing status

FP = Fully Protected species designated by the California Department of Fish and Wildlife SE = Endangered

SE = Endangered

ST = Threatened

³Species specific to electrical interconnection and network upgrade components only

The four Central Valley Wye alternatives provide suitable habitat for the 65 special-status wildlife species listed in Table 3.7-7, although not all species are likely to occur within the RSA for every alternative. In addition, habitat suitability varies depending on existing conditions, connectivity to habitat outside the Core Habitat RSA, and species' tolerance of human activity. Habitat for some species such as federally listed vernal pool branchiopods is restricted to the relatively limited amount of vernal pools and seasonal wetlands in the habitat study areas, while others such as Swainson's hawk, burrowing owl, and San Joaquin kit fox forage over a relatively large area of suitable agricultural lands. Of the four alternatives, the Avenue 21 to Road 13 Wye Alternative provides the smallest amount of suitable habitat for special-status wildlife because of lower acreages of vernal pools and riparian cover types.

The San Joaquin River crosses the western portion of the habitat study area for all four alternatives and provides habitat for Kern brook lamprey, fall-run Chinook salmon, Central Valley steelhead, hardhead, and San Joaquin roach. In addition, an experimental population of spring-run Chinook salmon is being reintroduced in the San Joaquin River from the Friant Dam to the

Merced River confluence as part of the SJRRP (see Section 3.7.2.1 and Section 3.7.5.3, Methods for NEPA and CEQA Impact Analysis, for more information on the SJRRP). Until the fall of 2016, flow in the segment of the San Joaquin River in the habitat study area was intermittent and the segment was dry during the summer months; however, the SJRRP has now restored flows to the mainstream San Joaquin River. As such, all four Central Valley Wye alternatives have an equal likelihood of affecting special-status fish species.

3.7.6.4 Habitats of Concern

Habitats of concern evaluated in the biological resources RSAs include special-status plant communities, jurisdictional waters, designated critical habitat, and EFH (Figure 3.7-2). This section provides a general overview of habitats of concern identified in the biological resources RSAs; more detailed descriptions and figures are provided in the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a) and the Second Supplemental Wetlands Delineation Report (Authority and FRA 2018a).

Special-Status Plant Communities

Special-status plant communities identified as potentially occurring in the Special-Status Plant RSA based on CNDDDB search results (CDFW 2014a) include mixed riparian, northern claypan vernal pool, valley sacaton grassland, and sycamore alluvial woodland. Riparian, valley sink scrub, wetland, and vernal pool communities are the only special-status plant communities that were observed during surveys of the special-status plant study area. Other special-status plant communities may be present in areas that were not accessible during the survey. For purposes of this discussion, the term *special-status* reflects terrestrial and aquatic plant communities that have been recognized as significant by the scientific community, that represent a rare vegetation type, that have limited distribution, or are recognized as rare by the CDFW. Table 3.7-8 lists the land cover types mapped in the special-status plant study area that would be considered special-status plant communities.

Table 3.7-8 Special-Status Plant Communities Occurring in the Special-Status Plant Study Area of all Central Valley Wye Alternatives

Land Cover Type	Closest Corresponding Holland (1986) Type	Identified as High Inventory Priority by CDFW
Vernal Pool	Northern Claypan Vernal Pool	Yes
Mixed Riparian	Great Valley Mixed Riparian Forest	Yes
Other Riparian	Central Coast Arroyo Willow Riparian	Yes
Palustrine Forested Wetland	Great Valley Mixed Riparian Forest	Yes
Seasonal Wetland	Northern Claypan Vernal Pool	Yes
Freshwater Marsh	Coastal and Valley Freshwater Marsh	Yes
Valley Sink Scrub	Desert Sink Scrub	Yes

Sources: Holland, 1986; CDFG, 2010; CDFW, 2016a
 CDFW = California Department of Fish and Wildlife

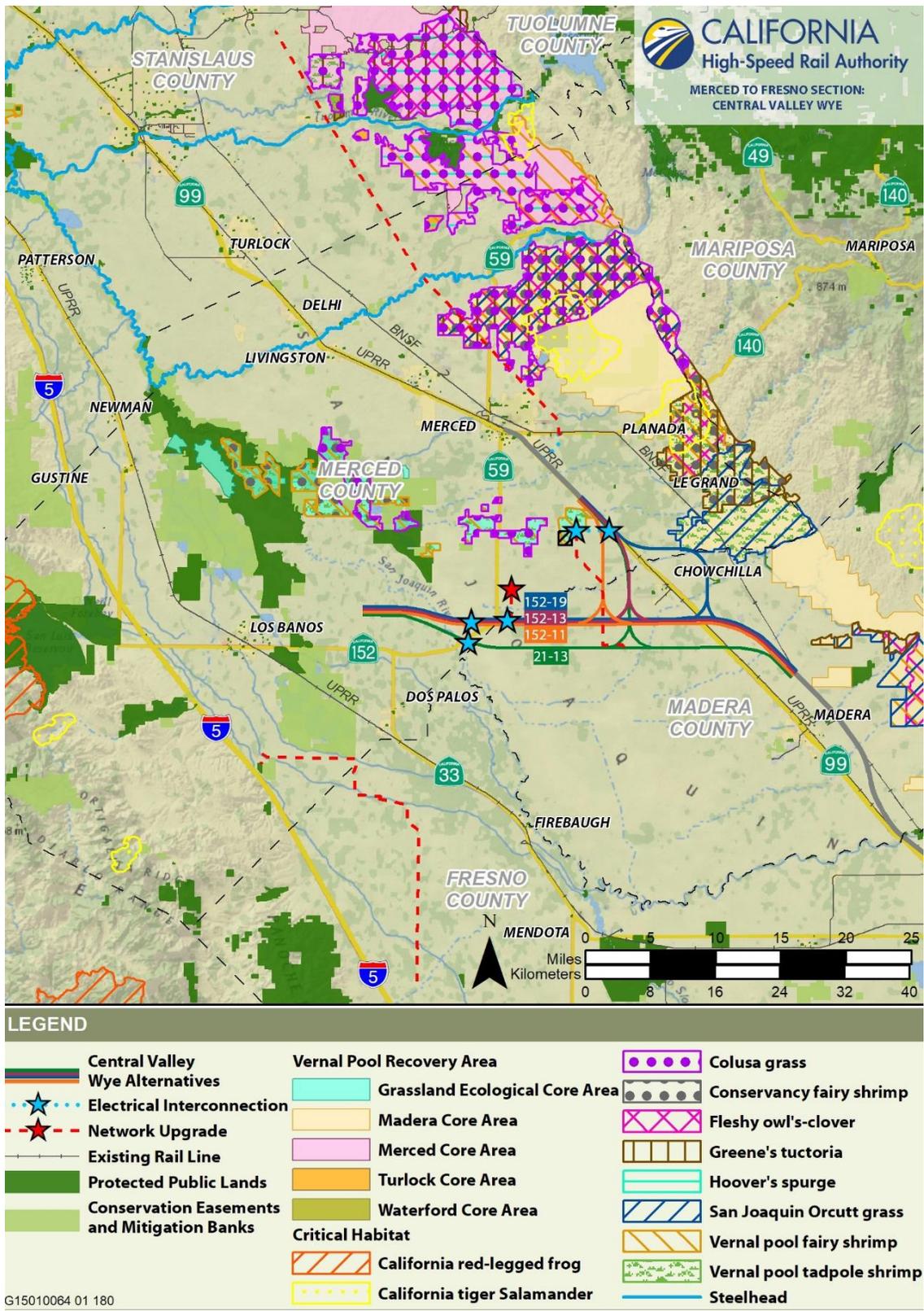


Figure 3.7-2 Habitats of Concern in the Habitat Study Area

Jurisdictional Aquatic Resources

The following is a very broad overview of jurisdictional aquatic resources in the wetland study area. More information is provided in the Second Supplemental Wetlands Delineation Report (Authority and FRA 2018a). Table 3.7-9 shows the different areas of jurisdictional waters, six of which are also special-status plant communities (Table 3.7-8), among the Central Valley Wye alternatives.

Table 3.7-9 Jurisdictional Aquatic Resources within the Wetland Study Area by Central Valley Wye Alternative (acres)

Jurisdictional Aquatic Resource Type	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye	Total Range Within the Wetland Study Area ¹
Wetlands					
Vernal Pools	0.36	0.36	1.16	0.38	0.36-1.16
Seasonal Wetlands ²	4.37	13.11	11.49	4.05	4.05-13.11
Freshwater Marsh	0.01	1.23	0.01	0.01	0.01-1.23
Mixed Riparian ³	2.11	10.84	4.51	3.24	2.11-10.84
Other Riparian ³	6.24	20.04	3.17	4.28 ⁴	3.17-20.04
Palustrine Forested Wetland ³	0.34	0.00	0.00	0.00	0.00-0.34
<i>Subtotal</i>	<i>13.42</i>	<i>50.65</i>	<i>19.54</i>	<i>11.96⁴</i>	<i>11.96-50.65⁴</i>
Other Waters					
Natural Watercourses	40.61	64.22	49.15	32.90	32.90-64.22
Open Waters	0.00	0.42	0.00	0.00	0.00-0.42
Constructed Basins	23.90	45.31	19.85	22.98 ⁴	19.85-45.31
Constructed Watercourses	169.25	192.16	166.22	165.42 ⁴	165.42-192.16 ⁴
<i>Subtotal</i>	<i>233.76</i>	<i>302.11</i>	<i>235.23</i>	<i>221.30⁴</i>	<i>221.30-302.11⁴</i>
Grand Total	247.18	352.76	254.76	233.26⁴	233.26-352.76⁴

Source: Calculations generated using ESRI ArcGIS versions 10.1, 10.2, and 10.3 from data generated by field surveys and aerial photo interpretation during 2010–2017. On April 27, 2018, USACE concurred with the findings of the delineation of waters of the United States. Minor differences in the totals are the result of rounding.

¹ Total range within the wetland study area identifies the least to most amount of habitat for each Central Valley Wye alternative.

² Seasonal Wetlands include Indirect Bisected vernal pools, which occur both inside and outside of the project footprints. The portion outside the footprint is referred to as "indirect bisected," but is considered a permanent direct impact for purposes of calculating mitigation requirements.

³ Mixed riparian and other riparian types are not considered "wetlands" by the USACE and therefore are not considered jurisdictional under Section 404 of the Clean Water Act. Palustrine forested wetlands are considered jurisdictional by the USACE. All types of riparian are considered to be regulated under Section 1602 of the California Fish and Game Code.

⁴ This value has been updated to reflect refinements to the Site 6 electrical interconnection. Refer to Section 2.2.3, Description of the Central Valley Wye Alternatives. All decimal values are presented to the hundredths place. Totals from 0.005 to 0.009 are therefore rounded to 0.01. Totals less than or equal to 0.004 acre are therefore rounded to zero (0).

SR = State Route

Wetlands

Wetland cover types identified within the wetland study area are vernal pools, seasonal wetlands, freshwater marsh, and palustrine forested wetland described under the subheading Riparian. All wetlands identified within the wetland study area are considered jurisdictional based on the Preliminary Jurisdictional Delineation option as described in the Jurisdictional Determinations, Regulatory Guidance Letter (USACE 2016).

Vernal pools are seasonal wetlands associated with soils containing hardpan or clay layers that impede drainage. They are dominated by annual grasses and forbs, and have specific flora and fauna associated with their seasonal inundation. The standing water that forms in vernal pools is ideal breeding habitat for several special-status species such as vernal pool fairy shrimp, Conservancy fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and western spadefoot.

Seasonal wetlands are a broader class of wetland characterized by seasonal inundation. Seasonal wetlands support a variety of both native and nonnative wetland plant species and may occur in a variety of landforms where soil saturation or inundation occurs. Although sharing a common hydrologic regime, seasonal wetlands are distinguished from vernal pool wetlands by their lack of distinctive vernal pool plant species and by the absence of a distinctive hardpan or clay soils. The seasonal wetlands in the wetland study area are typically degraded and of low quality due to nonnative plant community assemblages and land management modifications such as cultivation and grading.

Freshwater marshes are semi-permanently flooded areas that typically support perennial emergent vegetation such as cattails, sedges, and rushes. Freshwater marshes are found on floodplains, backwater areas, and within the channels of rivers and sloughs.

Other (Non-Wetland) Waters

Non-wetland waters identified in the wetland study area include natural watercourses, open water, constructed basin, constructed watercourses, and rice fields. All natural and constructed waterways are considered potentially jurisdictional under the Preliminary Jurisdictional Delineation format (USACE 2016).

Most of the natural watercourses in the wetland study area have ephemeral hydrology either because of their small watershed size or because they have been impounded or diverted upstream into other watercourses for agricultural purposes. They are characterized by low-gradient drainages with emergent vegetation along margins of pool-run habitat units with bottom substrates dominated by fine sediments.

Open water features in the wetland study area are primarily shallow depressions, including anthropogenic features such as scraps and ruts. The features are typically bare or sparsely vegetated by adventive native and nonnative herbaceous species. Despite primarily having an ephemeral hydroperiod, some open water features can provide marginal breeding habitat for federally listed species.

Constructed watercourses in the wetland study area include built canals and drainage and irrigation ditches. They are typically concrete-lined or earthen, and range from approximately 10 to 50 feet in width. These features are typically devoid of vegetation and have a highly manipulated hydrological regime; and thus, offer few biological resources to plants and wildlife.

Under Section 1602, the CDFW takes jurisdiction over rivers, streams, and lakes. The state's jurisdiction generally includes the streambed/lakebed to tops of bank. Although not specifically defined in Section 1602, jurisdiction in some instances may include adjacent riparian vegetation. The term *stream* is commonly understood as a watercourse having a source and terminus, banks and channel, through which waters flow, at least periodically. A *streambed* under Section 1602 includes the channel of a watercourse, which is generally defined to include the depression between the banks worn by the regular and usual flow of the water.

Riparian

Riparian areas are located on the banks of natural waterways including streams, sloughs, rivers, and, in some cases, constructed waterway features. Their vegetation is characterized by an overstory of trees that may consist of several tree species, such as willow species and Fremont cottonwood. Riparian areas form transition zones between terrestrial and aquatic ecosystems, providing habitat for a large variety of terrestrial and aquatic wildlife species.

Riparian communities identified in the wetland study area include palustrine forested wetlands, mixed riparian, and other riparian. Of these riparian communities, only palustrine forested wetlands are considered jurisdictional under Section 404 of the CWA. Other riparian communities (mixed riparian and other riparian) may only be subject to regulation under Section 1602.

Critical Habitat

Designated critical habitat for eight species (San Joaquin Orcutt grass, vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, Central Valley steelhead, Colusa grass, fleshy owl's clover, and Greene's tuctoria) occurs within the core habitat study area (see Figure 5-5 in the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a) and Table 2 in Appendix 2-D.4). Designated critical habitat for seven other species also occurs in the region but does not overlap with the habitat study area. It is important to note that critical habitat must have the primary constituent elements to be considered habitat for these species. *Primary constituent elements* are those physical and biological features of a landscape that a species needs to survive and reproduce. In the case of the vernal pool species with designated critical habitat in the core habitat study area, the actual acreage of vernal pools (i.e., the primary constituent elements for these species) is less than the total mapped critical habitat because only a portion of the area designated as critical habitat for vernal pool species are actually vernal pools. An analysis of the land cover mapping data and wetland delineation data conducted for the Central Valley Wye alternatives determined there was little vernal pool habitat and seasonal wetland habitat within the areas designated as critical habitat. Table 3.7-10 shows the acreages for federally designated critical habitat among the Central Valley Wye alternatives.

Table 3.7-10 Critical Habitat in Core Habitat Study Area by Central Valley Wye Alternative (acres)

Species with Critical Habitat	Area of Designated Critical Habitat/Aquatic Habitat (Acres)			
	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
San Joaquin Orcutt grass	0/0	367.46/4.72	0/0	0/0
Vernal pool fairy shrimp	0/0	364.06/4.72	0/0	2.94/0.21
Vernal pool tadpole shrimp	0/0	40.83/0.00	0/0	2.94/0.21
Conservancy fairy shrimp	0/0	345.34/4.72	0/0	0/0
Central Valley steelhead	0/0	0.81/0.81	0/0	0/0
Colusa grass	0/0	345.34/4.72	0/0	0/0
Fleshy owl's clover	0/0	345.34/4.72	0/0	0/0
Greene's tuctoria	0/0	345.34/4.72	0/0	0/0
Range	0/0	367.46/4.72	0/0	2.94/0.21

Source: USFWS, 2016
SR = State Route

Essential Fish Habitat

NMFS has designated most waterbodies that were historically accessible to Chinook salmon as EFH. This designation includes the Middle San Joaquin-Lower Chowchilla HUC 18040001, Lower San Joaquin River HUC 18040002, Upper Merced HUC 18040008, and Upper Tuolumne HUC 18040009 (Pacific Fisheries Management Council 2003, 2014), in which the Central Valley Wye alternatives occur. EFH has been designated for Chinook salmon within the San Joaquin River up to the boundary of HUC 18040001 at Friant Dam (Fed. Reg. 73:60987–60994).

Although EFH has been designated within the Middle San Joaquin River, surface water is only intermittently present in the Middle San Joaquin River since completion of the Central Valley Project in the late 1940s and early 1950s. The approximately 25-mile-long segment of the river between the Gravelly Ford gauging station and Mendota Pool is commonly without surface water due to diversions and infiltration losses, and conveys surface water only as a result of flood flow releases from Friant Dam. Since 1992, the CDFW has erected a diversion barrier at the Merced River confluence with the Middle San Joaquin River from mid-September to mid-December to stop salmonids from moving up the river above this location (CH2M HILL 2003, 2005). Fish habitat above the Merced River confluence, while potentially suitable for Chinook salmon and Central Valley steelhead, is currently affected by habitat degradation, including altered flow regimes and this managed fish barrier.

As a result of the SJRRP Settlement (San Joaquin Valley Regional Planning Agencies 2009) and Public Law 111-11, the NMFS, USFWS, and USBR have implemented the SJRRP (USBR 2010) with implementation support from DWR and CDFW. The SJRRP is a comprehensive, long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of the Merced River and restore a self-sustaining Chinook salmon fishery in the river while reducing or avoiding water supply impacts from restoration flows. Since 2014, the SJRRP has incrementally released groups of spring-run Chinook salmon back into the San Joaquin River in reintroduction efforts (NMFS 2019). Adult nonessential experimental population spring-run Chinook have returned to the San Joaquin River, though in low initial numbers, and adults must be captured downstream and transported around passage barriers to reach holding and spawning areas in Reach 1A. The number of spring-run Chinook salmon returning to the San Joaquin River is expected to increase over time, as experimental hatchery production of juveniles for release is scheduled to increase, as is the number of juveniles produced naturally due to increased adult escapement and spawning in-river.

In 2016, the CDFW released 25 adult hatchery-raised spring-run Chinook salmon (15 males and 10 females) into Reach 1 of the SJRRP (Friant Dam to Gravelly Ford) as part of a holding and spawning habitat use study (SJRRP 2016). In 2017, nearly 90,000 juveniles were released resulting in the first successful spawning of spring-run Chinook salmon in over 60 years. Because EFH in the habitat study area for all four Central Valley Wye alternatives is limited to the San Joaquin River, the only difference among the alternatives is that the Avenue 21 to Road 13 Wye Alternative is located south of the other three. With the introduction of restoration flows, EFH is increasing in habitat quality in the habitat study area relative to pre-2014 levels. Since flows were restored, this segment provides a migratory corridor for salmonids.

3.7.6.5 Wildlife Movement Corridors

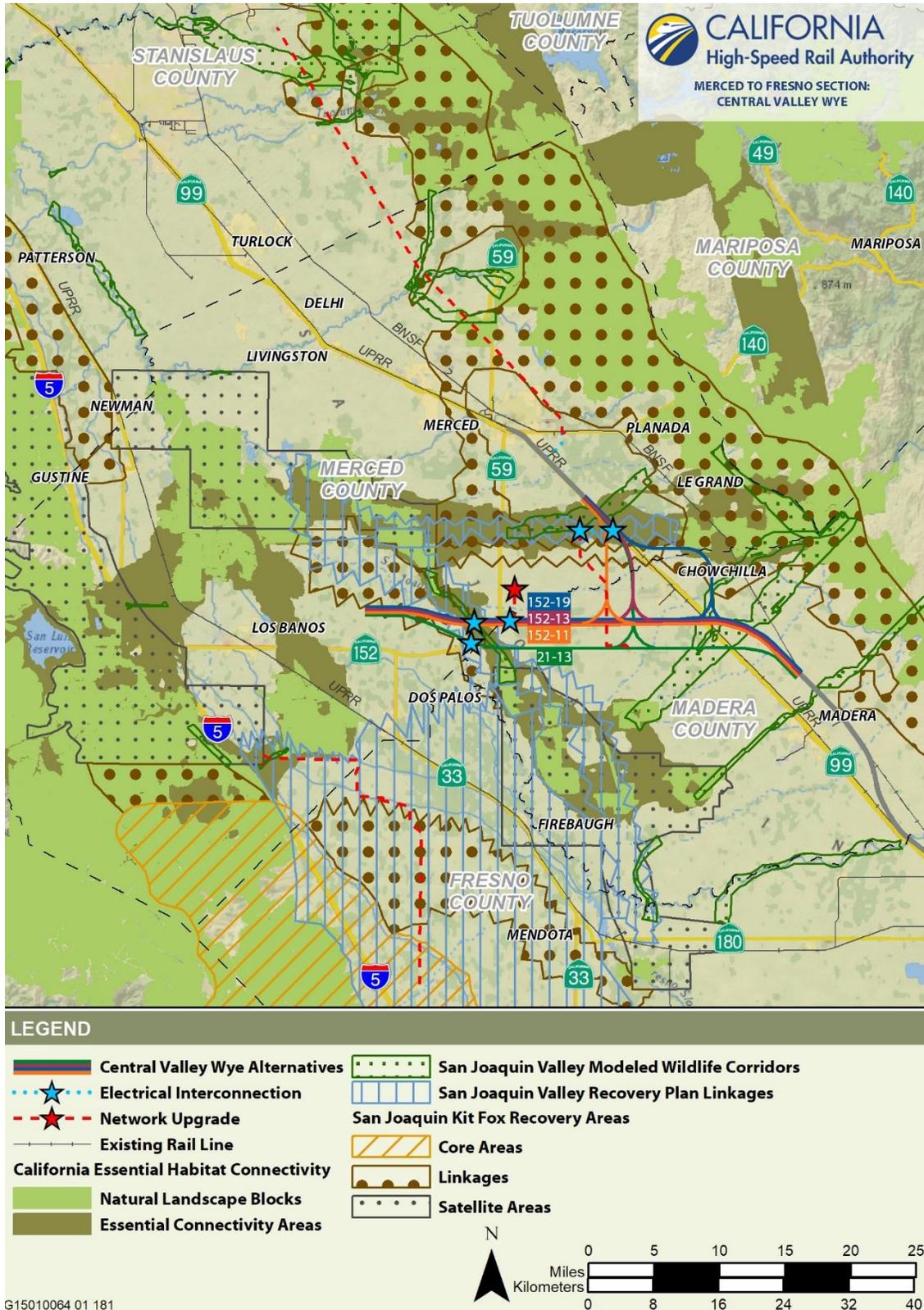
The Wildlife Movement RSA intersects six designated or modeled wildlife movement corridors:

- The Eastman Lake–Bear Creek ECA identified by the California Essential Habitat Connectivity Project (Spencer et al. 2010), crosses the Central Valley Wye alternatives as well as the Site 7—Le Grand Junction/Sandy Mush Road, Dutchman Switching Station and 115 kV Tie-Line associated with the SR 152 (North) to Road 19 Wye Alternative along the Deadman Creek and Dutchman Creek corridors.
- The Ash Slough–Merced National Wildlife Refuge ECA identified by Spencer et al. (2010), which is associated with the corridors of the San Joaquin River, Ash Slough, and the Eastside Bypass north and south of SR 152.

- The San Luis Canal-Kesterson National Wildlife Refuge ECA identified by Spencer et al. (2010) continues to be crossed by the Site 6—El Nido, Los Banos—Oro Loma—Canal 70 kV Power Line component, common to all the Central Valley Wye alternatives.
- The “Sandy Mush Road area” as designated in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998), which largely follows the Dutchman Creek corridor and Sandy Mush Road across the Central Valley Wye alternatives parallel to SR 99.
- The “Madera—Merced Linkage” as designated in *Missing Linkages: Restoring Connectivity to the California Landscape* (Penrod et al. 2001), which includes the area near Deadman Creek and Dutchman Creek near Sandy Mush Road and Le Grand.
- Berenda Slough and Fresno River wildlife movement corridors identified through modelling conducted for the CDFW by the Information Center for the Environment at the University of California, Davis, through evaluation of current land cover and management, road density, urban area density, natural area density, waterway density, and other elements (Huber 2007).

Additional details on the planning efforts, chronology, and locations of the previously listed corridors are provided in the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a). Figure 3.7-3 depicts the corridors' locations with respect to the Central Valley Wye alternatives.

In addition, the Central Valley Wye alternatives are located along the Pacific Flyway, a major bird migration route extending along the west coast of North America and South America. The Pacific Flyway encompasses the western half of North America and South America from Alaska to Patagonia west to the pelagic areas of the Eastern Pacific to the Great Basin. This flyway spans the majority of California and encompasses the Central Valley, including the wildlife movement study area.



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Source: Authority, 2019; Huber, 2007

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Figure 3.7-3 Wildlife Movement Corridors in the Wildlife Movement Study Area

Table 3.7-11 shows the distance in miles of designated wildlife movement corridors crossed by the Central Valley Wye alternatives.⁸ Overall, the SR 152 (North) to Road 11 Wye Alternative crosses the shortest linear distance (10.42 miles), and the SR 152 (North) to Road 19 Wye Alternative crosses the greatest distance (17.48 miles) relative to the other alternatives. The SR 152 (North) to Road 11 Wye Alternative crosses the greatest distance of Sandy Mush Road. The Avenue 21 to Road 13 Wye Alternative crosses about 0.44 mile more of the Ash Slough–Merced National Wildlife Refuge ECA than the other three alternatives.

Table 3.7-11 Wildlife Movement Corridors Crossed by the Central Valley Wye Alternatives (miles)

Wildlife Movement Corridors	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Eastman Lake-Bear Creek ECA	3.88	6.72	3.88	2.98
Ash Slough-Merced NWR ECA	1.87	1.87	2.30	1.87
Sandy Mush Road Area	1.43	1.40	1.43	1.81
Berenda Slough and Fresno River Corridors	3.84	7.49	4.23	3.77
Total	11.02	17.48	11.84	10.42

Source: Authority, 2016

ECA = Essential Connectivity Area

NWR = National Wildlife Refuge

SR = State Route

3.7.6.6 Condition Assessments and Watershed Profiles

Constructed basins, seasonal wetlands, constructed and natural watercourses, and vernal pools, were analyzed using CRAM. For each alternative, 9 to 16 of these features were assessed, for a total of 28 assessed features. (Some features were within the footprint of more than one alternative.) Possible CRAM scores range from 25 to 100 with 100 representing the maximum reference conditions within a given wetland type and 25 representing the lowest possible.

Constructed basins exhibited CRAM scores ranging from 44 to 45, reflected by the fact that these features are constructed (i.e., unnatural) and work in conjunction with other unnatural, built watercourses such as canals and ditches. Most are vegetated but have little topographic complexity.

The constructed watercourses assessed throughout the wetland study area yielded scores (51) approximately seven to eight CRAM points lower than scores for the natural watercourses (which had scores of 58 or 59). The low condition scores of constructed waterways result primarily because these are constructed, artificial features in an already modified watershed. Similarly, the modified watershed and surrounding agricultural uses lower the condition of the natural watercourses in the wetland study area and result in lower overall CRAM scores. Overall, when considered in the context of CRAM, constructed watercourses typically score poorly for buffer (i.e., the area adjoining the watercourse that is natural or semi-natural and not dedicated to anthropogenic uses), structural patch richness (types of physical features that may provide habitat for aquatic, wetland, or riparian species), and biotic structure (plant layers and numbers of

⁸ Because of the physical nature of the infrastructure (intermittent structures), electrical lines do not pose a barrier to wildlife movement. Therefore, the continued crossing of the San Luis Canal-Kesterson National Wildlife Refuge ECA and Eastman Lake-Bear Creek ECA by the Site 6—El Nido, Los Banos—Oro Loma—Canal 70 kV Power Line, common to all Central Valley Wye alternatives and the Site 7—Le Grand Junction/Sandy Mush Road, Dutchman Switching Station and 115 kV Tie-Line associated with the SR 152 (North) to Road 19 Wye Alternative, respectively are not included in Table 3.7-10.

plant species), and thus may not provide the same aquatic benefits as more natural riverine systems (CWMW 2013b).

Seasonal wetlands are common throughout the wetland study area, occurring in lower elevations of unused agricultural fields or as fragments of past natural riverine features. These natural features have better conditions than constructed basins and constructed watercourses, as exhibited by their higher CRAM scores of 52 to 53.

Because of limited property access, only one vernal pool (out of 26 total within the wetland study area) was surveyed within the wetland study area. This would be an inadequate sample size for characterizing the conditions of vernal pools; therefore, scores from 15 vernal pools assessed in a previous CRAM assessment of the Merced to Fresno Section were used to extrapolate to the inaccessible vernal pools located within the wetland study area. Based on these data, the CRAM score assigned to vernal pools was 65. However, based on qualitative observations of inaccessible vernal pools during field investigations made from adjacent accessible areas, most of the vernal pools in the wetland study area were dominated by nonnative grasses, with minimal vernal-pool-dependent species present. This is likely an indication of disturbance, but also strongly related to historical drought conditions and the timing of the field visit. No high quality undisturbed vernal pools were identified within the wetland resource/habitat study areas. However, each of the four Central Valley Wye alternatives achieved the same CRAM score of 65 for vernal pools.

An average overall CRAM score of all wetlands surveyed and extrapolated in each Central Valley Wye alternative was determined, and the result for all four Central Valley Wye alternatives was the same average overall CRAM score of 52. An increased sample size may have allowed the Central Valley Wye alternatives to be better distinguished with regard to overall CRAM score. However, these results indicate that conditions are similar along all four Central Valley Wye alternatives.

3.7.7 Environmental Consequences

3.7.7.1 Overview

This section evaluates how the No Project Alternative and the Central Valley Wye alternatives could affect biological resources and wetlands. Generally, the project could affect special-status species as well as native flora and fauna that are not considered special-status species (i.e., common species not protected under laws and regulations). Impacts on non-special-status species could include direct removal and destruction (native flora), or direct mortality, harassment, or other disturbance (native fauna). The impacts on native flora and fauna would be similar to impacts expected on special-status plant and wildlife species and are not discussed separately. Mitigation measures applicable to special-status plant and wildlife species, described in Section 3.7.8, Mitigation Measures, would have similar benefits to native flora and fauna, including avoiding, minimizing, and mitigating impacts on habitat from the Central Valley Wye alternatives. The impacts of the Central Valley Wye alternatives are described in Section 3.7.7.3, Central Valley Wye Alternatives, as follows:

Construction Impacts

Special-Status Plant Impacts

- Impact BIO#1: Direct Impacts on Special-Status Plant Species
- Impact BIO#2: Indirect Impacts on Special-Status Plant Species and Other Native Plants

Special-Status Wildlife Impacts

- Impact BIO#3: Direct Impacts on Special-Status Wildlife—Invertebrates
- Impact BIO#4: Indirect Impacts on Special-Status Wildlife—Invertebrates
- Impact BIO#5: Direct Impacts on Special-Status Wildlife—Fish
- Impact BIO#6: Indirect Impacts on Special-Status Wildlife—Fish
- Impact BIO#7: Direct Impacts on Special-Status Wildlife—Amphibians

- Impact BIO#8: Indirect Impacts on Special-Status Wildlife—Amphibians
- Impact BIO#9: Direct Impacts on Special-Status Wildlife—Reptiles
- Impact BIO#10: Indirect Impacts on Special-Status Wildlife—Reptiles
- Impact BIO#11: Direct Impacts on Special-Status Wildlife—Birds
- Impact BIO#12: Indirect Impacts on Special-Status Wildlife—Birds
- Impact BIO#13: Direct Impacts on Special-Status Wildlife—Mammals
- Impact BIO#14: Indirect Impacts on Special-Status Wildlife—Mammals

Special-Status Plant Community Impacts

- Impact BIO#15: Direct Impacts on Special-Status Plant Communities
- Impact BIO#16: Indirect Impacts on Special-Status Plant Communities

Jurisdictional Waters Impacts

- Impact BIO#17: Direct Impacts on Jurisdictional Waters
- Impact BIO#18: Indirect Impacts on Jurisdictional Waters

Critical Habitat Impacts

- Impact BIO#19: Direct Impacts on Critical Habitat
- Impact BIO#20: Indirect Impacts on Critical Habitat

Essential Fish Habitat Impacts

- Impact BIO#21: Direct Impacts on Essential Fish Habitat
- Impact BIO#22: Indirect Impacts on Essential Fish Habitat

Wildlife Movement Corridor Impacts

- Impact BIO#23: Direct Impacts on Wildlife Movement Corridors
- Impact BIO#24: Indirect Impacts on Wildlife Movement Corridors

Operations Impacts

Special-Status Plant Impacts

- Impact BIO#25: Direct Impacts on Special-Status Plants
- Impact BIO#26: Indirect Impacts on Special-Status Plants

Special-Status Wildlife Impacts

- Impact BIO#27: Direct Impacts on Special-Status Wildlife—Invertebrates
- Impact BIO#28: Indirect Impacts on Special-Status Wildlife—Invertebrates
- Impact BIO#29: Direct Impacts on Special-Status Wildlife—Fish
- Impact BIO#30: Indirect Impacts on Special-Status Wildlife—Fish
- Impact BIO#31: Direct Impacts on Special-Status Wildlife—Amphibians and Reptiles
- Impact BIO#32: Indirect Impacts on Special-Status Wildlife—Amphibians and Reptiles
- Impact BIO#33: Direct Impacts on Special-Status Wildlife—Birds
- Impact BIO#34: Indirect Impacts on Special-Status Wildlife—Birds
- Impact BIO#35: Direct Impacts on Special-Status Wildlife—Mammals
- Impact BIO#36: Indirect Impacts on Special-Status Wildlife—Mammals

Special-Status Plant Community Impacts

- Impact BIO#37: Direct Impacts on Special-Status Plant Communities
- Impact BIO#38: Indirect Impacts on Special-Status Plant Communities

Jurisdictional Waters Impacts

- Impact BIO#39: Direct Impacts on Jurisdictional Waters
- Impact BIO#40: Indirect Impacts on Jurisdictional Waters

Critical Habitat Impacts

- Impact BIO#41: Direct Impacts on Critical Habitat
- Impact BIO#42: Indirect Impacts on Critical Habitat

Essential Fish Habitat Impacts

- Impact BIO#43: Direct Impacts on Essential Fish Habitat
- Impact BIO#44: Indirect Impacts on Essential Fish Habitat

Wildlife Movement Corridor Impacts

- Impact BIO#45: Indirect Impacts on Wildlife Movement Corridors

3.7.7.2 No Project Alternative

The population in the San Joaquin Valley is expected to grow through 2040 (see Section 2.2.2.2, Planned Land Use). Development in the San Joaquin Valley to accommodate the population increase would continue under the No Project Alternative and result in associated direct and indirect impacts on biological resources and wetlands. Such planned projects that are anticipated to be constructed by 2040 include residential, commercial, industrial, recreational, transportation, and agricultural projects.

Future development projects in Merced and Madera Counties include dairy farm expansions, implementation of airport development and land use plans, and implementation of general and specific plans throughout both counties. Planned projects under the No Project Alternative would also include transportation projects such as the expansion of SR 99; residential, commercial, agricultural, and industrial developments; water projects; and implantation of land use plans. A full list of anticipated future development projects is provided in Appendix 3.19-A, Cumulative Plans and Non-Transportation Projects List, and Appendix 3.19-B, Cumulative Transportation Projects Lists. The residential and commercial growth expected in and around the City of Chowchilla, as described in the Introduction and Land Use sections of the *City of Chowchilla 2040 General Plan* (pages I-1 through L-69) (City of Chowchilla 2011), is anticipated to alter hydrologic conditions in wetlands, increase sediment discharges to waterbodies, expose wildlife to pesticides, and remove remnant patches of native vegetation.

Under the No Project Alternative, recent development trends are anticipated to continue, leading to impacts on biological resources and wetlands. Future changes in land use or allowable density of development, as well as ground disturbance associated with future infrastructure improvements such as highway expansions to accommodate population growth, would have comparable impacts on biological resources and wetlands as those that resulted from past development, such as habitat loss and degradation and extirpation of special-status species populations. If urbanization is confined within existing urban growth boundaries, as planned, lands near the Central Valley Wye alternatives habitat study area located outside of urban growth boundaries would experience relatively little land use change or associated impacts on biological and wetland resources. Continued use of farmlands near the Central Valley Wye alternatives corridor would likely result in ongoing impacts on biological and wetlands resources.

3.7.7.3 Central Valley Wye Alternatives

Construction and operations of the Central Valley Wye alternatives could result in direct and indirect impacts on biological resources and wetlands including special-status species and their habitat, habitats of concern (i.e., special-status plant communities, critical habitat, and EFH), and wildlife movement corridors.

Construction Impacts

Construction of the Central Valley Wye alternatives would involve, for example, demolition of existing structures; clearing and grubbing; handling, storing, hauling, excavating, and placing fill; possible pile driving; and construction of aerial structures, bridges, road modifications, utility upgrades and relocations, HSR electrical systems, and railbeds. Construction activities are described in Chapter 2, Alternatives

Special-Status Plant Impacts

Impact BIO#1 Direct Impacts on Special-Status Plant Species

Construction activities associated with all of the Central Valley Wye alternatives would require permanent removal of vegetation for the placement of permanent infrastructure. Temporary removal or disturbance of vegetation would also occur under any Central Valley Wye alternative from construction vehicles and personnel disrupting vegetation (i.e., trampling, covering, and crushing individual plants, plant populations, or suitable potential habitat for special-status plant species).

Table 3.7-12 provides the acreage of potential direct impacts on special-status plant species by habitat and alternative. Habitats correspond to one or more land cover types.

All four Central Valley Wye alternatives would have equal potential for direct impacts on the two special-status plant species associated with valley sink scrub because each would affect 4.26 acres of valley sink scrub potentially suitable for these species. Three of the four alternatives also would have equal potential for direct impacts on San Joaquin woolly-threads because each would impact 4.32 acres of California annual grassland and valley sink scrub potentially suitable as habitat and within this species' range. The SR 152 (North) to Road 19 Wye Alternative would have a greater potential for direct impacts on San Joaquin woolly-threads because it would impact 28.87 acres of potentially suitable habitat within this species' range. The alternatives differ in their potential for direct impacts on the remaining 39 special-status plant species associated with other habitats, and these differences are summarized below.

The SR 152 (North) to Road 19 Wye Alternative would have the greatest potential for impacts on 26 special-status plant species. These are species associated with the following land cover types (directly impacted acreage in parentheses): California annual grassland (130.19 acres), freshwater marsh/natural water course/open water/seasonal wetland (14.08 acres). This alternative would also have the greatest potential for impacts on habitats potentially suitable for palmate-bracted bird's-beak (134.45 acres), which is associated with both California annual grassland and valley sink scrub. For the remaining 12 species, this alternative would not have the greatest or least potential for impacts. The SR 152 (North) to Road 19 Wye Alternative would have the least potential for impacts on other riparian vegetation (0.54 acres). For the remaining special-status species this alternative would not have the greatest or least potential for impacts.

The Avenue 21 to Road 13 Wye Alternative would have the greatest potential for impacts on 10 special-status plant species. These are species associated with vernal pools, 0.75 acre of which would be directly impacted by this alternative. The Avenue 21 to Road 13 Wye Alternative would have the least potential for impacts on the 21 species associated with California annual grassland and on palmate-bracted bird's-beak. This alternative would affect 33.33 acres of California annual grassland and 37.59 acres of land cover potentially suitable as habitat for palmate-bracted bird's-beak.

The Avenue 21 to Road 13 Wye Alternative would have the greatest potential for impacts on two special-status plant species that are associated with the land cover type designated as other riparian (Table 3.7-8), of which this alternative would affect 2.43 acres.

The SR 152 (North) to Road 11 Wye Alternative would not have the greatest potential for impacts on any of the 39 special-status plant species for which the alternatives differ in their potential for impacts. The SR 152 (North) to Road 11 Wye Alternative would have the least potential for impacts on 12 special-status plant species. These are the species associated with the vernal pool and freshwater marsh/natural watercourse/open water/seasonal wetland land cover types, of which this alternative would affect 0.23 and 8.24 acres, respectively. For the remaining 23 species, this alternative would not have the greatest or least potential for impacts.

Table 3.7-12 Direct Impacts on Special-Status Plant Species Habitat by Central Valley Wye Alternative (acres)

Species Potentially Affected	Associated Land Cover Type	Impact Type	Alternative			
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Alkali milk-vetch, heartscale, crownscale, lesser saltscale, subtle orache, round-leaf filaree, Parry's rough tarplant, hispid bird's-beak, Hoover's cryptantha, Ewan's larkspur, recurved larkspur, golden goodmania, shining navarretia, fragile pentachaeta, Merced phacelia, Keck's checkerbloom, Lemmon's jewelflower, Showy golden madia, forked hare-leaf, Hoover's calycadenia, beaked clarkia	California Annual Grassland	Direct Permanent	90.14	91.23	25.01	69.53
		Direct Temporary	9.57	38.97	8.31	8.58
		Total	99.71	130.19	33.33	78.11
Vernal pool smallscale, succulent owl's-clover, Hoover's spurge, dwarf downingia, spiny-sepaed button-celery, hogwallow starfish, Ferris' goldfields, little mousetail, shining navarretia	Vernal Pool	Direct Permanent	0.18	0.19	0.10	0.19
		Indirect Bisected	0.04	0.04	0.64	0.04
		Total	0.23	0.23	0.75	0.23
Delta button-celery, Wright's trichocoronis	Other Riparian	Direct Permanent	1.22	0.42	1.85	0.77
		Direct Temporary	0.22	0.12	0.57	0.09
		Total	1.44	0.54	2.43	0.86
Sanford's arrowhead, Peruvian dodder, Boggs Lake hedge-hyssop	Freshwater Marsh, Natural Watercourse, Open Water, Seasonal Wetland	Direct Permanent	7.03	9.30	5.96	5.11
		Direct Temporary	3.81	4.79	5.48	3.12
		Total	10.84	14.08	11.44	8.24

Species Potentially Affected	Associated Land Cover Type	Impact Type	Alternative			
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Hall's tarplant, Lost Hills crownscale	Valley Sink Scrub	Direct Permanent	0.00	0.00	0.00	0.00
		Direct Temporary	4.26	4.26	4.26	4.26
		Total	4.26	4.26	4.26	4.26
San Joaquin wooly-threads	California Annual Grassland, Valley Sink Scrub (within mapped range)	Direct Permanent	0.00	0.34	0.00	0.00
		Direct Temporary	4.32	28.53	4.32	4.32
		Total	4.32	28.87	4.32	4.32
Palmate-bracted bird's-beak	California Annual Grassland ¹ , Valley Sink Scrub	Direct Permanent	90.14	91.23	25.01	69.53
		Direct Temporary	13.83	43.23	12.57	12.84
		Total	103.97	134.45	37.59	82.37

Source: Calculations generated using ESRI ArcGIS versions 10.1, 10.2, and 10.3 from data generated by field surveys and aerial photo interpretation during 2010–2017. On April 27, 2018, USACE concurred with the findings of the delineation of waters of the United States. *Minor differences in the totals are the result of rounding.*

¹ Actual impacts would be limited to alkaline substrate suitable for this species where present and thus the impact reported is likely to be some small subset of the total acreage reported.

SR = State Route

As discussed in Section 3.7.5.2, Impact Avoidance and Minimization Features, numerous IAMFs are incorporated as part of the Central Valley Wye alternatives to avoid and minimize impacts. The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the biological resources management plan (BRMP) (BIO-IAMF#1)
- Require construction personnel to attend worker environmental awareness program (WEAP) training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Prepare and implement a BRMP that would include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility for implementation (BIO-IAMF#5)
- Prepare and implement a weed control plan to minimize and avoid the spread of noxious and invasive weeds during ground-disturbing activities (BIO-IAMF#7)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish procedures to clean equipment to be free of mud and plant materials to avoid introduction of invasive species (BIO-IAMF#12)
- Prepare and establish a construction site best management practice (BMP) field manual containing standard construction site housekeeping practices (BIO-IAMF#13)

Removal and disturbance of vegetation in temporary impact areas and for the placement of permanent infrastructure would directly affect special-status plants. The features of the Central Valley Wye alternatives include effective measures to identify special-status plants, delineate environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field, and establish other measures to avoid and protect these resources. These measures would minimize but not avoid the removal of special-status plant species.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be significant because permanent and temporary removal or disturbance of vegetation for the placement of permanent infrastructure and for construction access would cause a substantial adverse effect on special-status plant species. The design characteristics of the Central Valley Wye alternatives include effective measures to identify special-status plants, delineate environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field. These measures would minimize but not avoid the removal of special-status plant species. BIO-MM#1a: Establish Environmentally Sensitive Areas, Wildlife Exclusion Fencing, and Non-Disturbance Zones, would require the establishment of fencing to protect environmentally sensitive areas. BIO-MM#1b: Establish and Implement a Compliance Reporting Program, would require preparation of monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and other requirements set forth in regulatory agency authorizations. BIO-MM#1c: Conduct Presence/Absence Pre-Construction Surveys for Special-Status Plant Species and Special-Status Plant Communities, would require surveys to identify special-status plants that were not identified in areas where permission to enter was not granted prior to construction, potentially allowing for some level of avoidance or salvage of special-status plant species. BIO-MM#2a: Prepare and Implement a Restoration and Revegetation Plan, would require preparation and implementation of a vegetation restoration and revegetation plan (RRP) to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species, wetlands and/or other aquatic resources. BIO-MM#2b: Prepare and Implement Plan for Salvage, Relocation, and/or Propagation of Special-Status Plant Species would provide for the removal or salvage of special-status plant species or seed prior to disturbance. BIO-MM#3a: Prepare and Implement a Compensatory Mitigation Plan (CMP) for

Impacts to Aquatic Resources, BIO-MM#3b: Prepare a Compensatory Mitigation Plan (CMP) for Species and Habitat, BIO-MM#4: Implement Measures to Minimize Impacts during Off-Site Habitat Restoration, Enhancement, or Creation on Mitigation Sites, and BIO-MM#43: Compensate for Impacts to Listed Plant Species, would allow for on-site and off-site habitat restoration and preservation of special-status plant species. These measures, combined with design characteristics, work together to minimize or avoid impacts on special-status plant species and appropriately unavoidable impacts. Therefore, because impacts would be avoided or mitigated through restoration, enhancement, and/or preservation, overall impacts on special-status plant species under any Central Valley Wye alternative would be reduced and the impact under CEQA would be less than significant after implementation of BIO-MM#1a, BIO-MM#1b, BIO-MM#1c, BIO-MM#2a, BIO-MM#2b, BIO-MM#3a, BIO-MM#3b, BIO-MM#4 and BIO-MM#43. No substantial adverse effect would occur, either directly or through habitat modifications, on any special-status plant species listed in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Impact BIO#2 Indirect Impacts on Special-Status Plant Species and Other Native Plants

Construction activities associated with any of the Central Valley Wye alternatives would require ground disturbance and equipment operation in the project footprints, affecting plants in adjacent areas (i.e., outside the project footprints but within 100 feet of it). The indirect impacts would be approximately the same for all Central Valley Wye alternatives because each alternative would result in large-scale changes to existing land uses within their respective project footprints, which could fragment existing habitats, as well as large-scale movement of earthen materials and equipment that could introduce or spread invasive plant species.

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Prepare and implement a BRMP that would include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility for implementation (BIO-IAMF#5)
- Prepare and implement a weed control plan to minimize and avoid the spread of noxious and invasive weeds during ground-disturbing activities (BIO-IAMF#7)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10);
- Establish procedures to clean equipment to be free of mud and plant materials to avoid introduction of invasive species (BIO-IAMF#12)
- Prepare and establish a construction site BMP field manual containing standard construction site housekeeping practices (BIO-IAMF#13).

Although these measures would avoid or minimize indirect impacts, indirect impacts may still occur because it is difficult to remove established invasive plants from native plant communities without intensive and regular management (e.g., manual hand-pulling, herbicide application) and monitoring.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be significant for special-status plant species and other native plants due to ground disturbance and equipment operation in the project footprints, which would have a substantial adverse impact on special-

status plant species in adjacent areas because of the potential for habitat fragmentation and introduction of invasive plants. The features of all of the Central Valley Wye alternatives include effective measures to create a weed control plan, provide awareness of sensitive biological resources, and maintain clean construction equipment, which would minimize but not avoid the spread of weeds and invasive species into areas that could affect special-status plants and other native vegetation. Under all of the Central Valley Wye alternatives, the Authority would implement mitigation measures to minimize impacts on special-status plants and other native plants. BIO-MM#1a: Establish Environmentally Sensitive Areas, Wildlife Exclusion Fencing, and Non-Disturbance Zones, would require the establishment of fencing to protect environmentally sensitive areas. BIO-MM#1b: Establish and Implement a Compliance Reporting Program, would require preparation of monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and other requirements set forth in regulatory agency authorizations. BIO-MM#1c: Conduct Presence/Absence Pre-Construction Surveys for Special-Status Plant Species and Special-Status Plant Communities, would require surveys to identify special-status plants that were not identified in areas where permission to enter was not granted prior to construction, potentially allowing for some level of avoidance of special-status plant species. BIO-MM#2a: Prepare and Implement a Restoration and Revegetation Plan, would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species, wetlands and/or other aquatic resources. BIO-MM#2b: Prepare and Implement Plan for Salvage, Relocation, and/or Propagation of Special-Status Plant Species would allow for the removal of special-status plant species prior to disturbance. BIO-MM#3a: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources, BIO-MM#3b: Prepare a Compensatory Mitigation Plan (CMP) for Species and Habitat, and BIO-MM#4: Implement Measures to Minimize Impacts During Off-Site Habitat Restoration, Enhancement, or Creation on Mitigation Sites. With implementation of BIO-MM#1a, BIO-MM#1b, BIO-MM#1c, BIO-MM#2a, BIO-MM#2b, BIO-MM#3a, BIO-MM#3b, and BIO-MM#4, the impact for any Central Valley Wye alternative under CEQA would be less than significant because impacts in adjacent areas would be reduced through avoidance, restoration, and preservation. Consequently, there would not be a substantial adverse effect from habitat fragmentation and introduction of invasive species on special-status plant species and other native plants.

Special-Status Wildlife Impacts

Construction activities could result in direct and indirect impacts on special-status wildlife species and their habitat. This section discusses indirect and direct construction-related impacts on special-status wildlife in the following subsections:

- Invertebrates
- Fish
- Amphibians
- Reptiles
- Birds
- Mammals

Impacts of each of the Central Valley Wye alternatives on special-status invertebrates, fish, amphibians, reptiles, birds, and mammals are presented in Table 3.7-13 and described in the impact discussions that follow.

Table 3.7-13 Direct Impacts on Special-Status Wildlife Species Habitat by Central Valley Wye Alternative¹ (acres)

Species Group and Species	Associated Land Cover Type	Impact Type	Alternative			
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Invertebrates						
Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp	VP, SEW	Direct Permanent	0.95	1.24	1.57	0.69
		Indirect Bisected	1.21	1.21	0.92	1.18
		Total	2.16	2.44	2.49	1.87
Valley elderberry longhorn beetle	MIR, OTR, PFW with elderberry shrubs (excluding areas within Madera and Fresno Counties)	Direct Permanent	1.49	1.21	2.11	1.15
		Direct Temporary	0.43	0.39	0.86	0.38
		Total	1.92	1.60	2.97	1.53
Crotch bumble bee	AGS, VSS	Direct Permanent	90.14	91.23	25.01	69.53
		Direct Temporary	13.83	43.24	12.57	12.84
		Total	103.97	134.47	37.58	82.37
Fish²						
Central Valley steelhead	NAW, OTR (San Joaquin River only)	Direct	2.24	2.24	1.97	2.18
		Total	2.24	2.24	1.97	2.18
Central Valley spring-run Chinook salmon	NAW, OTR (San Joaquin River only)	Direct	2.24	2.24	1.97	2.18
		Total	2.24	2.24	1.97	2.18
Hardhead	NAW, OTR (San Joaquin River only)	Direct	2.24	2.24	1.97	2.18
		Total	2.24	2.24	1.97	2.18
Kern brook lamprey	NAW, OTR (San Joaquin River only)	Direct	2.24	2.24	1.97	2.18
		Total	2.24	2.24	1.97	2.18
San Joaquin roach	NAW, OTR (San Joaquin River only)	Direct	2.24	2.24	1.97	2.18
		Total	2.24	2.24	1.97	2.18

Species Group and Species	Associated Land Cover Type	Impact Type	Alternative				
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye	
Chinook salmon— Central Valley fall/late-fall run ESU	NAW, OTR (San Joaquin River only)	Direct	2.24	2.24	1.97	2.18	
		Total	2.24	2.24	1.97	2.18	
Amphibians							
California tiger salamander	Aquatic: FWM, OPW, SEW, VP	Direct Permanent	0.85	1.62	0.99	0.57	
		Direct Temporary	0.11	0.55	0.59	0.12	
		<i>Subtotal</i>	<i>0.96</i>	<i>2.17</i>	<i>1.58</i>	<i>0.69</i>	
	Upland: BAR, AGS, MIR, OTR, PFW, PAS, RUD	Direct Permanent	139.87	149.26	77.16	109.75	
		Direct Temporary	48.56	163.88	35.92	45.82	
		<i>Subtotal</i>	<i>188.43</i>	<i>313.14</i>	<i>113.08</i>	<i>155.57</i>	
	Total		189.39	315.31	114.66	156.26	
	Western spadefoot	Aquatic: FWM, OPW, SEW, VP	Direct Permanent	0.85	1.62	0.99	0.57
			Direct Temporary	0.11	0.55	0.59	0.12
<i>Subtotal</i>			<i>0.96</i>	<i>2.17</i>	<i>1.58</i>	<i>0.69</i>	
Upland: BAR, AGS, RUD surrounding suitable aquatic habitat		Direct Permanent	42.74	47.15	13.81	25.46	
		Direct Temporary	1.56	22.60	1.63	2.91	
		<i>Subtotal</i>	<i>44.29</i>	<i>69.75</i>	<i>15.44</i>	<i>28.37</i>	
Total		45.26	71.92	17.02	29.06		
Reptiles							
Western pond turtle		Aquatic: FWM, NAW, OPW, PFW, SEW	Direct Permanent	7.11	9.30	6.04	5.11
	Direct Temporary		3.85	4.78	5.53	3.12	
	<i>Subtotal</i>		<i>10.96</i>	<i>14.07</i>	<i>11.57</i>	<i>8.24</i>	
		Direct Permanent	70.02	70.85	28.87	48.63	
		Direct Temporary	10.63	39.95	10.18	10.07 ³	

Species Group and Species	Associated Land Cover Type	Impact Type	Alternative				
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye	
	Upland: AGS, MIR, OTR, RUD within 1,300 feet of suitable aquatic habitat	<i>Subtotal</i>	80.65	110.80	39.04	58.70 ³	
	Total		91.61	124.87	50.61	66.94³	
Blunt-nosed leopard lizard	BAR, AGS, RUD within range	Direct Permanent	29.89	24.83	9.33	26.16	
		Direct Temporary	13.53	17.22	10.85	11.31 ³	
		Total	43.42	42.05	20.18	37.48³	
Blainville's horned lizard	BAR, AGS, RUD within range	Direct Permanent	133.29	135.66	68.15	107.90	
		Direct Temporary	70.48	147.60	56.29	68.46 ³	
		Total	203.77	283.26	124.44	176.36³	
Giant garter snake	Aquatic: FWM, NAW, OPW, RIC within range	Direct Permanent	6.34	7.83	5.02	4.73	
		Direct Temporary	3.72	4.26	4.95	3.01	
		<i>Subtotal</i>	10.06	12.09	9.97	7.74	
	Upland: AGS, PAS within 200 feet of suitable aquatic habitat	Direct Permanent	11.98	9.06	7.61	8.04	
		Direct Temporary	5.57	11.09	5.58	4.14	
		<i>Subtotal</i>	17.55	20.15	13.19	12.19	
	Total	27.61	32.24	23.15	19.93		
	Silvery legless lizard	AGS, VSS within range	Direct Permanent	0.00	0.34	0.00	0.00
			Direct Temporary	4.32	28.54	4.32	4.32
Total			4.32	28.88	4.32	4.32	
San Joaquin coachwhip	AGS, VSS, within range	Direct Permanent	0.00	0.00	0.00	0.00	
		Direct Temporary	4.32	4.32	4.32	4.32	
		Total	4.32	4.32	4.32	4.32	

Species Group and Species	Associated Land Cover Type	Impact Type	Alternative				
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye	
Birds							
American peregrine falcon	Foraging: BAR, AGS, COI, COB, COW, DAI, EUC, FAF, FIC, FWM, INA, MIR, NAW, OPW, ORC, OTR, PFW, PAS, RIC, ROC, RUD, RUR, SEW, SLO, TRC, URB, URW, VP, VIN	Direct Permanent	2,612.66	2,803.99	2,411.59	2,564.95 ³	
		Direct Temporary	656.90	1,227.35	485.80	549.21 ³	
		Total	3,269.56	4,031.34	2,897.38	3,114.16³	
Bald eagle	Nesting: EUC, MIR, OTR, PFW	Direct Permanent	1.49	1.21	2.11	1.15	
		Direct Temporary	0.43	0.39	0.86	0.38	
		<i>Subtotal</i>	<i>1.92</i>	<i>1.60</i>	<i>2.97</i>	<i>1.53</i>	
	Foraging: BAR, AGS, FAF, FIC, FWM, INA, NAW, OPW, PAS, RIC, ROC, RUD, SEW, SLO, VP	Direct Permanent	1,322.74	1,214.27	1,065.14	1,248.89 ³	
		Direct Temporary	351.82	484.75	271.32	299.55 ³	
		<i>Subtotal</i>	<i>1,674.56</i>	<i>1,699.02</i>	<i>1,336.46</i>	<i>1,548.44³</i>	
	Total		1,676.48	1,700.62	1,339.43	1,549.98³	
	Golden eagle	Nesting: EUC, MIR, OTR, PFW	Direct Permanent	1.30	0.42	1.93	0.77
			Direct Temporary	0.27	0.12	0.62	0.09
<i>Subtotal</i>			<i>1.57</i>	<i>0.54</i>	<i>2.55</i>	<i>0.86</i>	
Foraging: BAR, AGS, FAF, FIC, FWM, INA, PAS, RIC, ROC, RUD, SEW, SLO, VP		Direct Permanent	1,283.52	1,206.43	1,027.25	1,211.28 ³	
		Direct Temporary	380.98	480.50	299.25	329.42 ³	
		<i>Subtotal</i>	<i>1,664.50</i>	<i>1,686.93</i>	<i>1,326.49</i>	<i>1,540.70³</i>	
Total		1,666.06	1,687.47	1,329.05	1,541.56³		

Species Group and Species	Associated Land Cover Type	Impact Type	Alternative				
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye	
Swainson's hawk	Nesting: EUC, MIR, ORC, OTR, TRC	Direct Permanent	611.84	809.78	913.71	662.90	
		Direct Temporary	170.93	478.33	166.51	158.35 ³	
		<i>Subtotal</i>	<i>782.77</i>	<i>1,288.11</i>	<i>1,080.22</i>	<i>821.25³</i>	
	Foraging: BAR, AGS, FAF, FIC, INA, PAS, ROC, RUD, SEW, TRC	Direct Permanent	1,360.91	1,206.27	1,104.75	1,288.65 ³	
		Direct Temporary	302.93	479.99	221.16	253.76 ³	
		<i>Subtotal</i>	<i>1,663.83</i>	<i>1,686.26</i>	<i>1,325.91</i>	<i>1,542.42³</i>	
	Nesting/ Foraging: TRC	Direct Permanent	205.26	208.44	104.18	179.66	
		Direct Temporary	83.54	134.50	29.43	64.79 ³	
		<i>Subtotal</i>	<i>288.80</i>	<i>342.93</i>	<i>133.61</i>	<i>244.45³</i>	
	Total			2,735.40	3,317.30	2,539.74	2,607.10³
	Greater sandhill crane	Foraging: AGS, FAF, FIC, FWM, INA, PAS, RIC, ROC, RUD, SEW	Direct Permanent	1,341.02	1,173.61	1,083.04	1,272.90 ³
			Direct Temporary	251.01	403.48	170.08	200.51 ³
Total			1,592.02	1,577.09	1,253.12	1,473.41³	
Western snowy plover (interior population)	Foraging: BAR, AGS, FAF, FIC, INA, PAS, RIC, ROC, RUD	Direct Permanent	1,360.22	1,204.81	1,103.81	1,288.26 ³	
		Direct Temporary	291.82	468.47	209.61	240.25 ³	
		Total	1,652.04	1,673.28	1,313.42	1,528.51³	
Least Bell's vireo	Nesting: MIR, OTR, PFW	Direct Permanent	1.49	1.21	2.11	1.15	
		Direct Temporary	0.43	0.39	0.86	0.38	
		<i>Subtotal</i>	<i>1.92</i>	<i>1.60</i>	<i>2.97</i>	<i>1.53</i>	
	Foraging: FWM, MIR, NAW, OTR, PFW	Direct Permanent	6.34	7.83	5.02	4.73	
		Direct Temporary	0.43	0.39	0.86	0.38	
		<i>Subtotal</i>	<i>6.77</i>	<i>8.22</i>	<i>5.88</i>	<i>5.11</i>	
	Total			8.70	9.82	8.85	6.65

Species Group and Species	Associated Land Cover Type	Impact Type	Alternative				
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye	
Tricolored blackbird	Nesting: COW, NAW, OPW	Direct Permanent	20.53	20.95	29.46	15.39	
		Direct Temporary	9.29	9.37	8.94	6.74	
		<i>Subtotal</i>	29.82	30.31	38.40	22.14	
	Foraging: AGS, DAI, INA, MIR, OTR, PAS, VP	Direct Permanent	212.88	173.12	129.68	159.82 ³	
		Direct Temporary	50.75	111.21	32.52	30.66 ³	
		<i>Subtotal</i>	263.63	284.33	162.20	190.48 ³	
	Nesting / Foraging: FIC, FRM, SEW	Direct Permanent	1,018.06	913.76	795.75	1,026.30	
		Direct Temporary	180.29	198.47	110.10	145.02 ³	
		<i>Subtotal</i>	1,198.35	1,112.23	905.85	1,171.32 ³	
	Total			1,491.80	1,426.87	1,106.45	1,383.93³
	Western burrowing owl	Nesting/Foraging: BAR, AGS, COI, COW, INA, ORC, RUD, RUR, TRC, URB	Direct Permanent	1,134.84	1,351.02	1,180.91	1,108.36 ³
			Direct Temporary	386.15	887.98	281.92	340.90 ³
Total			1,520.99	2,239.00	1,462.82	1,449.26³	
Special-status ground nesting bird species	Nesting/Foraging: BAR, AGS, FAF, FIC, FWM, INA, PAS, RUD, SEW, TRC	Direct Permanent	1,433.66	1,309.20	1,056.99	1,375.18 ³	
		Direct Temporary	361.62	595.93	217.61	299.42 ³	
		Total	1,795.28	1,905.13	1,274.60	1,674.60³	
Special-status wading bird/ shorebird/ duck species	Nesting: COB, COW, FWM, MIR, NAW, OPW, OTR, PFW, PAS, SEW	Direct Permanent	53.52	41.48	61.18	42.32	
		Direct Temporary	13.37	54.85	14.87	10.54	
		<i>Subtotal</i>	66.89	96.33	76.06	52.87	
	Foraging: BAR, AGS, COB, COW, FAF, FIC, FWM, INA, MIR, NAW, OPW, OTR, PFW, PAS, RIC, ROC, RUD, SEW, VP	Direct Permanent	1,330.44	1,191.88	1,073.05	1,262.90 ³	
		Direct Temporary	296.08	474.84	212.61	244.64 ³	
		<i>Subtotal</i>	1,626.52	1,666.71	1,285.65	1,507.54 ³	
	Total			1,693.41	1,763.04	1,361.71	1,560.40³

Species Group and Species	Associated Land Cover Type	Impact Type	Alternative			
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Special-status tree-nesting bird species	Nesting: EUC, MIR, ORC, OTR, PFW, TRC	Direct Permanent	894.66	1,018.22	1,095.45	920.11
		Direct Temporary	254.47	612.82	195.94	215.43
		<i>Subtotal</i>	<i>1,149.12</i>	<i>1,631.04</i>	<i>1,291.38</i>	<i>1,135.55</i>
	Foraging: AGS, FAF, FIC, FWM, INA, MIR, ORC, OTR, PFW, PAS, ROC, RUD, SEW, TRC,	Direct Permanent	1,360.01	1,199.55	1,102.03	1,291.89 ³
		Direct Temporary	250.52	356.57	169.59	204.80 ³
		<i>Subtotal</i>	<i>1,610.52</i>	<i>1,556.12</i>	<i>1,271.62</i>	<i>1,496.69³</i>
Total			2,759.65	3,187.16	2,563.00	2,632.23³
Mammals						
Pallid bat	Roosting: MIR, OTR, PFW, Foraging: BAR, AGS, COI, COB, COW, DAI, EUC, FAF, FIC, FWM, INA, MIR, NAW, OPW, ORC, OTR, PFW, PAS, ROC, RUD, SEW, TRC, URB, VP, VIN	Direct Permanent	2,616.20	2,803.99	2,415.13	2,568.49 ³
		Direct Temporary	656.90	1,227.35	485.80	549.34 ³
		Total	3,273.10	4,031.34	2,900.92	3,117.83³
Western red bat	Roosting: MIR, OTR, PFW Foraging: BAR, AGS, COI, COB, COW, DAI, EUC, FAF, FIC, FWM, INA, MIR, NAW, OPW, ORC, OTR, PFW, PAS, ROC, RUD, SEW, TRC, URB, VP, VIN	Direct Permanent	2,616.20	2,803.99	2,415.13	2,568.49 ³
		Direct Temporary	656.90	1,227.35	485.80	549.34 ³
		Total	3,273.10	4,031.34	2,900.92	3,117.83³

Species Group and Species	Associated Land Cover Type	Impact Type	Alternative			
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Western mastiff bat	Foraging: BAR, AGS, COI, COB, COW, DAI, EUC, FAF, FIC, FWM, INA, MIR, NAW, OPW, ORC, OTR, PFW, PAS, ROC, RUD, RUR, SEW, TRC, URB, VP, VIN	Direct Permanent	2,616.20	2,802.78	2,415.13	2,568.49 ³
		Direct Temporary	656.90	1,226.96	485.80	549.34 ³
		Total	3,273.10	4,029.74	2,900.92	3,117.83³
Ringtail	MIR, OTR, PFW	Direct Permanent	1.49	1.21	2.11	1.15
		Direct Temporary	0.43	0.39	0.86	0.38
		Total	1.92	1.60	2.97	1.53
American badger	BAR, AGS, INA, MIR, OTR, PAS, RUD	Direct Permanent	212.42	188.57	159.40	171.04 ³
		Direct Temporary	97.08	218.08	77.81	88.90 ³
		Total	309.50	406.65	237.21	259.94³
San Joaquin kit fox	Denning: COW	Direct Permanent	14.74	13.67	25.77	11.18
		Direct Temporary	5.80	6.03	4.46	3.99
		<i>Subtotal</i>	<i>20.54</i>	<i>19.70</i>	<i>30.23</i>	<i>15.17</i>
	Denning and Movement: AGS, COW, PAS, RUD	Direct Permanent	112.65	103.76	47.62	87.69
		Direct Temporary	16.40	86.34	16.20	15.25
		<i>Subtotal</i>	<i>129.06</i>	<i>190.10</i>	<i>63.82</i>	<i>102.94</i>
	Movement: BAR, INA, ORC, ROC, RUD	Direct Permanent	832.94	996.76	1,164.61	827.50
		Direct Temporary	269.17	618.46	252.72	234.56 ³
		<i>Subtotal</i>	<i>1,102.12</i>	<i>1,615.23</i>	<i>1,417.33</i>	<i>1,062.06³</i>
	Total		1,251.71	1,825.02	1,511.38	1,180.16³

Species Group and Species	Associated Land Cover Type	Impact Type	Alternative			
			SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Giant kangaroo rat	AGS within range	Direct Permanent	0	0	0	0
		Direct Temporary	0.06	0.06	0.06	0.06
	Total		0.06	0.06	0.06	0.06
Nelson's antelope squirrel	AGS, VSS within range	Direct Permanent	0	0	0	0
		Direct Temporary	4.26	4.26	4.26	4.26
	Total		4.26	4.26	4.26	4.26
Fresno kangaroo rat	AGS, VSS within range	Direct Permanent	46.33	41.36	10.29	42.39
		Direct Temporary	12.04	12.10	10.88	10.03
	Total		58.37	53.46	21.17	52.42

Source: Authority, 2019. Calculations generated using ESRI ArcGIS versions 10.1, 10.2, and 10.3 from data generated by field surveys and aerial photo interpretation during 2010–2017. On April 27, 2018, USACE concurred with the findings of the delineation of waters of the United States. *Minor differences in the totals are the result of rounding.*

¹ Direct impacts on vernal pool invertebrates include both permanent and temporary impacts because temporary impacts on vernal pools are considered permanent. For all other species, direct permanent and direct temporary impact values reported separately. Indirect Bisected vernal pools occur both inside and outside of the project footprints. The portion outside the footprint is referred to as "indirect bisected," but is considered a permanent direct impact for purposes of calculating mitigation requirements.

² Direct impact numbers presented are amounts within the Central Valley Wye alternatives project footprints. Actual impacts from placement of piers would be less depending on final designs.

³ This value has been updated to reflect refinements to the Site 6 electrical interconnection. Refer to Section 2.2.3, Description of the Central Valley Wye Alternatives.

- SR = State Route
- BAR = Barren
- AGS = California Annual Grassland
- COI = Commercial/Industrial
- COB = Constructed Basin
- COW = Constructed Watercourse
- DAI = Dairy
- EUC = Eucalyptus
- FAF = Fallow Field
- FIC = Field Crop
- FWM = Freshwater Marsh
- INA = Inactive Agriculture
- MIR = Mixed Riparian
- NAW = Natural Watercourse
- OPW = Open Water
- ORC = Orchard
- OTR = Other Riparian
- PFW = Palustrine Forested Wetland
- PAS = Pasture
- RIC = Rice Field
- ROC = Row Crop
- RUD = Ruderal
- SEU = Evolutionarily Significant Units
- SEW = Seasonal Wetland
- SLO = Slough
- TRC = Transportation Corridor
- URB = Urban
- URW = Urban Woodland
- VP = Vernal Pool
- VPC = Vernal Pool Complex
- VIN = Vineyard

Impact BIO#3 Direct Impacts on Special-Status Wildlife—Invertebrates

Construction associated with all of the Central Valley Wye alternatives would require ground disturbance and other construction activities in areas suitable as habitat for special-status invertebrates. Direct impacts on special-status invertebrates would potentially include permanent loss of vernal pools occupied by vernal branchiopods, loss of elderberry shrubs occupied by Valley elderberry longhorn beetle, and loss of annual grassland and valley sink scrub occupied by Crotch bumble bee, as well as injury or mortality of individuals of these species during construction.

As presented in Table 3.7-13, construction of the Avenue 21 to Road 13 Wye Alternative would result in the greatest extent of direct impacts, compared to the other three alternatives, on special-status invertebrates that are dependent on vernal pool and wetland habitat (2.49 acres); however, a similar extent of impacts on these species would result from construction of the SR 152 (North) to Road 19 Wye Alternative (2.44 acres) and the SR 152 (North) to Road 13 Wye Alternative (2.16 acres). Construction of the SR 152 (North) to Road 11 Wye Alternative would result in the least direct impacts (1.87 acres) on vernal pool and wetland habitats suitable for special-status invertebrates.

Construction of the Avenue 21 to Road 13 Wye Alternative would result in the greatest extent of direct impacts on upland habitats suitable for valley elderberry longhorn beetle (2.97 acres). Construction of the SR 152 (North) to Road 11 Wye Alternative would result in the least direct impacts (1.53 acres) on habitats suitable for valley elderberry longhorn beetle, compared to the other three alternatives. The SR 152 (North) to Road 13 Wye Alternative would have greater potential for impact on upland habitat suitable for valley elderberry longhorn beetle (1.92 acres) than the SR 152 (North) to Road 19 Wye Alternative (1.60 acres).

Construction of the SR 152 (North) to Road 19 Wye Alternative would result in the greatest extent of direct impacts on annual grassland and valley sink scrub habitats (134.47 acres), which are habitats considered suitable for Crotch bumble bee. Construction of the Avenue 21 to Road 13 Wye Alternative would result in the least direct impacts (37.58 acres) on habitats suitable for Crotch bumble bee, compared to the other three alternatives. The SR 152 (North) to Road 13 Wye Alternative would have greater potential for impact on habitats suitable for Crotch bumble bee (103.97 acres) than the SR 152 (North) to Road 11 Wye Alternative (82.37 acres).

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Prepare and implement a BRMP that would avoid or minimize the alteration of local topography, direction of runoff, and flow volume in the watershed of specific vernal pools, preventing or minimizing alteration of seasonal inundation conditions, permanent conversion of occupied habitat to project infrastructure, changes to micro/local hydrology, or impacts on valley elderberry longhorn beetle due to damage or removal of elderberry host plants in which they occur (BIO-IAMF#5)
- Prepare and implement a weed control plan to minimize and avoid the spread of noxious and invasive weeds during ground-disturbing activities (BIO-IAMF#7)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and returning this soil to the original location wherever possible, while disposing of waste

unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)

- Establish procedures to clean equipment to be free of mud and plant materials to avoid introduction of invasive species (BIO-IAMF#12)
- Prepare and establish a construction site BMP field manual containing standard construction site housekeeping practices (BIO-IAMF#13)

Implementation of any of the Central Valley Wye alternatives could permanently remove occupied (i.e., vernal pools, elderberry shrubs, and annual grassland and valley sink scrub where species are present) and unoccupied special-status invertebrate habitat, resulting in direct construction impacts where impacts cannot be avoided.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be significant because of habitat degradation or modifications resulting from ground disturbance and construction activities, which would cause a substantial adverse effect on special-status invertebrates. The design characteristics of all of the Central Valley Wye alternatives would include measures to identify special-status invertebrate habitat to be avoided during construction. These design features would minimize, but not fully avoid, potential adverse impacts on vernal pool branchiopods from construction activities in suitable habitat. BIO-MM#1a would require the establishment of fencing to protect environmentally sensitive areas. BIO-MM#1b would require preparation of monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and other requirements set forth in regulatory agency authorizations. BIO-MM#2a would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species, wetlands and/or other aquatic resources. Additionally, under any of the Central Valley Wye alternatives, the Authority would implement mitigation measures BIO-MM#5: Conduct Pre-Construction Surveys for Vernal Pool Wildlife Species and BIO-MM#6: Implement Seasonal Vernal Pool Work Restriction, which would identify and document vernal pool fauna and habitat, guide the mitigation of unavoidable impacts on vernal pool fauna, and include BMPs to provide for seasonal avoidance of special-status vernal pool branchiopods and vernal pool-dependent species. BIO-MM#7: Implement and Monitor Vernal Pool Avoidance and Minimization Measures within Temporary Impact Areas would include BMPs to reduce impacts on vernal pools within temporary impact areas. BIO-MM#9a: Work Stoppage, would give the project biologist authority to halt work to prevent the death or injury to special-status invertebrates. BIO-MM#3b, BIO-MM#4, BIO-MM#44: Provide Compensatory Mitigation for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Habitat, and BIO-MM#45: Provide Compensatory Mitigation for Impacts on Valley Elderberry Longhorn Beetle Habitat would allow for on-site and off-site restoration and preservation of special-status invertebrate species habitat. The Authority would also implement BIO-MM#52: Conduct Surveys and Implement Avoidance Measures for Crotch Bumble Bee, which will identify occupied habitat and avoid and minimize impacts on individuals. BIO-MM#53: Provide Compensatory Mitigation for Impacts on Crotch Bumble Bee Habitat, would also provide for the off-site preservation of suitable habitat. With implementation of BIO-MM#1a, BIO-MM#1b, BIO-MM#2a, BIO-MM#3b, BIO-MM#4, BIO-MM#5, BIO-MM#6, BIO-MM#7, BIO-MM#9a, BIO-MM#44, BIO-MM#45, BIO-MM#52, and BIO-MM#53, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives because impacts from disturbance to special-status invertebrates and their habitat would be reduced through the incorporation of measures to identify occupied habitats, avoid work during important seasons, and compensate for impacts through on-site and/or off-site restoration or preservation of habitat. Consequently, there would not be a substantial adverse effect from habitat degradation and modification on special-status invertebrates.

Impact BIO#4 Indirect Impacts on Special-Status Wildlife—Invertebrates

All of the Central Valley Wye alternatives would stockpile soil, change the contour of landscape or disturb hardpan soils, have the potential for chemical spills, erect structures, introduce construction-related dust, or introduce and spread invasive weeds during construction. These

activities could affect special-status invertebrates or their habitat, including loss of vernal pools occupied by branchiopods, loss of elderberry shrubs occupied by valley elderberry longhorn beetle, and loss of annual grassland and valley sink scrub occupied by Crotch bumble bee. The introduction or spread of invasive weeds has the potential to affect special-status invertebrates indirectly by degrading native plant communities that provide suitable habitat for them. It is difficult to remove established invasive plants from native plant communities without intensive and regular management (e.g., manual hand-pulling, herbicide application) and monitoring.

The indirect impacts would be approximately the same for all Central Valley Wye alternatives because each alternative would result in large-scale changes to existing land uses within the project footprints, which could fragment existing habitats, as well as large-scale movement of earthen materials and equipment that could introduce or spread invasive plant species.

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Prepare and implement a BRMP that would avoid or minimize the alteration of local topography, direction of runoff, and flow volume in the watershed of specific vernal pools, preventing or minimizing alteration of seasonal inundation conditions, permanent conversion of occupied habitat to project infrastructure, changes to micro/local hydrology, or impacts on valley elderberry longhorn beetle due to damage or removal of elderberry host plants in which they occur (BIO-IAMF#5)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7).
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- Minimize the spread of invasive plants outside the project footprints by confirming that vehicles are cleaned of mud and plant materials prior to working in new areas, thus making certain that invasive plant seeds are not carried between construction work areas (BIO-IAMF#12)
- Prepare and establish a construction site BMP field manual containing standard construction site housekeeping practices (BIO-IAMF#13)

Therefore, the design of all of the Central Valley Wye alternatives would minimize the impacts of habitat degradation, alteration of vernal pool and seasonal wetland hydrology, reduction in reproductive success and survival of invertebrate species, water contamination, potential reduced health and vigor of elderberry host plants from construction-related dust accumulation and changes in local runoff, and potential effects on annual grassland and valley sink scrub habitats. These design characteristics would avoid some, but not all, indirect impacts on special-status invertebrate species and habitat.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because features of the Central Valley Wye alternatives would include BMPs and

measures that limit the movement of soil, sediment, and other materials out of the immediate work area and into adjacent habitats, which would prevent a substantial adverse effect on special-status invertebrates. Additionally, effective measures to minimize and avoid the spread of weeds and invasive species and provide for the identification of, contractor awareness of, and avoidance of sensitive biological resources, would further prevent impacts on special-status invertebrate species. The design characteristics of all the Central Valley Wye Alternatives include effective measures to avoid substantial adverse effects on special-status invertebrates; therefore, CEQA does not require any mitigation.

Impact BIO#5 Direct Impacts on Special-Status Wildlife—Fish

All of the Central Valley Wye alternatives would require construction activities within and adjacent to the San Joaquin River, including pile driving in the channel. Impacts from these activities on special-status fish may include reduced habitat suitability as a result of increased shading from overhead elevated structures, interruptions to fish passage from new bridge footings, and disturbance and possible mortality if sound levels from pile-driving reach the lethal range. All of the Central Valley Wye alternatives may also require dewatering during construction. Dewatering may result in direct impacts on special-status fish and their habitat from sedimentation, turbidity, altered water temperatures, oxygen depletion, accidental spill of contaminants, and stranding and mortality.

As presented in Table 3.7-13, the Avenue 21 to Road 13 Wye Alternative would result in the least direct impact (1.97 acres) on suitable habitat for all six special-status fish species, compared to the other three Central Valley Wye alternatives, which would result in slightly greater impacts. The SR 152 (North) to Road 13 Wye and SR 152 (North) to Road 19 Wye would result in the greatest direct impact on all six special-status fish species (2.24 acres), and the SR 152 (North) to Road 11 Wye would directly impact 2.18 acres of all six species.

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Prepare and implement a BRMP that would include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility for implementation (BIO-IAMF#5)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- Establish procedures to clean equipment to be free of mud and plant materials to avoid introduction of invasive species (BIO-IAMF#12)
- The Authority would develop and implement a construction site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13)
- Prepare and implement a dewatering plan, to be approved by resource agencies prior to work in an area, to minimize turbidity and siltation (BIO-IAMF#14)

- Prepare and implement a stormwater pollution prevention plan to effectively manage project runoff during construction (HYD-IAMF#3) and operations (HYD-IAMF#1), including for facilities designated as an industrial facility (HYD-IAMF#4)
- Prepare and implement a flood protection plan to minimize increases in flood elevations (HYD-IAMF#2)

As a feature of all of the Central Valley Wye alternatives, the Authority and the project biologist would consult with the NMFS and CDFW to identify appropriate work windows for federally listed species, including federally listed fish in the San Joaquin River. If work cannot be conducted when the channel lacks flowing or standing water, additional measures would be required in consultation with the NMFS and CDFW. Therefore, the design of the Central Valley Wye alternatives would minimize the potential impacts. These measures may not avoid all direct impacts on special-status fish and their habitat, but they are expected to minimize the likelihood and severity of such impacts because they would confirm that all in-water activities are conducted in accordance with resource agency standards.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be significant because habitat degradation or modification and the potential for mortality from construction activities within and adjacent to the San Joaquin River would cause a substantial adverse effect on special-status fish species. The design characteristics of all of the Central Valley Wye alternatives include effective measures that would identify appropriate work windows for federally listed species and require preparation of a dewatering plan that includes appropriate measures to minimize turbidity and siltation. These design characteristics would minimize but not avoid loss of special-status fish species that could affect abundance or diversity beyond the level of normal variability. The Authority would implement mitigation measures to further reduce direct impacts on special-status fish species. BIO-MM#8a: Work Windows for Fish, would require specific work windows to coincide with periods when fish are least likely to be affected. BIO-MM#8b: Pile Driving Underwater Sound Pressure Measures, and BIO-MM#42: Measure Pile Driving Sound Pressure and Attenuate Underwater Sound, would require measures to monitor and minimize underwater sound pressures that could injure or kill fish. BIO-MM#8c: Water Diversion Measures for Fish, would require specific design requirements related to dewatering to avoid injuring or killing fish that are within the work area. BIO-MM#8d: Fish Rescue Plan, would provide a plan for fish rescue if water depths were low within the cofferdam. BIO-MM#9a would give the project biologist authority to halt work to prevent the death or injury to special-status fish species. BIO-MM#3b and BIO-MM#4 would allow for on-site and off-site restoration and preservation of special-status fish species habitat, respectively. With implementation of BIO-MM#3b, BIO-MM#4, BIO-MM#8a, BIO-MM#8b, BIO-MM#8c, BIO-MM#8d, BIO-MM#9a, and BIO-MM#42, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives because the reduction in the number or habitat of fish species or adverse impacts on riparian habitat would be reduced, and there would not be a substantial adverse effect on special-status fish species.

Impact BIO#6 Indirect Impacts on Special-Status Wildlife—Fish

Construction of any of the Central Valley Wye alternatives would require ground disturbance, the use of construction equipment, and erection of security fencing, electrical infrastructure, and elevated structures. These actions may indirectly affect special-status fish by degrading water quality, leading to temporary shifts in foraging patterns or territories; increasing erosion and sedimentation into nearby aquatic habitats; contaminating downstream habitats in the event of a chemical spill from construction equipment; and providing artificial perch sites, which could attract avian predators and increase fish predation. The indirect impacts would be approximately the same for all of the Central Valley Wye alternatives because each alternative would result in large-scale changes to existing land uses within the project footprints and could affect the same waterbodies.

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Prepare and implement a BRMP that would include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility for implementation (BIO-IAMF#5)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- Establish procedures to clean equipment to be free of mud and plant materials to avoid introduction of invasive species (BIO-IAMF#12)
- The Authority would develop and implement a construction site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13)
- Prepare and implement a dewatering plan, to be approved by resource agencies prior to work in an area, to minimize turbidity and siltation (BIO-IAMF#14)
- Prepare and implement a stormwater pollution prevention plan to effectively manage project runoff during construction (HYD-IAMF#3) and operations (HYD-IAMF#1), including for facilities designated as an industrial facility (HYD-IAMF#4)
- Prepare and implement a flood protection plan to minimize increases in flood elevations (HYD-IAMF#2).

The design characteristics of all of the Central Valley Wye alternatives would reduce the likelihood of excess sediment or contaminants entering the water during construction and would minimize the potential for other indirect impacts. Therefore, construction of any of the Central Valley Wye alternatives would not substantially contribute to erosion and sedimentation or water quality such that degradation of special-status fish species or habitat would occur.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact on special-status fish under CEQA would be less than significant because there would not be a substantial adverse effect from habitat modification or predation, as these effects are unlikely to occur from excess sediment or contaminants entering the water during construction or from the attraction of raptors to artificial perch sites created by infrastructure components. The design characteristics of all of the Central Valley Wye alternatives would include effective measures to manage sediment or contaminants from entering water during construction, avoiding impacts on special-status fish species. Therefore, CEQA does not require any mitigation.

Impact BIO#7 Direct Impacts on Special-Status Wildlife—Amphibians

Construction of all of the Central Valley Wye alternatives would include temporary activities in upland and aquatic habitats suitable for special-status amphibians, and could result in the permanent conversion of occupied aquatic and upland habitat to HSR infrastructure.

As presented in Table 3.7-13, construction of the SR 152 (North) to Road 19 Wye Alternative would result in the greatest extent of direct temporary and permanent impacts (315.31 acres) on aquatic and upland habitats suitable to California tiger salamander, compared to the other three

alternatives. Construction of the Avenue 21 to Road 13 Wye Alternative would result in the least direct temporary and permanent impact (114.66 acres) on aquatic and upland habitats suitable to California tiger salamander, compared to the other three alternatives. Construction of the SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative would result in 189.39 acres and 156.26 acres of direct temporary and permanent impacts on California tiger salamander habitats, respectively.

As presented in Table 3.7-13, construction of the SR 152 (North) to Road 19 Wye Alternative would result in the greatest extent of direct temporary and permanent impacts (71.92 acres) on aquatic and upland habitats suitable to western spadefoot, compared to the other three alternatives. Construction of the Avenue 21 to Road 13 Wye Alternative would result in the least direct temporary and permanent impact (17.02 acres) on aquatic and upland habitats suitable to western spadefoot, compared to the other three alternatives. Construction of the SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative would result in 45.26 acres and 29.06 acres of direct temporary and permanent impacts on western spadefoot habitats, respectively.

As features of all of the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status amphibians:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Require that the BRMP identify of special-status amphibian habitat features (e.g., seasonal wetlands and vernal pools) as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement a weed control plan to minimize and avoid the spread of noxious and invasive weeds during ground-disturbing activities (BIO-IAMF#7)
- the design of the Central Valley Wye alternatives would prohibit the use of plastic monofilament netting or similar materials in erosion control materials, reducing the likelihood of special-status amphibians being caught in plastic netting and dying from desiccation, predation, or starvation (BIO-IAMF#8). At the end of each work day, the contractor would cover all excavated, steep-sided holes or trenches more than 8 inches deep with plywood or similar materials, or provide a minimum of one escape ramp per 100 feet of trenching (with slopes no greater than a 3:1) constructed of earth fill or wooden planks. The contractor would also screen, cover, or store more than 1 foot off the ground, all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored at the construction site for one or more overnight periods. All such materials would also be inspected by the project biologist prior to their movement, capping, or burial. The design of the Central Valley Wye alternatives would also reduce the likelihood of special-status amphibian mortality by confirming that none becomes trapped in the work area (BIO-IAMF#9).
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- Establish procedures to clean equipment to be free of mud and plant materials to avoid introduction of invasive species (BIO-IAMF#12)

- The Authority would develop and implement a construction site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13)

Speed limits of 15 miles per hour (mph) would be established in construction zones to reduce the likelihood of special-status amphibian mortality from vehicle strikes (BIO-IAMF#15). The design of all of the Central Valley Wye alternatives would minimize but not avoid the direct impacts of construction activities, which could cause mortality, injury, or harassment of adults, eggs or egg masses, and larvae; permanent or temporary destruction, degradation, fill, or pollution of breeding, foraging, or movement habitat; and the temporary loss of burrows or other upland refugia. Mortality, injury, or harassment may also occur if these species become trapped in open, excavated areas. Other potential direct impacts on aquatic habitat that change seasonal inundation patterns would be the same as those described for vernal pool branchiopods. Direct impacts also include the permanent conversion of occupied aquatic and upland habitat to Central Valley Wye infrastructure, fragmentation of habitats and landscapes, which would interfere with seasonal movement and dispersal of special-status amphibians, and changes to micro/local hydrology, which could affect inundation periods of aquatic habitat.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be significant because impacts resulting from habitat modifications and mortality from construction activities in upland and aquatic habitats would cause a substantial adverse effect on special-status amphibian species. The design characteristics of the Central Valley Wye alternatives would include effective measures to identify special-status amphibian aquatic habitat to be avoided during construction; install barriers to prevent special-status amphibians from entering the work area; prohibit the use of plastic monofilament netting or similar materials in erosion control materials; cover all excavated, steep-sided holes or trenches; and implement speed limits of 15 mph in construction zones. These measures would minimize but not avoid permanent conversion of occupied aquatic and upland habitat to Central Valley Wye infrastructure. BIO-MM#1a would require the establishment of fencing to protect environmentally sensitive areas. BIO-MM#1b would require preparation of monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and other requirements set forth in regulatory agency authorizations. BIO-MM#2a would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species, wetlands and/or other aquatic resources. BIO-MM#9a would give the project biologist authority to halt work to prevent the death or injury to special-status amphibians. BIO-MM#9b: Conduct Pre-construction Surveys for Special-Status Reptile and Amphibian Species and BIO-MM#10: Implement Avoidance and Minimization Measures for Special-Status Reptile and Amphibian Species would implement pre-construction surveys in suitable habitats to determine the presence of amphibian species and would require the contractor's project biological monitor to oversee construction activities to avoid special-status amphibians or relocate them outside the construction area. BIO-MM#11: Conduct Pre-Construction Surveys for California Tiger Salamander and BIO-MM#12: Implement Avoidance and Minimization Measures for California Tiger Salamander, would survey potential breeding habitat for the presence of California tiger salamander and install and maintain exclusion fencing along the perimeter of the HSR right-of-way within California tiger salamander suitable habitat areas. BIO-MM#13: Conduct Emergence and Larval Surveys for Western Spadefoot would conduct pre-construction emergence and larval surveys for western spadefoot during the fall and winter rainy season. BIO-MM#3b, BIO-MM#4, and BIO-MM#46: Provide Compensatory Mitigation for Impacts on California Tiger Salamander Habitat, would allow for on-site and off-site restoration and preservation of special-status amphibian species. With implementation of BIO-MM#1a, BIO-MM#1b, BIO-MM#2a, BIO-MM#3b, BIO-MM#4, BIO-MM#9a, BIO-MM#9b, BIO-MM#10, BIO-MM#11, BIO-MM#12, BIO-MM#13, and BIO-MM#46, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives because impacts resulting from habitat modifications and mortality on special-status amphibian species and their habitat would be reduced and there would not be a substantial adverse effect from habitat modification and construction-related mortality on special-status amphibians.

Impact BIO#8 Indirect Impacts on Special-Status Wildlife—Amphibians

All of the Central Valley Wye alternatives would stockpile soil, change the contour of landscape or disturb hardpan soils, have the potential for chemical spills, erect structures, introduce construction-related dust, or introduce and spread invasive weeds. These actions have the potential to degrade special-status amphibian habitat. The indirect impacts would be approximately the same for all of the Central Valley Wye alternatives because each alternative would result in large-scale changes to existing land uses within the project footprints, which could fragment existing habitats, as well as large-scale movement of earthen materials and equipment that could introduce or spread invasive plant species.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status amphibians:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Require that the BRMP identify of special-status amphibian habitat features (e.g., seasonal wetlands and vernal pools) as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)
- The design of the Central Valley Wye alternatives would prohibit the use of plastic monofilament netting or similar materials in erosion control materials, reducing the likelihood of special-status amphibians being caught in plastic netting and dying from desiccation, predation, or starvation (BIO-IAMF#8)
- At the end of each work day, the contractor would cover all excavated, steep-sided holes or trenches more than 8 inches deep with plywood or similar materials, or provide a minimum of one escape ramp per 100 feet of trenching (with slopes no greater than a 3:1) constructed of earth fill or wooden planks. The contractor would also screen, cover, or store more than 1 foot off the ground, all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored at the construction site for one or more overnight periods. All such materials would also be inspected by the project biologist prior to their movement, capping, or burial. The design of the Central Valley Wye alternatives would also reduce the likelihood of special-status amphibian mortality by confirming that none becomes trapped in the work area (BIO-IAMF#9)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- Minimize the spread of invasive plants within or adjacent to sensitive habitat areas as defined by the project biologist by confirming that vehicles are cleaned of mud and plant materials prior to working in new areas, thus making certain that invasive plant seeds are not carried between construction work areas (BIO-IAMF#12)
- The Authority would develop and implement a construction site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13)

- Speed limits of 15 mph would be established in construction zones to reduce the likelihood of special-status amphibian mortality from vehicle strikes (BIO-IAMF#15).

Thus, the design characteristics of the Central Valley Wye alternatives include effective measures to minimize the spread of weeds during construction activities and to avoid sensitive areas, which would prevent disturbance of special-status amphibians. Therefore, construction of the Central Valley Wye alternatives would not alter special-status amphibian habitat such that substantial changes to individuals or a population would occur.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant on special-status amphibian species because there would not be a substantial adverse effect from indirect habitat modification. In the context of the wildlife movement study area, the effect on special-status amphibians from habitat fragmentation would be limited by the availability of several wildlife movement corridors, which would reduce the effects of habitat fragmentation. The design of the Central Valley Wye alternatives includes provisions for the management of invasive species and protection of sensitive biological resources. Therefore, CEQA does not require any mitigation.

Impact BIO#9 Direct Impacts on Special-Status Wildlife—Reptiles

All of the Central Valley Wye alternatives would require construction of infrastructure in potential habitat suitable for special-status reptile species, which could convert or fragment occupied habitat or landscapes. Direct impacts may include mortality, injury, or harassment of adults, eggs, or juveniles because of construction activities and vehicle use. Other direct impacts may include the permanent conversion of occupied habitat to HSR infrastructure, and habitat fragmentation resulting from construction of the Central Valley Wye alternatives, which would interfere with seasonal movement and dispersal of special-status reptiles.

As presented in Table 3.7-13, construction of any of the Central Valley Wye alternatives would result in no permanent direct impacts and 4.32 acres of temporary direct impacts on habitats suitable for San Joaquin coachwhip. For other special-status reptile species, the alternatives differ in the direct impacts on suitable habitats that would result from their construction. These impacts are discussed below by alternative.

Compared to the other three alternatives, construction of the SR 152 (North) to Road 19 Wye Alternative would result in the greatest extent of direct impact on suitable habitats for Western pond turtle (124.87 acres), Blainville's horned lizard (283.26 acres), and giant garter snake (32.24 acres). The SR 152 (North) to Road 19 Wye Alternative also would have the greatest extent of direct impact (28.88 acres) on habitat suitable for silvery legless lizard; the majority (28.54 acres) of the impact would be temporary. Construction of any of the other three alternatives would result in no permanent direct impacts and only 4.32 acres of temporary direct impacts on silvery legless lizard habitats. For blunt-nosed leopard lizard, the SR 152 (North) to Road 19 Wye Alternative would result in slightly less direct impact on suitable habitats than the SR 152 (North) to Road 13 Wye Alternative (42.05 acres versus 43.42 acres, respectively), and thus would result in the second greatest impact on suitable habitats for blunt-nosed leopard lizard.

Construction of the SR 152 (North) to Road 13 Wye Alternative would result in the second greatest extent of direct impact on suitable habitats for Western pond turtle (91.61 acres), Blainville's horned lizard (203.77 acres), and giant garter snake (27.61 acres). For blunt-nosed leopard lizard, the SR 152 (North) to Road 13 Wye Alternative would result in slightly more direct impact on suitable habitats than the SR 152 (North) to Road 19 Wye Alternative (43.42 acres versus 42.05 acres, respectively), and thus would result in the greatest impact on suitable habitat for blunt-nosed leopard lizard.

Construction of the SR 152 (North) to Road 11 Wye Alternative would result in less direct impact on habitats suitable for special-status reptiles than the SR 152 (North) to Road 19 Wye Alternative or the SR 152 (North) to Road 13 Wye Alternative: Western pond turtle (66.94 acres), blunt-nosed leopard lizard (37.48 acres), Blainville's horned lizard (176.36 acres), and giant garter snake (19.93 acres). Except for giant garter snake, these impact acreages are greater than

those that would result from construction of the Avenue 21 to Road 13 Wye Alternative. For giant garter snake, the SR 152 (North) to Road 11 Wye Alternative would result in slightly less direct impact on suitable habitats than the Avenue 21 to Road 13 Wye Alternative (19.93 acres versus 23.15 acres, respectively), and thus would result in the least impact on suitable habitat for giant garter snake.

Construction of the Avenue 21 to Road 13 Wye Alternative would result in the least direct impact on habitats suitable for Western pond turtle (50.61 acres), blunt-nosed leopard lizard (20.18 acres), and Blainville's horned lizard (124.44 acres). For giant garter snake, the Avenue 21 to Road 13 Wye Alternative would impact a slightly greater acreage of suitable habitat than the SR 152 (North) to Road 11 Wye Alternative (23.15 acres versus 19.93 acres, respectively), and thus would result in the second least direct impact on suitable habitats for giant garter snake.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status reptiles:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- The Authority would develop and implement requirements to identify special-status reptile habitat to be avoided during construction and to delineate habitat features as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)
- The use of plastic monofilament netting or similar materials in erosion control materials would be prohibited, reducing the likelihood of special-status reptiles being caught in plastic netting and dying from desiccation, predation, or starvation (BIO-IAMF#8)
- At the end of each work day, the contractor would cover all excavated, steep-sided holes or trenches more than 8 inches deep with plywood or similar materials, or provide a minimum of one escape ramp per 100 feet of trenching (with slopes no greater than a 3:1) constructed of earth fill or wooden planks. The contractor would also screen, cover, or store more than 1 foot off the ground, all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored at the construction site for one or more overnight. All such materials would also be inspected by the project biologist prior to their movement, capping, or burial, which would reduce the likelihood of special-status reptile mortality by confirming that none becomes trapped in the work area (BIO-IAMF#9)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- Minimize the spread of invasive plants within or adjacent to sensitive habitat areas as defined by the project biologist by confirming that vehicles are cleaned of mud and plant materials prior to working in new areas, thus making certain that invasive plant seeds are not carried between construction work areas (BIO-IAMF#12)

- The Authority would develop and implement a construction site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13)
- Speed limits of 15 mph would be established in construction zones to reduce the likelihood of special-status reptile mortality from vehicle strikes (BIO-IAMF#15).

Therefore, the design of the Central Valley Wye alternatives would minimize the impacts of construction activities in suitable special-status reptile habitat by confirming contractors are aware of and would avoid habitat features adjacent to the project footprints and implementing provisions to reduce the likelihood of special-status reptile mortality and entrapment during construction. These design characteristics would avoid some, but not all, direct impacts on special-status reptiles and their habitat. Impacts that could still result from the Central Valley Wye alternatives include mortality, injury, or harassment of adults, eggs, or juveniles; temporary destruction, degradation, or pollution of habitat and the temporary loss of nesting areas, burrows, or other refugia; entrapment in open, excavated areas; and interference with seasonal movement and dispersal of special-status reptiles. Due to its status as a California Fully Protected species, blunt-nosed leopard lizard may not be taken. The features of the Central Valley Wye alternatives could collectively disturb habitat for special-status reptiles, thereby affecting individuals and populations of special-status reptiles.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be significant because impacts would result from mortality, injury, harassment, or habitat modifications from construction activities in suitable upland or aquatic habitat, which would cause a substantial adverse effect on special-status reptile species. The design characteristics of the Central Valley Wye alternatives include effective measures to identify special-status reptile habitat to be avoided, install wildlife exclusion fencing around the perimeter of environmentally sensitive areas and environmentally restricted areas, prohibit the use of plastic monofilament netting or similar materials in erosion control materials, require contractors to cover all excavated steep-sided holes or trenches, and limit speed in construction areas. These design characteristics would reduce but not avoid impacts on suitable upland or aquatic habitat.

The Authority would implement mitigation measures to minimize impacts on special-status reptile species. BIO-MM#1a would require the establishment of fencing to protect environmentally sensitive areas. BIO-MM#1b would require preparation of monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and other requirements set forth in regulatory agency authorizations. BIO-MM#2a would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species, wetlands and/or other aquatic resources. BIO-MM#9a would give the project biologist authority to halt work to prevent the death or injury to special-status reptiles. BIO-MM#9b and BIO-MM#10 would implement pre-construction surveys in suitable habitats to determine the presence of reptile species and would require the contractor's project biological monitor to oversee construction activities to avoid special-status reptiles or relocate them (for species other than blunt nosed leopard lizard) outside the construction area. BIO-MM#14: Conduct Protocol-level Surveys for Blunt-Nosed Leopard Lizard, and BIO-MM#15: Implement Avoidance Measures, for Blunt-Nosed Leopard Lizard would require surveys in suitable habitats to determine the presence of blunt-nosed leopard lizard and would conduct visual pre-construction surveys in areas of potential blunt-nosed leopard lizard habitat no more than 30 days before ground-disturbing activities, which would avoid take of this fully protected species. BIO-MM#16: Conduct Western Pond Turtle Pre-construction Surveys and Relocation and BIO-MM#17: Conduct Western Pond Turtle Monitoring would involve conducting pre-construction surveys to determine the presence or absence of western pond turtles, and would require the project biologist to observe all construction activities within western pond turtle habitat identified during the pre-construction surveys. BIO-MM#18: Implement Western Pond Turtle Avoidance and Relocation would include measures to avoid the western pond turtle and, if avoidance were not feasible, the project biologist would coordinate with CDFW to identify where to relocate western pond turtles. BIO-MM#19: Avoid Suitable Giant Garter Snake Habitat and

BIO-MM#20: Conduct Work in Giant Garter Snake Habitat During the Active Season would protect giant garter snake aquatic habitat by installing environmentally sensitive area fencing and would require all construction activities affecting giant garter snake habitat to occur between May 1 and October 1, which is the active period for this species. BIO-MM#21: Conduct Pre-construction Surveys and Implement Minimization Measures for Giant Garter Snakes, would require a project biologist to conduct a pre-construction survey for giant garter snake within 24 hours before construction. BIO-MM#22: Conduct Pre-construction Surveys for Blainville's Horned Lizards, San Joaquin Coachwhip, and Silvery Legless Lizards and BIO-MM#23: Conduct Blainville's Horned Lizards, San Joaquin Coachwhip, and Silvery Legless Lizards Monitoring, Avoidance, and Relocation would require a biological monitor to conduct pre-construction surveys in suitable habitats to determine the presence or absence of Blainville's horned lizards, San Joaquin coachwhip, and silvery legless lizards and would require a biological monitor to observe all construction activities in suitable habitat, avoid the horned lizard where feasible, or otherwise relocate them in an area approved by the USFWS and CDFW. BIO-MM#3b, BIO-MM#4, BIO-MM#47: Compensate for Impacts on Blunt-nosed Leopard Lizard and Nelson's Antelope Squirrel, and BIO-MM#51: Provide Compensatory Mitigation for Impacts to Giant Garter Snake Habitat, would allow for on-site and off-site restoration and preservation of special-status reptile species.

With implementation of BIO-MM#1a, BIO-MM#1b, BIO-MM2a, BIO-MM#9a, BIO-MM#9b, BIO-MM#10, BIO-MM#14 through BIO-MM#23, as well as BIO-MM#3b, BIO-MM#4, BIO-MM#47, and BIO-MM#51, the impact under CEQA would be less than significant because impacts on special-status reptiles and their habitat would be reduced under any of the Central Valley Wye alternatives and there would not be a substantial adverse effect from habitat modification or direct harm on special-status reptiles.

Impact BIO#10 Indirect Impacts on Special-Status Wildlife—Reptiles

All Central Valley Wye alternatives would stockpile soil, change the contour of landscape or disturb hardpan soils, erect structures, and have the potential to introduce invasive weeds. These construction activities can reduce habitat suitability; change the suitability of soil for burrowing; temporarily shift foraging patterns or territories; and attract opportunistic predators (e.g., ravens, feral cats, raccoons) or raptors to artificial perches. The indirect impacts would be approximately the same for all of the Central Valley Wye alternatives because each alternative would result in large-scale changes to existing land uses within their respective project footprints, which could fragment existing habitats, as well as large-scale movement of earthen materials and equipment that could introduce or spread invasive plant species.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status reptiles:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Require that the BRMP identify special-status reptile habitat features as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- The Authority would prepare and implement a weed control plan (BIO-IAMF#7) to minimize and avoid the spread of weeds during ground-disturbing activities
- The design of the Central Valley Wye alternatives would prohibit the use of plastic monofilament netting or similar materials in erosion control materials, reducing the likelihood of special-status reptiles being caught in plastic netting and dying from desiccation, predation, or starvation (BIO-IAMF#8)

- At the end of each work day, the contractor would cover all excavated, steep-sided holes or trenches more than 8 inches deep with plywood or similar materials, or provide a minimum of one escape ramp per 100 feet of trenching (with slopes no greater than a 3:1) constructed of earth fill or wooden planks. The contractor would also screen, cover, or store more than 1 foot off the ground, all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored at the construction site for one or more overnight periods. All such materials would also be inspected by the project biologist prior to their movement, capping, or burial. The design of the Central Valley Wye alternatives would also reduce the likelihood of special-status reptile mortality by confirming that none becomes trapped in the work area (BIO-IAMF#9)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- the design of the Central Valley Wye alternatives would also minimize the spread of invasive plants within or adjacent to sensitive habitat areas as defined by the project biologist by confirming that vehicles are cleaned of mud and plant materials prior to working in new areas, thus making certain that invasive plant seeds are not carried between construction work areas (BIO-IAMF#12)
- The Authority would develop and implement a construction site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13)
- Speed limits of 15 mph would be established in construction zones to reduce the likelihood of special-status reptile mortality from vehicle strikes (BIO-IAMF#15).

The Central Valley Wye alternatives would include effective measures to minimize the spread of weeds during construction activities, to avoid sensitive areas, as well as other measures which would prevent disturbance of individual or habitats of special-status reptiles.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant to special-status reptile species because there would not be a substantial adverse effect from habitat modification. In the context of the wildlife movement study area, the effect on special-status reptiles from habitat fragmentation would be limited by the availability of several wildlife movement corridors, which would reduce the effects of habitat fragmentation. The design features of the Central Valley Wye alternatives include managing the spread of weeds and invasive species and protecting sensitive biological resources. Therefore, CEQA does not require any mitigation.

Impact BIO#11 Direct Impacts on Special-Status Wildlife—Birds

Construction of any of the Central Valley Wye alternatives would require grubbing, grading excavation, and driving off-road, which could directly affect special-status birds by altering or removing nesting or foraging habitat, disturbing or destroying nests, perches or burrows, or affecting behavior in ways that could reduce overall fitness or breeding success. All effects on active nests would occur at the time of construction activities and are considered direct impacts. Additionally, electrical components of the Central Valley Wye alternatives could introduce electrocution or strike hazards to the landscape that could kill or injure birds.

For the twelve bird species and species groups that could be affected by construction of any of the Central Valley Wye alternatives, acreages are provided in Table 3.7-13 for temporary and permanent direct impacts on suitable habitats. Because many special-status birds have the potential to occur over large areas of various land cover types in the project footprints, the extent

of direct impacts to habitat of these species is large relative to impacts on other types of special-status wildlife. However, for most of these species/species groups differences among the four Central Valley Wye alternatives are relatively small. Below, these impacts on suitable habitat are discussed by alternative, using the total acreages of impacts on suitable habitats in Table 3.7-13.

Relative to the other three Central Valley Wye alternatives, construction of the SR 152 (North) to Road 19 Wye Alternative would result in the greatest extent of direct impacts on habitats suitable for ten of the twelve special-status bird species/species groups: American peregrine falcon (4,031.34 acres), bald eagle (1,700.62 acres), golden eagle (1,687.47 acres), Swainson's hawk (3,317.30 acres), Western snowy plover (interior population) (1,673.28 acres), Least Bell's vireo (9.82 acres), western burrowing owl (2,239.00 acres), ground nesting birds (1,905.13 acres), wading birds/shorebirds/ducks (1,763.04 acres), and tree nesting birds (3,187.16 acres). For the other two bird species/species groups (greater sandhill crane and tricolored blackbird), the SR 152 (North) to Road 19 Wye Alternative would result in the second greatest impact on suitable habitats.

Construction of the SR 152 (North) to Road 13 Wye Alternative would result in the greatest extent of direct impact on two of the twelve special-status bird species/species groups: greater sandhill crane (1,592.02 acres) and tricolored blackbird (1,491.80 acres). For nine of the species/species groups, this alternative would result in the second greatest impact on suitable habitats: American peregrine falcon, bald eagle, golden eagle, Swainson's hawk, Western snowy plover, western burrowing owl, ground-nesting birds, wading birds/shorebirds/ducks, and tree nesting bird species.

For all special-status bird species/species groups, the SR 152 (North) to Road 11 Wye Alternative would result in less extensive direct impacts on suitable habitat than the SR 152 (North) to Road 19 Wye Alternative or the SR 152 (North) to Road 13 Wye Alternative.

Relative to the other three Central Valley Wye alternatives, construction of the Avenue 21 to Road 13 Wye Alternative would result in the least direct impact on ten of the twelve special-status bird species/species groups: American peregrine falcon (2,897.38 acres), bald eagle (1,339.43 acres), golden eagle (1,329.05 acres), Swainson's hawk (2,539.74 acres), greater sandhill crane (1,253.12 acres), Western snowy plover (interior population) (1,313.42 acres), tricolored blackbird (1,106.45 acres), ground nesting birds (1,274.60 acres), wading birds/shorebirds/ducks (1,361.71 acres), and tree nesting birds (2,563.00 acres). The Avenue 21 to Road 13 Wye Alternative would have the second greatest extent of impact on suitable habitat for least Bell's vireo, and third greatest extent of impact on suitable habitat for western burrowing owl.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status birds:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Require that the BRMP identify special-status bird species habitat features as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)

The Central Valley Wye alternatives could have direct impacts on nesting birds, including removal or disturbance of potential nesting habitat; mortality, injury, or permanent conversion of occupied nesting and foraging habitat; habitat fragmentation; and disturbance of nests during the breeding

season (February 1 to September 1), which could potentially result in the loss of eggs or developing young (i.e., nest abandonment during the incubation, nestling, or fledgling stages).

Burrowing owls extensively use open landscapes with suitable natural or artificial burrows. Suitable habitat exists along most of the project footprints. Vibration from construction equipment along with increased vehicular construction traffic could collapse occupied burrows.

Raptors may nest in riparian habitat, in roadside trees, in windbreaks, in oak woodlands, and on built towers. Several special-status species were identified as potentially occurring in the survey area, including Swainson's hawks.

Despite the design characteristics, construction of the Central Valley Wye alternatives could permanently remove nesting and foraging habitat for special-status birds, resulting in direct impacts. The features of the Central Valley Wye alternatives also could collectively degrade special-status bird habitat, thereby affecting special-status birds.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be significant because impacts from habitat modification and mortality could result from construction activities (e.g., grubbing, grading, excavation, and driving off-road), from vibration from construction equipment, and from increased vehicular construction traffic, which would cause a substantial adverse effect on special-status bird species. The Authority would implement mitigation measures to reduce impacts on special-status birds. BIO-MM#1a would require the establishment of fencing to protect environmentally sensitive areas. BIO-MM#1b would require preparation of monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and other requirements set forth in regulatory agency authorizations. BIO-MM#2a would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species, wetlands and/or other aquatic resources. BIO-MM#9a would give the project biologist authority to halt work to prevent the death or injury to special-status birds. BIO-MM#24a: Conduct Pre-construction Surveys and Delineate Active Nest Buffers and Exclusion Areas for Breeding Birds, and BIO-MM#24b: Conduct Pre-construction Surveys and Monitoring for Raptors, would require the project biologist to conduct visual pre-construction surveys where suitable habitats are present for nesting raptors if construction and habitat removal activities were scheduled to occur during the bird-breeding season (February 1 to September 1). BIO-MM#25a: Conduct Surveys and Implement Avoidance Measures for Active Tricolored Blackbird Nest Colonies, and BIO-MM#25b: Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat, would identify whether or not any active tricolored blackbird colonies are present at the time of construction and would avoid and mitigate for impacts on those colonies. BIO-MM#25c: Bird Protection would require the project biologist to verify that the catenary system, masts, and other structures such as fencing are designed to be bird and raptor-safe. BIO-MM#26: Conduct Surveys for Swainson's Hawk Nests, and BIO-MM#27: Implement Avoidance and Minimization Measures for Swainson's Hawk Nests, would require the project biologist to conduct pre-construction surveys for Swainson's hawks during the nesting season (March 1 to August 1) and, if active nests were found, monitor them until the young fledge or for the length of construction, whichever occurs first. BIO-MM#28: Monitor Removal of Nest Trees for Swainson's Hawks, would require the biological monitor to monitor nest trees for Swainson's hawks and, if removal is required, the Authority would obtain take authorization through a Section 2081 Incidental Take Permit from CDFW and implement BIO-MM#48: Provide Compensatory Mitigation for Loss of Swainson's Hawk Nesting Trees and Habitat. BIO-MM#29: Conduct Protocol-level Surveys for Burrowing Owls, and BIO-MM#30: Implement Avoidance and Minimization Measures for Burrowing Owl, would require a qualified, agency-approved biologist to conduct protocol-level surveys and to identify how BMPs would be implemented related to burrowing owl avoidance and minimization features. BIO-MM#48, would require project-specific compensatory mitigation for impacts to Swainson's hawk nest trees and foraging habitat. BIO-MM#49, Provide Compensatory Mitigation for Loss of Burrowing Owl Active Burrows and Habitat, describes how active burrows permanently lost during construction would be mitigated. BIO-MM#3b and BIO-MM#4 would allow for on-site and off-site restoration and preservation of special-status bird species habitat, respectively. With

implementation of BIO-MM#1a, BIO-MM#1b, BIO-MM#2a, BIO-MM#9a, BIO-MM#24 through BIO-MM#30, as well as BIO-MM#3b, BIO-MM#4, BIO-MM#48, and BIO-MM#49, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives because impacts from habitat modification and mortality would be minimized and there would not be a substantial adverse effect from habitat modification or construction-related mortality on special-status birds.

Impact BIO#12 Indirect Impacts on Special-Status Wildlife—Birds

All four of the Central Valley Wye alternatives would require the construction of security fences, elevated structures, railbeds, and associated facilities, which would cause construction noise, vibration, and visual stimuli that could indirectly affect special-status birds. All effects to active nests are considered to be direct impacts and are fully addressed in Impact BIO#11. The indirect impacts would be approximately the same for all of the Central Valley Wye alternatives because each alternative would result in similar quantities and sizes of new infrastructure.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status birds:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Require that the BRMP identify special-status bird species habitat features as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)

Therefore, construction of any one of the Central Valley Wye alternatives would not indirectly affect special-status bird species to such a degree that impacts on special-status bird individuals or populations would occur.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because there would not be a substantial adverse effect from habitat modification and mortality. The design characteristics of the Central Valley Wye alternatives would include effective measures to avoid and minimize effects, thus preventing permanent or temporary displacement, habitat disturbance, and fragmentation. Therefore, CEQA does not require any mitigation.

Impact BIO#13 Direct Impacts on Special-Status Wildlife—Mammals

All Central Valley Wye alternatives would require nighttime construction, construction of infrastructure, and ground disturbance, resulting in direct temporary and permanent impacts on special-status mammals as presented in Table 3.7-13. As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status mammals:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)

- Require that the BRMP identify of special-status mammal habitat features as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- The design of the Central Valley Wye alternatives would prohibit the use of plastic monofilament netting or similar materials in erosion control materials, reducing the likelihood of special-status mammals being caught in plastic netting and dying from dehydration, predation, or starvation (BIO-IAMF#8)
- At the end of each work day, the contractor would cover all excavated, steep-sided holes or trenches more than 8 inches deep with plywood or similar materials, or provide a minimum of one escape ramp per 100 feet of trenching (with slopes no greater than a 3:1) constructed of earth fill or wooden planks. The contractor would also screen, cover, or store more than 1 foot off the ground, all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored at the construction site for one or more overnight periods. All such materials would also be inspected by the project biologist prior to their movement, capping, or burial. The design of the Central Valley Wye alternatives would also reduce the likelihood of special-status mammal mortality by confirming that none becomes trapped in the work area (BIO-IAMF#9)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- The Authority would develop and implement a construction site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13)
- Speed limits of 15 mph would be established in construction zones to reduce the likelihood of special-status mammal mortality from vehicle strikes (BIO-IAMF#15).

Thus, the design of the Central Valley Wye alternatives would minimize but not avoid the following direct impacts:

- **Special-Status Bat Species**—Increased lighting after sunset during nighttime construction could temporarily disrupt foraging activities by special-status bat species. Nocturnal insects are drawn by lighting, which in turn attracts foraging bats. Special-status bats that are attracted to lighted construction areas could have higher potential mortality through disorientation and collisions with construction equipment. Direct impacts on bats could also include temporary disturbances from noise, dust, and ultrasonic vibrations from construction equipment, permanent conversion of occupied roosting and foraging habitat to HSR infrastructure, and permanent fragmentation of habitats and landscapes resulting from construction, which could interfere with seasonal movement and dispersal of special-status bats.

Because special-status bats have the potential to forage over large areas of various land cover types in the project footprints, the extent of direct impacts on the four such species presented in Table 3.7-13 is large relative to impacts on some other types of special-status wildlife. Construction of the SR 152 (North) to Road 19 Wye Alternative would result in the greatest extent of direct impact (4,031.34 acres for pallid bat and Western red bat, and 4,029.74 for Western mastiff bat) on nesting and foraging habitats for special-status bats, compared to the other three alternatives. Construction of the SR 152 (North) to Road 13 Wye Alternative would result in the next greatest direct impacts on pallid bat, Western red bat, and Western mastiff bat (3,273.10 acres), followed by construction of the SR 152 (North) to Road 11 Wye Alternative with 3,117.83 acres of direct impacts on pallid bat, Western red bat, and Western mastiff bat. Construction of the Avenue 21 to Road 13 Wye Alternative would result

in the least direct impact (2,900.92 acres for pallid bat, Western red bat, and Western mastiff bat) on nesting and foraging habitats for special-status bats, relative to the other three alternatives.

- **San Joaquin Kit Fox**—Impacts on San Joaquin kit foxes could occur because this species has the potential to actively use the project footprints and adjacent areas. Mortality and injury of San Joaquin kit foxes (permanent impacts) could occur from burrows being crushed by construction equipment or from vehicle strikes in work areas. Direct impacts also include the permanent conversion of occupied denning and dispersal habitat to HSR infrastructure, and the permanent fragmentation of habitats and landscapes resulting from construction, which could interfere with seasonal movement and dispersal of San Joaquin kit foxes.

Construction of the SR 152 (North) to Road 19 Wye Alternative would result in the greatest extent of direct impact (1,825.02 acres) on denning and movement habitats for San Joaquin kit fox, compared to the other three alternatives. Construction of the SR 152 (North) to Road 11 Wye Alternative would result in the least direct impact (1,180.16 acres) on denning and movement habitats for San Joaquin kit fox, relative to the other three alternatives.

Construction of the Avenue 21 to Road 13 Wye Alternative and the SR 152 (North) to Road 13 Wye Alternative would result in 1,511.38 acres and 1,251.71 acres of direct impact on denning and movement habitats for San Joaquin kit fox, respectively.

- **American Badger**—Mortality and injury of American badgers could occur from burrows being crushed by construction equipment or from vehicle strikes in construction work areas. Ground disturbance could lead to the temporary loss of foraging habitat. Temporary impacts on American badgers may occur from noise, lighting, vibrations, dust, and motion disturbance. Direct impacts also include the permanent conversion of occupied habitat to HSR infrastructure and fragmentation of habitats and landscapes resulting from construction, which could interfere with seasonal movement and dispersal of badgers.

Construction of the SR 152 (North) to Road 19 Wye Alternative would result in the greatest extent of direct impact (406.65 acres) on habitats suitable for American badger, compared to the other three alternatives. Construction of the Avenue 21 to Road 13 Wye Alternative would result in the least direct impact (237.21 acres) on habitats suitable for American badger, compared to the other three alternatives. Construction of the SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative would result in 309.50 acres and 259.94 acres of direct impact on American badger habitats, respectively.

- **Ringtail**—Mortality and injury of ringtail, a fully protected species under California Fish and Game Code, could occur from individuals being crushed by construction equipment working in riparian habitats in the absence of measures to protect individuals. Ground disturbance could result in permanent and temporary loss of foraging habitat. Direct impacts also include the permanent conversion of occupied habitat to HSR infrastructure.

Construction of the Avenue 21 to Road 13 Wye Alternative would result in the greatest extent of direct impact (2.97 acres) on habitats suitable for ringtail, compared to the other three alternatives. Construction of the SR 152 (North) to Road 11 Wye Alternative would result in the least direct impact (1.53 acres) on habitats suitable for ringtail, compared to the other three alternatives. Construction of the SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 19 Wye Alternative would result in 1.92 acres and 1.60 acres of direct impact on ringtail habitats, respectively.

- **Special-Status Rodent Species**—Direct impacts on special-status rodent species habitat (giant kangaroo rat, Nelson's antelope ground squirrel) could occur because these species have the potential to actively use the project footprints and adjacent areas of the Site 6—El Nido, Los Banos—Oro Loma—Canal 70 kV Power Line, common to all Central Valley Wye alternatives. Additionally, direct impacts on Fresno kangaroo rate could also occur because it has the potential to use the project footprints and adjacent areas of Central Valley Wye alternatives as well as Site 6—El Nido, Los Banos—Oro Loma—Canal 70 kV Power Line, common to all Central Valley Wye alternatives. Mortality and injury of special-status rodents

could occur from crushing burrows with construction equipment as well as from vehicle strikes in work areas. Habitat loss for giant kangaroo rat and Nelson's antelope ground squirrel would only occur on a temporary basis. Habitat loss for Fresno kangaroo rat would occur both on a permanent and temporary basis

None of the four Central Valley Wye alternatives would result in permanent direct impacts on habitats suitable for giant kangaroo rat and Nelson's antelope squirrel, and all four Central Valley Wye alternatives would result in identical temporary direct impacts on giant kangaroo rat (0.06 acre) and Nelson's antelope squirrel (4.26 acres). Each of the four Central Valley Wye alternatives would result in permanent direct impacts on habitats suitable for Fresno kangaroo rat. The SR 152 (North) to Road 13 Wye Alternative would have the greatest impact on habitat for Fresno kangaroo rat (58.37 acres), with the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative resulting in similar but slightly less impact (53.46 acres and 52.42 acres, respectively). The Avenue 21 to Road 13 Wye Alternative would result in the least impact on Fresno kangaroo rat habitat at 21.17 acres.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be significant because impacts from habitat modification and mortality could result from nighttime construction, construction of infrastructure, and ground disturbance, which would cause a substantial adverse effect on special-status mammal species. The design characteristics of the Central Valley Wye alternatives include effective measures to install artificial dens along wildlife exclusion fencing to enable special-status mammal and other terrestrial wildlife movement through work areas during construction. These measures would reduce but not avoid impacts from nighttime construction, construction of infrastructure, and ground disturbance.

The Authority would implement mitigation measures to minimize the impacts on special-status mammal species. BIO-MM#1a would require the establishment of fencing to protect environmentally sensitive areas. BIO-MM#1b would require preparation of monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and other requirements set forth in regulatory agency authorizations. BIO-MM#2a would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species. BIO-MM#9a would give the project biologist authority to halt work to prevent the death or injury to special-status mammals. BIO-MM#31: Conduct Pre-construction Surveys for Special-Status Bat Species, and BIO-MM#32: Implement Bat Avoidance and Relocation Measures, would require a qualified, agency-approved biologist to conduct a visual and acoustic pre-construction survey for roosting bats at potential roost sites no more than 30 days before the start of ground-disturbing activities and to identify how BMP's would be implemented during ground-disturbing activities if active or hibernation roosts were found during the pre-construction surveys. As necessary, roosts would be removed with approval from CDFW between August 1 and October 31. BIO-MM#33: Implement Bat Exclusion and Deterrence Measures, would require the project biologist to identify how BMPs related to ground-disturbing activities would be implemented if nonbreeding or non-hibernating individuals or groups of bats were found during the pre-construction surveys. BIO-MM#34: Conduct Pre-construction Surveys for American Badger Den Sites and Implement Minimization Measures, and BIO-MM#35: Conduct Pre-construction Surveys for Ringtail and Ringtail Den Sites and Implement Avoidance Measures, would require the project biologist to conduct pre-construction surveys for American badger and ringtail dens within suitable habitats no more than 30 days before the start of ground disturbance, and establishes a 50-foot buffer around occupied American badger and ringtail dens found during the pre-construction surveys. BIO-MM#36: Conduct Pre-construction Surveys for San Joaquin Kit Fox, and BIO-MM#37: Minimize Impacts on San Joaquin Kit Fox, would require the project biologist to conduct pre-construction surveys between May 1 and September 30 and to identify how BMPs related to construction activity would be implemented to minimize impacts on San Joaquin kit fox. BIO-MM#39a: Establish Wildlife Crossings, would require the Authority to assess and incorporate appropriate wildlife crossings to maintain landscape permeability. BIO-MM#39b, Install Aprons or Barriers with Security Fencing,

would prevent special-status species from moving through or underneath fencing and gaining access to areas within the right-of-way. BIO-MM#40: Conduct Pre-construction Surveys for Giant Kangaroo Rat, Nelson's Antelope Ground Squirrel, and Fresno Kangaroo Rat, and BIO-MM#41: Monitoring, Avoidance and Relocation of Giant Kangaroo Rat, Nelson's Antelope Ground Squirrel, and Fresno Kangaroo Rat would require a qualified agency-approved biologist to conduct pre-construction monitoring for special-status rodents within the species' ranges 14 days prior to ground disturbance, establish buffers around occupied burrows, and provide for relocation if buffers are not feasible. BIO-MM#38: Construction in Wildlife Movement Corridors, would require the contractor's project biologist to submit a construction avoidance and minimization plan for wildlife movement linkages to the Authority via the mitigation manager for concurrence. BIO-MM#3b and BIO-MM#4 would allow for on-site and off-site restoration and preservation of special-status mammal species habitat, respectively. BIO-MM#50: Provide Compensatory Mitigation for Impacts to San Joaquin Kit Fox Habitat, describes how the permanent loss of San Joaquin kit fox habitat would be mitigated.

With implementation of BIO-MM#1a, BIO-MM#1b, BIO-MM#2a, BIO-MM#3b, BIO-MM#4, BIO-MM#9a, BIO-MM#31 through BIO-MM#41, and BIO-MM#50, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives because impacts from habitat modification and mortality on special-status mammals would be reduced and there would not be a substantial adverse effect from habitat modification or construction-related mortality on special-status mammals.

Impact BIO#14 Indirect Impacts on Special-Status Wildlife—Mammals

Construction activities associated with all of the Central Valley Wye alternatives would require ground-disturbing activities, such as excavation, vegetation removal, construction of the railbed, placement of temporary structures and staging areas, and equipment operation. Indirect impacts would be approximately the same for all Central Valley Wye alternatives because each alternative would result in large-scale changes to existing land uses within their respective project footprints, which could fragment existing habitats, as well as large-scale movement of earthen materials and equipment that could introduce or spread invasive plant species. As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status mammals:

- establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1);
- require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3);
- require that the BRMP identify of special-status mammal habitat features as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5);
- the design of the Central Valley Wye alternatives would prohibit the use of plastic monofilament netting or similar materials in erosion control materials, reducing the likelihood of special-status mammals being caught in plastic netting and dying from dehydration, predation, or starvation (BIO-IAMF#8);
- at the end of each work day, the contractor would cover all excavated, steep-sided holes or trenches more than 8 inches deep with plywood or similar materials, or provide a minimum of one escape ramp per 100 feet of trenching (with slopes no greater than a 3:1) constructed of earth fill or wooden planks. The contractor would also screen, cover, or store more than 1 foot off the ground, all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored at the construction site for one or more overnight periods. All such materials would also be inspected by the project biologist prior to their movement, capping, or burial. The design of the Central Valley Wye alternatives would also reduce the

likelihood of special-status mammal mortality by confirming that none becomes trapped in the work area (BIO-IAMF#9);

- delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10);
- establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11);
- the Authority would develop and implement a construction site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13); and
- Speed limits of 15 mph would be established in construction zones to reduce the likelihood of special-status mammal mortality from vehicle strikes (BIO-IAMF#15).

Therefore, features of the Central Valley Wye alternatives would minimize but not avoid the following impacts:

- **Special-Status Bats**—Ground-disturbing activities, such as excavation, vegetation removal, construction of the railbed, placement of temporary structures and staging areas, and equipment operation would result in noise, dust, or vibration disturbance. These disturbances could disrupt breeding or roosting activity, or result in the temporary loss of foraging habitat.
- **San Joaquin Kit Fox and American Badger**—Ground disturbance could lead to the temporary loss of foraging and denning habitat, which in turn could result in increased vulnerability of San Joaquin kit fox to predation and a reduction in prey availability. Kit fox and badger individuals that are unhabituated to noise, lighting, vibration, dust, and motion associated with construction may avoid the area, resulting in the disruption of normal foraging, denning, or sheltering behavior. Indirect impacts could also include reduced burrow suitability due to soil compaction and removal of burrowing prey species. The inadvertent introduction of invasive weeds could reduce habitat suitability for these species.
- **Ringtail**—Indirect impacts on ringtail, a fully protected species under California Fish and Game Code, from construction include disruption of normal behavioral patterns due to construction within or adjacent to riparian habitat, temporary loss of foraging habitat and cover, and habitat fragmentation that disrupts seasonal movement and dispersal patterns.
- **Special-Status Rodent Species**—Indirect impacts on special-status rodent species (giant kangaroo rat and Nelson’s antelope ground squirrel) could occur because these species have the potential to actively use the project footprints and adjacent areas of the Site 6—El Nido, Los Banos—Oro Loma—Canal 70 kV Power Line, common to all Central Valley Wye alternatives. Additionally, direct impacts on Fresno kangaroo rat could also occur because it has the potential to use the project footprints and adjacent areas of Central Valley Wye alternatives as well as Site 6—El Nido, Los Banos—Oro Loma—Canal 70 kV Power Line, common to all Central Valley Wye alternatives. Ground-disturbing activities, such as excavation, vegetation removal, placement of temporary structures and staging areas, and equipment operation would result in noise, dust, or vibration disturbance. These disturbances could disrupt breeding activity or result in the temporary loss of foraging habitat. Giant kangaroo rat and Fresno kangaroo rat are nocturnal species and lighting of construction sites that spills into adjacent habitat could also disrupt normal foraging activities.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be significant because impacts from habitat modification from ground-disturbing activities, such as excavation, vegetation removal, construction of the railbed, placement of temporary structures and staging areas, and equipment operation, could cause a substantial adverse effect on special-status mammal species. The design characteristics of the Central Valley Wye alternatives include

effective measures to prepare a wildlife corridor assessment identifying how facilitation of animal movement occurs in the design, which would minimize but not avoid impacts on special-status bats, San Joaquin kit fox, American badger, and ringtail. The Authority would implement mitigation measures to reduce impacts on special-status mammal species. BIO-MM#1a would require the establishment of fencing to protect environmentally sensitive areas. BIO-MM#1b would require preparation of monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and other requirements set forth in regulatory agency authorizations. BIO-MM#2a would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species. BIO-MM#31 and BIO-MM#32 would require a qualified, agency-approved biologist to conduct a visual and acoustic pre-construction survey for roosting bats at potential roost sites no more than 30 days before the start of ground-disturbing activities and to identify how BMPs would be implemented during ground-disturbing activities if active or hibernation roosts were found during the pre-construction surveys. As necessary, roosts would be removed with approval from CDFW between August 1 and October 31. BIO-MM#33 would require the project biologist to identify how BMPs related to ground-disturbing activities would be implemented if nonbreeding or nonhibernating individuals or groups of bats were found during the pre-construction surveys. BIO-MM#34 and BIO-MM#35 would require the project biologist to conduct pre-construction surveys for American badger and ringtail dens within suitable habitats no more than 30 days before the start of ground disturbance, and establish a 50-foot buffer around occupied American badger and ringtail dens found during the pre-construction surveys. BIO-MM#36 and BIO-MM#37 would require the project biologist to conduct pre-construction surveys between May 1 and September 30 and prepare a memorandum identifying how BMPs related to construction activity would be implemented to minimize impacts on San Joaquin kit fox. BIO-MM#40 and BIO-MM#41 would require a qualified agency-approved biologist to conduct pre-construction monitoring for special-status rodents within the species' ranges 14 days prior to ground disturbance, establish buffers around occupied burrows, and provide for relocation if buffers are not feasible. BIO-MM#38 would require the contractor's project biologist to submit a construction avoidance and minimization plan for wildlife movement linkages (as described in any permits or approvals) to the Authority via the mitigation manager for concurrence. BIO-MM#39a: Establish Wildlife Crossings, would require the Authority to assess and incorporate appropriate wildlife crossings to maintain landscape permeability. BIO-MM#39b: Install Aprons or Barriers with Security Fencing, would prevent special-status species from moving through or underneath fencing and gaining access to areas within the right-of-way. BIO-MM#3b and BIO-MM#4 would allow for on-site and off-site restoration and preservation of special-status mammal species habitat, respectively. BIO-MM#50 describes how the permanent loss of San Joaquin kit fox habitat would be mitigated. With implementation of BIO-MM#1a, BIO-MM#1b, BIO-MM#2a, BIO-MM#3b, BIO-MM#4, BIO-MM#31 through BIO-MM#41, and BIO-MM#50, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives because impacts from habitat modification from ground-disturbing activities on special-status mammal species would be reduced and there would not be a substantial adverse effect from habitat modification on special-status mammals.

Special-Status Plant Community Impacts

Construction activities could result in direct and indirect impacts on special-status plant communities. Areas directly affected by each of the Central Valley Wye alternatives along with the types of plant community affected are presented in Table 3.7-14 and discussed in each impact discussion following the table.

Table 3.7-14 Direct Impacts on Special-Status Plant Communities by Central Valley Wye Alternative (acres)

Special-Status Plant Community	SR 152 (North) to Road 13 Wye			SR 152 (North) to Road 19 Wye			Avenue 21 to Road 13 Wye			SR 152 (North) to Road 11 Wye			Total Range of Impact ¹ (Acres)
	Direct Impacts (Acres)			Direct Impacts (Acres)			Direct Impacts (Acres)			Direct Impacts (Acres)			
	Permanent	Temporary	Total	Permanent	Temporary	Total	Permanent	Temporary	Total	Permanent	Temporary	Total	
Vernal Pool	0.18	—	0.18	0.19	—	0.19	0.10	—	0.10	0.19	—	0.19	0.10-0.19
Indirect Bisected Vernal Pool ²	0.04	—	0.04	0.04	—	0.04	0.64	—	0.64	0.04	—	0.04	0.04-0.64
Mixed Riparian	0.19	0.17	0.36	0.80	0.26	1.06	0.17	0.24	0.42	0.38	0.30	0.68	0.36-1.06
Other Riparian	1.22	0.22	1.44	0.42	0.12	0.54	1.85	0.57	2.43	0.77	0.09	0.86	0.54-2.43
Seasonal Wetlands	0.69	0.09	0.78	1.46	0.52	1.99	0.94	0.54	1.47	0.39	0.11	0.49	0.49-1.99
Palustrine Forested Wetland	0.08	0.04	0.12	0.00	0.00	0.00	0.08	0.04	0.12	0.00	0.00	0.00	0.00-0.12
Valley Sink Scrub	0.00	4.26	4.26	0.00	4.26	4.26	0.00	4.26	4.26	0.00	4.26	4.26	4.26-4.26
Total	2.40	4.78	7.18	2.91	5.16	8.07	3.78	5.65	9.43	1.77	4.76	6.52	6.52-9.43

Source: Authority, 2019. Calculations generated using ESRI ArcGIS versions 10.1, 10.2, and 10.3 from data generated by field surveys and aerial photo interpretation during 2010–2017. On April 27, 2018, USACE concurred with the findings of the delineation of waters of the United States. Minor differences in the totals are the result of rounding.

¹ Total range of impact identifies the least to most amount of habitat affected by the Central Valley Wye alternatives.

² Indirect Bisected vernal pools occur both inside and outside of the project footprints. The portion outside the footprint is referred to as “indirect bisected,” but is considered a permanent direct impact for purposes of calculating mitigation requirements.

All decimal values are presented to the hundredths place. Totals from 0.005 to 0.009 are therefore rounded to 0.01. Totals less than or equal to 0.004 acre are therefore rounded to zero (0).

SR = State Route

Impact BIO#15 Direct Impacts on Special-Status Plant Communities

All of the Central Valley Wye alternatives require disruption of plants and permanent removal of vegetation within the HSR right-of-way; however, adjacent vegetation requiring removal to accommodate construction activities (i.e., access and laydown area) would be restored after construction activities are completed. Construction of any of the Central Valley Wye alternatives could nonetheless permanently remove some extent of special-status plant communities, resulting in direct construction impacts where such communities are present and impacts cannot be avoided. The features associated with any of the Central Valley Wye alternatives could collectively contribute to the alteration of special-status plant communities. Within the context of special-status plant communities, vernal pools and riparian community types typically provide the greatest functions and values for special-status species, are typically the most uncommon types on the landscape, and thus are considered of greatest importance for protection and management.

As presented in Table 3.7-14, the greatest extent of direct impact (0.19 acre) on vernal pools would result from construction of the SR 152 (North) to Road 19 Wye Alternative or the SR 152 (North) to Road 11 Wye Alternative. Construction of the SR 152 (North) to Road 13 Wye Alternative would result in a nearly equal extent of direct impact (0.18 acre) on vernal pools. Construction of the Avenue 21 to Road 13 Wye Alternative would result in the least direct impacts (0.10 acre) on the vernal pool plant community, relative to the other three Central Valley Wye alternatives.

Indirect impacts on the vernal pool plant community caused by individual pools being bisected by construction are considered direct impacts for this analysis (Table 3.7-14). Construction of the Avenue 21 to Road 13 Wye Alternative would result in the greatest extent of impact (0.64 acre) on these bisected vernal pools, relative to the other three Central Valley Wye alternatives, which would result in identical direct impacts of 0.04 acre each.

Relative to the other three Central Valley Wye alternatives, construction of the SR 152 (North) to Road 19 Wye Alternative would result in the greatest extent of direct impact (1.06 acres) on the mixed riparian plant community, and construction of the Avenue 21 to Road 13 Wye Alternative would result in the greatest extent of direct impact (2.43 acres) on the other riparian plant community. The least direct impact on the mixed riparian plant community would result from construction of the SR 152 (North) to Road 13 Wye Alternative (0.36 acre) and the least direct impact (0.54 acre) on the other riparian plant community would result from construction of the SR 152 (North) to Road 19 Wye Alternative. Construction of the SR 152 (North) to Road 11 Wye Alternative and the Avenue 21 to Road 13 Wye Alternative would result in 0.68 acre and 0.42 acre, respectively, of direct impacts on the mixed riparian plant community. Construction of the SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative would result in 1.44 acres and 0.86 acre, respectively, of direct impacts on the other riparian plant community.

As presented in Table 3.7-14, construction of the SR 152 (North) to Road 19 Wye Alternative would result in the greatest extent of direct impact (1.99 acres) on seasonal wetlands, with the least direct impact (0.49 acre) resulting from construction of the SR 152 (North) to Road 11 Wye Alternative. Construction of the Avenue 21 to Road 13 Wye Alternative and the SR 152 (North) to Road 13 Wye Alternative would result in 1.47 acres and 0.78 acres, respectively, of direct impacts on the seasonal wetland plant community.

As presented in Table 3.7-14, the greatest extent of direct impact (0.12 acre) on the palustrine forested wetland community would result equally from construction of the SR 152 (North) to Road 13 Wye Alternative or the Avenue 21 to Road 13 Wye Alternative. Construction of the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative would completely avoid direct impacts on this special-status plant community.

Construction of any of the four Central Valley Wye alternatives would equally result in 4.26 acres of direct impact on the valley sink scrub plant community.

Special-status plant communities would be affected by temporary and permanent removal or disruption of plants and vegetation within the right-of-way.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status plant communities:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Require that the BRMP identify special-status plant communities as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- The Authority would prepare and implement a weed control plan (BIO-IAMF#7) to minimize and avoid the spread of weeds during ground-disturbing activities
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- The design of the Central Valley Wye alternatives would also minimize the spread of invasive plants within or adjacent to sensitive habitat areas as defined by the project biologist by confirming that vehicles are cleaned of mud and plant materials prior to working in new areas, thus making certain that invasive plant seeds are not carried between construction work areas (BIO-IAMF#12)
- Prepare and establish a construction site BMP field manual containing standard construction site housekeeping practices (BIO-IAMF#13)

These features of the Central Valley Wye alternatives include effective measures to identify special-status plant communities and delineate environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field. These measures would reduce but not avoid the removal of vegetation.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be significant because impacts from habitat modification could result from the temporary and permanent removal of vegetation for the placement of permanent infrastructure and within temporary impact areas, which would cause a substantial adverse effect on special-status plant communities. The design characteristics of all of the Central Valley Wye alternatives would include measures to identify special-status plants and delineate environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field. These measures would reduce but not fully avoid the removal of vegetation. Under any of the Central Valley Wye alternatives, the Authority would implement BIO-MM#1a, which would require the establishment of protection around environmentally sensitive areas. The Authority would also implement BIO-MM#1c and BIO-MM#2b, which would involve conducting protocol-level surveys to identify special-status plants in areas where permission to enter was not granted prior to construction and allow for the removal of special-status plant species prior to disturbance. BIO-MM#2a would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status plant communities. BIO-MM#3b and BIO-MM#4 would allow for on-site and off-site restoration and preservation of special-status plant species. With implementation of BIO-MM#1a through BIO-MM#2b, BIO-MM#3b, and BIO-MM#4, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives because impacts from habitat modification on special-status plant species would be reduced and there would not be a substantial adverse effect from habitat modification on special-status plant communities.

Impact BIO#16 Indirect Impacts on Special-Status Plant Communities

Construction of any of the Central Valley Wye alternatives would disturb land similarly through increased cover by invasive plant species, construction dust, and an increased risk of fire (e.g.,

construction equipment use and smoking by construction workers) in adjacent open spaces. Indirect impacts would be approximately the same for all Central Valley Wye alternatives because each alternative would result in large-scale changes to existing land uses within their respective project footprints, which could fragment existing habitats, as well as large-scale movement of earthen materials and equipment that could introduce or spread invasive plant species.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status plant communities:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Require that the BRMP identify special-status plant communities as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- The Authority would prepare and implement a weed control plan (BIO-IAMF#7) to minimize and avoid the spread of weeds during construction activities. The weed control plan would also include delineation of environmentally restricted areas and would provide for identification of, contractor awareness of, and avoidance of sensitive biological resources adjacent to but outside the project footprint of the alternative selected for construction.
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- During construction, the Authority would require that contractors return excavated soils to their original locations to be used as backfill (BIO-IAMF#11) to reduce indirect impacts on sensitive natural communities
- Implementation of BIO-IAMF#12 would also minimize the spread of invasive plants outside the project footprint of the alternative selected for construction by confirming that vehicles are cleaned of mud and plant materials prior to working in new areas, thus making certain that invasive plant seeds are not carried between construction work areas
- Prepare and establish a construction site BMP field manual containing standard construction site housekeeping practices (BIO-IAMF#13)
- Construction speed limits would minimize special-status plant community exposure to dust (BIO-IAMF#15).

These measures would help to minimize impacts on special-status plants and other native vegetation occurring outside but adjacent to the project footprint of the alternative selected for construction.

In spite of features intended to minimize indirect impacts, indirect impacts may still occur because it is difficult to remove established invasive nonnative plants from native plant communities without intensive and regular management (e.g., manual hand-pulling, herbicide application) and monitoring. The features of any of the Central Valley Wye alternatives would collectively degrade lands such that alteration of special-status plant communities would occur.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be significant because impacts from habitat modification could result due to the degradation of sensitive vegetation communities from increased cover of invasive plant species, construction dust, and an increased risk of fire, which would cause a substantial adverse effect on special-status plant communities. The design characteristics of the Central Valley Wye alternatives include effective measures to prepare and implement a weed control plan to minimize and avoid the spread of

weeds and provide for identification and contractor awareness and avoidance of sensitive biological resources. Also included are measures to make sure mud and plant material are cleaned off vehicles and provisions for speed limits during construction to minimize special-status plant community exposure to dust. These measures would minimize but not avoid impacts on special-status plant species. Under any of the Central Valley Wye alternatives, the Authority would implement mitigation measures to reduce the impacts on special-status plant communities. BIO-MM#1a would require the establishment of protection around environmentally sensitive areas. BIO-MM#1c and BIO-MM#2b would require protocol-level surveys to identify special-status plant communities in areas where permission to enter was not granted prior to construction and allow for the removal of special-status plant species prior to disturbance. BIO-MM#2a would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status plant communities. BIO-MM#3b and BIO-MM#4 would allow for on-site and off-site habitat restoration and preservation of special-status plant species, respectively. With implementation of BIO-MM#1a through BIO-MM#2b, BIO-MM#3b, and BIO-MM#4, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives because impacts from habitat modification on special-status plant species would be reduced and there would not be a substantial adverse effect from habitat modification or degradation on special-status plant communities.

Jurisdictional Aquatic Resources Impacts

Construction activities could result in direct and indirect impacts on jurisdictional aquatic resources.⁹ As presented in Tables 3.7-15 and 3.7-16, the Central Valley Wye alternatives would result in direct impacts on wetlands and other waters considered jurisdictional under Section 404 of the CWA as well as riparian areas not considered jurisdictional under Section 404 of the CWA, but considered jurisdictional under California Fish and Game Code Section 1600 et seq. Additionally, some aquatic resources are considered jurisdictional under both Section 404 of the CWA and California Fish and Game Code Section 1600 et seq. (e.g., natural watercourses).

Impact BIO#17 Direct Impacts on Jurisdictional Aquatic Resources

All of the Central Valley Wye alternatives would require construction where jurisdictional aquatic resources (i.e., aquatic resources regulated under Section 404 of the CWA, regulated as waters of the State of California, or otherwise regulated under California Fish and Game Code Section 1600 et seq.) are present. Design features of the Central Valley Wye alternatives include effective measures to avoid or minimize the removal or modification of local hydrology or the redirection of flow within aquatic resources. Additionally, features of the Central Valley Wye alternatives would preclude altering the long-term presence of the aquatic feature, or in the case of built aquatic features, removal or disruption of limited biological functions provided by such aquatic features (e.g., hydrology, vegetation, wildlife habitat, water quality).

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)

⁹ Collectively, aquatic resources consists of resources under the jurisdiction of the USACE pursuant to Section 404 of the Clean Water Act, the State Water Resources Control Board under the Porter-Cologne Water Quality Control Act, and CDFW under Section 1600 et seq. of the California Fish and Game Code. Some aquatic resources may also be under the jurisdiction of the USACE pursuant to Section 10 of the Rivers and Harbors Act.

- Prepare and implement a BRMP that would include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility for implementation (BIO-IAMF#5)
- Prepare and implement a weed control plan to minimize and avoid the spread of noxious and invasive weeds during ground-disturbing activities (BIO-IAMF#7)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- Construction vehicles would require cleaning to be free of mud and plant materials to avoid introduction of invasive species and cleaning areas would be located to avoid impacts on surface waters (BIO-IAMF#12)
- Prepare and establish a construction site BMP field manual containing standard construction site housekeeping practices (BIO-IAMF#13)
- Prepare and implement a dewatering plan, to be approved by resource agencies prior to work in an area, to minimize turbidity and siltation (BIO-IAMF#14)
- Prepare and implement a stormwater pollution prevention plan to effectively manage project runoff during construction (HYD-IAMF#3) and operations (HYD-IAMF#1), including for facilities designated as an industrial facility (HYD-IAMF#4)
- Prepare and implement a flood protection plan to minimize increases in flood elevations (HYD-IAMF#2)

These measures would minimize but not avoid all impacts on jurisdictional aquatic resources.

Section 404 Wetlands and Other Waters

The greatest extent of direct impact (45.68 acres) on wetlands and other waters considered jurisdictional under Section 404 of the CWA would result from construction of the Avenue 21 to Road 13 Wye Alternative. The least direct impact (29.98 acres) on wetlands and other waters would result from construction of the SR 152 (North) to Road 11 Wye Alternative. Construction of the SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 19 Wye Alternative would result in 39.21 acres and 37.57 acres of direct impact on wetlands and other waters, respectively (Table 3.7-15).

California Fish and Game Code Section 1600 et seq. Streams, Rivers, and Lakes (including riparian areas)

The greatest extent of direct impact (2.97 acres) on riparian areas considered jurisdictional under California Fish and Game Code Section 1600 et seq. would result from construction of the Avenue 21 to Road 13 Wye Alternative (Table 3.7-16), whereas the least direct impact (1.53 acres) would result from the SR 152 (North) to Road 11 Wye Alternative. Construction of the SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 19 Wye Alternative would result in 1.92 acres and 1.60 acres of direct impact on riparian areas, respectively. The greatest extent of direct impact (41.37 acres) of all areas considered subject to notice under Section 1600 et seq. (i.e., riparian habitats and stream habitats) would result from construction of the Avenue 21 to Road 13 Wye Alternative, whereas the least direct impact (23.67 acres) on areas considered subject to notice under Section 1600 et seq. would result from the SR 152 (North) to Road 11 Wye Alternative (Table 3.7-16). Construction of the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to Road 13 Wye Alternative would result in 31.91 acres and 31.74 acres of direct impact on areas considered subject to notice under Section 1600 et seq., respectively.

Table 3.7-15 Direct Impacts on Wetlands and Other Waters by Central Valley Wye Alternative (acres)

Jurisdictional Water Type	SR 152 (North) to Road 13 Wye			SR 152 (North) to Road 19 Wye			Avenue 21 to Road 13 Wye			SR 152 (North) to Road 11 Wye			Total Range of Impact (Acres) ¹
	Direct Impacts (Acres)			Direct Impacts (Acres)			Direct Impacts (Acres)			Direct Impacts (Acres)			
	Permanent	Temporary	Total	Permanent	Temporary	Total	Permanent	Temporary	Total	Permanent	Temporary	Total	
Wetlands													
Vernal Pool	0.18	—	0.18	0.19	—	0.19	0.10	—	0.10	0.19	—	0.19	0.10-0.19
Indirect Bisected Vernal Pool ²	0.04	—	0.04	0.04	—	0.04	0.64	—	0.64	0.04	—	0.04	0.04–0.64
Seasonal Wetland	0.69	0.09	0.78	1.46	0.52	1.99	0.94	0.54	1.47	0.39	0.11	0.49	0.49-1.99
Palustrine Forested Wetland ³	0.08	0.04	0.12	0.00	0.00	0.00	0.08	0.04	0.12	0.00	0.00	0.00	0.00-0.12
<i>Subtotal</i> ³	<i>1.00</i>	<i>0.13</i>	<i>1.13</i>	<i>1.69</i>	<i>0.52</i>	<i>2.21</i>	<i>1.76</i>	<i>0.58</i>	<i>2.34</i>	<i>0.62</i>	<i>0.11</i>	<i>0.72</i>	<i>0.72-2.34</i>
Other Waters													
Constructed Basin	7.73	0.53	8.26	4.76	0.28	5.05	4.73	0.21	4.94	6.71	0.42	7.12	4.94-8.26
Constructed Watercourse ⁵	14.19	5.57	19.76	13.11	5.11	18.22	24.45	3.98	28.43	10.67	3.73	14.40	10.67-28.43
Natural Watercourse ⁴	6.34	3.72	10.06	7.83	4.26	12.09	5.02	4.95	9.97	4.73	3.01	7.74	7.74-12.09
<i>Subtotal</i>	<i>28.26</i>	<i>9.82</i>	<i>38.08</i>	<i>25.71</i>	<i>9.65</i>	<i>35.36</i>	<i>34.19</i>	<i>9.15</i>	<i>43.34</i>	<i>22.11</i>	<i>7.15</i>	<i>29.26</i>	<i>29.26-43.34</i>
Grand Total³	29.26	9.95	39.21	27.40	10.17	37.57	35.96	9.73	45.68	22.72	7.26	29.98	29.98-45.68

Source: Authority, 2018. Calculations generated using ESRI ArcGIS versions 10.1, 10.2, and 10.3 from data generated by field surveys and aerial photo interpretation during 2010–2017. On April 27, 2018, USACE concurred with the findings of the delineation of waters of the United States.

¹ Total range of impact identifies the least to most amount of habitat affected by the Central Valley Wye alternatives. *Minor differences in the totals are the result of rounding.*

² Indirect bisected vernal pools occur both inside and outside of the project footprints. The portion outside the footprint is referred to as "indirect bisected," but is considered a permanent direct impact for purposes of calculating mitigation requirements.

³ Palustrine forested wetland is considered jurisdictional under Section 404 of the CWA. Additional riparian habitat types considered jurisdictional under Section 1600 et seq. of the California Fish and Game Code, are provided in Table 3.7-16.

⁴ Natural Watercourse would be regulated under both Section 404 and 401 of the Clean Water Act and under Section 1600 of the California Fish and Game Code and therefore the values presented in Tables 3.7-15 and 3.7-16 are identical for this type.

⁵ Acres shown include 0.23 acre associated with the Site 7—Wilson, 230 kV Tie-Line which would be designed to avoid these direct impacts.

All decimal values are presented to the hundredths place. Totals from 0.005 to 0.009 are therefore rounded to 0.01. Totals less than or equal to 0.004 acre are therefore rounded to zero (0).

SR = State Route

Table 3.7-16 Direct Impacts on Streams, Rivers, and Lakes (Including Riparian Areas) by Central Valley Wye Alternative (acres)

Habitat Type	SR 152 (North) to Road 13 Wye			SR 152 (North) to Road 19 Wye			Avenue 21 to Road 13 Wye			SR 152 (North) to Road 11 Wye			Total Range of Impact (Acres) ¹
	Direct Impacts (Acres)			Direct Impacts (Acres)			Direct Impacts (Acres)			Direct Impacts (Acres)			
	Permanent	Temporary	Total	Permanent	Temporary	Total	Permanent	Temporary	Total	Permanent	Temporary	Total	
Riparian Types													
Mixed Riparian ²	0.19	0.17	0.36	0.80	0.26	1.06	0.17	0.24	0.42	0.38	0.30	0.68	0.36-1.06
Other Riparian ²	1.22	0.22	1.44	0.42	0.12	0.54	1.85	0.57	2.43	0.77	0.09	0.86	0.54-2.43
Palustrine Forested Wetland ²	0.08	0.04	0.12	0.00	0.00	0.00	0.08	0.04	0.12	0.00	0.00	0.00	0.00-0.12
<i>Subtotal</i>	<i>1.49</i>	<i>0.43</i>	<i>1.92</i>	<i>1.21</i>	<i>0.39</i>	<i>1.60</i>	<i>2.11</i>	<i>0.86</i>	<i>2.97</i>	<i>1.15</i>	<i>0.38</i>	<i>1.53</i>	<i>1.15-1.92</i>
Stream Types													
Natural Watercourse ³	6.34	3.72	10.06	7.83	4.26	12.09	5.02	4.95	9.97	4.73	3.01	7.74	7.74-12.09
Constructed Watercourse	14.19	5.57	19.76	13.11	5.11	18.22	24.45	3.98	28.43	10.67	3.73	14.40	10.67-28.43
<i>Subtotal</i>	<i>20.53</i>	<i>9.29</i>	<i>29.82</i>	<i>20.94</i>	<i>9.37</i>	<i>30.31</i>	<i>29.47</i>	<i>8.93</i>	<i>38.40</i>	<i>15.40</i>	<i>6.74</i>	<i>22.14</i>	<i>22.14-38.40</i>
Grand Total	22.02	9.72	31.74	22.15	9.76	31.91	31.58	9.79	41.37	16.55	7.12	23.67	23.67-41.37

Source: Authority, 2019. Calculations generated using ESRI ArcGIS versions 10.1, 10.2, and 10.3 from data generated by field surveys and aerial photo interpretation during 2010–2017. On April 27, 2018, USACE concurred with the findings of the delineation of waters of the United States.

¹ Total range of impact identifies the least to most amount of habitat affected by the Central Valley Wye alternatives. *Minor differences in the totals are the result of rounding.*

² Mixed riparian, other riparian, and palustrine forested wetland types presented are considered subject to notice under Section 1600 et seq. of the California Fish and Game Code. Palustrine forested wetland would also be considered jurisdictional under Section 404 of the Clean Water Act, as presented in Table 3.7-15.

³ Natural Watercourse would be regulated under both Section 404 of the Clean Water Act and under Section 1600 et. seq. of the California Fish and Game Code and therefore the values presented in Tables 3.7-15 and 3.7-16 are identical for this type.

All decimal values are presented to the hundredths place. Totals from 0.005 to 0.009 are therefore rounded to 0.01. Totals less than or equal to 0.004 acre are therefore rounded to zero (0).

SR = State Route

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA on wetlands and other waters considered jurisdictional under Section 404 of the CWA would be significant because impacts on federally protected wetlands and other waters would occur through direct removal, filling, and hydrological interruption, causing a substantial adverse effect. Additionally, under any of the Central Valley Wye alternatives, the impact under CEQA on riparian and stream habitats would also be significant because impacts on riparian habitats would occur through direct or temporary removal, causing a substantial adverse effect.

The design characteristics of the Central Valley Wye alternatives would include effective measures to avoid or minimize the removal or modification of local hydrology, the redirection of flow within aquatic resources, altering the long-term presence of the feature, or in the case of built features, removal, or disruption of limited biological functions provided by such features. These measures would reduce but not avoid impacts on all jurisdictional aquatic resources. Under all of the Central Valley Wye alternatives, the Authority would implement mitigation measures to reduce the impacts on jurisdictional aquatic resources. BIO-MM#1a would require the establishment of fencing to protect environmentally sensitive areas. BIO-MM#1b would require preparation of monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and other requirements set forth in regulatory agency authorizations. BIO-MM#2a would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species, wetlands and/or other aquatic resources. BIO-MM#3a and BIO-MM#4 would allow for no net loss of functions and values of aquatic resources through the creation, restoration, enhancement, and preservation of wetlands or other waters. Additionally, under the “no net loss of wetlands” policy (which provides that the total area of wetlands must not be reduced through the implementation of compensatory wetland mitigation) and through conditions required under a Streambed Alteration Agreement (which would minimize and mitigate impacts on riparian and stream habitats), there would not be substantial adverse effects on jurisdictional aquatic resources. With implementation of the no net loss policy and BIO-MM#1a through BIO-MM#2a, BIO-MM#3a, and BIO-MM#4, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives as there would not be a substantial adverse effect on jurisdictional aquatic resources through direct removal, filling, or hydrological interruption, on these resources.

Impact BIO#18 Indirect Impacts on Jurisdictional Aquatic Resources

All of the Central Valley Wye alternatives require construction near wetlands and other jurisdictional aquatic resources. Potential indirect impacts on jurisdictional aquatic resources include temporary, construction-related water-quality-related impacts, such as erosion, siltation, and runoff into natural and constructed water features and fill downstream of the project footprints.

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Prepare and implement a BRMP that would include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility for implementation (BIO-IAMF#5)
- Prepare and implement a weed control plan to minimize and avoid the spread of noxious and invasive weeds during ground-disturbing activities (BIO-IAMF#7)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)

- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- Require construction vehicles to be cleaned to be free of mud and plant materials to avoid introduction of invasive species and cleaning areas would be located to avoid impacts on surface waters (BIO-IAMF#12)
- Prepare and establish a construction site BMP field manual containing standard construction site housekeeping practices (BIO-IAMF#13)
- Prepare and implement a dewatering plan, to be approved by resource agencies prior to work in an area, to minimize turbidity and siltation (BIO-IAMF#14)
- Prepare and implement a stormwater pollution prevention plan to effectively manage project runoff during construction (HYD-IAMF#3) and operations (HYD-IAMF#1), including for facilities designated as an industrial facility (HYD-IAMF#4)
- Prepare and implement a flood protection plan to minimize increases in flood elevations (HYD-IAMF#2)

Therefore, the design of the Central Valley Wye alternatives would include features to avoid or minimize potential indirect impacts on jurisdictional aquatic resources, including potential degradation of wetlands or other waters or riparian areas outside the project footprints due to excess sediment or contaminants generated during construction. The indirect impacts would be approximately the same for all Central Valley Wye alternatives because each alternative would result in large-scale changes to existing land uses within the project footprints, which could alter the topography and hydrology of existing habitats, as well as large-scale movement of earthen materials and equipment that could introduce sediment or spread invasive plant species.

Impacts on jurisdictional aquatic resources due to the generation of excess sediment or contaminants during construction would occur on a limited basis because features of the Central Valley Wye alternatives include measures to prepare a construction site BMP field manual and prepare a dewatering plan, which would identify BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures, and minimize turbidity and siltation.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because indirect impacts on jurisdictional aquatic resources would be avoided or minimized through BMPs and measures that limit the movement of soil, sediment, and other materials out of the immediate work area and into adjacent jurisdictional aquatic resources. The design characteristics of all of the Central Valley Wye alternatives include effective measures to reduce the likelihood of excess sediment or contaminants entering jurisdictional aquatic resources during construction and potentially degrading downstream features. Therefore, CEQA does not require any mitigation.

Critical Habitat Impacts

Construction activities could result in direct and indirect impacts on federally designated critical habitat for San Joaquin Orcutt grass, vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, Central Valley steelhead, Colusa grass, fleshy owl's clover and Greene's tuctoria, that occurs in the core habitat study area of two of the four Central Valley Wye alternatives (Table 3.7-10). Although critical habitat is a federal designation that identifies key areas for endangered species recovery, the impact of taking (i.e., disturbing, removing, or adversely modifying) critical habitat affects the planning, policies, and regulations under the provisions of CEQA. Direct and indirect effects could occur through habitat removal or modification.

Impact BIO#19 Direct Impacts on Critical Habitat

Two alternatives, the SR 152 (North) to Road 13 Wye Alternative and the Avenue 21 to Road 13 Wye Alternative, would have no impacts on critical habitat. The SR 152 (North) to Road 11 Wye Alternative would affect critical habitat for only two species, vernal pool fairy shrimp, and vernal pool tadpole shrimp.

The SR 152 (North) to Road 19 Wye Alternative would affect the same two species as well as six other species; San Joaquin Orcutt grass, Conservancy fairy shrimp, Central Valley steelhead, Colusa grass, fleshy owl's-clover, and Greene's tuctoria (Table 3.7-10). With the exception of Central Valley steelhead, each of these species requires vernal pool habitat. The Site 7—Le Grand Junction/Sand Mush Road, Warnerville—Wilson 230 kV Transmission Line, associated with the SR 152 (North) to Road 19 Wye Alternative could have indirect impacts on critical habitat for Central Valley steelhead within the Merced River and Tuolumne River. While the construction work areas associated with existing self-supporting lattice steel towers are not within the channel of the Merced and Tuolumne Rivers, they are located within 250 feet of both the rivers; consequently, direct impacts on Central Valley Steelhead are not anticipated. The project could result in direct impacts on critical habitat through direct removal, temporary disturbance, or through habitat modification of the vernal pools within these areas.

The amounts of vernal pool critical habitat within the mapped critical habitat areas are also provided in Table 3.7-10. Based on these values, the greatest extent of direct impact (367.46 acres of mapped critical habitat and 4.72 acres of aquatic habitat within that area) would result from construction of the SR 152 (North) to Road 19 Wye Alternative. The SR 152 (North) to Road 11 Wye Alternative would have less direct impact (2.94 acres of mapped critical habitat and 0.21 acre of aquatic habitat within that area).

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Identify vernal pools and other critical habitat to be avoided during construction (BIO-IAMF#5), which would help to minimize and avoid impacts on federally designated critical habitat for vernal pool species within the project footprint of the alternative selected for construction
- Prepare and implement a weed control plan to minimize and avoid the spread of noxious and invasive weeds during ground-disturbing activities (BIO-IAMF#7).

However, these measures would not avoid all impacts on critical habitat.

CEQA Conclusion

For the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative, the impact under CEQA would be significant because there would be a substantial adverse effect on critical habitat. The design characteristics of the Central Valley Wye alternatives would include effective measures to identify vernal pools to be avoided during construction. These measures would minimize but not avoid all impacts on critical habitat. Under the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative the Authority would implement mitigation measures to further reduce impacts on critical habitat. BIO-MM#3b and BIO-MM#4 would allow for on-site and off-site habitat restoration and preservation of critical habitat by creating, restoring, enhancing, and preserving habitat that provide the same functions and values as those permanently affected by construction. With implementation of BIO-MM#3b and BIO-MM#4, the impact under CEQA would be less than significant under the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative because impacts on critical habitat would be reduced, and there would not be a substantial adverse effect on critical habitat.

Impact BIO#20 Indirect Impacts on Critical Habitat

Construction of the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative would have indirect impacts that would involve stockpiling soil, changing the contour of landscape or disturb hardpan soils, the potential for chemical spills or the introduction of invasive weeds, erecting structures, and introducing construction-related dust. The indirect impacts would be approximately the same for the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to

Road 11 Wye Alternative because each alternative would result in large-scale changes to existing land uses within the project footprints, which could fragment (i.e., bisect) existing habitats, as well as large-scale movement of earthen materials and equipment that could introduce or spread invasive plant species.

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Identify vernal pools and other critical habitat to be avoided during construction (BIO-IAMF#5), which would help to minimize and avoid impacts on federally designated critical habitat for vernal pool species within the project footprint of the alternative selected for construction
- Prepare and implement a weed control plan (BIO-IAMF#7) to minimize and avoid the spread of weeds during construction activities. The weed control plan also includes delineation of environmentally restricted areas and would provide for identification of, contractor awareness of, and avoidance of sensitive biological resources adjacent to but outside the project footprint of the alternative selected for construction
- Minimize the spread of invasive plants outside the project footprint of the alternative selected for construction by confirming that vehicles are cleaned of mud and plant materials prior to working in new areas, thus making sure that invasive plant seeds are not carried between construction work areas (BIO-IAMF#12)
- The contractor would prepare and implement a construction stormwater pollution prevention plan (HYD-IAMF#3) to minimize potential short-term increases in sediment transport, including erosion control requirements and channel dewatering for affected stream crossings. This plan would therefore, minimize the impacts of habitat degradation, alteration of vernal pool and seasonal wetland hydrology, reduction of reproductive success and survival of invertebrate species, and water contamination of the Central Valley Wye alternatives.

The Site 7—Le Grand Junction/Sand Mush Road, Warnerville—Wilson 230 kV Transmission Line, associated with the SR 152 (North) to Road 19 Wye Alternative could have indirect impacts on critical habitat for Central Valley steelhead within the Merced River and Tuolumne River. While the construction work areas associated with existing self-supporting lattice steel towers are not within the channel of the Merced and Tuolumne Rivers, they are located within 250 feet of both the rivers; therefore, indirect impacts on critical habitat due to increased erosion, sedimentation, and siltation as a result of ground disturbance during construction could result. However, as part of the design of the Central Valley Wye alternatives, the Authority would develop and implement a construction site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13). Therefore, the design of the SR 152 (North) to Road 19 Wye Alternative would minimize the impacts of sedimentation and siltation on critical habitat for Central Valley steelhead. No indirect impacts on critical habitat for Central Valley steelhead would result from construction of any of the other three alternatives.

CEQA Conclusion

For the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative the impact under CEQA would be less than significant because indirect impacts would not cause a substantial adverse effect on critical habitat. The design characteristics of the Central Valley Wye alternatives include effective measures to avoid construction disturbance of vernal pool branchiopod, vernal pool plant and Central Valley steelhead critical habitat by minimizing sedimentation and the spread of weeds and invasive species during construction activities. Therefore, CEQA does not require any mitigation.

Essential Fish Habitat Impacts

Impact BIO#21 Direct Impacts on Essential Fish Habitat

All of the Central Valley Wye alternatives require construction of bridges and aerial crossings over EFH (i.e., the San Joaquin River). The extent of direct impacts on EFH for each alternative would depend upon the final design to determine the exact distance of each aquatic crossing, the shading potential and the number of piers installed within or over EFH.

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3);
- Prepare and implement a BRMP that would include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility for implementation (BIO-IAMF#5)
- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- require construction vehicles to be cleaned to be free of mud and plant materials to avoid introduction of invasive species and cleaning areas would be located to avoid impacts on surface waters (BIO-IAMF#12)
- Prepare a construction-site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13);
- The contractor would be required to prepare a dewatering plan for review and approval by the resource agencies, which would include appropriate measures to minimize turbidity and siltation (BIO-IAMF#14)
- Prepare and implement a stormwater pollution prevention plan to effectively manage project runoff during construction (HYD-IAMF#3) and operations (HYD-IAMF#1), including for facilities designated as an industrial facility (HYD-IAMF#4)
- Prepare and implement a flood protection plan to minimize increases in flood elevations (HYD-IAMF#2)

Therefore, the design of the Central Valley Wye alternatives would minimize the impacts of placing piers in EFH, permanent loss of aquatic habitat, and permanent areas of channel shading.

EFH in the San Joaquin River in the habitat study area for the Central Valley Wye alternatives has historically been poor quality. Until recently, the reach within the habitat study area was dry, with sandy substrate, and nonnative vegetation lines the banks. Since flows have been restored, this area provides a migratory corridor for salmonids (see Section 3.7.2.1) and an increasing quality for EFH. Final bridge design plans are not currently available but may require placing pilings in the San Joaquin River channel. The HSR crossing would be designed in coordination with the planned increase in river flows under the SJRRP and would not conflict with goals for restoration flows. A program-level environmental document on the SJRRP has been prepared (*Final Program EIS/EIR for the San Joaquin River Restoration Program* [USBR and DWR 2012]). During an initial coordination meeting with the USBR and

DWR on June 6, 2011, it was determined that the Central Valley Wye alternatives design would not conflict with the SJRRP; however, this would be further evaluated as part of the permitting process, including FESA Section 7 consultation with NMFS. The Authority would continue to coordinate with the SJRRP and comply with regulations regarding construction during the spawning and migration season.

These features may not avoid direct impacts on EFH entirely but are expected to minimize the likelihood and severity of such impacts by establishing that all in-water activities would be conducted in accordance with resource agency standards to avoid and minimize such impacts.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be significant to EFH due to reduction in the number or habitat of fish species or adverse impacts on riparian habitat from bridge or aerial crossing construction, which would cause a substantial adverse effect. The design characteristics of the Central Valley Wye alternatives include effective measures to identify appropriate work windows for federally listed species, including federally listed fish in the San Joaquin River, and prepare a dewatering plan for review and approval by the resource agencies. These measures would reduce but not avoid direct impacts on EFH. The Authority would implement mitigation measures to minimize the impacts on EFH. BIO-MM#1a would require the establishment of fencing to protect environmentally sensitive areas. BIO-MM#1b would require preparation of monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and other requirements set forth in regulatory agency authorizations. BIO-MM#2a would require preparation and implementation of a vegetation RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species, wetlands and/or other aquatic resources. BIO-MM#8a would require specific work windows to coincide with periods when fish are least likely to be affected. BIO-MM#8b would require measures to monitor and minimize underwater sound pressures that could injure or kill fish. BIO-MM#8c would require specific design requirements related to dewatering to avoid injuring or killing fish that are within the work area. BIO-MM#8d would provide a plan for fish rescue if water depths were low within the cofferdam. BIO-MM#42: Measure Pile Driving Sound Pressure and Attenuate Underwater Sound, would provide for underwater sound monitoring during pile driving activities and requirements to cease pile driving activities when allowable daily accumulated sound exposure levels are exceeded. BIO-MM#3b and BIO-MM#4 would allow for on-site and off-site restoration and preservation of special-status fish species habitat, respectively. With implementation of BIO-MM#1a through BIO-MM#2a, BIO-MM#3b, BIO-MM#4, BIO-MM#8a, BIO-MM#8b, BIO-MM#8c, BIO-MM#8d, and BIO-MM#42, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives because the reduction in the number or habitat of fish species or adverse impacts on riparian habitat would be reduced, and there would not be a substantial adverse effect on EFH.

Impact BIO#22 Indirect Impacts on Essential Fish Habitat

Construction of any of the Central Valley Wye alternatives would have the potential to alter topography and hydrology upslope or upstream of EFH, which could affect water quality of EFH. The indirect impacts would be approximately the same for all of the Central Valley Wye alternatives because each alternative would result in large-scale changes to existing land uses within the project footprints and could affect the same waterbodies or EFH downslope or downstream.

The Authority would implement the following requirements under any of the Central Valley Wye alternatives:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Prepare and implement a BRMP that would include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility for implementation (BIO-IAMF#5)

- Delineate equipment staging areas and traffic routes outside of areas of sensitive biological resources (BIO-IAMF#10)
- Establish a plan to temporarily store excavated materials in areas at or near the construction site, and return this soil to the original location wherever possible, while disposing of waste unsuitable for treatment or re-use in accordance with applicable state and federal laws (BIO-IAMF#11)
- require construction vehicles to be cleaned to be free of mud and plant materials to avoid introduction of invasive species and cleaning areas would be located to avoid impacts on surface waters (BIO-IAMF#12)
- Prepare a construction-site BMP field manual that identifies BMPs for temporary soil stabilization and temporary sediment control, among other general site cleanliness measures (BIO-IAMF#13)
- The contractor would be required to prepare a dewatering plan for review and approval by the resource agencies, which would include appropriate measures to minimize turbidity and siltation (BIO-IAMF#14)
- Prepare and implement a stormwater pollution prevention plan to effectively manage project runoff during construction (HYD-IAMF#3) and operations (HYD-IAMF#1), including for facilities designated as an industrial facility (HYD-IAMF#4)
- Prepare and implement a flood protection plan to minimize increases in flood elevations (HYD-IAMF#2)

Therefore, the design of the Central Valley Wye alternatives would minimize the potential for indirect impacts on EFH in the Merced River, Tuolumne River, and San Joaquin River such as contamination of EFH outside the project footprints from increased erosion, sedimentation, siltation, and runoff due to alterations in topography and hydrology; hindrance of reestablishment of salmonids along the San Joaquin River due to the restoration of stream flows in the upper reaches from Friant Dam to the Merced River confluence; and changes to hydraulics on increased velocity of water in the wetted channels due to construction of piles which could impede migrating Chinook salmon.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant as there would not be a substantial adverse effect on EFH because impacts on riparian habitat would be avoided. The design characteristics of the Central Valley Wye alternatives include effective measures to reduce the alteration of topography on hydrology such as a construction site BMP field manual; measures to stabilize soil, control sediment, and provide site cleanliness; and a dewatering plan. Therefore, CEQA does not require any mitigation.

Wildlife Movement Corridor Impacts

Construction of any of the Central Valley Wye alternatives would result in direct and indirect impacts on the Eastman Lake–Bear Creek ECA, Ash Slough–Merced National Wildlife Refuge ECA, Sandy Mush Road Area, and other modeled wildlife corridors. Although the four Central Valley Wye alternatives would differ in the extent of corridors affected (Table 3.7-11), the types of direct and indirect impacts are expected to be the same under each alternative. All four alternatives would include both elevated and at-grade crossings that would include both the mainline of the tracks as well as other permanent features of the Central Valley Wye alternatives. Many of the crossings would include single-span or multispan bridges over natural watercourses. All bridge crossings for all design options have limited/scattered riparian habitat. However, some of the crossings would include cross culverts. The HSR system has incorporated permeability features within the Central Valley Wye alternatives design as a component of the project description. These features enable wildlife movement across HSR facilities and include elevated rail structures (a fundamental design feature of the Central Valley Wye alternatives), wildlife-dedicated crossing structures, roadway overpasses, and cross culverts that, coupled with the viability of the hydraulic crossings, maintain permeability. The final size and frequency of the wildlife-dedicated crossings would be determined in coordination with the USFWS and CDFW under their respective permitting processes, which require that impacts on movement by listed species are avoided or minimized to the extent feasible.

Existing linear facilities in the wildlife movement study area for the Central Valley Wye alternatives, including SR 99, the existing BNSF Railway and the Union Pacific Railroad alignments, roadways and canals, and urban and certain agricultural land uses (e.g., vineyards) impede terrestrial wildlife movement. As a result, the ability of wildlife species to move freely across the wildlife movement study area is impaired. Natural dispersal corridors such as waterways have also become increasingly constrained due to adjacent land use conversion and infrastructure. The following impact analysis considers the HSR engineering design features and the existing linear facilities within the wildlife movement study area within the context of evaluating construction impacts on wildlife movement corridors.

Impact BIO#23 Direct Impacts on Wildlife Movement Corridors

All of the Central Valley Wye alternatives require construction activities that would have the potential to create permanent linear barriers to wildlife movement. Temporary and permanent impacts from placement of barriers within natural lands and known linkages during construction activities may affect the ability of special-status species and other free-ranging animals to move freely within the ECAs, Sandy Mush Road Area, and modeled wildlife movement corridors. Although construction activities have the potential to interfere with established wildlife movement corridors, these activities are not long term and the construction phasing is anticipated to allow some dispersal over the construction period.

Additionally, the Central Valley Wye alternatives (and most of the Central Valley of California) are located within the Pacific Flyway, a major north-south migratory pathway for birds. Along the Pacific Flyway, there are typically many key rest stops where birds of many species gather to feed and regain strength before continuing. The project is not expected to substantially affect the movement of migratory species. Major migratory stop over areas in the region are primarily located within the Grassland Ecological Area to the west of the Central Valley Wye. Therefore, the Central Valley Wye alternatives are not expected to substantially affect stopover areas within the flyway.

As presented in Table 3.7-11, the greatest extent of direct impact (17.48 miles) on wildlife corridors would result from construction of the SR 152 (North) to Road 19 Wye Alternative, compared to the other three alternatives. The least extent of direct impact (10.42 miles) on wildlife corridors would result from construction of the SR 152 (North) to Road 11 Wye Alternative. Construction of the SR 152 (North) to Road 13 Wye Alternative and the Avenue 21 to Road 13 Wye Alternative would result in 11.02 miles and 11.84 miles of direct impact on wildlife movement corridors, respectively.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on wildlife movement corridors:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- require the project biologist to inspect excavated steep-sided holes or trenches for trapped animals at the start and end of each workday and covering such areas at the end of each workday (BIO-IAMF#9)
- Speed limits of 15 mph would be established in construction zones to reduce the likelihood of wildlife mortality from vehicle strikes (BIO-IAMF#15)

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be significant to wildlife movement corridors because the Central Valley Wye alternatives would substantially interfere with the movement of wildlife species, including small mammals, in migratory corridors due the creation of potential permanent linear barriers/security fencing. The Authority would implement mitigation measures to minimize the

impacts on wildlife movement corridors. BIO-MM#25c would require the Authority to design and construct the project consistent with APLIC guidelines to protect birds from collisions and electrocutions. BIO-MM#38 would require the project biologist to submit a construction avoidance and minimization plan for wildlife movement linkages to the Authority. Prior to the construction of the project, BIO-MM#39a would require the assessment and placement of wildlife crossings. The crossings would be placed considering applicable landscape and habitat variables to both accommodate animal movement and to create linkages to core habitat areas. Information developed in the assessment would inform the final design to facilitate safe animal passage across the HSR alignment, maintaining landscape-level habitat connectivity, and preventing injury to wildlife species attempting to cross the Central Valley Wye alternatives. BIO-MM#39b would be implemented and would require the installation of permanent security fencing along portions of the HSR infrastructure that are adjacent to wildlife movement corridors and natural habitats, which would prevent injury to wildlife species attempting to cross the HSR infrastructure. With implementation of BIO-MM#25c, BIO-MM#38, BIO-MM#39a, and BIO-MM#39b, the impact under CEQA would be less than significant under any of the Central Valley Wye alternatives because interference with the movement of wildlife species in migratory corridors would be reduced, and there would not be a substantial effect on wildlife movement corridors.

Impact BIO#24 Indirect Impacts on Wildlife Movement Corridors

Construction of any of the Central Valley Wye alternatives would require concentrated heavy vehicles and equipment use within existing agricultural and urban development areas, causing indirect impacts on portions of wildlife corridors outside but adjacent to the project footprints. Indirect impacts may include disruption of wildlife movement through lighting, noise, motion, and startle impacts that could occur from construction activities. Such lighting, noise, motion and startle impacts could occur for the duration of construction activities that are adjacent to wildlife movement corridors, which could occur for 1 to 3 years at any given location. The indirect impacts would be approximately the same for all Central Valley Wye alternatives because each alternative would result in similar vehicle use and other disturbance-generating uses within the project footprints.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on wildlife movement corridors:

- Establish qualified biological monitors and obtain approval from resource agencies for the proposed monitors to oversee implementation of the biological mitigation measures outlined in the BRMP (BIO-IAMF#1)
- Require construction personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Require the project biologist to inspect excavated steep-sided holes or trenches for trapped animals at the start and end of each workday and covering such areas at the end of each workday (BIO-IAMF#9)
- Speed limits of 15 mph would be established in construction zones to reduce the likelihood of wildlife mortality from vehicle strikes (BIO-IAMF#15)

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be significant to wildlife movement corridors because the Central Valley Wye alternatives would substantially interfere with the movement of wildlife species within migratory wildlife corridors due to concentrated heavy vehicle and equipment use within existing agricultural and urban development areas. As discussed in Section 3.16.6, Environmental Consequences, implementation of AVR-MM#2: Minimize Light Disturbance during Construction would shield nighttime construction lighting and direct it downward in such a manner that the light source is not visible offsite, and so that the light does not fall outside the boundaries of the project site. Implementation of NV-MM#1: Construction Noise Mitigation would require the contractor to monitor construction noise to verify compliance with noise limits. With implementation of AVR-MM#2 and NV-MM#1, the impact under CEQA would be less than significant under any of the Central Valley Wye

alternatives because interference with the movement of wildlife species in migratory corridors would be reduced, and there would not be a substantial effect on wildlife movement corridors.

Operations Impacts

Operations of any of the Central Valley Wye alternatives would involve service of the train along the HSR line through the Central Valley Wye. In addition, operations of the Central Valley Wye alternatives would include inspection and maintenance along the track and railroad right-of way, as well as on the structures, fencing, power system, train control, and communications. Operations and maintenance activities are described in Chapter 2. Operations impacts would be approximately the same for all four Central Valley Wye alternatives because the types, frequency, and intensity of maintenance activities would be the same under all alternatives and would be conducted within developed rights-of-way, unless otherwise stated. Impact avoidance and minimization features that are part of the project are described in Appendix 2-B, including those that particularly apply to the operations and maintenance timeframe.

Special-Status Plant Impacts

Impact BIO#25 Direct Impacts on Special-Status Plants

For any of the Central Valley Wye alternatives, ongoing operations and maintenance activities (e.g., routine inspection and maintenance of the HSR right-of-way) are unlikely to have any direct impacts on plant communities and land cover types because these activities could occur where the natural vegetation (i.e., areas with potential habitat for special-status plant species) has already been removed during construction of the Central Valley Wye. Direct impacts, if they occur, could include incidental trampling or crushing of vegetation caused by increased human activity related to the maintenance of equipment and facilities associated with the HSR system and exposure to accidental spills, including contaminants or pollutants. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status plants:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Impacts on special-status plants due to mortality from incidental trampling or crushing caused by increased human activity related to the maintenance of equipment and facilities associated with the HSR system and exposure to accidental spills, including contaminants or pollutants could occur but on a limited basis because the design characteristics of the Central Valley Wye alternatives include effective measures that require maintenance personnel to attend a WEAP training, and certify they understand the material and would comply with associated regulatory requirements to protect biological resources. In addition, restricted and sensitive areas would be delineated to minimize chemical and physical impacts on vegetation. These measures would minimize the impacts of land disturbance on special-status plants.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because habitat degradation during operations and maintenance activities would be avoided, and there would not be a substantial adverse effect on special-status plants. The design of the Central Valley Wye alternatives includes effective measures to reduce the likelihood of inadvertent direct impacts on special-status plants that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR

right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, restricted and sensitive areas would be delineated to minimize chemical and physical impacts on vegetation. Therefore, CEQA does not require any mitigation.

Impact BIO#26 Indirect Impacts on Special-Status Plants

Under any of the Central Valley Wye alternatives, ongoing operations and maintenance activities may result in indirect impacts on special-status plants. While the source of such impacts, such as vegetation management or ditch cleaning, may occur seasonally or intermittently, the duration of the impact on special-status plants and their habitats could be long-term or permanent. These indirect impacts would include any changes in local hydrology that could cause a change in habitat conditions for plant species dependent on vernal pools, and chemical runoff from use of pesticides and herbicides. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives. The Authority would require maintenance personnel to attend a WEAP training to gain knowledge of biological resources and associated regulatory requirements (BIO-IAMF#4). Operational maintenance requires vegetation and pest control through a variety of methods. If operational maintenance requires weed abatement activities, such as the use of herbicides, these activities could also contribute to chemical runoff and pollution of adjacent suitable habitats.

The technology for the HSR system does not require large amounts of lubricants or hazardous materials for operations, compared to diesel locomotive fuel tanks. Traction power substations (TPSS), switching stations, and substations may involve storage of oil and other materials; maintenance of these materials would be required.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status plants:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)
- Implement an environmental management system to promote the use of nonhazardous materials to the extent possible (HMW-IAMF#3)
- Where hazardous materials cannot be avoided, the Authority would implement hazardous monitoring plans as a basis for a hazardous materials business plan and a spill, prevention, control, and countermeasure plan to reduce potential impacts of the use and storage of hazardous materials at facilities associated with the Central Valley Wye alternatives (i.e., TPSSs) (HMW-IAMF#10).

Therefore, the design of the Central Valley Wye alternatives would minimize impacts during operations by training maintenance personnel to gain knowledge of biological resources and associated regulatory requirements; implementing protection measures for special status species; controlling erosion and sedimentation; applying pesticides and herbicides in accordance with state requirements and prepared plans; and limiting the amount of hazardous substances used for HSR operations.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because a substantial adverse effect from habitat degradation could not occur. The design of the Central Valley Wye alternatives includes effective measures to reduce the likelihood of inadvertent indirect impacts on special-status plants that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow regulatory agency procedures and

permit requirements to avoid impacts. In addition, measures would be implemented to protect special-status species and control erosion and sedimentation, apply pesticides and herbicides in accordance with state requirements and prepared plans, and to limit the amount of hazardous substances. Therefore, CEQA does not require any mitigation.

Special-Status Wildlife Impacts

Impact BIO#27 Direct Impacts on Special-Status Wildlife—Invertebrates

Direct impacts associated with operations and maintenance of all Central Valley Wye alternatives on special-status invertebrates (vernal pool branchiopods, valley elderberry longhorn beetle, and Crotch bumble bee), would include mortality from incidental trampling or crushing caused by increased human activity related to the maintenance of equipment and facilities associated with the HSR system and exposure to accidental spills, including contaminants or pollutants. While the source of such impacts may occur seasonally or intermittently, the duration of the impact on individual special-status invertebrates would be permanent and the duration the impact on habitat for special-status invertebrates would be long-term or permanent. Additionally, wind caused by train operations could occur, potentially affecting Crotch bumble bee flights, foraging, or dispersal. Similar effects on other common bees and pollinators could also occur. However, effects of induced wind during operations will be a matter of the wind speed generated. The Authority studied induced wind speed from train operations, and potential effects on pollination, in whitepapers in 2012 (Authority 2012a and 2012b), and found that wind speed at the edge of the right-of-way is predicted to be less than 5 mph at a distance of 30 feet from a train going 220 mph. Consequently, wind speeds within proximity to trains are unlikely to substantially exceed normal wind speeds and are unlikely to affect flights, foraging, or dispersal. Lastly, bees and other pollinators could be struck and killed by moving trains, although this effect is expected to be minimal and similar to normal background impacts from passenger cars and trucks on roads. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status invertebrates:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize the direct impacts on special-status invertebrates that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow procedures for avoiding impacts, and restricted and sensitive areas would be delineated to minimize or avoid impacts on wildlife.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts of incidental trampling, crushing, or spills would be reduced and there would not be a substantial adverse effect on special-status invertebrate species. The design of the Central Valley Wye alternatives includes effective measures to reduce the likelihood of inadvertent direct impacts on special-status invertebrates that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, restricted and sensitive areas would be delineated to minimize chemical and physical impacts on vegetation. Therefore, CEQA does not require any mitigation.

Impact BIO#28 Indirect Impacts on Special-Status Wildlife—Invertebrates

All Central Valley Wye alternatives would increase vehicle traffic and the potential for chemical spills or drift during operations and maintenance compared to the No Project Alternative. While the source of such impacts may occur seasonally or intermittently, the duration of the impact on individual special-status invertebrates (vernal pool branchiopods, valley elderberry longhorn beetle, and Crotch bumble bee) would be permanent and the duration the impact on habitat for special-status invertebrates would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status invertebrates:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize the impacts of land disturbance and chemical vegetation management on special-status invertebrates by training maintenance personnel to gain knowledge of biological resources and associated regulatory requirements; implementing protection measures for special status species; and controlling erosion and sedimentation and spills.

Impacts on special-status invertebrate species due to habitat degradation from vehicle traffic and maintenance activities would be minimized because the design characteristics of the Central Valley Wye alternatives include effective measures that require maintenance personnel to attend a WEAP training and certify they understand the material and would comply with associated regulatory requirements to protect biological resources. In addition, measures would be implemented to protect special-status species from changes in topography or increases in vehicle traffic through erosion and sedimentation controls and speed limits. These measures would reduce the likelihood of inadvertent indirect impacts on special-status invertebrates.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because a substantial adverse effect from habitat degradation on special-status invertebrates would not occur. The design of the Central Valley Wye alternatives includes effective measures to reduce the likelihood of inadvertent indirect impacts on special-status invertebrates that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, measures would be implemented to protect special-status species from changes in topography or increases in vehicle traffic through erosion and sedimentation controls and speed limits. Therefore, CEQA does not require any mitigation.

Impact BIO#29 Direct Impacts on Special-Status Wildlife—Fish

Under any of the Central Valley Wye alternatives, ongoing operations and maintenance activities may result in direct impacts on special-status fish. Direct impacts could include potential exposure to contaminants or pollutants from accidental chemical spills and increased sedimentation from erosion, resulting in mortality, habitat degradation, or reduced reproductive success of special-status fish. While the source of such impacts may occur seasonally and intermittently, the duration of the impact on individual special-status fish and their habitat would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status fish:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a stormwater pollution prevention plan to effectively manage project runoff during operations (HYD-IAMF#1), including for facilities designated as an industrial facility (HYD-IAMF#4)
- Prepare and implement a flood protection plan to minimize increases in flood elevations (HYD-IAMF#2)

Therefore, the design of the Central Valley Wye alternatives would minimize direct impacts on special-status fish species including through exposure to contaminants or pollutants or as a result of increased sedimentation from erosion.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts from exposure to contaminants or pollutants from accidental spills and increased sedimentation from erosion that could substantially reduce the number or habitat of fish species or result in the loss of a substantial number of special-status fish species would be reduced, and a substantial adverse effect on special-status fish species would not occur. The design of the Central Valley Wye alternatives includes effective measures that would require preparation of an annual vegetation control plan, minimizing adverse chemical and nonchemical (e.g., mowing or trimming) on vegetation that provides habitat for special-status fish species, which would minimize the potential for direct impacts on special-status fish from operations. Therefore, CEQA does not require any mitigation.

Impact BIO#30 Indirect Impacts on Special-Status Wildlife—Fish

Under any of the Central Valley Wye alternatives, indirect impacts on special-status fish could occur due to scour and changes to local hydrologic profiles from operations-related maintenance and other activities. While the source of such impacts may occur seasonally and intermittently, the duration of the impact on individual special-status fish and their habitat would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status fish:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a stormwater pollution prevention plan to effectively manage project runoff during operations (HYD-IAMF#1), including for facilities designated as an industrial facility (HYD-IAMF#4)
- Prepare and implement a flood protection plan to minimize increases in flood elevations (HYD-IAMF#2).

Therefore, the design of the Central Valley Wye alternatives would minimize indirect impacts on special-status fish species including changes in hydrology, habitat degradation, or reduced reproductive success of special-status fish.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts from scour and changes to local hydrologic profiles from operations-related maintenance and other activities would be minimized and there would not be a substantial adverse effect on special-status fish species. The design of the Central Valley Wye alternatives includes effective measures to reduce the likelihood of indirect impacts on special-status fish species that may result from operations of the Central Valley Wye alternatives because maintenance personnel would be well informed of their potential presence in and adjacency to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, design characteristics would minimize excess sediment or contaminants entering the water during operations, preventing erosion, sedimentation, and changes to the hydrology that could result in degradation of special-status fish species. Therefore, CEQA does not require any mitigation.

Impact BIO#31 Direct Impacts on Special-Status Wildlife—Amphibians and Reptiles

During operations, any of the Central Valley Wye alternatives would include the potential for direct impacts on amphibians and reptiles such as mortality from being struck by a train or maintenance truck, incidental trampling, or exposure to accidental spills of contaminants. While the source of such impacts may occur seasonally or intermittently, the duration of the impact on individual special-status amphibians and reptiles would be permanent and the duration the impact on habitat for special-status amphibians and reptiles would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status amphibians and reptiles:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize direct impacts on special-status amphibians and reptiles because maintenance personnel would be well informed of their potential presence in and adjacency to the HSR right-of-way and would be required to follow procedures for avoiding impacts; speed limits would be implemented to reduce the risk from vehicles; pesticides and herbicides would be applied in accordance with state requirements and in accordance with prepared plans, and the amount of hazardous substances used for HSR operations would be limited.

CEQA Conclusion

Under any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts from mortality by being struck by a train or maintenance truck, incidental trampling, or exposure to accidental spills of contaminants would be minimized and a substantial adverse effect on special-status amphibians and reptiles would not occur. The design characteristics of the Central Valley Wye alternatives include effective measures to reduce the likelihood of inadvertent direct impacts on special-status amphibians and reptiles because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, speed limits would be implemented to minimize the risk from vehicle strikes, pesticides and herbicides would be applied in

accordance with state requirements and in accordance with prepared plans, and the amount of hazardous substances used for HSR operations would be limited. Therefore, CEQA does not require any mitigation.

Impact BIO#32 Indirect Impacts on Special-Status Wildlife—Amphibians and Reptiles

During operations, any of the Central Valley Wye alternatives would have the potential for indirect impacts on amphibians and reptiles resulting from chemical spills from fuel or motor leaks that could drift or wash into nearby habitat. Amphibians and reptiles could be exposed to contaminants from inhalation, dermal contact and absorption, direct ingestion of contaminated soils and plants, or consumption of contaminated prey. Exposure to contaminants may cause short- or long-term morbidity. Contaminants may also have a negative effect on prey diversity and abundance (USFWS 2014b). While the source of such impacts may occur seasonally or intermittently, the duration of the impact on individual special-status amphibians and reptiles would be permanent and the duration the impact on habitat for special-status amphibians and reptiles would be long-term or permanent. As noted in Section 3.7.7.3, these impacts would be the same for all Central Valley Wye alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status amphibians and reptiles:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize habitat impacts during operations by training maintenance personnel to gain of knowledge of biological resources and associated regulatory requirements; implementing protection measures for special-status species; controlling erosion and sedimentation; applying pesticides and herbicides in accordance with state requirements and in accordance with prepared plans; and limiting the amount of hazardous substances used for HSR operations. Therefore, the design of the Central Valley Wye alternatives would minimize the indirect impacts including chemical spills (i.e., from fuel, transmission fluid, lubricating oil, and motor oil leaks), water column contamination, habitat degradation, increased predation, and increased cover of invasive species.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts from potential chemical spills, water column contamination, habitat degradation, increased predation, and increased cover of invasive species would be minimized and there would not be a substantial adverse effect on special-status amphibians and reptiles. The design characteristics of the Central Valley Wye alternatives include effective measures to reduce the likelihood of indirect impacts on special-status reptiles and amphibians because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, measures would be implemented to protect special-status species and control erosion and sedimentation, apply pesticides and herbicides in accordance with state requirements and prepared plans, and limit the amount of hazardous substances. Therefore, CEQA does not require any mitigation.

Impact BIO#33 Direct Impacts on Special-Status Wildlife—Birds

All Central Valley Wye alternatives would include the potential for direct impacts on birds such as mortality from being struck by a train or maintenance truck, although these impacts are expected to be infrequent and dispersed over time and location. Additionally, activities related to operations and maintenance that could result in the destruction of active nests. Maintenance activities (e.g., mowing,

weed control, and driving off-road) during operations would result in the removal or disturbance of areas that provide nesting habitat for special-status birds. If conducted during the nesting season (generally between February 1 and September 1), such activities could result in the destruction of active nests. While the source of such impacts may occur seasonally or intermittently, the duration of the impact on individual special-status birds would be permanent and the duration the impact on birds would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status birds:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize direct impacts including the removal or disturbance of areas that provide nesting habitat for special-status birds because maintenance personnel would be well informed of their potential presence in and adjacency to the HSR right-of-way and would be required to follow procedures for avoiding impacts; restricted and sensitive areas would be delineated to minimize or avoid impacts on vegetation; and speed limits would be limited in areas with potential habitat.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts that would reduce the number or habitat of birds could not occur and there would not be a substantial adverse effect on special-status birds. The design characteristics of the Central Valley Wye alternatives include effective measures to reduce the likelihood of inadvertent direct impacts on special-status bird species because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, restricted and sensitive areas and speed limits would be delineated to minimize chemical and physical impacts on special-status bird species. Therefore, CEQA does not require any mitigation.

Impact BIO#34 Indirect Impacts on Special-Status Wildlife—Birds

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status birds:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize indirect impacts on special-status bird species because maintenance personnel would be well informed of their potential presence in

and adjacency to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts; restricted and sensitive areas would be delineated to minimize indirect impacts on special-status bird species.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts that could reduce the number or habitat of birds could not occur during operation and maintenance activities and there would not be a substantial adverse effect on special-status birds. The design characteristics of the Central Valley Wye alternatives include effective measures to reduce the likelihood of inadvertent indirect impacts on special-status bird species because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, restricted and sensitive areas would be delineated during maintenance activities. Therefore, CEQA does not require any mitigation.

Impact BIO#35 Direct Impacts on Special-Status Wildlife—Mammals

All Central Valley Wye alternatives would include activities that could result in ground disturbance during operations that could reduce the number or habitat of special-status mammals. While the source of such impacts may occur seasonally or intermittently, the duration of the impact on individual special-status mammals or their habitats would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives. Additionally, mammals could make it onto the tracks and be struck and killed by trains. This impact is expected to be infrequent and dispersed over time and location.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status mammals:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize the direct impacts on special-status wildlife that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well informed of their potential presence in and adjacency to the HSR right-of-way and would be required to follow procedures for avoiding impacts, and restricted and sensitive areas would be delineated to minimize or avoid impacts on mammals.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts that could reduce the number or habitat of mammals could not occur during operation and maintenance activities and there would not be a substantial adverse effect on special-status mammal species. The design characteristics of the Central Valley Wye alternatives include effective measures to reduce the direct impacts on mammals that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, restricted and sensitive areas would be delineated to minimize chemical and physical impacts on mammals. Therefore, CEQA does not require any mitigation.

Impact BIO#36 Indirect Impacts on Special-Status Wildlife—Mammals

Operations of all Central Valley Wye alternatives would include activities that could result in indirect impacts on special-status mammals or their habitats, including chemical management of vegetation, which could reduce adjacent habitat values. In addition, local noise and motion disturbance impacts resulting from HSR operations may cause some avoidance behavior. While the source of such impacts may occur seasonally or intermittently, the duration of the impact on individual special-status mammals or their habitats would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status mammals:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify of special-status mammal habitat features as environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize the potential for indirect impacts on special-status mammals.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts that could reduce the number or habitat of mammals could not occur during operation and maintenance activities and there would not be a substantial adverse effect on special-status mammal species. The design characteristics of the Central Valley Wye alternatives include effective measures to reduce the indirect impacts on mammals because maintenance personnel would be well-informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts, and because maintenance personnel would implement a vegetation control plan annually that would limit the introduction and spread of invasive plants. Therefore, CEQA does not require any mitigation.

Special-Status Plant Community Impacts

Impact BIO#37 Direct Impacts on Special-Status Plant Communities

Under any of the Central Valley Wye alternatives, ongoing operations and maintenance activities (e.g., routine inspection and maintenance of the HSR right-of-way) are unlikely to have any direct impacts on plant communities and land cover types because these activities could occur where the natural vegetation has already been removed during construction of the Central Valley Wye alternatives. Direct impacts, if they occur, could include incidental trampling or crushing of vegetation caused by increased human activity related to the maintenance of equipment and facilities associated with the HSR system and exposure to accidental spills, including contaminants or pollutants. While the source of such impacts may occur seasonally and intermittently, the duration of the impact on special-status plant communities would be short-term and temporary. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on special-status plant communities:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)

- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Impacts on special-status plant communities due to the periodic removal of vegetation from within the HSR right-of-way and the disturbance of plants due to an increase of maintenance activity in the area would be minimized because the design characteristics of the Central Valley Wye alternatives include effective measures to require that maintenance personnel attend a WEAP training and certify they understand the material and would comply with associated regulatory requirements to protect biological resources.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts that would reduce the number of endangered, rare, or threatened species could not occur during operations and there would not be a substantial adverse effect on special-status plant species. The design characteristics of the Central Valley Wye alternatives include effective measures to reduce the likelihood of inadvertent direct impacts on special-status plant communities because maintenance personnel would be informed of their potential presence in and adjacency to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. Therefore, CEQA does not require any mitigation.

Impact BIO#38 Indirect Impacts on Special-Status Plant Communities

Operations of all of the Central Valley Wye alternatives have the potential to increase erosion and runoff due to alterations in topography and hydrology from vegetation removal, which could affect aquatic habitats that support special-status plants in nearby water features. There would also be an increased risk of fire in adjacent open spaces due to maintenance activity and the potential for the introduction of noxious plant species from increased human activity. While the source of such impacts may occur seasonally and intermittently, the duration of the impact on special-status plant communities would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on special-status plant communities:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

These measures would help to minimize impacts on special-status plants and other native vegetation occurring outside but adjacent to the project footprints.

Impacts on special-status plant communities could occur on a limited basis due to alternations in topography and hydrology from vegetation removal. However, the design characteristics of the Central Valley Wye alternatives include effective measures to control erosion and siltation, prepare a weed control plan, implement speed limits and measures to reduce the risk of fire, clean moving equipment, and return excavated soils to their original location. These measures would minimize impacts including increased erosion, sedimentation, siltation, and runoff; degradation of aquatic habitats in nearby water

features; wind erosion impacts (including from unvegetated rights-of-way and passing high-speed trains); increased risk of fire in adjacent open spaces due to maintenance activity; and the introduction of noxious plant species from increased human activity.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts that would reduce the number of endangered, rare, or threatened species could not occur during operations and there would not be a substantial adverse effect on special-status plant species. The design characteristics of the Central Valley Wye alternatives include effective measures to reduce the likelihood of inadvertent indirect impacts on special-status plant communities by controlling erosion and siltation, preparing a weed control plan, implementing speed limits and measures to reduce the risk of fire, cleaning moving equipment, and returning excavated soils to their original location. Therefore, CEQA does not require any mitigation.

Jurisdictional Aquatic Resources Impacts

Impact BIO#39 Direct Impacts on Jurisdictional Aquatic Resources

All of the Central Valley Wye alternatives require maintenance activity and additional vehicular traffic for operations. These activities could result in accidental spills, including contaminants/pollutants, and could require the use of machinery to clean drains, control vegetation, and remove litter. While the source of such impacts may occur seasonally and intermittently, the duration of the impact on jurisdictional aquatic resources would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on jurisdictional aquatic resources:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize the potential impacts from accidental spills, introduction of contaminants/pollutants, and degradation of jurisdictional aquatic resources.

Impacts on jurisdictional aquatic resources could occur on a limited basis due to the use of machinery to clean drains, control vegetation, and remove litter. However, the design characteristics of the Central Valley Wye alternatives include effective measures to require that maintenance personnel attend a WEAP training and certify that they understand the material and would comply with associated regulatory requirements to protect biological resources. In addition, measures would be implemented to protect jurisdictional aquatic resources, apply pesticides and herbicides in accordance with state requirements and prepared plans, and limit the amount of hazardous substances. These measures would minimize the impacts of accidental spills, introduction of contaminants/pollutants, and degradation of jurisdictional aquatic resources.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts could not occur during operations and there would not be a substantial adverse effect on aquatic resources. The design characteristics of the Central Valley Wye alternatives include measures to require that maintenance personnel attend a WEAP training and certify that they understand the material and would comply with associated regulatory requirements to protect biological resources. In

addition, measures would be implemented to protect jurisdictional aquatic resources, apply pesticides and herbicides in accordance with state requirements and prepared plans, and limit the amount of hazardous substances. Therefore, CEQA does not require any mitigation.

Impact BIO#40 Indirect Impacts on Jurisdictional Aquatic Resources

All of the Central Valley Wye alternatives would require periodic maintenance within the right-of-way (i.e., removal of vegetation, litter, and debris from culverts, drains, and other structures). These maintenance activities could result in impacts on water quality, erosion, siltation, and runoff into natural and constructed water features downstream of the Central Valley Wye alternatives, which would indirectly affect jurisdictional aquatic resources. While the source of such impacts may occur seasonally and intermittently, the duration of the impact on jurisdictional aquatic resources would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on jurisdictional aquatic resources:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize impacts during operations by training maintenance personnel to gain knowledge of biological resources and associated regulatory requirements, implementing protection measures for jurisdictional aquatic resources, and controlling erosion and sedimentation.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because impacts could not occur during operations and there would not be a substantial adverse effect on aquatic resources. The design of the Central Valley Wye alternatives includes effective measures to reduce the likelihood of inadvertent indirect impacts on jurisdictional aquatic resources that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well informed of their potential presence in and adjacency to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, measures would be implemented to protect jurisdictional aquatic resources and to control erosion and sedimentation. Therefore, CEQA does not require any mitigation.

Critical Habitat Impacts

Impact BIO#41 Direct Impacts on Critical Habitat

All of the Central Valley Wye alternatives require maintenance and increased vehicular traffic during operations, which could degrade critical habitat, particularly vernal pools, through accidental spills, including contaminants and pollutants. While the source of such impacts may occur seasonally and intermittently, the duration of the impact on Critical Habitat would be long-term or permanent. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on critical habitat:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize critical habitat impacts during operations by training maintenance personnel to gain knowledge of biological resources and associated regulatory requirements; applying pesticides and herbicides in accordance with state requirements and in accordance with prepared plans; and limiting the amount of hazardous substances used for HSR operations, which could contaminate the water column and result in degraded critical habitat.

Impacts on critical habitat due to degradation of vernal pools from increased maintenance activity and vehicular traffic would be limited because the design characteristics of the Central Valley Wye alternatives include effective measures to require that maintenance personnel attend a WEAP training and certify that they understand the material and would comply with associated regulatory requirements to protect biological resources. In addition, measures would be implemented to apply pesticides and herbicides in accordance with state requirements and prepared plans, and limit the amount of hazardous substances. These measures would minimize the impacts of accidental spills, including contaminants and pollutants.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because adverse modification of critical habitat by direct removal or by affecting its long-term viability would be minor and there would not be a substantial adverse effect on critical habitat. The design of the Central Valley Wye alternatives includes effective measures to reduce the likelihood of direct impacts on critical habitat that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well informed of their potential presence in and adjacent to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, measures would be implemented to apply pesticides and herbicides in accordance with state requirements and prepared plans, and limit the amount of hazardous substances. Therefore, CEQA does not require any mitigation.

Impact BIO#42 Indirect Impacts on Critical Habitat

During operations, all Central Valley Alternatives would stockpile soil, change the contour of landscape or disturb hardpan soils, have the potential for chemical spills, and introduce maintenance-related dust or invasive weeds. The likelihood of such impacts occurring under any of the Central Valley Wye alternatives is low, however, because most operations could occur where habitat has already been removed or limited to at-grade portions of the project footprints. Maintenance criteria would be included as part of the BRMP (BIO-IAMF#6), which would include, but not be limited to, measures for the protection of special-status species, specifications on the purpose, type, frequency, and extent of chemical use for insect and disease control operations, and measures for erosion and siltation control. Pesticide and herbicide application would be accomplished by certified pesticide applicators in accordance with all requirements of the California Department of Pesticide Regulation and County Agricultural Commissioners.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on critical habitat:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)

- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a weed control plan to minimize and avoid the spread of weeds during ground-disturbing activities (BIO-IAMF#7)

Therefore, the design of the Central Valley Wye alternatives would minimize critical habitat impacts during operations by training maintenance personnel to gain knowledge of biological resources and associated regulatory requirements; implementing protection measures for special status species; controlling erosion and sedimentation; applying pesticides and herbicides in accordance with state requirements and in accordance with prepared plans; and limiting the amount of hazardous substances used for HSR operations, which could contaminate the water column and result in degraded critical habitat.

Impacts on critical habitat due to stockpiling of soil; changes in the contour of landscape or disturbance of hardpan soils, have the potential for chemical spills; or introduction of invasive weeds and maintenance-related dust would occur on a limited basis because the design characteristics of the Central Valley Wye alternatives include effective measures to require that maintenance personnel attend a WEAP training and certify that they understand the material and would comply with associated regulatory requirements to protect biological resources. In addition, measures would be implemented to protect critical habitat and control erosion and sedimentation, apply pesticides and herbicides in accordance with state requirements and prepared plans, and limit the amount of hazardous substances.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because adverse modification of critical habitat by direct removal or by affecting its long-term viability would be minor and there would not be a substantial adverse effect on critical habitat. The design characteristics of the Central Valley Wye alternatives include effective measures to reduce likelihood of inadvertent indirect impacts on critical habitat that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well-informed of their potential presence in and adjacency to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, measures would be implemented to protect critical habitat and control erosion and sedimentation, apply pesticides and herbicides in accordance with state requirements and prepared plans, and limit the amount of hazardous substances. Therefore, CEQA does not require any mitigation.

Essential Fish Habitat Impacts

Impact BIO#43 Direct Impacts on Essential Fish Habitat

EFH in the San Joaquin River in the habitat study area has historically been poor quality. Until recently, the reach was dry, with sandy substrate, and nonnative vegetation lines the banks. With the return to flows within the San Joaquin River, EFH is increasing in habitat quality. However, few to no operations impacts are anticipated under any of the Central Valley Wye alternatives because maintenance of the bridge over the San Joaquin River, once constructed, would be conducted from underneath the structure, without requiring activities in EFH.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize direct impacts on EFH:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)

- Prepare and implement a stormwater pollution prevention plan to effectively manage project runoff during operations (HYD-IAMF#1), including for facilities designated as an industrial facility (HYD-IAMF#4)
- Prepare and implement a flood protection plan to minimize increases in flood elevations (HYD-IAMF#2).

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because substantial reductions in the number or habitat of fish species, or impacts on federally protected wetlands or on any riparian habitat could not occur and there would not be a substantial adverse effect on EFH. Few to no operations impacts are anticipated because maintenance of the bridge over the San Joaquin River, once constructed, would be conducted from underneath the structure, without requiring activities in EFH. Therefore, CEQA does not require any mitigation.

Impact BIO#44 Indirect Impacts on Essential Fish Habitat

Indirect impacts on EFH could result from maintenance activities upslope or upstream of the San Joaquin River that have the potential to reduce water quality, such as chemical management of vegetation or erosion from land disturbance. The source of such impacts would occur seasonally and intermittently, and the duration of the impact on EFH would likely be short-term. As noted in Section 3.7.7.3, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on EFH:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)
- Prepare and implement an annual vegetation management plan to guide the maintenance of vegetation during operations (BIO-IAMF#6)
- Prepare and implement a stormwater pollution prevention plan to effectively manage project runoff during operations (HYD-IAMF#1), including for facilities designated as an industrial facility (HYD-IAMF#4)
- Prepare and implement a flood protection plan to minimize increases in flood elevations (HYD-IAMF#2).

Therefore, the design of the Central Valley Wye alternatives would minimize the impacts of reduced water quality from increased erosion, sedimentation, siltation, and runoff due to alterations in hydrology during operations-related maintenance such as vegetation removal, drain cleaning, and litter removal; wind erosion impacts (including from unvegetated rights-of-way and passing high-speed trains); increased risk of fire in adjacent open spaces due to increased human activity; and the introduction of noxious plant species from increased human activity/disturbance by making sure that the contractors follow the rules of the training program and associated regulatory requirements.

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant because substantial reductions in the number or habitat of fish species, or impacts on federally protected wetlands or on any riparian habitat could not occur and there would not be a substantial adverse effect on EFH. The design of the Central Valley Wye alternatives includes effective measures to reduce the likelihood of inadvertent indirect impacts on EFH habitat that may result from the operations of the Central Valley Wye alternatives because maintenance personnel would be well-informed of their potential presence in and adjacency to the HSR right-of-way and would be required to follow regulatory agency procedures and permit requirements to avoid impacts. In addition, measures would be implemented to protect EFH and control erosion and sedimentation. Therefore, CEQA does not require any mitigation.

Wildlife Movement Corridor Impacts

Impact BIO#45 Indirect Impacts on Wildlife Movement Corridors

All of the Central Valley Wye alternatives would result in indirect impacts on wildlife movement corridors from maintenance and operations. Maintenance activities would be dispersed over time and location and thus are not expected to substantially affect wildlife movement corridors. Potential effects on wildlife movement due to project operations (i.e., the passage of trains and associated noise, motion, and startle effects) are based on information provided in FRA guidance manual, *High-Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA 2005). As discussed in Section 3.4, the FRA has defined noise exposure limits for wildlife that are assumed to elicit an avoidance response. Sound exposure levels from passing trains (i.e., noise exposure from an individual train passage) that exceed 100 A-weighted decibels are expected to elicit an avoidance response from wildlife moving through nearby habitat. Based on the modeled noise calculations contained within the Noise and Vibration Technical Report (Authority and FRA 2016c), wildlife would have to be within approximately 50 feet of the edge of the HSR right-of-way to experience noise effects above FRA's recommended threshold. Wildlife movement through a wildlife corridor is expected to be a relatively rare event, would have to correspond with the passage of a train, and the animal would have to be within 50 feet of the edge of the HSR right-of-way for effects from noise or startle to occur which is expected to be an uncommon occurrence.

The level of indirect impacts caused by a particular alternative would be dependent on the number, type, and length of wildlife corridor crossed by an alternative, as well as the frequency of passing trains. Each of the Central Valley Wye alternatives would cross the same wildlife movement corridors (Table 3.7-11) but with varying distances. Generally, the SR 152 (North) to Road 11 Wye Alternative would cross the least distance of wildlife corridors and the SR 152 (North) to Road 10 Wye Alternative would cross the greatest distance of wildlife corridors. All alternatives would have the same frequency of passing trains.

As features of all the Central Valley Wye alternatives, the Authority would implement the following IAMFs to avoid and minimize indirect impacts on wildlife movement corridors:

- Require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including those that would avoid incidental trampling or crushing and spills (BIO-IAMF#4)
- Require that the BRMP identify environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#5)

CEQA Conclusion

For any of the Central Valley Wye alternatives, the impact under CEQA would be less than significant on wildlife movement corridors due to operations, and operations would not interfere substantially with wildlife movement. The distance at which effects are considered to affect wildlife are relatively short (within 50 feet of the HSR right-of-way), and wildlife movement through corridors is expected to be infrequent. Effects would only occur if an animal were within 50 feet of the HSR right-of-way at the time a train was passing. These effects would be infrequent and limited in area and duration, and thus would not result in a significant impact on wildlife movement. Therefore, CEQA does not require any mitigation.

3.7.8 Mitigation Measures

This section identifies mitigation measures that would be implemented on the Central Valley Wye alternatives to avoid, minimize, or compensate for impacts on biological resources. These measures are generally consistent with the mitigation required under the Merced to Fresno Final EIR/EIS; however, several of the mitigation measures developed under the Merced to Fresno Final EIR/EIS do not apply to the Central Valley Wye alternatives. As a result, only the mitigation measures specific to the Central Valley Wye alternatives are described in this section. Following are detailed descriptions of the individual measures.

BIO-MM#1a: Establish Environmentally Sensitive Areas, Wildlife Exclusion Fencing, and Non-Disturbance Zones

Prior to any ground-disturbing activity in a Work Area, the Project Biologist will use flagging to mark environmentally sensitive areas that support special-status species or aquatic resources and are subject

to seasonal restrictions or other avoidance and minimization measures. The Project Biologist will also direct the installation of wildlife exclusion fencing to prevent special-status wildlife species from entering Work Areas. The wildlife exclusion fencing will have exit doors to allow animals that may be inside an enclosed area to leave the area. The Project Biologist will also direct the installation of construction exclusionary fencing (exclusionary fencing) at the boundary of the Work Area, as appropriate, to avoid and minimize impacts on special-status species or aquatic resources outside of the Work Area during the construction period. The environmentally sensitive areas, wildlife exclusion fencing, and exclusionary fencing will be delineated by the Project Biologist based on the results of habitat mapping or modeling and any pre-construction surveys, and in coordination with the Authority. The environmentally sensitive areas, wildlife exclusion fencing, and exclusionary fencing will be regularly inspected and maintained by the Project Biologist.

The environmentally sensitive areas, wildlife exclusion fencing, and exclusionary fencing locations will be identified and depicted on an exclusion fencing exhibit. The purpose of the environmentally sensitive areas and wildlife exclusion fencing will be explained at WEAP training, and the locations of the environmentally sensitive areas and wildlife exclusion fencing areas will be noted during worker tailgate sessions.

This mitigation measure is anticipated to be effective because it identifies, documents, and protects sensitive areas, reducing the potential for disturbance during construction. Implementation of this measure would not result in secondary environmental impacts.

BIO-MM#1b: Establish and Implement a Compliance Reporting Program

The Project Biologist will prepare monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and requirements set forth in regulatory agency authorizations. The Authority will review and approve all compliance reports prior to submittal to the regulatory agencies. Reports will be prepared in compliance with the content requirements outlined in the regulatory agency authorizations.

Pre-activity survey reports will be submitted within 15 days of completing the surveys and will include:

- Location(s) of where pre-activity surveys were completed, including latitude and longitude, Assessor Parcel Number, and HST parcel number.
- Written description of the surveyed area. A figure of each surveyed location will be provided that depicts the surveyed area and survey buffers over an aerial image.
- Date, time, and weather conditions observed at each location.
- Personnel who conducted the pre-activity surveys.
- Verification of the accuracy of the Authority's habitat mapping at each location, provided in writing and on a figure.
- Observations made during the survey, including the type and locations (written and GIS) of any sensitive resources detected.
- Identification of relevant measures from the BRMP to be implemented as a result of the survey observations.

Daily Compliance Reports will be submitted to the Authority via EMMA within 24 hours of each monitoring day. Non-compliance events will be reported to the Authority the day of the occurrence. Daily Compliance Reports will include:

- Date, time, and weather conditions observed at each location where monitoring occurred.
- Personnel who conducted compliance monitoring.
- Project activities monitored, including construction equipment in use.
- Compliance conditions implemented successfully.
- Non-compliance events observed.

Daily Compliance Reports will also be included in the Monthly Compliance Reports, which will be submitted to the Authority by the 10th of each month and will include:

- Summary of construction activities and locations during the reporting month, including any non-compliance events and their resolution, work stoppages, and take of threatened or endangered species.
- Summary of anticipated project activities and Work Areas for the upcoming month.
- Tracking of impacts on suitable habitats for each threatened and endangered species identified in USFWS and CDFW authorizations, including:
 - An accounting of the number of acres of habitats for which we provide compensatory mitigation that has been disturbed during the reporting month, and
 - An accounting of the cumulative total number of acres of threatened and endangered species habitat that has been disturbed during the project period.
- Up-to-date GIS layers, associated metadata, and photo documentation used to track acreages disturbed.
- Copies of all pre-activity survey reports, daily compliance reports, and non-compliance/ work stoppage reports for the reporting month.

Annual Reports will be submitted to the Authority by the 20th of January and will include:

- Summary of all Monthly Compliance Reports for the reporting year.
- A general description of the status of the project, including projected completion dates.
- All available information about project-related incidental take of threatened and endangered species.
- Information about other project impacts on the threatened and endangered species.
- A summary of findings from pre-construction surveys (e.g., number of times a threatened or endangered species or a den, burrow, or nest was encountered, location, if avoidance was achieved, if not, what other measures were implemented).
- Written description of disturbances to threatened and endangered species habitat within Work Areas, both for the preceding 12 months and in total since issuance of regulatory authorizations by USFWS and CDFW, and updated maps of all land disturbances and updated maps of identified habitat features suitable for threatened and endangered species within the project area.

In addition to the compliance reporting requirements outlined above, the following items will be provided for compliance documentation purposes:

- If agency personnel visit the construction footprint in accordance with BIO-IAMF#2, the Project Biologist will prepare a memorandum within one day of the visit that memorializes the issues raised during the field meeting. This memorandum will be submitted to the Authority via EMMA. Any issues regarding regulatory compliance raised by agency personnel will be reported to the Authority and the Contractor.
- Compliance reporting will be submitted to the Authority via EMMA in accordance with the report schedule. The Project Biologist will prepare and submit compliance reports that document the following:
 - Compliance with BIO-MM#1a: Establish Environmentally Sensitive Areas, Wildlife Exclusion Fencing, and Non-Disturbance Zones.
 - Implementation and performance of the RRP described in BIO-MM#2a.
 - Summary of progress made regarding the implementation of the Weed Control Plan described in BIO-IAMF#7.
 - Compliance with BIO-IAMF#8: Establish Monofilament Restrictions.
 - Compliance with BIO-IAMF#9: Prevent Entrapment in Construction Materials and Excavations.
 - Compliance with BIO-IAMF#10: Delineate Equipment Staging Areas and Traffic Route.
 - Compliance with BIO-IAMF#11: Dispose of Construction Spoils and Waste.
 - Compliance with BIO-IAMF#12: Clean Construction Equipment.

- BMP field manual implementation and any recommended changes to construction site housekeeping practices outlined in BIO-IAMF#13: Maintain Construction Sites.
- Compliance with BIO-IAMF#15: Vehicle Traffic and Construction Site Speed Limits
- Work stoppages and measures taken under BIO-MM#9a: Work Stoppage will be documented in a memorandum prepared by the Project Biologist and submitted to the Authority within two business days of the work stoppage.

This mitigation measure is anticipated to be effective because it identifies, documents, and tracks the implementation of measures to protect biological resources. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#1c: Conduct Presence/Absence Pre-construction Surveys for Special-Status Plant Species and Special-Status Plant Communities

Prior to any ground-disturbing activity, the Project Biologist will conduct presence/absence botanical field surveys for special-status plant species and special-status plant sensitive natural communities in all potentially suitable habitats within a Work Area. The surveys shall be consistent with Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018) and Guidelines for Conducting and Report Botanical Inventories for Federally Listed, Proposed and Candidate Plants (USFWS 2001). The Project Biologist will flag and record in GIS the locations of any observed special-status plant species and special-status plant sensitive natural communities. Portions of the project footprint that support special-status plant species that would be temporarily disturbed would be restored to pre-construction conditions as defined in the BRMP prepared under BIO-IAMF#6. Before disturbance, pre-construction conditions, including species composition, species richness, and percent cover of key species would be documented, and photo points would be established. If special-status plant species cannot be avoided, mitigation for impacts on these species would be documented (density, percent cover, key habitat characteristics, including soil type, associated species, hydrology, topography, and photo documentation of pre-construction conditions) and incorporated into a relocation/compensation program, as described in BIO-MM#2. The project biologist would provide verification of survey results and report findings to the Authority to document compliance with this measure.

This mitigation measure is anticipated to be effective because it identifies, documents, and protects special-status plant species within 100 feet of the project footprint, reducing the potential for disturbance during construction. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#2a: Prepare and Implement a Restoration and Revegetation Plan

Prior to any ground disturbing activity, the Project Biologist will prepare an RRP to address temporary impacts resulting from ground-disturbing activities within areas that potentially support special-status species, wetlands and/or other aquatic resources. Restoration activities may include, but not be limited to: grading landform contours to approximate pre-disturbance conditions, re-vegetating disturbed areas with native plant species, and using certified weed-free straw and mulch. The Authority will implement the RRP in all temporarily disturbed areas outside of the permanent right-of-way that potentially support special-status species, wetlands and/or other aquatic resources. Consistent with section 1415 of the Fixing America's Surface Transportation Act (FAST Act) restoration activities will provide habitat for native pollinators through plantings of native forbs and grasses. The Project Biologist will obtain a locally sourced native seed mix. The restoration success criteria will include limits on invasive species, as defined by the California Invasive Plant Council, to an increase no greater than 10 percent compared to the pre-disturbance condition, or to a level determined through a comparison with an appropriate reference site consisting of similar natural communities and management regimes. The RRP will outline at a minimum:

- a. Procedures for documenting pre-construction conditions for restoration purposes.
- b. Sources of plant materials and methods of propagation.
- c. Specification of parameters for maintenance and monitoring of re-established habitats, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas.

- d. Specification of success criteria for re-established plant communities.
- e. Specification of the remedial measures to be taken if success criteria are not met.
- f. Methods and requirements for monitoring restoration/replacement efforts, which may involve a combination of qualitative and/or quantitative data gathering.
- g. Maintenance, monitoring, and reporting schedules, including an annual report due to the Authority by January 31st of the following year.

The RRP will be submitted to the Authority and regulatory agencies, as defined in the conditions of regulatory authorizations, for review and approval.

This mitigation measure is anticipated to be effective because it identifies, documents, and implements a plan to restore and revegetate habitats following construction. Implementation of this measure would not trigger secondary environmental impacts because it occurs in areas already disturbed.

BIO-MM#2b: Prepare and Implement Plan for Salvage, Relocation, and/or Propagation of Special-Status Plant Species

Prior to construction (any ground-disturbing activity), the project biologist will collect seeds and plant materials and stockpile and segregate the top four inches of topsoil from locations within the Work Area where species listed as threatened or endangered under FESA, threatened, endangered, or candidate for listing under CESA, state-designated "Rare" species, and California Rare Plant Rank 1B and 2 species were observed during surveys for use on off-site locations. Suitable sites to receive salvaged material include Authority mitigation sites, refuges, reserves, federal or state lands, and public/private mitigation banks.

If relocation or propagation is required by authorizations issued under FESA and/or CESA, the project biologist will prepare a plant species salvage plan to address monitoring, salvage, relocation, and/or seed banking of federal or State-listed species.

The plan will include provisions that address the techniques, locations, and procedures required for the collection, storage, and relocation of seed or plant material; collection, stockpiling, and redistribution of topsoil and associated seed. The plan will also include requirements related to outcomes such as percent absolute cover of highly invasive species, as defined by the California Invasive Plant Council (less than documented baseline conditions), maintenance, monitoring, implementation, and the annual reporting. The plan will reflect conditions required under regulatory authorizations issued for federal or state-listed species. The Project Biologist will submit the plan to the Authority for review and approval.

This mitigation measure is anticipated to be effective because it salvages unavoidable impacts on special-status species within the project footprint; relocates salvaged species to suitable habitat acquired within the region, and monitors relocated species per the Special Plant Species Management Plan to provide for suitable survival of special-status plant species, reducing the potential for disturbance during construction.

BIO-MM#2b would have a temporary impact on special-status plants through direct disturbance as part of salvage and relocation efforts, but ultimately would be beneficial because the plan would salvage, relocate, and protect special-status plants.

Implementation of this mitigation measure may also require the acquisition of suitable additional lands outside of the project footprint for the purposes of relocating special-status plant species. This land may be converted from other current uses, such as agriculture, which in turn could have potential secondary environmental impacts on agricultural resources (through farmland conversion), other biological resources (through direct and indirect impacts on species habitat), and cultural resources (through disturbance of archaeological resources and impacts on historic properties). Such secondary impacts from off-site mitigation activities are addressed under BIO-MM#4. Impacts on additional environmental resources are not anticipated.

BIO-MM#3a: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources

The Authority will prepare and implement a Compensatory Mitigation Plan (CMP) that identifies mitigation to address temporary and permanent loss, including functions and values, of aquatic resources defined as waters of the U.S. under the federal CWA and/or waters of the State under the Porter-Cologne Act. The compensatory mitigation for state and federally protected aquatic resources would meet the federal and state policies for no net loss of functions and values. Compensatory mitigation may involve the restoration, establishment, enhancement, and/or preservation of aquatic resources through one or more of the following methods:

- Purchase of credits from an agency-approved mitigation bank.
- Preservation of aquatic resources through acquisition of property.
- Establishment, restoration, or enhancement of aquatic resources.
- In lieu fee contribution determined through consultation with the applicable regulatory agencies.

The following ratios will be used for compensatory mitigation for permanent impacts, unless a higher ratio is required pursuant to regulatory authorizations issued under Section 404 of the CWA and/or the Porter-Cologne Act:

- Vernal pools: 2:1.
- Seasonal wetlands: between 1.1:1 and 1.5:1 based on impact type, function and values lost.
- All other wetland types: 1:1
- All non-wetland types: mitigated onsite at 1:1 or offsite 1:1 if onsite mitigation is not possible

For mitigation involving establishment, restoration, enhancement, or preservation of aquatic resources by the Authority, the CMP will contain the following information:

- Objectives. A description of the resource types and amounts that will be provided, the type of compensation (i.e., restoration, establishment, enhancement, and/or preservation), and the manner in which the resource functions of the compensatory mitigation project will address the needs of the watershed or ecoregion.
- Site selection. A description of the factors considered during the term sustainability of the resource.
- Adaptive management plan. A management strategy to address changes in site conditions or other components of the compensatory mitigation project.
- Financial assurances. A description of financial assurances that will be provided to ensure that the compensatory mitigation will be successful.

Additional information required in a CMP as outlined in 33 C.F.R. Section 332.4(c), as deemed appropriate and necessary by the USACE would also be required in the CMP. In circumstances where the Authority intends to fulfill compensatory mitigation obligations by securing credits from approved mitigation banks or in-lieu fee programs, the CMP need only include the name of the specific mitigation bank or in-lieu fee program to be used, the number of credits proposed to be purchased, and a rationale for why this number of credits was determined appropriate.

As addressed in the discussion of BIO-MM#4, compensatory mitigation could involve some secondary impacts, however these impacts would be minimized, and it is expected that there would be overall net increases in aquatic resources functions and services, and the measures set forth in BIO-MM#4 would be implemented to minimize any adverse impacts.

BIO-MM#3b: Prepare a Compensatory Mitigation Plan (CMP) for Species and Habitat

The Authority will prepare a CMP that sets out the compensatory mitigation that will be provided to offset permanent and temporary impacts to federal and state-listed species and their habitat, fish and wildlife

resources regulated under Section 1600 et seq. of the Fish and Game Code, and certain other special-status species. The CMP will include the following:

- A description of the species and habitat types for which compensatory mitigation is being provided.
- A description of the methods used to identify and evaluate mitigation options. Mitigation options will include one or more of the following:
 - Purchase of mitigation credits from an agency-approved mitigation bank.
 - Protection of habitat through acquisition of fee-title or conservation easement and funding for long-term management of the habitat. Title to lands acquired in fee will be transferred to CDFW and conservation easements will be held by an entity approved in writing by the applicable regulatory agency. In circumstances where the Authority protects habitat through a conservation easement, the terms of the conservation easement will be subject to approval of the applicable regulatory agencies, and the conservation easement will identify applicable regulatory agencies as third-party beneficiaries with a right of access to the easement areas.
 - Payment to an existing in-lieu fee program.
- A summary of the estimated direct permanent and temporary impacts on species and species habitat.
- A description of the process that will be used to confirm impacts. Actual impacts to species and habitat could differ from estimates. Should this occur, adjustments will be made to the compensatory mitigation that will be provided. Adjustments to impact estimates and compensatory mitigation will occur in the following circumstances:
 - Impacts on species (typically measured as habitat loss) are reduced or increased as a result of changes in project design,
 - Pre-construction site assessments indicate that habitat features are absent (e.g., because of errors in land cover mapping or land cover conversion),
 - The habitat is determined to be unoccupied based on negative species surveys, or
 - impacts initially categorized as permanent qualify as temporary impacts.
- An overview of the strategy for mitigating effects on species. The overview will include the ratios to be applied to determine mitigation levels and the resulting mitigation totals.
- A description of habitat restoration or enhancement projects, if any, that will contribute to compensatory mitigation commitments.
- A description of the success criteria that will be used to evaluate the performance of habitat restoration or enhancement projects, and a description of the types of monitoring that will be used to verify that such criteria have been met.
- A description of the management actions that will be used to maintain the habitat on the mitigation sites, and the funding mechanisms for long-term management.
- A description of adaptive management approaches, if applicable, that will be used in the management of species habitat.
- A description of financial assurances that will be provided to demonstrate that the funding to implement mitigation is assured.

As addressed in the discussion of BIO-MM#4, compensatory mitigation could involve some secondary impacts, however these impacts would be minimized, and it is expected that there would overall net increases in species' habitat and function, and the measures set forth in BIO-MM#4 would be implemented to minimize any adverse impacts.

BIO-MM#4: Implement Measures to Minimize Impacts During Off-Site Habitat Restoration, Enhancement, or Creation on Mitigation Sites

Prior to site preparation at the mitigation site(s), the Authority or its designee would consider the off-site habitat restoration, enhancement, or preservation program, and quantify short-term temporary and long-

term permanent impacts associated with restoration/enhancement activities. A determination would be made on any impacts from the physical alteration of the site to on-site biological resources, including plant communities, land cover types, and the distribution of special-status plants and wildlife. Six potential mitigation/conservation banks and three potential permittee-responsible mitigation (PRM) sites are under consideration for restoration, enhancement, or preservation of jurisdictional aquatic resources and special-status species habitat. Habitat restoration and enhancement activities on the six mitigation/conservation banks are already occurring and have been permitted by the bank operators. Therefore, any new impacts on resources present at off-site mitigation sites would be limited to the three PRM sites. All three PRM sites are located in the western foothills of the Sierra Nevada range and support the same types of jurisdictional aquatic resources and special-status species habitat that would be affected by the Central Valley Wye alternatives.

Site 1 is an approximately 2,016-acre property in south-central Madera County that contains vernal pools, mixed riparian, seasonal wetlands, freshwater emergent marsh, natural watercourses, constructed basins, constructed watercourses, and open water. Given the high level of ecological functions currently supported at Site 1, restoration and enhancement opportunities are relatively limited, and would consist of restoration (rehabilitation) and enhancement of up to 20 acres of vernal pools and vernal swales.

Site 2 is an approximately 3,300-acre property in northern Fresno County that contains vernal pools, mixed riparian, freshwater emergent marsh, natural watercourses, constructed watercourses, and open water. Restoration and enhancement opportunities at Site 2 include establishment or restoration (re-establishment) of up to 63 acres of vernal pools and enhancement of up to 62 acres of riparian habitat.

Site 3 is an approximately 7,350-acre property on the border of eastern Merced County and western Mariposa County that contains vernal pools, natural watercourses, mixed riparian, seasonal wetlands, and open water. Numerous restoration and enhancement opportunities are apparent on Site 3, attributable largely to dry farming practices conducted between the 1930s and 1950s. Specifically, approximately 326 acres of clay slope wetlands, seasonal wetlands, vernal pools, vegetated swales, and riparian (stream) areas may be suitable for re-establishment and rehabilitation, and approximately 874 acres of upland grasslands may be suitable for enhancement.

All three PRM sites provide habitat for special-status plants and wildlife. San Joaquin Valley Orcutt grass, succulent owl's-clover, and vernal pool fairy shrimp have been observed on all three sites. Other special-status wildlife species observed on PRM sites include Conservancy fairy shrimp (Site 2), vernal pool tadpole shrimp (Sites 2 and 3), California tiger salamander (Sites 1 and 2), western spadefoot (Sites 1 and 3), golden eagle (Site 2), Swainson's hawk (Sites 1 and 2), and San Joaquin kit fox (Sites 1 and 3). Aquatic features on the sites may support western pond turtle, and the extensive grassland on all three sites provides habitat for burrowing owl, grasshopper sparrow, northern harrier, short-eared owl, white-tailed kite, and American badger.

Future restoration or enhancement activities on PRM sites 1–3 may include the following:

- Grading
- Removal of nonnative invasive plants by hand (e.g., hand-pulling), mechanical (e.g., string trimming, mowing) or chemical (i.e., herbicides) methods
- Removal and disposal of existing agricultural infrastructure
- Excavation of existing channels or basins
- Stockpiling, disposal, and reuse of soils
- Collection and/or planting of native vegetation for wetland and upland habitat enhancement
- Installation and maintenance of erosion control and/or irrigation systems
- Installation of piezometers for groundwater monitoring
- Installation and maintenance of protective fencing and signage
- Periodic hydrological, botanical, and wildlife monitoring by field technicians

Some of these activities, especially those involving ground disturbance, could result in the same type of impacts described in Section 3.7.7, Environmental Consequences. Specifically, direct and indirect impacts on special-status plant and wildlife species (Impacts BIO#1–BIO#4 and BIO#7–BIO#14), special-status plant communities (Impacts BIO#15 and BIO#16), jurisdictional waters (Impacts BIO#17 and BIO#18), and critical habitat (Impacts BIO#19 and BIO#20) could occur where such resources are present on the PRM sites. The following IAMFs and mitigation measures would be applied at PRM sites to reduce, lessen, or avoid impacts on these resources:

- BIO-IAMF#1: Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors
- BIO-IAMF#2: Facilitate Agency Access
- BIO-IAMF#3: Prepare Worker Environmental Awareness Program (WEAP) Training Materials and Conduct Construction Period WEAP Training
- BIO-IAMF#7: Prepare and Implement a Weed Control Plan
- BIO-IAMF#8: Establish Monofilament Restrictions
- BIO-IAMF#9: Prevent Entrapment in Construction Materials and Excavations
- BIO-IAMF#10: Delineate Equipment Staging Areas and Traffic Routes
- BIO-IAMF#11: Dispose of Construction Spoils and Waste
- BIO-IAMF#12: Clean Construction Equipment
- BIO-IAMF#13: Maintain Construction Sites
- BIO-IAMF#14: Dewatering and Water Diversion
- BIO-IAMF#15: Vehicle Traffic and Construction Site Speed Limits
- BIO-MM#1a: Establish Environmentally Sensitive Areas, Wildlife Exclusion Fencing, and Non-Disturbance Zones
- BIO-MM#1c: Conduct Presence/Absence Pre-construction Surveys for Special-Status Plant Species and Special-Status Plant Communities
- BIO-MM#5: Conduct Pre-construction Surveys for Vernal Pool Wildlife Species
- BIO-MM#6: Implement Seasonal Vernal Pool Work Restriction
- BIO-MM#7: Implement and Monitor Vernal Pool Avoidance and Minimization Measures Within Temporary Impact Areas
- BIO-MM#9a: Work Stoppage
- BIO-MM#9b: Conduct Pre-construction Surveys for Special-Status Reptile and Amphibian Species
- BIO-MM#11: Conduct Pre-construction Surveys for California Tiger Salamander
- BIO-MM#12: Implement Avoidance and Minimization Measures for California Tiger Salamander
- BIO-MM#13: Conduct Emergence and Larval Surveys for Western Spadefoot
- BIO-MM#16: Conduct Western Pond Turtle Pre-construction Surveys and Relocation
- BIO-MM#17: Conduct Western Pond Turtle Monitoring
- BIO-MM#18: Implement Western Pond Turtle Avoidance and Relocation
- BIO-MM#24a: Conduct Pre-construction Surveys and Delineate Active Nest Buffers and Exclusion Areas for Breeding Birds
- BIO-MM#24b: Conduct Pre-construction Surveys and Monitoring for Raptors

- BIO-MM#25a: Conduct Surveys and Implement Avoidance Measures for Active Tricolored Blackbird Nest Colonies
- BIO-MM#26: Conduct Surveys for Swainson's Hawk Nests
- BIO-MM#27: Implement Avoidance and Minimization Measures for Swainson's Hawk Nests
- BIO-MM#29: Conduct Protocol-level Surveys for Burrowing Owls
- BIO-MM#30: Implement Avoidance and Minimization Measures for Burrowing Owl
- BIO-MM#34: Conduct Pre-construction Surveys for American Badger Den Sites and Implement Minimization Measures
- BIO-MM#35: Conduct Pre-construction Surveys for Ringtail and Ringtail Den Sites and Implement Avoidance Measures
- BIO-MM#36: Conduct Pre-construction Surveys for San Joaquin Kit Fox
- BIO-MM#37: Minimize Impacts on San Joaquin Kit Fox

Restoration and enhancement of aquatic resources may result in the permanent conversion of grassland to wetland or riparian habitat. While such activities would be beneficial for special-status vernal pool or riparian species, they would result in a small but measurable loss of upland habitat that could support denning, foraging, or movement by San Joaquin kit fox; nesting and foraging by burrowing owl, short-eared owl, grasshopper sparrow, and northern harrier; and foraging by golden eagle and white-tailed kite. Permanent impacts on grassland habitat from aquatic resource restoration and enhancement would be mitigated at a minimum ratio of 1:1 (acres preserved, enhanced, or restored: acres affected). Due to the high amount of grassland on all three PRM sites, it is expected that this mitigation can be accomplished within each site.

The off-site habitat restoration, enhancement, and preservation program would be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, California Fish and Game Code Section 1600 et seq. Streambed Alteration Agreement, and FESA and CESA as they apply to their jurisdiction and resources on-site. Potential impacts on site-specific hydrology and the downstream resources would be evaluated as a result of implementation of the restoration-related activity. Site-specific BMPs and a stormwater pollution prevention plan would be implemented as appropriate.

The Authority or its designee would report on compliance with permitting requirements. The Authority or its designee would be responsible for the monitoring and tracking of the program, would document compliance, and would submit it to the appropriate regulatory agency.

This mitigation measure is anticipated to be effective because it quantifies and compensates for temporary and permanent impacts (i.e., conversion of grassland special-status habitat to wetland) on the natural landscape that would occur from the restoration, enhancement, and preservation program actions at off-site mitigation sites, thereby avoiding a net loss of special-status species habitat.

Other Potential Impacts and Mitigations for Off-Site Mitigation Sites

Environmental impacts on other resource categories (beyond biological resources) are possible through implementing restoration activities at these three off-site mitigation sites. These impacts would result from transportation to and from the mitigation sites and from ground-disturbing activities on these sites to create habitat. Table 3.7-17 includes a discussion of the different resource categories and the potential for impacts from the off-site restoration activities.

Table 3.7-17 Potential Nonbiological Impacts of Off-Site Mitigation Activities

Resource Type	Potential for Impacts
Transportation	<p>No. During initial restoration of habitat areas, earthmoving equipment and other construction vehicles would be transported to the sites. These trips would be relatively few in number and would not be anticipated to cause traffic congestion near or en route to/from the sites. After restoration, there would be intermittent transportation to and from the mitigation sites. These trips would be intermittent and largely single vehicle trips and would not be anticipated to cause traffic congestion near or en route to/from the sites.</p>
Air Quality and Global Climate Change	<p>Yes, for criteria pollutant emissions. Construction vehicle exhaust and vehicle trips during management activities would contribute to diesel particulate emissions.</p> <p>Earthmoving, grading, and vegetation removal activities on the mitigation sites would result in fugitive dust during construction. However, the Central Valley Wye alternatives include application of site BMPs and the inclusion of IAMFs to reduce fugitive dust.</p> <p>Habitat restoration and re-vegetation would occur on offsite mitigation sites in rural areas and potential receptors sensitive to localized air impacts are anticipated to be distant. The establishment and management of these mitigation sites do not include any materials or activities that may subject receptors to objectionable odors.</p> <p>Vehicle trips and the use of mowers and other machinery associated with the establishment and management of the mitigation sites would contribute to GHG emissions. However, these activities would be short term during construction and intermittent afterwards and, as stated in Section 3.3, Air Quality and Global Climate Change, the increase in the construction GHG emissions of the Central Valley Wye alternatives generated during construction would be offset by the net GHG reductions during operation.</p>
Noise and Vibration	<p>No. Restoration activities may result in noise and vibration impacts from vehicles, heavy equipment, mowers, and other small machinery. These activities would occur in a limited capacity, and for a short duration in comparison with the overall construction noise of the full Central Valley Wye alternatives. As these sites are located in a rural environment, sensitive receptors are generally distant and thus, human receptors would not be exposed to the generation of noise levels in excess of established standards or local noise ordinances</p>
Electromagnetic Fields and Electromagnetic Interference	<p>No. No large electrical equipment would be installed or removed at the mitigation sites and no ongoing radio or electrical transmissions would be required at the mitigation sites. Therefore, no electromagnetic fields would be generated that could cause electromagnetic interference.</p>
Public Utilities and Energy	<p>No. No existing energy infrastructure would be affected or required for the mitigation sites. The removal of existing irrigation systems, removal of agricultural plantings, and removal of any existing structures on the mitigation sites would generate small quantities of solid waste. These quantities are expected to be relatively small in the context of the total solid waste generated for construction of the Central Valley Wye alternatives and local landfills have adequate capacity to accept any waste materials that would be hauled from the sites.</p> <p>At mitigation sites where irrigation infrastructure is currently in place, the existing irrigation water supply may be temporarily used. Water supply uses may include regular watering of native plantings to facilitate vegetation establishment and growth. Once success criteria have been met, the irrigation system would be removed and the watering efforts would cease. During this period, water use is not expected to exceed current water use patterns required for the existing agricultural uses. After establishment, these sites would not require irrigation water, and as such would increase the amount of water available for downstream uses. No irrigation facility would be removed or added that would affect existing water supply for downstream water customers.</p> <p>Mitigation sites would not require construction or expansion of wastewater treatment facilities or stormwater drainage facilities.</p>

Resource Type	Potential for Impacts
Hydrology and Water Resources	<p>No. Restoration activities at mitigation sites could result in channel/basin excavation, wetland and upland habitat enhancement and re-vegetation (hydroseed/plantings), channel enhancement and stabilization (installation of large woody debris, excavation of pools), and installation of erosion measures.</p> <p>As stated in Section 3.8, Hydrology and Water Resources, construction BMPs would be used to minimize or avoid discharge of sediment from construction activities to waterways.</p> <p>Activities at mitigation sites would not include actions that would deplete groundwater supplies or interfere with groundwater recharge, such as creating an increase in impervious surfaces. Temporary construction activities associated with mitigation measures would not alter drainage patterns to a degree that would result in flooding or exceed the capacity of stormwater drainage facilities.</p>
Geology, Soils, Seismicity, and Paleontological Resources	<p>No. Restoration of the mitigation sites would not expose people or structures to potential impacts from the ruptures of an earthquake, strong seismic ground shaking, seismic-related ground failure, or landslides because no structures are proposed as part of the mitigation.</p> <p>Excavation and vegetation removal could result in soil erosion. However, erosion control measures would be implemented that would prevent impacts from soil erosion and landslides. No structures are proposed that could be affected by unstable soils, lateral spreading, subsidence, liquefaction, or collapse.</p> <p>Ground-disturbing activities associated with the restoration of mitigation sites could result in impacts on known and previously unknown paleontological deposits. The design of the Central Valley Wye alternatives includes effective measures to engage a paleontological resource specialist for direct monitoring during construction, and provisions to halt construction if paleontological resources were found. These measures would avoid and reduce the potential loss of valuable paleontological resources.</p>
Hazardous Materials and Wastes	<p>No. The establishment and management of off-site mitigation lands, including agricultural infrastructure removal, operation of heavy equipment, and use of herbicides could result in a temporary increase in the transportation, use, and storage of hazardous materials.</p> <p>Demolition of existing structures is unlikely, however, if needed, may result in a temporary increase in waste disposal. However, structures likely to be removed would be small in scale, such as agricultural infrastructure involving wood, wire, metal, piping, and concrete materials and are not anticipated to contain large amounts of hazardous materials.</p> <p>Facilities and construction sites that use, store, generate, or dispose of hazardous materials or wastes and hazardous material/waste transporters are required to maintain plans for warning, notification, evacuation, and site security under stringent regulations (see Section 3.10, Hazardous Materials and Wastes). Routine transport, use, storage, and disposal of hazardous materials are governed by numerous laws, regulations, and ordinances, thereby reducing the risk of accidental spills or releases.</p>
Safety and Security	<p>No. These mitigation sites would not be open to the public and there would be no safety and security issues related to their establishment and management.</p>
Socioeconomics and Communities	<p>No. These use of these off-site mitigation sites would not divide an established community or displace housing or businesses. These sites do not presently contain public facilities that would require relocation and would not affect the economy through changes in changes in property tax or sales tax revenues. If these sites are presently in agricultural production, their removal from production may result in minor changes to the agricultural economy and job base.</p>
Land Use and Development	<p>No. These mitigation sites would not conflict with any applicable land use plans, policies, or regulations. As these sites are presently agricultural or range land, their protection from development to use for biological resource mitigation would not create new incompatible land uses.</p>

Resource Type	Potential for Impacts
Agricultural Farmland	<p>Yes. The partial or complete conversion of these mitigation sites to biological habitat could result in the loss of existing farmland or rangeland, including designated Important Farmland.</p> <p>It is not anticipated that there would be any required changes to Williamson Act contracts because the preservation of the land through the use conservation easements and acquisition of the property would not threaten or violate the terms of most of the Williamson Act contracts.</p>
Parks, Recreation, and Open Space	<p>No. No impacts on parks and recreation would occur because these measures would not prevent the use of parks or recreation areas, acquire any current public open-space areas, create a barrier to the access of any park or recreation area, result in acquisition of a recreation resource, increase the use of existing neighborhood and regional parks, or result in the alteration of existing recreational facilities.</p>
Aesthetics and Visual Resources	<p>No. No structures are needed or proposed for the mitigation sites and no lighting would be used. Therefore, none of the mitigation activities would block views or be sources of nighttime glare or light.</p>
Cultural Resources	<p>Yes, for archaeological resources, if such resources were demolished or altered. Ground-disturbing activities associated with the restoration of mitigation sites could result in impacts on known and previously unknown archaeological deposits. These resources may be eligible for the CRHR or the NRHP.</p> <p>The eligibility of historic architectural resources on these mitigation sites has not yet been evaluated and would take place prior to construction. Existing structures including agricultural outbuildings and irrigation infrastructure could be found to be eligible for the CRHR or the NRHP. Existing project design features and legal requirements would prevent the destruction or unauthorized alteration of any such architectural resources.</p>

Source: Authority, 2018

BMP = best management practice

CRHR = California Register of Historical Resources

GHG = greenhouse gas

IAMF = impact avoidance and minimization feature

NRHP = National Register of Historic Places

For potential air quality impacts related to criteria pollutants, the following mitigation measures would be implemented:

- AQ-MM#1: Reduce Criteria Exhaust Emissions from Construction Equipment
- AQ-MM#2: Reduce Criteria Exhaust Emissions from On-Road Construction Vehicles
- AQ-MM#4: Offset Construction Emissions through a San Joaquin Valley Air Pollution Control District Voluntary Emission Reduction Agreement

See Section 3.4 for more information on these mitigation measures and how they reduce impacts. With implementation of these mitigation measures, it is anticipated that criteria pollutant emission association with the off-site mitigation sites would effectively reduce potential impacts.

For potential impacts on agricultural farmland the following mitigation measures would be implemented:

- AG-MM#1: Conserve Important Farmland (Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland)

While this mitigation measure would reduce the impact of the conversion of farmland at the mitigation sites, it may not completely avoid it and a net loss of Important Farmland may occur. This conversion is not considered a new impact, but is captured in Impact AG#2: Permanent Conversion of Important Farmland to Nonagricultural Use. As noted in Section 3.14, agricultural farmland has been converted to nonagricultural uses on a large scale throughout the San Joaquin Valley as a result of development pressures, and because agricultural farmland cannot be created, the loss of any such land is

considerable. This impact is unavoidable and no additional mitigation is possible. For more information, refer to Section 3.14.

The potential impacts on cultural resources of the establishment and management of the mitigation sites is captured in two impacts discussed in Section 3.17, Cultural Resources: Impact CUL#1: Permanent Disturbance of Unknown Archaeological Sites, and Impact CUL#5: Common Impacts on Archaeological Resources. The following mitigation measures would reduce potential impacts of the off-site mitigation sites.

- CUL-MM#1: Amend Archaeological and Built Environment Treatment Plans
- CUL-MM#2: Mitigate Adverse Effects to Archaeological and Built Environment Resources Identified During Phased Identification. Comply with the Stipulations Regarding the Treatment of Archaeological and Historic Built Resources in the PA and MOA
- CUL-MM#3: Halt Work in the Event of an Archaeological Discovery and Comply with the PA, MOA, ATP, and all State and Federal Laws, as Applicable

In conclusion, there are no new impacts or unique associated with the establishment and management of the off-site mitigation areas that have not already been evaluated and addressed in other sections of this Final Supplemental EIR/EIS.

BIO-MM#5: Conduct Pre-construction Surveys for Vernal Pool Wildlife Species

Prior to any ground-disturbing activities, the Project Biologist will conduct an aquatic habitat assessment and survey for vernal pool wildlife species in seasonal wetlands and vernal pools that occur within both the Work Area and the area extending 250 feet from the outer boundary of the Work Area where access is available, consistent with USFWS vernal pool survey protocols. The Project Biologist will visit these areas after the first rain event of the season to determine whether seasonal wetlands and vernal pools have been inundated. A seasonal wetland/vernal pool will be considered to be inundated when it holds greater than 3 cm of standing water 24 hours after a rain event. Approximately two weeks after the pools have been determined to be inundated, the Project Biologist will conduct surveys in appropriate seasonal wetland and vernal pool habitats. The Project Biologist will submit a report to the Authority within 30 days of completing the work. BIO-MM#5 would have temporary impacts on listed vernal pool branchiopods due to take of a few individuals; however, the surveys are minimally invasive and would not result in additional physical disturbance outside the project footprint.

This mitigation measure is anticipated to be effective because it would identify and document vernal pool fauna and habitat within the project footprint, and guide the mitigation for unavoidable impacts on vernal pool fauna within the project footprint. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#6: Implement Seasonal Vernal Pool Work Restriction

To the extent feasible, ground-disturbing activities will not occur within 250 feet of vernal pools or seasonal wetlands during the rainy season (October 15 to April 15). In the event ground-disturbing activities are to occur within the buffer area during the rainy season, such activities should, to the extent feasible, be undertaken when the aquatic features are not inundated. BIO-MM#6 would be beneficial to listed vernal pool branchiopods and special-status amphibians because it would minimize the chance of loss of vernal pool branchiopods and special-status amphibians. Implementing a seasonal work restriction would not result in additional physical disturbance outside the project footprint.

This is anticipated to be effective because it protects suitable aquatic habitat for special-status vernal pool branchiopods and other vernal-pool-dependent species during the rainy season, when vernal pool fauna are active in suitable habitat. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#7: Implement and Monitor Vernal Pool Avoidance and Minimization Measures Within Temporary Impact Areas

To the extent feasible, impacts to vernal pools in Work Areas outside of the permanent right-of-way will be avoided. The Project Biologist will install and maintain exclusionary fencing to prevent impacts to

vernal pools from construction activities. When avoidance of impacts to vernal pools is not feasible, the construction activity will be scheduled to occur in the dry season, where feasible. Prior to the initiation of a ground-disturbing activity occurring during the dry season, the Project Biologist will collect a representative sampling of soils from the affected vernal pools to obtain viable plant seeds and vernal pool branchiopod cysts. After collecting soil, the Project Biologist may also put rinsed gravel in the vernal pools and cover with geotextile fabric to minimize damage to the soils and protect the pools' contours, as provided by regulatory authorizations issued under FESA.

The soils containing seeds and cysts may later be returned to the affected pool after work has been completed or incorporated into other vernal pools, as provided by regulatory authorizations issued under FESA. BIO-MM#7 would have no impacts on vernal pool branchiopods because ground disturbance would not be required. Overall, implementation of this measure would be beneficial to listed vernal pool branchiopods because it would minimize the chance of loss of vernal pool branchiopods.

This mitigation measure is anticipated to be effective because it implements protective measures that prevent suitable aquatic habitat for special-status vernal pool branchiopods and other vernal-pool-dependent species from being affected within the temporary impact areas. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#8a: Work Windows for Fish

Near-water and in-water work will be conducted within specified work windows based on date, channel inundation, and water temperature. Work windows will include the general time periods when effects on migrating juvenile and adult California Central Valley steelhead and Central Valley spring-run Chinook salmon would be minimal. Additionally, in-water work will be allowed when salmonid use is temperature limited (defined as one week of average water temperature of 75°F or more); and work will be allowed in the channel and on the floodplain when channels are dry or ponded.

Near-water work is defined as construction activities other than impact pile driving occurring within the floodplain but not in the wetted channel (i.e., located between the wetted channel and the landside toe of the bordering levees). In-water work is defined as all in-water work within the wetted channel and impact pile driving within the floodplain.

For near-water work at the San Joaquin River and Eastside Bypass, the construction work window will be April 30 through December 1. For in-water work, the construction work window will be June 1 through December 1.

If channels are dry or ponded (i.e., lack continuous flow), or water temperatures average 75°F or more for seven consecutive days, in-water and near-water work can proceed outside of the work windows stated above. NMFS will be consulted to verify work can proceed if these conditions are present during construction.

This mitigation measure is anticipated to be effective because it implements protective work windows for fish that minimize impacts on fish by focusing construction during periods that fish are not present. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#8b: Pile Driving Underwater Sound Pressure Measures

If in-water pile driving occurs in the wetted channel during the in-water work window, one of the following means of attenuating underwater sound will be implemented:

- Cofferdam—a cofferdam will be established around the pile driving area to keep it dewatered during impact pile driving.
- Air barrier—a pipe with a larger diameter than the driven pile will be set to keep the area between the pile and the pipe completely dewatered with an air barrier.
- Contained bubble curtain—a bubble curtain will be maintained around the driven pile.

NMFS will be consulted regarding the measure(s) to install piles and notified of the selected measure(s).

During implementation of any of these measures and installation of driven piles, underwater sound monitoring will be conducted. If underwater sound monitoring indicates that underwater sound exceeds

206 peak strike decibels (estimated at 10 meters from the driven pile), or that the daily accumulated sound exposure level is calculated to have exceeded 187 decibels (estimated at 10 meters from the driven pile), NMFS will be notified (within 24 hours) and construction will cease until corrections are made to the attenuation apparatus/protocol so that the thresholds are not exceeded.

This mitigation measure is anticipated to be effective because it implements protective measures for fish that minimize impacts on fish by measuring and preventing harmful levels of sound. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described as part of the Central Valley Wye alternatives.

BIO-MM#8c: Water Diversion Measures for Fish

Construction within waterways may require temporary dewatering to minimize potential impacts on fisheries and minimize potential erosion, sediment loss, scour, or increases in turbidity. If deemed necessary by NMFS, the contractor will construct cofferdams around the proposed work area or areas. Cofferdams will be kept to the minimum footprint necessary. The cofferdams will be constructed of sheet piles, gravel-filled sandbags, or comparable material. The temporary fill used to construct the cofferdam will be kept to the minimum footprint necessary. The cofferdams will be constructed over visqueen or similar material to facilitate clean-up and removal of materials. Upon completion of construction, all temporary fills associated with the dewatering including sandbags and/or rock will be removed and the area restored to pre-construction contours.

During implementation of any of these measures and installation of driven piles, underwater sound monitoring will be conducted. If underwater sound monitoring indicates that underwater sound exceeds 206 peak strike decibels (estimated at 10 meters from the driven pile), or that the daily accumulated sound exposure level is calculated to have exceeded 187 decibels (estimated at 10 meters from the driven pile), NMFS will be notified (within 24 hours) and construction will cease until corrections are made to the attenuation apparatus/protocol so that the thresholds are not exceeded.

This mitigation measure is anticipated to be effective because it implements protective measures for fish that minimize impacts on fish by creating protective structures. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#8d: Fish Rescue Plan

If construction requires the installation of cofferdams or dewatering, a fish rescue plan will be developed by the Authority in coordination with NMFS. The fish rescue plan will be approved by NMFS prior to starting work that may result in fish stranding. The plan will contain the following content:

- **Biologist Qualifications**—Fish rescue and relocation will be conducted by a qualified fisheries biologist with a current CDFW Scientific Collecting Permit.
- **Timing and Approach**—The fish rescue effort will be implemented during the dewatering of the areas behind the cofferdam(s) and will involve capture and return of those fish to suitable habitat within the adjacent waterways. The area will first be seined, followed by electrofishing to remove fish that are behind the cofferdam. A fisheries biologist will be on-site during initial pumping (dewatering) to confirm compliance with the fish rescue plan.
- **Minimization Measures**—Implementation of the fish rescue plan will include measures to minimize potential adverse effects on listed fish species (if present) associated with fish stranding during dewatering activities. The fish rescue plan will also contain methods for minimizing the risk of stress and mortality from capture and handling of fish removed from the construction sites and returned to adjacent waterways.
- **Monitoring and Reporting Requirements**—The progress of dewatering will be monitored and allow for the fish rescue to occur prior to completely closing the cofferdam and again when water depths reach approximately 2 feet. NMFS will be notified at least 48 hours prior to the start of fish rescue efforts. Information on the species, number, and sizes of fish collected will be recorded during the fish rescue and provided in a letter report to be submitted to NMFS within 30 days of the fish rescue.

This mitigation measure is anticipated to be effective because it develops and implements a fish rescue plan to relocate fish from work areas within coffer dams to unaffected aquatic habitat. BIO-MM#8d would have impacts on special-status fish through disruption of their normal patterns and movements. Overall, the mitigation measure would be beneficial to fish because it would minimize the chance of injury or death. Implementation of this mitigation measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for additional impacts on biological or other resources.

BIO-MM#9a: Work Stoppage

In the event that any special-status wildlife species is found in a Work Area, the Project Biologist will have the authority to halt work to prevent the death or injury to the species. Any such work stoppage will be limited to the area necessary to protect the species and work may be resumed once the Project Biologist determines that the individuals of the species have moved out of harm's way or the Project Biologist has relocated them out of the Work Area.

Any such work stoppages and the measures taken to facilitate the removal of the species, if any, will be documented in a memorandum prepared by the Project Biologist and submitted to the Authority within two business days of the work stoppage.

BIO-MM#9b: Conduct Pre-construction Surveys for Special-Status Reptile and Amphibian Species

Prior to any ground disturbing activities, the Project Biologist will conduct pre-construction surveys in suitable habitat to determine the presence or absence of special-status reptiles and amphibian species within the Work Area. Surveys will be conducted no more than 30 days before the start of ground disturbing activities in a Work Area. The results of the pre-construction survey will be used to guide the placement of environmentally sensitive areas or conduct species relocation. This mitigation measure is anticipated to be effective because it identifies and documents special-status reptile and amphibian species and their habitat within the project footprint, informing methods for the species' avoidance, protective fencing placement, and relocation activities. Implementation of this measure would have temporary impacts on special-status reptiles and amphibians resulting from take (harassment) of a few individuals, if identified during surveys. The sampling is an assessment that would be useful in understanding the species present and would help guide the implementation of the performance standards to be consistent with other mitigation requirements. In general, the surveys are minimally invasive and would not result in physical disturbance outside the project footprint. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#10: Implement Avoidance and Minimization Measures for Special-Status Reptile and Amphibian Species

The Project Biologist will monitor all initial ground disturbing activities that occur within suitable habitat for special-status reptiles and amphibians, and will conduct clearance surveys of suitable habitat in the Work Area on a daily basis. If a special-status reptile or amphibian is observed, the Project Biologist will identify actions, to the extent feasible, sufficient to avoid impacts on the species and to allow it to leave the area on its own volition. Such actions may include establishing a temporary environmentally sensitive area in the area where a special-status reptile or amphibian has been observed and delineating a 50-foot no-work buffer around the environmentally sensitive area. In circumstances where a no-work buffer is not feasible the Project Biologist will relocate any of the species observed from the Work Area. For federal or state-listed species, relocations will be undertaken in accordance with regulatory authorizations issued under FESA and/or CESA. This mitigation measure is anticipated to be effective because it implements wildlife exclusion fencing around the construction area, clearance surveys and construction monitoring for special-status reptile and amphibian species, avoidance of the species if present, and relocation of any individuals within the active construction area to areas outside of the footprint that otherwise could be harmed by construction activities. Implementation of this measure would have temporary impacts on special-status reptiles and amphibians resulting from take (harassment) of individuals, if identified during clearance surveys or monitoring. Surveys, construction monitoring, and relocation are minimally invasive and would not result in additional physical disturbance outside the project footprint. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#11: Conduct Pre-construction Surveys for California Tiger Salamander

Prior to any ground-disturbing activity scheduled to occur during the dry season (June 1–October 15), the Project Biologist will conduct a pre-construction survey of modeled suitable upland habitat within the Work Area and extending out 100 feet from the boundary of the Work Area, where access is available, to determine whether Central California tiger salamanders are present. Such surveys will be conducted no earlier than 30 days prior to ground-disturbing activities in the Work Area. The Project Biologist may employ the use of conservation dogs (scent dogs) to augment focused species surveys using methods described in Wasser et al. 2004, Smith et al. 2003, and/or Filazzola et al. 2017. The Project Biologist will coordinate with USFWS and CDFW before using conservation dogs.

In the event that ground-disturbing activities are scheduled to occur during the rainy season (October 15–June 1), in addition to upland surveys, the Project Biologist will survey potential breeding habitat in the Work Area for the presence of California tiger salamander using methods from the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (USFWS and CDFG 2003) or other more recent guidelines, if available.

This mitigation measure is anticipated to be effective because it identifies and documents California tiger salamander individuals and their habitat within the project footprint, informing the species' avoidance, protective fencing placement, and mitigation. This measure would have temporary impacts on California tiger salamanders resulting from take (harassment) of a few individuals, if identified during surveys. The surveys are minimally invasive and would not result in additional physical disturbance outside the project footprint. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#12: Implement Avoidance and Minimization Measures for California Tiger Salamander

Prior to any ground-disturbing activity the Project Biologist will install wildlife exclusion fencing along the boundary of the Work Area containing California tiger salamander modeled suitable habitat or will implement similar measures as otherwise required pursuant to regulatory authorizations issued under FESA and/or CESA. Wildlife exclusion fencing must be trenched into the soil at least 4 inches in depth, with the soil compacted against both sides of the fence for its entire length to prevent California tiger salamanders from passing under the fence, and must have intermittent exit points. During the dry season (June 1–October 15), the Project Biologist will inspect the wildlife exclusion fencing at least twice weekly on non-consecutive days and on a daily basis between October 15 and June 1. Wildlife exclusion fencing will be installed with turnarounds at access points to direct California tiger salamanders away from gaps in the fencing.

To the extent feasible, construction activities will not be conducted within 250 feet of areas identified as occupied California tiger salamander breeding habitat during the rainy season (October 15–June 1). However, construction activities may begin within such areas after April 15 if the breeding habitat is no longer inundated.

This mitigation measure is anticipated to be effective because it implements fencing of the construction area that would exclude the California tiger salamander and prevent harm of the species during construction. The seasonal restriction of construction protects the species during the wet season, when individual salamanders inhabit aquatic habitat at high densities and are most active (e.g., breeding, egg laying, and developing). Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#13: Conduct Emergence and Larval Surveys for Western Spadefoot

The project biologist or designee (qualified herpetologist) would conduct pre-construction emergence and larval surveys for western spadefoot during the fall and winter rainy season. Emergence surveys would be conducted within the appropriate period(s) after precipitation events as evaluated by a qualified herpetologist and would be conducted partially in tandem with California tiger salamander surveys. Potential breeding depressions, including vernal pools, would be surveyed for western spadefoot larvae concurrently with special-status vernal pool branchiopod and California tiger salamander pre-construction surveys. Adults found within the project footprint during emergence surveys would be relocated to an appropriate area adjacent to another pool suitable for breeding. The project biologist would document compliance after surveys are complete.

This mitigation measure is anticipated to be effective because it identifies and documents western spadefoots within the project footprint and relocates individuals to suitable habitat outside of the project footprint to avoid mortality or injury of individuals from construction activities. BIO-MM#13 would have temporary impacts on western spadefoot because the sampling requires dip netting ponds and temporarily removing spadefoots for verification. This activity could result in a disruption of normal behavior. The sampling is an assessment that would be useful in understanding the species present. Overall, the surveys would be minimally invasive and would not result in additional physical disturbance outside the project footprint.

BIO-MM#14: Conduct Protocol-level Surveys for Blunt-Nosed Leopard Lizard

No more than 12 months before the start of any ground-disturbing activity, in accordance with authorizations under the FESA, a habitat assessment of the project footprint will be conducted by the Project Biologist in suitable habitat for the blunt-nosed leopard lizard to identify all habitat suitable for blunt-nosed leopard lizard within the project footprint. Within 12 months prior to any ground-disturbing activity, the Project Biologist will conduct surveys for blunt nosed leopard lizard in blunt-nosed lizard suitable habitats (e.g., areas containing burrows) within the Work Area. These surveys will be conducted in accordance with the *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard* (CDFW 2019), or other more recent guidelines, if available.

In instances where blunt-nosed leopard lizards are observed at any time during presence/absence surveys, pre-construction surveys, or construction monitoring, USFWS and CDFW will be notified of the occurrence within 2 business days. BIO-MM#14 would have no impacts on blunt-nosed leopard lizards because the survey methods are noninvasive and do not require handling individuals or other habitat disturbance. Overall, this measure would be beneficial to blunt-nosed leopard lizards because it would minimize the chance of injury or death of blunt-nosed leopard lizards.

This mitigation measure is anticipated to be effective because it identifies and documents blunt-nosed leopard lizard individuals and their habitat within the project footprint, informing the species' avoidance, protective fencing placement, and mitigation. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#15: Implement Avoidance Measures for Blunt-Nosed Leopard Lizard

For Work Areas where surveys confirm that blunt-nosed leopard lizards are absent, the Project Biologist may install wildlife exclusion fencing along the perimeter of the Work Area. The wildlife exclusion fencing will be monitored daily and maintained.

During the non-active season for blunt-nosed leopard lizards (October 16–April 14), to the extent feasible, ground-disturbing activities will not occur in areas where blunt-nosed leopard lizards or signs of the species have been observed and that contain burrows suitable for blunt-nosed leopard lizards. If ground-disturbing activities are scheduled during the non-active season, suitable burrows identified during the surveys will be avoided through establishment of 50-foot no-work buffers. The Project Biologist may reduce the size of the no-work buffers if information indicates that the extent of the underground portion of burrows is less than 50 feet.

During the active season when blunt-nosed leopard lizards are moving above ground (April 15–October 15), the following measures will be implemented in areas where blunt-nosed leopard lizards or signs of blunt-nosed leopard lizards have been observed:

- **Establishment of No-Work Buffers.** The Project Biologist will establish, monitor, and maintain 50-foot no-work buffers around burrows and egg clutch sites identified during surveys. The 50-foot no-work buffers will be established around burrows in a manner that allows for a connection between the burrow site and the suitable natural habitat adjacent to the project footprint so that blunt-nosed leopard lizards and/or hatchlings may leave the area after eggs have hatched. Construction activities will not occur within the 50-foot no-work buffers until such time as the eggs have hatched and blunt-nosed leopard lizards have left the area.
- **Fencing of Work Areas.** Prior to installing wildlife exclusion fencing, the Project Biologist will confirm that no blunt-nosed leopard lizards are present within a Work Area by conducting focused blunt-nosed leopard lizard observational surveys for 12 days over the course of a 30- to 60-day period. At

least one survey session will occur over 4 consecutive days. These observational surveys may be paired with scent detection dog surveys for blunt-nosed leopard lizard scat.

- Within 3 days of completing these surveys with negative results, wildlife exclusion fencing will be installed in a configuration that accounts for burrow locations and enables blunt-nosed leopard lizards to leave the Work Area. The following day, the Project Biologist will conduct an observational survey. If no blunt-nosed leopard lizards are observed, the Project Biologist will install additional wildlife exclusion fencing to further enclose the Work Area. This Work Area will be monitored daily while the wildlife exclusion fencing is in place.

If blunt-nosed leopard lizards are observed prior to installing the last of the wildlife exclusion fencing, the Project Biologist will continue observational surveys until the lizard is observed leaving the Work Area or until 30 days elapse with no blunt-nosed leopard lizards observations within the Work Area. This mitigation measure is anticipated to be effective because it identifies and documents blunt-nosed leopard lizard individuals and their habitat within a 50-foot buffer around the project footprint and work areas, informing the species' avoidance, protective fencing placement, and mitigation. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#16: Conduct Western Pond Turtle Pre-construction Surveys and Relocation

Prior to ground-disturbing activities, conduct pre-construction surveys for western pond turtles to determine the presence or absence of western pond turtles within the project footprint. If western pond turtles were found within the project footprint, conduct daily clearance surveys prior to the initiation of any construction activities.

If a western pond turtle nest would be affected by ground-disturbing activities, relocate the eggs according to relocation protocol coordinated with CDFW for all life stages of western pond turtles. Relocate hatchling and adult turtles outside of the project footprint in suitable habitat. The project biologist would submit a report to the Authority documenting compliance.

This mitigation measure is anticipated to be effective because it identifies and documents western pond turtle within the project footprint and relocates individuals to suitable habitat outside of the project footprint to avoid mortality or injury of individuals from construction activities. BIO-MM#16 would have impacts on western pond turtles. The act of surveying may disrupt their normal behavior but the impacts would be temporary. This measure would be beneficial to western pond turtles because it would minimize the chance of injury or death of western pond turtles. Overall, the surveys would be minimally invasive and would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#17: Conduct Western Pond Turtle Monitoring

During ground-disturbing activities, the project biologist would observe all construction activities within habitat that supports populations of western pond turtles identified during the pre-construction surveys described under BIO-MM#16. If environmentally sensitive areas were deemed necessary, the project biologist would conduct a clearance survey for western pond turtles prior to the time the fence is installed. If necessary, conduct daily clearance surveys prior to construction. The project biologist would submit a report to the Authority documenting compliance.

This mitigation measure is anticipated to be effective because it identifies and documents western pond turtles within the project footprint, installs turtle exclusion fencing to prevent turtle from entering the construction area, and routinely monitors and relocates individuals to suitable habitat outside of the project footprint to avoid mortality or injury of individuals from construction activities. BIO-MM#17 would result in no impacts on western pond turtles because no ground disturbance is required. Overall, this measure would be beneficial to western pond because it would minimize the chance of injury or death of western pond turtles. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#18: Implement Western Pond Turtle Avoidance and Relocation

Prior to ground-disturbing activities, if a western pond turtle nesting area was present and would be affected by ground-disturbing activities as determined by the project biologist during the pre-construction surveys described under BIO-MM#16, the contractor would avoid western pond turtle nesting areas by at least 50 feet. If avoidance is not feasible, as determined by the Authority or its designee, the project biologist would coordinate with CDFW to identify where to relocate western pond turtles. The project biologist would coordinate specific trapping and relocation protocols with CDFW for adults, hatchlings, and eggs prior to ground-disturbing activities. The contractor would not move eggs or hatchlings without prior coordination with the project biologist and concurrence from CDFW. The project biologist would document compliance on a weekly basis or as determined appropriate pending construction progress.

This mitigation measure is anticipated to be effective because it identifies and documents western pond turtles within the construction area, and traps and relocates individuals to suitable habitat outside of the construction area to avoid mortality or injury of individuals from construction activities. BIO-MM#18 would have temporary impacts on western pond turtles from relocation that would disrupt their normal behavior and movements. Overall, relocation would allow the Central Valley Wye alternatives to avoid the loss of western pond turtles. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#19: Avoid Suitable Giant Garter Snake Habitat

The contractor would avoid impacts on giant garter snake aquatic habitat (i.e., freshwater marsh, natural watercourses, open water, and rice field within mapped range of species) in the project footprint, but outside of permanent or temporary impact areas, by installing environmentally sensitive area fencing as directed by the project biologist or biological monitor(s) (consistent with BIO-MM#1a). Protective fencing would be installed along the upper bank of aquatic habitat features within the project footprint (including temporary and permanent access roads). In addition, all construction equipment service and refueling procedures would be conducted at least 100 feet away from giant garter snake aquatic habitat.

This mitigation measure is anticipated to be effective because it identifies giant garter snake habitat within the permanent and temporary impact areas, installs fencing to exclude the species from construction areas, and protects giant garter snakes and their habitat from pollutant introduction to avoid mortality or injury of individuals from construction activities. These measures also avoid giant garter snake habitat degradation from construction activities and pollutants. BIO-MM#19 would result in no impacts on giant garter snakes because no ground disturbance would be required. Overall, this measure would be beneficial to giant garter snakes because it would minimize the chance of injury or death of giant garter snakes. Implementation of this mitigation measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#20: Conduct Work in Giant Garter Snake Habitat during the Active Season

All construction activities affecting giant garter snake habitat would be conducted between May 1 and October 1, which is the active period for this species. Conducting construction activities during this period reduces the likelihood of mortality since snakes are expected to actively move and avoid danger. If construction activities in giant garter snake habitat were necessary between October 2 and April 30, the USFWS Sacramento Office would be contacted to determine whether additional take avoidance and minimization measures are necessary. Recommended measures would be implemented. After April 15, any dewatered habitat would remain dry for at least 15 consecutive days before workers excavate or fill the dewatered habitat.

This mitigation measure is anticipated to be effective because it restricts construction activities in giant garter snake habitat to occur during the species' active season when individuals are motile and can move away from construction equipment, and allows time for snakes to move from dewatered habitat before construction disturbance occurs. Both components of this measure avoid mortality or injury of individuals from construction activities. BIO-MM#20 would not have impacts on giant garter snakes, because the measure requires construction during a time when giant garter snakes are more active and can more easily move out of the project footprint. Overall, this measure would be beneficial to giant garter snakes

because it would minimize the chance of injury or death of giant garter snakes. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#21: Conduct Pre-construction Surveys and Implement Minimization Measures for Giant Garter Snakes

Prior to any ground-disturbing activity that occurs within 200 feet of suitable giant garter snake aquatic habitat, the Project Biologist will conduct a pre-construction survey for giant garter snake no earlier than 24 hours before the commencement of the activity. The Project Biologist will remain on-site for the duration of the ground-disturbing activity. To the extent feasible, wildlife exclusion fencing will be installed along the upper bank of suitable aquatic habitat located within 200 feet of the boundary of the Work Area (provided access to such areas is available) to prevent snakes from moving into upland areas within the Work Area. If a giant garter snake is encountered during construction, the Project Biologist will direct that work that has the potential to injure the snake be stopped until it is determined that work can continue without potential harm to the snake, or the snake moves out of the immediate Work Area on its own volition. Pre-construction surveys in Work Areas will be repeated whenever construction activity lapses for 2 weeks or more.

This mitigation measure is anticipated to be effective because it identifies and documents giant garter snakes within 200 feet of construction areas, installs exclusion fencing to prevent snakes from entering the construction area, and routinely monitors the construction area and surrounding 200 feet for giant garter snakes to avoid mortality or injury of individuals from construction activities. BIO-MM#21 would have no impacts on giant garter snakes because the survey methods are noninvasive and do not require disturbance of the snakes. Overall, this measure would be beneficial to giant garter snakes because it would minimize the chance of injury or death of giant garter snakes. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#22: Conduct Pre-construction Surveys for Blainville's Horned Lizards, San Joaquin Coachwhip, and Silvery Legless Lizards

Before the start of ground-disturbing activities, a biological monitor (designated by the project biologist) would conduct pre-construction surveys in suitable habitats within the species' range to determine the presence or absence of Blainville's horned lizards (California annual grassland, valley sink scrub, and ruderal), San Joaquin coachwhip, and silvery legless lizards (California annual grassland and valley sink scrub) within the project footprint. Surveys would be conducted no more than 30 days before the start of ground-disturbing activities and would be phased with build-out of the Central Valley Wye alternatives.

The results of the pre-construction survey would be used to guide the placement of the environmentally sensitive area and/or environmentally restricted area fencing.

This mitigation measure is anticipated to be effective because it identifies and documents Blainville's horned lizards, San Joaquin coachwhip, and silvery legless lizards within the project footprint, which would guide future monitoring and avoidance procedures to avoid mortality or injury of individuals from construction activities. BIO-MM#22 would have no impacts on Blainville's horned lizards, San Joaquin coachwhip, and silvery legless lizards because the survey is noninvasive and ground disturbance is not required. Overall, this measure would be beneficial to Blainville's horned lizards, San Joaquin coachwhip, and silvery legless lizards because it would minimize the chance of injury or death. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#23: Conduct Blainville's Horned Lizards, San Joaquin Coachwhip, and Silvery Legless Lizards Monitoring, Avoidance, and Relocation

During ground-disturbing activities, a biological monitor would observe all construction activities in habitat that supports Blainville's horned lizards, San Joaquin coachwhip, and silvery legless lizards as identified during the pre-construction surveys described under BIO-MM#22. If suitable habitat is present and environmentally sensitive areas or environmentally restricted areas are deemed necessary, the biological monitor would conduct a clearance survey within the area for Blainville's horned lizards, San Joaquin

coachwhip, and silvery legless lizards and wildlife exclusion fencing would be installed. If a Blainville's horned lizard is present during construction, the contractor would avoid the horned lizard, where feasible. Otherwise, the biological monitor would relocate Blainville's horned lizards, San Joaquin coachwhip, and silvery legless lizards found in the project footprint to an outside area approved by the CDFW. If necessary, clearance surveys would be conducted daily.

This mitigation measure is anticipated to be effective because it identifies and documents Blainville's horned lizards, San Joaquin coachwhip, and silvery legless lizards within the project footprint, installs exclusion fencing to prevent individual lizards from entering the construction area, and routinely monitors and relocates individuals to suitable habitat outside of the construction area to avoid mortality or injury of individuals from construction activities. BIO-MM#23 would have temporary impacts on Blainville's horned lizards, San Joaquin coachwhip, and silvery legless lizards from catching and relocating individuals, which would disrupt their normal behavior and movement patterns. Overall, this measure would minimize the potential of mortality to Blainville's horned lizards, San Joaquin coachwhip, and silvery legless lizards. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#24a: Conduct Pre-construction Surveys and Delineate Active Nest Buffers and Exclusion Areas for Breeding Birds

Prior to any ground-disturbing activity, including vegetation removal, scheduled to occur during the bird breeding season (February 1–September 1), the Project Biologist will conduct visual pre-construction surveys within the Work Area for nesting birds and active nests (nests with eggs or young) of non-raptor species listed under the MBTA and/or the Fish and Game Code.

In the event that active bird nests are observed during the pre-construction survey, the Project Biologist will delineate no-work buffers. No-work buffers will be set at a distance of 75 feet, unless a larger buffer is required pursuant to regulatory authorizations issued under the FESA and/or CESA. No-work buffers will be maintained until nestlings have fledged and are no longer reliant on the nest or parental care for survival or the Project Biologist determines that the nest has been abandoned. In circumstances where it is not feasible to maintain the standard no-work buffer, the no-work buffer may be reduced, provided that the Project Biologist monitors the active nest during the construction activity to ensure that the nesting birds do not become agitated. Additional measures that may be used when no-work buffers are reduced include visual screens and sound barriers.

This mitigation measure is anticipated to be effective because it would require identification and documentation of breeding bird nests during the breeding season. The buffers and subsequent nest monitoring prevent construction activities from disturbing nests while active, allowing young to develop and fledge. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described as part of the Central Valley Wye alternatives.

BIO-MM#24b: Conduct Pre-construction Surveys and Monitoring for Raptors

If construction or other vegetation removal activities are scheduled to occur during the breeding season for raptors (January 1 to September 1), no more than 14 days before the start of the activities, the Project Biologist will conduct pre-construction surveys for nesting raptors in areas where suitable habitat is present. Specifically, such surveys will be conducted in habitat areas within the Construction Footprint, and additional buffer areas, with the buffer distance depending on the potential for fully protected raptors to occur. Surveys for all raptors will be conducted within 500 feet of the boundary of the Construction Footprint, or within 0.5 mile of the boundary of the Construction Footprint for fully protected raptors, where access is available. If breeding raptors with active nests are found, the Project Biologist will delineate a 500-foot buffer (or as modified by regulatory authorizations for species listed under the FESA and/or CESA) around the nest to be maintained until the young have fledged from the nest and are no longer reliant on the nest or parental care for survival or until such time as the Project Biologist determines that the nest has been abandoned.

If fully protected raptors (e.g., white tailed-kite, golden eagle, American peregrine falcon, bald eagle) with active nests are found, the project biologist in conjunction with contractor would establish a 0.5-mile buffer around the nest to be maintained until the young have fledged from the nest or the nest fails (as

determined by the project biologist). Nest buffers may be adjusted if the Project Biologist determines that smaller buffers would be sufficient to avoid impacts to nesting raptors.

BIO-MM#24b would have temporary impacts on nesting raptors from the disruption or disturbance required during surveys. Overall, this measure would be beneficial and would allow the Central Valley Wye alternatives to avoid the removal of occupied nests.

This mitigation measure is anticipated to be effective because it would require identification and documentation of active raptor nests within 500 feet or 0.5 mile of the proposed construction area, establishes protective buffers from construction around active nests, and monitors the nests until they are inactive. The buffers and subsequent nest monitoring prevent construction activities from disturbing raptor nests while active, allowing young to develop and fledge. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#25a: Conduct Surveys and Implement Avoidance Measures for Active Tricolored Blackbird Nest Colonies

Prior to initiation of construction at any location within 300 feet of suitable nesting habitat, the Project Biologist with experience surveying for and observing tricolored blackbird will conduct pre-construction surveys to establish use of nesting habitat by tricolored blackbird colonies. Surveys will be conducted in suitable habitat within 300 feet of proposed construction areas, where access allows, during the nesting season (March 15–July 31).

If construction is initiated near suitable habitat during the nesting season, three surveys will be conducted within 15 days prior to construction, with one of the surveys within 5 days prior to the start of construction. If active tricolored blackbird nesting colonies are identified, construction activities will avoid the nesting colonies during the breeding season (March 15–July 31) to the extent practicable within 300 feet of the colony, consistent with the CDFW's *Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields in 2015* (CDFW 2015). This minimum buffer may be reduced in areas with dense forest, buildings, or other habitat features between the construction activities and the active nest colony, or where there is sufficient topographic relief to protect the colony from excessive noise or visual disturbance as determined by a Project Biologist experienced with tricolored blackbird. If tricolored blackbirds colonize habitat adjacent to construction after construction has been initiated, the Authority will reduce disturbance through establishment of buffers or sound curtains, as determined by the Project Biologist.

This mitigation measure is anticipated to be effective because it would require identification and documentation of active tricolored blackbird nests within proposed construction areas and establishes protective buffers. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#25b: Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat

The Authority will provide compensatory mitigation to offset impacts on tricolored blackbird. Compensatory mitigation will replace permanent loss of habitat with habitat that is commensurate with the type (nesting, roosting, and foraging) and amount of habitat lost. Suitable tricolored blackbird nesting habitat will be permanently protected or restored and managed at a ratio of 3:1 (protected or restored: affected) at a location subject to CDFW approval and in proximity to the nearest breeding colony observed within the past 15 years, if possible. Suitable breeding-season foraging habitat will be protected and managed at a ratio of 1:1 (protected: affected) at a location subject to CDFW approval. Suitable roosting habitat will be protected or restored at a ratio of 1:1 (protected: affected) if not occupied, and a ratio of 2:1 (protected: affected) if occupied by tricolored blackbirds. Compensatory mitigation will be provided using one or more of the methods described in the CMP.

This mitigation measure is anticipated to be effective because it provides a minimum compensatory mitigation standard for tricolored black-bird and the protection of suitable breeding and foraging habitat (i.e., 1:1 ratio). Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#4. No other secondary impacts are anticipated.

BIO-MM#25c: Bird Protection

Prior to final construction design, the Authority will ensure that the catenary system, masts, and other structures such as fencing, electric lines, communication towers and facilities are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) and Reducing Avian Collisions with Power Lines: State of the Art in 2012 (APLIC 2012). Applicable APLIC recommendations include, but are not limited to:

- Ensuring sufficient spacing of phase conductors to prevent bird electrocution
- Configuring lines to reduce vertical spread of lines and/or decreasing the span length if such options are feasible
- Marking lines and fences (e.g., Bird Flight Diverter for fencing and lines) to increase the visibility of lines and reduce the potential for collision. Where fencing is necessary, using bird compatible design standards to increase visibility of fences to prevent collision and entanglement.
- Installing perch guards to discourage avian presence on and near project facilities
- Minimizing the use of guywires. Where the use of guywires is unavoidable, demarcating guywires using the best available methods to minimize avian strikes (e.g., line markers).
- Reusing or co-locating new transmission facilities and other ancillary facilities with existing facilities and disturbed areas to minimize habitat impacts and avoid collision risks
- Structures will be monopole or dual-pole design versus lattice tower design to minimize perching and nesting opportunities. Communication towers will conform to Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning (UFWS 2018).
- Use of facility lighting that does not attract birds or their prey to project sites. These include using non-steady burning lights (red, dual red and white strobe, strobe-like flashing lights) to meet Federal Aviation Administration requirements, using motion or heat sensors and switches to reduce the time when lights are illuminated, using appropriate shielding to reduce horizontal or skyward illumination, and avoiding the use of high-intensity lights (e.g., sodium vapor, quartz, and halogen). Lighting will not be installed under viaduct and bridge structures in riparian habitat areas.

BIO-MM#25c would have no impact on birds or raptors because no direct disturbance would occur. Overall, the measure is protective and would be beneficial to raptors because it would minimize the chance of injury or death of raptors as a result of electrocution.

This mitigation measure is anticipated to be effective because it requires that infrastructure associated with the Central Valley Wye alternatives be designed to discourage perching and minimize the potential for collisions, ultimately reducing the possibility of birds being killed or injured by operations of the Central Valley Wye alternatives. Implementation of this measure would not trigger secondary environmental impacts because it would not change the scope, scale, or location of construction activities beyond those that have been described as part of the Central Valley Wye alternatives.

BIO-MM#26: Conduct Surveys for Swainson's Hawk Nests

Surveys must be performed no more than one year prior to the commencement of construction activities. The Project Biologist will conduct surveys for Swainson's hawk during the nesting season (March through August) within both the Work Area and a 0.5-mile buffer surrounding the Work Area, provided access to such areas is available. No sooner than 30 days prior to any ground disturbing activity, the Project Biologist will conduct pre-construction surveys of nests identified during the earlier surveys to determine if any are occupied. The initial nesting season surveys and subsequent pre-construction nest surveys will follow the protocols set out in the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee [SHTAC] 2000). This mitigation measure is anticipated to be effective because it would require identification and documentation of active Swainson's hawk nests within 0.5 mile of the proposed construction area, and

establishes protective buffers from construction around active nests. The buffers and subsequent nest monitoring prevent construction activities from disturbing raptor nests while active, allowing young to develop and fledge. Implementation of the mitigation measure would have temporary impacts on Swainson's hawks from the disruption or disturbance required to survey for them. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#27: Implement Avoidance and Minimization Measures for Swainson's Hawk Nests

Any active Swainson's hawk nests (defined as a nest used one or more times in the last 5 years) found within 0.5 mile of the boundary of the Work Area during the nesting season (February 1 to September 1) will be monitored daily by the Project Biologist to assess whether the nest is occupied. If the nest is occupied, the Project Biologist will establish no-work buffers following CDFW's Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California (CDFG 1994), and the status of the nest will be monitored until the young fledge or for the length of construction activities, whichever occurs first. Adjustments to the buffer(s) may be made in consultation with CDFW.

If an occupied Swainson's hawk nest tree is to be removed, an incidental take permit under CESA will be obtained and impacts will be minimized and fully mitigated. This mitigation measure is anticipated to be effective because it would require identification and documentation of active raptor nests within 0.5 mile of the proposed construction area, establishes protective buffers from construction around active nests, and monitors the nests until they are inactive. The buffers and subsequent nest monitoring prevent construction activities from disturbing raptor nests while active, allowing young to develop and fledge. Implementation of the mitigation measure would have temporary impacts on Swainson's hawks from the disruption or disturbance required to survey for them. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#28: Monitor Removal of Nest Trees for Swainson's Hawks

Prior to construction (any ground-disturbing activity), the biological monitor would monitor nest trees for Swainson's hawks in the project footprint following the SHTAC Survey Recommendations (SHTAC 2000). If an occupied Swainson's hawk nest must be removed, the Authority would obtain take authorization through a Section 2081 Incidental Take Permit (including compensatory mitigation to offset the loss of the nest tree) from CDFW. If ground-disturbing activities or other activities may cause nest abandonment by a Swainson's hawk or forced fledging within the specified buffer area, monitoring of the nest site by the biological monitor(s) would be conducted to determine if the nest was abandoned. Removal of nesting trees outside of the nesting season (generally between October 1 and February 1) does not require authorization under the Section 2081 Incidental Take Permit. The project biologist would report to the Authority on a monthly basis during the nesting season to document compliance with this measure.

This mitigation measure is anticipated to be effective because it implements monitoring the removal of Swainson's hawk nest trees in the proposed construction area outside of the nesting season to the extent possible, monitoring of active Swainson's hawk nests to determine when they become inactive, and establishment of protective buffers around active nests. The buffers, nest, and nest tree removal monitoring prevent construction or tree removal activities from disturbing raptor nests while active, allowing young to develop and fledge. Implementation of the mitigation measure would have temporary impacts on Swainson's hawks from the disruption or disturbance required to survey for them, as well as the loss of nest trees in the project footprint. Overall, this measure would be beneficial and would allow the Central Valley Wye alternatives to avoid, to the extent possible, the removal of occupied nests. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#29: Conduct Protocol-level Surveys for Burrowing Owls

Prior to any ground-disturbing activity, the Project Biologist will conduct protocol-level surveys for burrowing owl within suitable habitat located in the Work Area and/or extending 500 feet from the boundary of the Work Area, where access is available. Surveys will be conducted in accordance with guidelines in the CDFW Staff Report on Burrowing Owl Mitigation (CDFG 2012). BIO-MM#29 would have temporary impacts on burrowing owls from disruption of their normal behavior resulting from conducting surveys. Overall, the measure would be beneficial because it would allow the Central Valley Wye alternatives to avoid affecting burrowing owls. Implementation of this measure would not result in

additional physical disturbance outside the project footprint. Therefore, there is no potential for additional impacts on biological or other resources.

This mitigation measure is anticipated to be effective because it would require identification and documentation of active burrowing owl burrows and foraging habitat within 500 feet of the proposed construction area to avoid impacts from construction activities, and guides future protective buffer placement and mitigation. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#30: Implement Avoidance and Minimization Measures for Burrowing Owl

Occupied burrowing owl burrows that will be directly affected by ground-disturbing activities will be relocated in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). To the extent feasible, the Project Biologist will establish 600-foot no-work buffers around occupied burrowing owl burrows in the Work Area during the nesting season (February 1–September 1). If the no-work buffer is not feasible and occupied burrows will be relocated during the nesting season, relocation will occur either before the birds have begun egg-laying and incubation or after the Project Biologist has determined that the juveniles from the occupied burrows are foraging independently and are capable of independent survival.

This mitigation measure is anticipated to be effective because it would require identification and documentation of active burrowing owl burrows, foraging habitat, and nest burrows within 500 feet of the proposed construction area; establishes buffers around active nest burrows; monitors nest burrows to determine when they are no longer active; and evicts owls from non-nest burrows in the project footprint to avoid owl mortality from construction activities. This measure would have temporary impacts on non-nesting burrowing owls because it would allow the Central Valley Wye alternatives to avoid the loss of burrowing owls by avoiding the removal of occupied burrows outside of the nesting season. The buffers, monitoring, and eviction prevent construction activities from disturbing active nest burrows or occupied non-nest burrows, allowing young to develop and fledge and owls to vacate the project footprint prior to construction disturbance. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#31: Conduct Pre-construction Surveys for Special-Status Bat Species

No more than 1 year before the replacement or modification of any bridges or removal of other structures identified as bat habitat and where access is available, the Project Biologist would conduct a survey of the bridge looking for evidence of roosting bats. If bat sign is detected, biologists would conduct an evening visual emergence survey of the bridge or structure, from a half hour before sunset to 1–2 hours after sunset for a minimum of 2 nights within the season that construction would be taking place. If a potentially active bat roost is in the bridge or structure, passive monitoring with full-spectrum bat detectors would be used to assist in determining species present. To the extent possible, all monitoring would be conducted during favorable weather conditions (calm nights with temperatures conducive to bat activity and no precipitation predicted). The biologists would analyze the bat call data using appropriate software and would prepare a report that would be submitted to the Authority, including an assessment of the significance of the roost for local bat populations.

This mitigation measure is anticipated to be effective because it would require identification and documentation of active bat roosts (hibernation and nursery) within and immediately adjacent to the proposed construction area to avoid impacts from construction activities, and guides future protective avoidance and relocation. This measure would have no impacts on roosting bats because noninvasive survey techniques would be used. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#32: Implement Bat Avoidance and Relocation Measures

Prior to any ground-disturbing activity, the project biologist shall survey for active hibernacula or maternity roosts. If active hibernacula or maternity roosts are identified in the work area or 500 feet extending from the work area during pre-construction surveys, they would be avoided to the extent feasible. If avoidance of a hibernacula is not feasible, the Project Biologist would prepare a relocation plan to remove the hibernacula and provide for construction of an alternative bat roost outside of the work area with CDFW

guidance. Compensation would include the installation of nearby suitable alternative roosting structures if displacements are long term or permanent. The alternative roosting structure, if required, would be constructed in accordance with CDFW guidance and would be designed to have comparable size and quality of the impacted habitat. The Project Biologist would implement the relocation plan before the commencement of any ground-disturbing activities that would occur within 500 feet of the hibernacula. Removal of roosts would be guided by accepted exclusion and deterrent techniques.

BIO-MM#32 would have no impacts on roosting bats because it requires avoidance of roosts. Overall, the measure would be beneficial because it would allow the Central Valley Wye alternatives to avoid affecting roosting bats. This mitigation measure is anticipated to be effective because it avoids (to the extent feasible) and monitors active bat roosts (hibernation and nursery) within and immediately adjacent to the proposed construction area to avoid impacts from construction activities, requires preparation of a Bat Roost Relocation Plan before construction disturbance; and removes roosts before the hibernation period and after young are volant to avoid bat mortality from construction activities. The avoidance, relocation plan, seasonal restrictions on roost removal, and roost removal prevent construction activities from disturbing active bat roosts, allowing young to develop and bats to vacate the project footprint and immediately adjacent areas prior to construction disturbance. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#33: Implement Bat Exclusion and Deterrence Measures

If nonbreeding or nonhibernating individuals or groups of bats are found roosting within the work area, the Project Biologist would facilitate the eviction of the bats by either opening the roosting area to change the lighting and airflow conditions or installing one-way doors or other appropriate methods.

To the extent feasible, the Authority would leave the roost undisturbed by project activities for a minimum of 1 week after implementing exclusion and/or eviction activities. Steps would not be taken to evict bats from active maternity or hibernacula; instead such features may be relocated pursuant to a relocation plan.

BIO-MM#33 would have temporary impacts on roosting bats because it would allow the Central Valley Wye alternatives to avoid the loss of bats by avoiding the removal of occupied roosting habitat. This mitigation measure is anticipated to be effective because it deters (to the extent feasible) bat roosting and evicts bats from the proposed construction area and immediately adjacent areas before the hibernation period and after young are volant to avoid bat mortality prior to construction activities. The bat deterrence, seasonal restrictions on roost removal, and bat eviction prevent construction activities from disturbing active bat roosts, allow young to develop, and permit bats to vacate the project footprint and immediately adjacent areas prior to construction disturbance avoiding bat mortality. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#34: Conduct Pre-construction Surveys for American Badger Den Sites and Implement Minimization Measures

Prior to any ground-disturbing activity, the Project Biologist will conduct pre-construction surveys for American Badger den sites within suitable habitat located within the Work Area. These surveys will be conducted no less than 14 days and no more than 30 days prior to the start of ground disturbing activities in a Work Area. The Project Biologist will establish a 100-foot no-work buffer around occupied maternity dens throughout the pup-rearing season (February 15 through July 1) and a 50-foot no-work buffer around occupied dens during other times of the year. If non-maternity dens are found and cannot be avoided during construction activities, they will be monitored for badger activity. If the Project Biologist determines that dens may be occupied, passive den exclusion measures will be implemented for three to five days to discourage the use of these dens prior to project disturbance activities.

BIO-MM#34 would have no impacts on American badgers because noninvasive survey techniques would be used. This mitigation measure is anticipated to be effective because it would require identification and documentation of active badger dens within the project footprint to avoid mortality or injury of individuals from construction activities, and guides future protective avoidance. Implementation of this measure would not trigger secondary environmental impacts.

BIO-MM#35: Conduct Pre-construction Surveys for Ringtail and Ringtail Den Sites and Implement Avoidance Measures

Prior to any ground-disturbing activity, the Project Biologist will conduct pre-construction surveys for ringtail and ringtail den sites within suitable habitat located within the Work Area. These surveys will be conducted no more than 30 days before the start of ground disturbing activities in a Work Area. The Project Biologist will establish 100-foot no-work buffers around occupied maternity dens throughout the pup-rearing season (May 1 through June 15) and a 50-foot no work buffer around occupied dens during other times of the year. This mitigation measure is anticipated to be effective because it avoids occupied and maternity ringtail dens within the project footprint during construction activities to allow young to develop, and ringtails to vacate the dens and the project footprint, avoiding mortality or injury of individuals from construction activities. BIO-MM#35 would be beneficial to ringtails because it would allow the Central Valley Wye alternatives to avoid the loss of this fully protected species. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#36: Conduct Pre-construction Surveys for San Joaquin Kit Fox

Within 30 days prior to the start of any ground disturbing activity, the Project Biologist will conduct pre-construction surveys in modeled suitable habitat in the Work Area. The surveys will be conducted in accordance with USFWS' San Joaquin Kit Fox Survey Protocol for the Northern Range (USFWS 1999b) between May 1 and September 30 for the purpose of identifying potential San Joaquin kit fox dens. If any occupied or potential dens are found during pre-construction surveys, they will be flagged and a 50-foot no-work buffer will be established around the den until the den is cleared, if necessary, to allow construction activities to proceed. This mitigation measure is anticipated to be effective because it identifies and documents active San Joaquin kit fox dens within 250 feet of the project footprint to avoid mortality or injury of individuals from construction activities, and guides future protective avoidance and minimization. Implementation of BIO-MM#36 would have temporary impacts on San Joaquin kit fox as a result of disruption of their normal behavior resulting from conducting surveys. Overall, this measure would be beneficial to San Joaquin kit foxes because it would allow the Central Valley Wye alternatives to avoid the loss of this species. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#37: Minimize Impacts on San Joaquin Kit Fox

The Authority will implement USFWS' Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS [1999] 2011) to minimize impacts on this species, including:

- Disturbance to all kit fox dens will be avoided to the extent feasible.
- Construction activities that occur within 200 feet of any occupied dens will cease within one-half hour after sunset and will not begin earlier than one-half hour before sunrise, to the extent feasible.
- All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored within the Construction Footprint for one or more overnight periods will be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved.
- If a San Joaquin kit fox is detected within a Work Area during construction, the Project Biologist will request approval from the USFWS and CDFW to capture and relocate the kit fox if it does not safely leave the area by its own volition.
- To minimize the temporary impacts of wildlife exclusion fencing and construction exclusion fencing on kit fox and their movement/migration corridors during construction, artificial dens will be installed along the outer perimeter of wildlife exclusion fencing and construction exclusion fencing. Artificial dens or similar escape structures will also be installed at dedicated wildlife crossing structures to provide escape cover and protection against predation. The artificial dens will be located on parcels owned by the Authority or at locations where access is available.

This mitigation measure is anticipated to be effective because it identifies and implements BMPs to avoid active San Joaquin kit fox dens within 200 feet of the project footprint to prevent mortality or injury of individuals from construction activities and minimize impacts on individuals from ground disturbance. BIO-MM#37 would have temporary impacts on San Joaquin kit fox as a result of disruption of their normal behavior resulting from conducting protective measures for individuals. Overall, this measure would be beneficial to San Joaquin kit foxes because it would allow the Central Valley Wye alternatives to avoid causing the loss of individuals of this species. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#38: Construction in Wildlife Movement Corridors

Prior to construction (any ground-disturbing activity), the contractor's project biologist would submit a construction avoidance and minimization plan for wildlife movement linkages (as described in any permits or approvals) to the Authority via the mitigation manager for concurrence. The plan would limit the use of construction and avoid permanent fencing in wildlife movement linkages in areas where viaducts (e.g., elevated platforms) or bridges are included in the final design. The contractor would minimize ground-disturbing activities within the wildlife linkages during nighttime hours to the extent practicable. The contractor would also keep nighttime illumination (e.g., for security) from spilling into the linkages or shield nighttime lighting to avoid illumination spilling into the linkages. Inspections by the project biologist would verify compliance with this measure. The project biologist would report to the Authority on a monthly basis to document compliance with this measure.

This mitigation measure is anticipated to be effective because it minimizes construction-related disturbance to terrestrial wildlife using established wildlife movement linkages. By limiting the amount of construction fencing and permanent fencing, the impacts on wildlife movement corridors would be reduced. Furthermore, by reducing the amount of light and noise where construction is required over linkages (e.g., stream crossings), individual animals would be less likely to avoid the area and alter their natural behavioral patterns. Implementation of this measure would not result in additional physical disturbance outside the project footprint, and would not change the scope, scale, or location of activities already described as part of the Central Valley Wye alternatives. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#39a: Establish Wildlife Crossings

The Authority will create dedicated wildlife crossings to accommodate wildlife movement across permanently fenced infrastructure (consistent with any wildlife corridor assessment prepared), where wildlife movement would be significantly reduced. Prior to final construction design the Project Biologist will confirm appropriate placement and dimensions of wildlife crossings.

For terrestrial wildlife, crossings will conform to the minimum design specifications below, unless different designs are specified in authorizations issued under the FESA or CESA.

To the extent feasible, all wildlife crossings created specifically for terrestrial species will include the following features and design considerations:

- Native earthen bottom
- Ledges or tunnels incorporated into the design to facilitate safe passage of small mammals
- Unobstructed entrances (e.g., no riprap, energy dissipaters, grates), although vegetative cover, adjacent to and near the entrances of crossings, is permissible
- Openness and clear line of sight from end to end
- Year-round absence of water for a portion of the width of the crossing (i.e., no flowing water)
- Slight grade at approaches to prevent flooding
- Limited open space between crossing and cover/habitat
- Separation from human use areas (e.g., trails, multiuse undercrossings)

- Avoidance of artificial light at approaches to wildlife crossings

In addition, the Authority will incorporate features to accommodate wildlife movement into the design of bridges and culverts that are replaced or modified as part of project construction, wherever feasible. Project Biologist review of final construction design for consistency with placement and dimensions of wildlife crossings will be verified in a memorandum provided to the Authority.

This mitigation measure is anticipated to be effective because it minimizes construction-related disturbance to terrestrial wildlife using established wildlife movement linkages. By establishing wildlife crossings, the permeability of the landscape can be maintained. Implementation of this measure would not result in additional physical disturbance outside the project footprint, and would not change the scope, scale, or location of activities already described as part of the Central Valley Wye alternatives. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#39b: Install Aprons or Barriers within Security Fencing

Prior to final construction design the Project Biologist will review the fencing plans along any portion of the permanent right-of-way that is adjacent to natural habitats and confirm that the permanent security fencing will be enhanced with a barrier (e.g., fine mesh fencing) that extends at least 12 inches below ground and 12 inches above ground to prevent special-status reptiles, amphibians, and mammals from moving through or underneath the fencing and gaining access to areas within the right-of-way. At the 12-inch depth of the below grade portion of the apron, it will extend or be bent at an approximately 90-degree angle and oriented outward from the right-of-way a minimum of 12 inches, to prevent fossorial mammals, reptiles, and amphibians from digging or tunneling below the security fence and gaining access to the right-of-way. A climber barrier (e.g., rigid curved or bent overhang) will be installed at the top of the apron to prevent reptiles, amphibians and mammals from climbing over the apron.

The Project Biologist will ensure that the selected apron material and climber barrier does not cause harm, injury, entanglement, or entrapment to wildlife species. The Authority will provide for quarterly inspection and repair of the fencing.

The specific design and method for installation of an apron or barrier may vary as required by regulatory authorizations issued under the FESA and/or CESA. Prior to operation the Project Biologist will field inspect the fencing along any portion of the permanent right-of-way that is adjacent to natural habitats and confirm that the fencing has been appropriately installed. Fencing plan review and field inspection will be documented in a memorandum from the Project Biologist and provided to the Authority.

This mitigation measure is anticipated to be effective because it implements fencing to exclude special-status mammals and reptiles from the project footprint to prevent mortality or injury of individuals from construction and operations activities. BIO-MM#39b would affect wildlife movement because it would create a new barrier in areas that are currently barrier-free. However, because it would prevent terrestrial wildlife from entering the railroad right-of-way, it would also likely reduce wildlife mortality. In addition, impacts on wildlife movement would be minimized through the creation of wildlife crossing structures near known wildlife corridors. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#40: Conduct Pre-construction Surveys for Giant Kangaroo Rat, Nelson's Antelope Ground Squirrel, and Fresno Kangaroo Rat

Prior to construction (any ground-disturbing activity), the project biologist would conduct pre-construction surveys for giant kangaroo rat, Nelson's antelope ground squirrel, and Fresno kangaroo rat burrows within suitable habitats (California annual grassland and valley sink scrub) in the project footprint plus a 50-foot buffer. Pre-construction surveys for giant kangaroo rat, Nelson's antelope ground squirrel, and Fresno kangaroo rat would be conducted 14 days prior to any ground-disturbing activities within the range of each of the species to identify known or potential burrows. If potential burrows were identified, live trapping surveys to determine occupancy by giant kangaroo rat Nelson's ground squirrel, or Fresno kangaroo rat may be used in coordination with the USFWS and CDFW. BIO-MM#40 would have temporary impacts on giant kangaroo rat, Nelson's antelope ground squirrel, and Fresno kangaroo rat as live trapping may be used for pre-construction surveys. Overall, this measure would minimize the

potential for mortality of giant kangaroo rats, Nelson’s ground squirrels, and Fresno kangaroo rat. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for additional impacts on biological or other resources.

This mitigation measure is anticipated to be effective because it would require identification and documentation of potential giant kangaroo rat, Nelson’s antelope ground squirrel, and Fresno kangaroo rat burrows within the limit of direct impacts plus a 50-foot buffer to avoid mortality or injury of individuals from construction activities, and guides future protective avoidance and relocation.

BIO-MM#41: Monitoring, Avoidance and Relocation of Giant Kangaroo Rat, Nelson’s Antelope Ground Squirrel, and Fresno Kangaroo Rat

At least 14 days prior to construction (any ground-disturbing activity), the contractor, under the direction of the project biologist, would establish a 50-foot buffer around potential giant kangaroo rat, Nelson’s antelope ground squirrel, and Fresno kangaroo rat burrows identified during the pre-construction surveys described under BIO-MM#41. The contractor would cease construction activities within 50 feet of any potential burrow one-half hour before sunset and would not begin construction activities earlier than one-half hour after sunrise to avoid indirect impacts from artificial light to this nocturnal species. If any burrow cannot be avoided, and it is determined that the burrow is occupied by a giant kangaroo rat or Nelson’s ground squirrel, the rodent would be allowed to leave the burrow and move to an area that would not be disturbed. A nondisturbance exclusion fence with one-way exit/escape points would be placed to exclude special-status rodents from the construction area. The wildlife exclusion fence would be established around burrows in a manner that allows special-status rodent species to leave the project footprint. Additional measures such as vegetation trimming and live trapping within the exclusion fence may be implemented in coordination with CDFW and USFWS.

Adjustments to the buffer(s) would require prior approval by CDFW and USFWS as coordinated by the project biologist, under the supervision of the mitigation manager. The project biologist would report to the Authority on a monthly basis to document compliance with this measure.

This mitigation measure is anticipated to be effective because it identifies and documents giant kangaroo rat, Nelson’s ground squirrel, and Fresno kangaroo rat within the project footprint and a 50-foot buffer, installs exclusion fencing to prevent individual rodents from entering the construction area, and if needed, routinely monitors and relocates individuals to suitable habitat outside of the construction area to avoid mortality or injury of individuals from construction activities. BIO-MM#41 would have temporary impacts on giant kangaroo rats, Nelson’s ground squirrels, and Fresno kangaroo rats from catching and relocating individuals, which would disrupt their normal behavior and movement patterns. Overall, this measure would minimize the potential of mortality to giant kangaroo rats, Nelson’s ground squirrels, and Fresno kangaroo rats. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#42: Measure Pile Driving Sound Pressure and Attenuate Underwater Sound

If in-water pile driving occurs in the wetted channel during the in-water work window, one of the following means of attenuating underwater sound will be implemented:

- Cofferdam—A cofferdam will be established around the pile driving area to keep it dewatered during impact pile driving.
- Air barrier—A pipe with a larger diameter than the driven pile will be set to keep the area between the pile and the pipe completely dewatered with an air barrier.
- Contained bubble curtain—A bubble curtain will be maintained around the driven pile.

NMFS will be consulted regarding the measure(s) to install piles and notified of the selected measure(s).

During implementation of any of these measures and installation of driven piles, underwater sound monitoring will be conducted. If underwater sound monitoring indicates that underwater sound exceeds 206 peak strike decibels (estimated at 10 meters from the driven pile), or that the daily accumulated sound exposure level is calculated to have exceeded 187 decibels (estimated at 10 meters from the

driven pile), NMFS will be notified (within 24 hours) and construction will cease until corrections are made to the attenuation apparatus/protocol so that the thresholds are not exceeded.

This mitigation measure is anticipated to be effective because it develops a plan to minimize underwater sound pressures, monitors pile driving sound pressure, and guides pile driving methods to avoid mortality or injury to aquatic fauna. BIO-MM#42 would not have any impacts on special-status fish because it is a planning measure to measure the magnitude of impacts. Overall, the mitigation measure would be beneficial to fish because it would minimize the chance of injury or death. Implementation of this mitigation measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for additional impacts on biological or other resources.

BIO-MM#43: Compensate for Impacts to Listed Plant Species

The Authority will provide compensatory mitigation for direct impacts to federal and state-listed plant species based on the number of acres of plant habitat directly affected. Such mitigation will include the following measures:

- Compensatory mitigation will be provided at a 1:1 ratio to offset direct impacts on federally listed plant species habitat, unless a higher ratio is required pursuant to regulatory authorizations issued under FESA.
- Compensatory mitigation will be provided at a 1:1 ratio to offset direct impacts on state-listed plant species habitat, unless a higher ratio is required pursuant to regulatory authorizations issued under CESA.

Compensatory mitigation will be provided using one or more of the methods described in the CMP. This mitigation measure is anticipated to be effective because it provides a minimum compensatory mitigation standard for special-status plants (i.e., 1:1 ratio). Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#4. No other secondary impacts would occur.

BIO-MM#44: Provide Compensatory Mitigation for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Habitat

The Authority will provide compensatory mitigation for direct and indirect impacts, including both temporary and permanent impacts, to vernal pool branchiopod habitat at a 1:1 ratio, unless a higher ratio is required by FESA. Compensatory mitigation will be provided using one or more of the methods described in the CMP. This mitigation measure is anticipated to be effective because it describes how compensatory mitigation for vernal pool fairy shrimp and vernal pool tadpole shrimp would be accomplished and provides compensatory mitigation for the loss of fairy shrimp and tadpole shrimp habitat. Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#4. No other secondary impacts would occur.

BIO-MM#45: Provide Compensatory Mitigation for Impacts on Valley Elderberry Longhorn Beetle Habitat

The Authority will provide compensatory mitigation for impacts on valley elderberry longhorn beetle habitat, including through transplantation and replacement of elderberry shrubs and maintenance of replacement shrubs, consistent with the USFWS' Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (USFWS 2017), as follows:

- Suitable riparian habitat will be replaced at a 3:1 ratio (acres of mitigation to acres of impact).
- Suitable nonriparian habitat will be replaced at a ratio of 1:1.
- Individual elderberry shrubs in riparian areas will be replaced through a purchase of two credits at a USFWS-approved bank for each shrub that is trimmed or removed, regardless of the presence of beetle exit holes.
- Individual elderberry shrubs in nonriparian areas will be replaced through a purchase of one credit at a USFWS-approved bank for each shrub trimmed if beetle exit holes have been found in any shrub in or within 165 feet of the area to be disturbed.

- If an elderberry shrub is to be completely removed by the activity, the entire shrub will be transplanted to a USFWS-approved location in addition to the specified credit purchase, and the transplanted shrub will be monitored for ten years.

For transplanted elderberry plants, a survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants must be maintained throughout the ten-year monitoring period. If survival rates drop below 60 percent during the monitoring period, failed plantings will be replaced and maintained until the 60 percent survival rate is achieved. This mitigation measure is anticipated to be effective because it provides minimum compensatory mitigation standards for valley elderberry longhorn beetle. Potential secondary impacts on biological and other resources from this measure (i.e., conversion of grassland to riparian habitat) would be the same as those described under BIO-MM#4. No other secondary impacts would occur.

BIO-MM#46: Provide Compensatory Mitigation for Impacts on California Tiger Salamander Habitat

The Authority will provide compensatory mitigation to offset the loss of California tiger salamander habitat. Compensatory mitigation will be provided in the following ratios, unless higher ratios are required through regulatory authorizations issued under the FESA and/or CESA. Permanent and temporary impacts on California tiger salamander habitat would be mitigated at ratios of 1:1 (acres preserved, enhanced, or restored: acres affected) and 0.5:1, respectively. Compensatory mitigation will be provided using one or more of the methods described in the CMP. This mitigation measure is anticipated to be effective because it provides minimum compensatory mitigation standards for California tiger salamander. Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#4. No other secondary impacts would occur.

BIO-MM#47: Compensate for Impacts on Blunt-nosed Leopard Lizard and Nelson's Antelope Squirrel

The Authority will provide compensatory mitigation to offset the permanent and temporary loss of suitable habitat for the blunt-nosed leopard lizard and Nelson's antelope squirrel. Mitigation will be provided at a ratio of 1:1, unless a higher ratio is required by authorizations issued under FESA for blunt-nosed leopard lizard or under CESA for Nelson's antelope squirrel. Compensatory mitigation will be provided using one or more of the methods described in the CMP. This mitigation measure is anticipated to be effective because it provides for compensatory mitigation to offset habitat loss for blunt-nosed leopard lizard and Nelson's antelope squirrel. Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#4. No other secondary impacts would occur.

BIO-MM#48: Provide Compensatory Mitigation for Loss of Swainson's Hawk Nesting Trees and Habitat

To compensate for permanent impacts on active Swainson's hawk nest trees (i.e., trees in which Swainson's hawks were observed building nests during surveys described in BIO-MM#26) and foraging habitat, the Authority would provide project-specific compensatory mitigation that replaces affected nest trees and provides foraging habitat. Lands proposed as compensatory mitigation for Swainson's hawk would meet the following minimum criteria:

- Support at least three mature native riparian trees suitable for Swainson's hawk nesting (i.e., valley oak, Fremont cottonwood, or willow) for each Swainson's hawk nest tree removed by construction of the project extent.
- Support at least one Swainson's hawk nesting territory in the last 5 years.
- Contribute to the project extent's mitigation commitment for Swainson's hawk foraging habitat, which would be calculated based on the following ratios:
 - 1:1 for impacts on Active Primary Foraging Habitat
 - 0.75:1 for impacts on Active Secondary Foraging Habitat
 - 0.5:1 for impacts on Active Tertiary Foraging Habitat

This mitigation measure is anticipated to be effective because it provides minimum compensatory mitigation standards for nesting Swainson's hawks. Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#4. No other secondary impacts would occur.

BIO-MM#49: Provide Compensatory Mitigation for Loss of Burrowing Owl Active Burrows and Habitat

To compensate for permanent impacts on occupied burrowing owl breeding habitat, the Authority would provide compensatory mitigation at a minimum 1:1 ratio for occupied breeding and foraging habitat. Lands proposed as compensatory mitigation would meet one of the following criteria:

- Support at least two breeding adult owls for every breeding adult owl displaced by construction of the project
- Support at least 1 acre of burrowing owl breeding habitat for every acre of habitat affected (i.e., 1:1 mitigation ratio). For the purposes of this measure, burrowing owl breeding habitat is defined as any land cover type with all of the following attributes:
 - Open terrain with well-drained soils
 - Short, sparse vegetation with few shrubs and no trees
 - Underground burrows or burrow surrogates (e.g., debris piles, culverts, pipes) for nesting and shelter from predators or weather. Burrows in earthen levees, berms, or canal banks within or along the margins of agricultural fields can be counted as compensatory breeding habitat as long as adjacent fields or pastures are suitable for foraging.
 - Abundant and accessible prey (arthropods, small rodents, amphibians, lizards)

This mitigation measure is anticipated to be effective because it provides minimum compensatory mitigation standards for burrowing owl. Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#4. No other secondary impacts would occur.

BIO-MM#50: Provide Compensatory Mitigation for Impacts to San Joaquin Kit Fox Habitat

The Authority will provide compensatory mitigation for impacts on modeled San Joaquin kit fox habitat through the acquisition of suitable habitat that is acceptable to USFWS and CDFW. Habitat will be replaced at a minimum ratio of 1:1 for natural lands and at a ratio of 0.1:1 for suitable urban or agricultural lands, unless a higher ratio is required by regulatory authorizations issued under the FESA and/or CESA. This mitigation measure is anticipated to be effective because it provides minimum compensatory mitigation standards for San Joaquin kit fox. Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#4. No other secondary impacts would occur.

BIO-MM#51: Provide Compensatory Mitigation for Impacts to Giant Garter Snake Habitat

The Authority would mitigate the destruction of giant garter snake habitat by the purchase of suitable, approved habitat (USFWS and CDFW). Habitat would be replaced at a minimum ratio of 1:1 for aquatic habitat and a ratio of 0.1:1 for suitable upland habitat to provide additional protection and habitat in a location that is consistent with the recovery of the species. The Authority would mitigate the impacts on giant garter snake in accordance with the USFWS Biological Opinion and/or CDFW 2081(b) Incidental Take Permit. The Authority would submit a memorandum to the USFWS and CDFW to document compliance with this measure.

This mitigation measure is anticipated to be effective because it provides minimum compensatory mitigation standards for giant garter snake. Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#4. No other secondary impacts would occur.

BIO-MM#52: Conduct Surveys and Implement Avoidance Measures for Crotch Bumble Bee

Surveys for Crotch bumble bee in suitable habitat (identified by species habitat suitability modeling) in the project footprint would be conducted by qualified biologists within 1 year prior to the start of construction.

Surveys would be conducted during four evenly spaced sampling periods during the flight season (March–September) (Thorp et al. 1983). For each sampling event, the biologist(s) would survey suitable habitat within the project footprint and, as access outside the footprint permits, a 100-foot buffer surrounding the project footprint using nonlethal netting methods for 1 person-hour per 3 acres of the highest quality habitat or until 150 bumble bees are sighted, whichever comes first. If initial sampling of a given habitat area indicates that the habitat is of low quality or nonexistent, no further sampling of that area would be required. General guidelines and best practices for bumble bee surveys would follow USFWS' *Survey Protocols for the Rusty Patched Bumble Bee (Bombus affinis)* (USFWS 2019), which are consistent with other bumble bee survey protocols used by The Xerces Society (Hatfield et al. 2017; Washington Department of Fish and Wildlife et al. 2019).

If surveys conducted within 1 year prior to construction identify occupied Crotch bumble bee habitat within the project footprint or the 100-foot buffer, the project biologist would then conduct additional pre-construction surveys of such habitat for active bee nest colonies and associated floral resources (i.e., flowering vegetation on which bees from the colony are observed foraging) no more than 30 days prior to any ground disturbance between March and September. The purpose of this pre-construction survey would be to identify active nest colonies and associated floral resources outside of impact areas that could be avoided by construction personnel. The project biologist would establish, monitor, and maintain no-work buffers around nest colonies and floral resources identified during surveys. The size and configuration of the no-work buffer would be based on best professional judgment of the project biologist. At a minimum, the buffer would provide at least 50 feet of clearance around nest entrances and maintain disturbance-free airspace between the nest and nearby floral resources. Construction activities would not occur within the no-work buffers until the colony is no longer active (i.e., no bees are seen flying in or out of the nest for three consecutive days indicating the colony has completed its nesting season and the next season's queen has dispersed from the colony).

This mitigation measure is anticipated to be effective because it identifies procedures for identification of occupied Crotch bumble bee habitat and implementation of avoidance and minimization measures to reduce effects to habitat and individuals of this species. Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#53: Provide Compensatory Mitigation for Impacts on Crotch Bumble Bee Habitat

The Authority would provide compensatory mitigation for impacts on occupied habitat for Crotch bumble bee. Impacts on occupied habitat (confirmed through surveys as described in BIO-MM#52) would be compensated for at a ratio of 3:1, unless a higher ratio is required pursuant to an authorization issued under CESA, through the purchase of CDFW-approved bank credits (if available) or through preservation of habitat in perpetuity including suitable habitat currently preserved by the Authority.

This mitigation measure is anticipated to be effective because it provides minimum compensatory mitigation standards for Crotch bumble bee that will offset impacts. Potential secondary impacts on biological and other resources from this measure would be the same as those described under BIO-MM#4. No other secondary impacts would occur.

3.7.9 Impacts Summary for NEPA Comparison of Alternatives

This section summarizes the impacts of the Central Valley Wye alternatives and compares them to the anticipated impacts of the No Project Alternative. Table 3.7-18 provides a comparison of the potential impacts of each of the Central Valley Wye alternatives, summarizing the more detailed information provided in Section 3.7.7. A comparison of the impacts on biological resources and wetlands of the different Central Valley Wye alternatives follows Table 3.7-18.

As discussed in Chapter 2, under the No Project Alternative, development resulting from an increasing population in Merced and Madera Counties is anticipated to continue recent development patterns, resulting in continued conversion of agricultural lands to residential and commercial land uses. Future changes in land use or allowable density of development, as well as ground disturbance associated with future infrastructure improvements such as highway expansions to accommodate population growth, would have comparable impacts on biological resources and wetlands as those that resulted from past development, such as habitat loss and degradation and extirpation of special-status species populations. If urbanization is confined within existing urban growth boundaries, as planned, lands near the Central Valley Wye alternatives habitat study area located outside of urban growth boundaries would experience relatively little land use change or associated impacts on biological and wetland resources. Continued use of farmlands near the Central Valley Wye alternatives corridor would likely result in ongoing impacts on biological and wetlands resources.

The Merced to Fresno Final EIR/EIS concluded that development of the HSR system would result in potential impacts on biological resources and wetlands. Implementing the Central Valley Wye alternatives could also result in impacts on biological resources and wetlands from construction and operations activities. The Central Valley Wye alternatives would incorporate IAMFs that would minimize impacts on biological resources and wetlands. These IAMFs would include measures to delineate environmentally sensitive areas, implement weed control plans, create wildlife exclusion fencing and nondisturbance zones, and employ other restrictions and design features to minimize impacts on plant and wildlife species and wetlands. The Central Valley Wye alternatives also implement mitigation measures that would reduce impacts on biological resources and wetlands. These mitigation measures include such activities as pre-construction surveys for special-status species, monitoring for special-status species during construction, salvage and relocation of special-status species encountered during surveys or monitoring, seasonal work restrictions, measuring pile driving sound pressure, and providing compensatory mitigation for loss of habitat and other impacts on biological resources and wetlands.

The Central Valley Wye alternatives could result in construction-related impacts on special-status plant species, special-status wildlife species, special-status plant communities, jurisdictional waters, critical habitats, EFH, and wildlife movement corridors.

Table 3.7-18 Comparison of Central Valley Wye Alternatives Impacts

Impacts	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Construction				
Special-Status Plant Impacts				
Impact BIO#1: Direct Impacts on Special-Status Plant Species				
Effects related to total area of disturbance (acres) for 21 plant species associated with California Annual Grassland community	90.14 (P) 9.57 (T)	91.23 (P) 38.97 (T)	25.01 (P) 8.31 (T)	69.53 (P) 8.58 (T)
Effects related to total area of disturbance (acres) for 9 plant species associated with Vernal Pool community	0.18 (P) 0.04 (T)	0.19 (P) 0.04 (T)	0.10 (P) 0.64 (T)	0.19 (P) 0.04 (T)
Effects related to total area of disturbance (acres) for 2 plant species associated with Other Riparian community	1.22 (P) 0.22 (T)	0.42 (P) 0.12 (T)	1.85 (P) 0.57 (T)	0.77 (P) 0.09 (T)
Effects related to total area of disturbance (acres) for 3 plant species associated with Freshwater Marsh, Natural Watercourses, Open Water, Seasonal Wetland	7.03 (P) 3.81 (T)	9.30 (P) 4.79 (T)	5.96 (P) 5.48 (T)	5.11 (P) 3.12 (T)
Effects related to total area of disturbance (acres) for 2 plant species associated with Valley Sink Scrub community	4.26 acres (T) under any of the Central Valley Wye alternatives			
Effects related to total area of disturbance (acres) for 1 plant species associated with California Annual Grassland and valley sink scrub communities (within mapped range)	0.00 (P) 4.32 (T)	0.34 (P) 28.53 (T)	0.00 (P) 4.32 (T)	0.00 (P) 4.32 (T)
Effects related to total area of disturbance (acres) for 1 plant species associated with California Annual Grassland and valley sink scrub communities	90.14 (P) 13.83 (T)	91.23 (P) 43.23 (T)	25.01 (P) 12.57 (T)	69.53 (P) 12.84 (T)
Impact BIO#2: Indirect Impacts on Special-Status Plant Species and Other Native Plants	Under any of the Central Valley Wye alternatives: erosion, siltation, and runoff into natural and constructed watercourses; soil and water contamination from construction equipment leaks; construction dust reducing photosynthetic capability; altered hydrology; increased risk of fire in adjacent open spaces; habitat degradation through fragmentation and changes in habitat heterogeneity; and introduction of noxious plant species resulting from ground disturbance			

Impacts	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Special-Status Wildlife Impacts				
Impact BIO#3: Direct Impacts on Special-Status Wildlife—Invertebrates				
Effects related to total area of disturbance (acres) for 3 species associated with Vernal Pool and Seasonal Wetland communities	2.16 (P)	2.44 (P)	2.49 (P)	1.87 (P)
Effects related to total area of disturbance (acres) for 1 species associated with Mixed Riparian and Other Riparian communities	1.49 (P) 0.43 (T)	1.21 (P) 0.39 (T)	2.11 (P) 0.86 (T)	1.15 (P) 0.38 (T)
Effects related to total area of disturbance (acres) for 1 species (Crotch bumble bee) associated with Annual Grassland and Valley Sink Scrub communities	90.14 (P) 13.83 (T)	91.23 (P) 43.24 (T)	25.01 (P) 12.57 (T)	69.53 (P) 12.84 (T)
Impact BIO#4: Indirect Impacts on Special-Status Wildlife—Invertebrates	Under any of the Central Valley Wye alternatives: alterations to water quality and hydroperiod of aquatic habitats resulting from indirect ground disturbance affecting reproductive success and survival of invertebrate species and their food; shading of habitat by structures and inadvertent introduction of nonnative invasive weeds negatively affecting host plants			
Impact BIO#5: Direct Impacts on Special-Status Wildlife—Fish				
Effects related to total area of disturbance (acres) for 7 fish species associated with Natural Watercourses and Other Riparian (San Joaquin River only)	2.24 (P)	2.24 (P)	1.97 (P)	2.18 (P)
Impact BIO#6: Indirect Impacts on Special-Status Wildlife—Fish	Under any of the Central Valley Wye alternatives: changes in water quality; increasing erosion and sedimentation into nearby creeks, rivers, and other waters; contamination from chemical spills; attraction of predators to fencing, electrical infrastructure, elevated structures			
Impact BIO#7: Direct Impacts on Special-Status Wildlife—Amphibians				
Effects related to total area of disturbance (acres) for California tiger salamander aquatic and upland habitat	140.72 (P) 48.67 (T)	150.89 (P) 164.43 (T)	78.15 (P) 36.51 (T)	110.32 (P) 45.94 (T)
Effects related to total area of disturbance (acres) for western spadefoot aquatic and upland habitat	43.59 (P) 1.67 (T)	48.78 (P) 23.15 (T)	14.79 (P) 2.22 (T)	26.03 (P) 3.03 (T)
Impact BIO#8: Indirect Impacts on Special-Status Wildlife—Amphibians	Habitat degradation under any of the Central Valley Wye alternatives			
Impact BIO#9: Direct Impacts on Special-Status Wildlife—Reptiles				

Impacts	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Effects related to total area of disturbance (acres) for western pond turtle aquatic and upland habitat	77.13 (P) 14.48 (T)	80.15 (P) 44.73 (T)	34.90 (P) 15.71 (T)	53.75 (P) 13.19 (T) ²
Effects related to total area of disturbance (acres) for blunt-nosed leopard lizard upland habitat	29.89 (P) 13.53 (T)	24.83 (P) 17.22 (T)	9.33 (P) 10.85 (T)	26.16 (P) 11.31 (T) ²
Effects related to total area of disturbance (acres) for Blainville's horned lizard upland habitat	133.29 (P) 70.48 (T)	135.66 (P) 147.60 (T)	68.15 (P) 56.29 (T)	107.90 (P) 68.46 (T) ²
Effects related to total area of disturbance (acres) for giant garter snake aquatic and upland habitat	18.32 (P) 9.29 (T)	16.89 (P) 15.34 (T)	12.62 (P) 10.53 (T)	12.77 (P) 7.16 (T)
Effects related to total area of disturbance (acres) for silvery legless lizard upland habitat	0.00 (P) 4.32 (T)	0.34 (P) 28.54 (T)	0.00 (P) 4.32 (T)	0.00 (P) 4.32 (T)
Effects related to total area of disturbance (acres) for San Joaquin coachwhip upland habitat	0.00 (P) 4.32 (T)	0.00 (P) 4.32 (T)	0.00 (P) 4.32 (T)	0.00 (P) 4.32 (T)
Impact BIO#10: Indirect Impacts on Special-Status Wildlife—Reptiles	Habitat degradation and attraction of predators under any of the Central Valley Wye alternatives			
Impact BIO#11: Direct Impacts on Special-Status Wildlife—Birds				
Effects related to total area of disturbance (acres) for American peregrine falcon foraging habitat	2,612.66 (P) 656.90 (T)	2,803.99 (P) 1,227.35 (T)	2,411.59 (P) 485.80 (T)	2,564.95 (P) ² 549.21 (T) ²
Effects related to total area of disturbance (acres) for bald eagle nesting and foraging habitat	1,324.23 (P) 352.25 (T)	1,215.48 (P) 485.14 (T)	1,067.25 (P) 272.18 (T)	1,250.04 (P) ² 299.93 (T) ²
Effects related to total area of disturbance (acres) for golden eagle nesting and foraging habitat	1,284.82 (P) 381.24 (T)	1,206.85 (P) 480.62 (T)	1,029.18 (P) 299.87 (T)	1,212.05 (P) ² 329.51 (T) ²
Effects related to total area of disturbance (acres) for Swainson's hawk nesting and foraging habitat	2,178.01 (P) 557.39 (T)	2,224.49 (P) 1,092.81 (T)	2,122.64 (P) 417.10 (T)	2,131.21 (P) ² 476.90 (T) ²
Effects related to total area of disturbance (acres) for greater sandhill crane foraging habitat	1,341.02 (P) 251.01 (T)	1,173.61 (P) 403.48 (T)	1,083.04 (P) 170.08 (T)	1,272.90 (P) ² 200.51 (T) ²
Effects related to total area of disturbance (acres) for western snowy plover foraging habitat	1,360.22 (P) 291.82 (T)	1,204.81 (P) 468.47 (T)	1,103.81 (P) 209.61 (T)	1,288.26 (P) ² 240.25 (T) ²

Impacts	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Effects related to total area of disturbance (acres) for least Bell's vireo nesting and foraging habitat	7.83 (P) 0.86 (T)	9.05 (P) 0.77 (T)	7.12 (P) 1.72 (T)	5.88 (P) 0.77 (T)
Effects related to total area of disturbance (acres) for tricolored blackbird nesting and foraging habitat	1,251.47 (P) 240.33 (T)	1,107.82 (P) 319.05 (T)	954.89 (P) 151.55 (T)	1,201.51 (P) ² 182.42 (T) ²
Effects related to total area of disturbance (acres) for western burrowing owl nesting and foraging habitat	1,134.84 (P) 386.15 (T)	1,351.02 (P) 887.98 (T)	1,180.91 (P) 281.92 (T)	1,108.36 (P) ² 340.90 (T) ²
Effects related to total area of disturbance (acres) for ground-nesting bird species	1,433.66 (P) 361.62 (T)	1,309.20 (P) 595.93 (T)	1,056.99 (P) 217.61 (T)	1,375.18 (P) ² 299.42 (T) ²
Effects related to total area of disturbance (acres) for wading bird/shorebird/duck species	1,383.96 (P) 309.45 (T)	1,233.35 (P) 529.68 (T)	1,134.23 (P) 227.48 (T)	1,305.22 (P) ² 255.18 (T) ²
Effects related to total area of disturbance (acres) for tree-nesting bird species	2,254.66 (P) 504.98 (T)	2,217.77 (P) 969.39 (T)	2,197.48 (P) 365.52 (T)	2,212.00 (P) ² 420.23 (T) ²
Impact BIO#12: Indirect Impacts on Special-Status Wildlife—Birds	Under any of the Central Valley Wye alternatives: disturbance; fragmentation; displacement; interference with daily movement, foraging, and dispersal; reduced reproductive success and increased mortality through exposure of nests to predators and the elements			
Impact BIO#13: Direct Impacts on Special-Status Wildlife—Mammals				
Effects related to total area of disturbance (acres) for roosting and foraging habitat of pallid bat and Western red bat	2,616.20 (P) 656.90 (T)	2,803.99 (P) 1,227.35 (T)	2,415.13 (P) 485.80 (T)	2,568.49 (P) ² 549.34 (T) ²
Effects related to total area of disturbance (acres) for roosting and foraging habitat of Western mastiff bat	2,616.20 (P) 656.90 (T)	2,802.78 (P) 1,226.96 (T)	2,415.13 (P) 485.80 (T)	2,568.49 (P) ² 549.34 (T) ²
Effects related to total area of disturbance (acres) for ringtail habitat	1.49 (P) 0.43 (T)	1.21 (P) 0.39 (T)	2.11 (P) 0.86 (T)	1.15 (P) 0.38 (T)
Effects related to total area of disturbance (acres) for American badger habitat	212.42 (P) 97.08 (T)	188.57 (P) 218.08 (T)	159.40 (P) 77.81 (T)	171.04 (P) ² 88.90 (T) ²
Effects related to total area of disturbance (acres) for San Joaquin kit fox denning and movement habitat	960.34 (P) 291.38 (T)	1,114.19 (P) 710.83 (T)	1,238.00 (P) 273.38 (T)	926.37 (P) 253.80 (T) ²

Impacts	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Effects related to total area of disturbance (acres) for giant kangaroo rat habitat	0.00 (P) acres under any of the Central Valley Wye alternatives 0.06 (T) acres under any of the Central Valley Wye alternatives			
Effects related to total area of disturbance (acres) for Nelson's antelope squirrel habitat	0.00 (P) acres under any of the Central Valley Wye alternatives 4.26 (T) acres under any of the Central Valley Wye alternatives			
Effects related to total area of disturbance (acres) for Fresno kangaroo rat habitat	46.33 (P) 12.04 (T)	41.36 (P) 12.10 (T)	10.29 (P) 10.88 (T)	42.39 (P) 10.03 (T)
Impact BIO#14: Indirect Impacts on Special-Status Wildlife—Mammals	Under any of the Central Valley Wye alternatives: Bats - disruption of breeding or roosting activity, or temporary loss of foraging habitat San Joaquin Kit Fox and American Badger – disruption of normal foraging, denning, or sheltering behavior; reduced burrow suitability; reduced habitat suitability Ringtail: disruption of normal and seasonal behavioral patterns, temporary loss of foraging habit and cover Rodents – disruption of breeding and foraging activity, temporary loss of foraging habitat			
Special-Status Plant Community Impacts				
Impact BIO#15: Direct Impacts on Special-Status Plant Communities				
Effects related to total area of disturbance (acres): vernal pools	0.18	0.19	0.10	0.19
Effects related to total area of disturbance (acres): bisected vernal pools	0.04	0.04	0.64	0.04
Effects related to total area of disturbance (acres): mixed riparian	0.36	1.06	0.42	0.68
Effects related to total area of disturbance (acres): other riparian	1.44	0.54	2.43	0.86
Effects related to total area of disturbance (acres): seasonal wetland	0.78	1.99	1.47	0.49
Effects related to total area of disturbance (acres): palustrine forested wetland	0.12	0.00	0.12	0.00
Effects related to total area of disturbance (acres): valley sink scrub	4.26 acres under any of the Central Valley Wye alternatives			
Impact BIO#16: Indirect Impacts on Special-Status Plant Communities	Under any of the Central Valley Wye alternatives: habitat degradation resulting from construction equipment leaks; construction dust resulting in a reduction in photosynthetic capability; and increased risk of fire in adjacent open spaces			

Impacts	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Jurisdictional Aquatic Resources Impacts				
Impact BIO#17: Direct Impacts on Jurisdictional Aquatic Resources				
Effects related to total area of disturbance (acres): wetlands	1.00 (P) 0.13 (T)	1.69 (P) 0.52 (T)	1.76 (P) 0.58 (T)	0.62 (P) 0.11 (T)
Effects related to total area of disturbance (acres): other or non-wetland waters	28.26 (P) 9.82 (T)	25.71 (P) 9.65 (T)	34.19 (P) 9.15 (T)	22.11 (P) 7.15 (T)
Effects related to total area of disturbance (acres): riparian habitats	1.49 (P) 0.43 (T)	1.21 (P) 0.39 (T)	2.11 (P) 0.86 (T)	1.15 (P) 0.38 (T)
Effects related to total area of disturbance (acres): all stream and riparian habitats	22.02 (P) 9.72 (T)	22.15 (P) 9.76 (T)	31.58 (P) 9.79 (T)	16.55 (P) 7.12 (T)
Impact BIO#18: Indirect Impacts on Jurisdictional Aquatic Resources	Degradation due to excess sediment or contaminants under any of the Central Valley Wye alternatives			
Critical Habitat Impacts				
Impact BIO#19: Direct Impacts on Critical Habitat				
Effects related to total area of disturbance (acres) for 4 plant species and 3 invertebrate species associated with vernal pool community, and 1 species associated with riverine habitat (maximum acreage of effects is provided)	No	367.46/4.72 (mapped CH versus aquatic habitat)	No	2.94/0.21 (mapped CH versus aquatic habitat)
Impact BIO#20: Indirect Impacts on Critical Habitat				
Vernal pool invertebrates: habitat degradation, alteration of vernal pool and seasonal wetland hydrology, water contamination	Same under the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative. No impact under the SR 152 (North) to Road 13 Wye Alternative or the Avenue 21 to Road 13 Wye Alternative			
Central Valley steelhead within Merced and Tuolumne Rivers: increased erosion, sedimentation, siltation	No	Yes	No	No

Impacts	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Essential Fish Habitat Impacts				
Impact BIO#21: Direct Impacts on Essential Fish Habitat	Construction of bridges and aerial crossings over EFH under any of the Central Valley Wye alternatives			
Impact BIO#22: Indirect Impacts on Essential Fish Habitat	Increased erosion, sedimentation, siltation and runoff to San Joaquin River under any of the Central Valley Wye alternatives			
Wildlife Movement Corridor Impacts				
Impact BIO#23: Direct Impacts on Wildlife Movement Corridors				
Effects related to total length of designated wildlife movement corridors crossed (miles)	11.02	17.48	11.84	10.42
Impact BIO#24: Indirect Impacts on Wildlife Movement Corridors	Startling and disruption of movement through lighting, noise, motion under any of the Central Valley Wye alternatives			
Operations				
Special-Status Plant Impacts				
Impact BIO#25: Direct Impacts on Special-Status Plant Species	Trampling or crushing of vegetation and exposure to accidental spills under any of the Central Valley Wye alternatives			
Impact BIO#26: Indirect Impacts on Special-Status Plant Species	Changes in habitat due to changes in hydrology and chemical runoff from use of pesticides and herbicides under any of the Central Valley Wye alternatives			
Special-Status Wildlife Impacts				
Impact BIO#27: Direct Impacts on Special-Status Wildlife—Invertebrates	Trampling or crushing and exposure to accidental spills under any of the Central Valley Wye alternatives			
Impact BIO#28: Indirect Impacts on Special-Status Wildlife—Invertebrates	Habitat degradation under any of the Central Valley Wye alternatives			
Impact BIO#29: Direct Impacts on Special-Status Wildlife—Fish	Exposure to contaminants and pollutants and increased sedimentation from erosion under any of the Central Valley Wye alternatives			
Impact BIO#30: Indirect Impacts on Special-Status Wildlife—Fish	Changes in hydrology, degradation of habitat, or reduced reproductive success under any of the Central Valley Wye alternatives			
Impact BIO#31: Direct Impacts on Special-Status Wildlife—Amphibians and Reptiles	Mortality from vehicle strikes, trampling, exposure to accidental spills under any of the Central Valley Wye alternatives			

Impacts	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Impact BIO#32: Indirect Impacts on Special-Status Wildlife—Amphibians and Reptiles	Exposure to accidental spills, water column contamination, habitat degradation, increased predation and increased cover of invasive species under any of the Central Valley Wye alternatives			
Impact BIO#33: Direct Impacts on Special-Status Wildlife—Birds	Removal or disturbance of areas that provide nesting habitat under any of the Central Valley Wye alternatives			
Impact BIO#34: Indirect Impacts on Special-Status Wildlife—Birds	Nest failure or abandonment, avoidance behavior by some species in response to increased noise and lighting, and startle and motion disturbances under any of the Central Valley Wye alternatives			
Impact BIO#35: Direct Impacts on Special-Status Wildlife—Mammals	Injury or mortality from ground disturbance under any of the Central Valley Wye alternatives			
Impact BIO#36: Indirect Impacts on Special-Status Wildlife—Mammals	Habitat degradation and noise and motion disturbance under any of the Central Valley Wye alternatives			
Special-Status Plant Community Impacts				
Impact BIO#37: Direct Impacts on Special-Status Plant Communities	Trampling and crushing of special-status plant communities under any of the Central Valley Wye alternatives			
Impact BIO#38: Indirect Impacts on Special-Status Plant Communities	Increase in erosion, runoff, and fire under any of the Central Valley Wye alternatives			
Jurisdictional Aquatic Resources Impacts				
Impact BIO#39: Direct Impacts on Jurisdictional Aquatic Resources	Degradation due to accidental spills, vegetation management, drain cleaning, and litter removal under any of the Central Valley Wye alternatives			
Impact BIO#40: Indirect Impacts on Jurisdictional Aquatic Resources	Degradation of water quality under any of the Central Valley Wye alternatives			
Critical Habitat Impacts				
Impact BIO#41: Direct Impacts on Critical Habitat	Degradation due to accidental spills			
Impact BIO#42: Indirect Impacts on Critical Habitat	Increased erosion, sedimentation, siltation and runoff, and exposure to accidental spills under any of the Central Valley Wye alternatives			
Essential Fish Habitat Impacts				
Impact BIO#43: Direct Impacts on Essential Fish Habitat	Few to no impacts anticipated under any of the Central Valley Wye alternatives			
Impact BIO#44: Indirect Impacts on Essential Fish Habitat	Under any of the Central Valley Wye alternatives: reduced water quality from increased erosion, sedimentation, siltation, and runoff; increased wind erosion; increased risk of fire in adjacent open spaces; and introduction of noxious plant species			

Impacts	SR 152 (North) to Road 13 Wye	SR 152 (North) to Road 19 Wye	Avenue 21 to Road 13 Wye	SR 152 (North) to Road 11 Wye
Wildlife Movement Corridor Impacts				
Impact BIO#45: Indirect Impacts on Wildlife Movement Corridors	Under any of the Central Valley Wye alternatives, impacts on wildlife movement corridors and wildlife using corridors would be limited in extent and duration and effects, if they occur, would be infrequent.			

Source: Authority, 2019. Calculations generated using ESRI ArcGIS versions 10.1, 10.2, and 10.3 from data generated by field surveys and aerial photo interpretation during 2010–2017. On April 27, 2018, USACE concurred with the findings of the delineation of waters of the United States.

P = Permanent; T = Temporary

¹ Impact calculation covers multiple species

² This value has been updated to reflect refinements to the Site 6 electrical interconnection. Refer to Section 2.2.3, Description of the Central Valley Wye Alternatives.

3.7.9.1 Special-Status Plants

All four Central Valley Wye alternatives would have equal potential for direct impacts on the following special-status plant species associated with valley sink scrub: Hall's tarplant and Lost Hills crowscale. Three of the four alternatives also would have equal potential for direct impacts on San Joaquin wooly-threads. The SR 152 (North) to Road 19 Wye Alternative would have a greater potential for direct impacts on San Joaquin wooly-threads.

The SR 152 (North) to Road 19 Wye Alternative would have the greatest potential for impacts on 21 special-status plant species associated with California annual grassland because it would directly affect the greatest area of California annual grassland community compared to the other three Central Valley Wye alternatives. California annual grassland is abundant within the project footprint of the Central Valley Wye alternatives and vicinity, and rehabilitation following disturbance would have a reasonable likelihood of success compared to other more sensitive habitats. The SR 152 (North) to Road 19 Wye Alternative also would have the greatest potential for impacts on three special-status plant species associated with freshwater marsh, natural watercourses, open water, and seasonal wetlands because it would directly affect the greatest area of these plant communities compared to the other three Central Valley Wye alternatives. The SR 152 (North) to Road 19 Wye Alternative also would have the greatest potential for impacts on palmate-bracted bird's-beak and San Joaquin wooly-threads, which are associated with the valley sink scrub community and some California annual grassland. The SR 152 (North) to Road 19 Wye Alternative would have the least potential for impacts on two species associated with other riparian communities. Relative to the other Central Valley Wye alternatives, the SR 152 (North) to Road 19 Wye Alternative would not result in the greatest or least potential for impacts on the following other groups of special-status plant species identified in Table 3.7-18: nine species associated with vernal pools.

Relative to the other Central Valley Wye alternatives, the Avenue 21 to Road 13 Wye Alternative would have the greatest potential for impacts on nine special-status plant species associated with vernal pools. Impacts on vernal pools are generally considered permanent once disturbance occurs because of the difficulty in restoring these habitats back to their original functions and values. The Avenue 21 to Road 13 Wye Alternative would also have the greatest potential for impacts on other riparian vegetation because it would directly affect the greatest area of these special-status plant species compared to the other three Central Valley Wye alternatives. The Avenue 21 to Road 13 Wye Alternative would have the least potential for impacts on 21 special-status plant species associated with California annual grassland because it would affect less area than the other three Central Valley Wye alternatives. The Avenue 21 to Road 13 Wye Alternative also would have the least potential for impacts on palmate-bracted bird's-beak habitat. The Avenue 21 to Road 13 Wye Alternative would not result in the greatest or least potential for impacts on three special-status plant species associated with freshwater marsh, natural watercourses, open water, and seasonal wetlands.

Relative to the other Central Valley Wye alternatives, the SR 152 (North) to Road 11 Wye Alternative would have the least potential, or equal potential, for impacts on the following groups of special-status plant species identified in Table 3.7-18: nine species associated with vernal pools; and three species associated with freshwater marsh, natural watercourses, open water, or seasonal wetlands. The SR 152 (North) to Road 11 Wye Alternative would not result in the greatest or least potential for impacts on 21 special-status plant species associated with California annual grassland or palmate-bracted bird's beak.

3.7.9.2 Special-Status Wildlife

Relative to the other Central Valley Wye alternatives, the Avenue 21 to Road 13 Wye Alternative would have the greatest potential for impacts on vernal pool invertebrates and valley elderberry longhorn beetle. The SR 152 (North) to Road 19 Wye Alternative would have the greatest potential for impacts on Crotch bumble bee. The SR 152 (North) to Road 11 Wye Alternative would have the least potential for impacts on valley elderberry longhorn beetle and vernal pool and wetland invertebrates, while the Avenue 21 to Road 13 Wye Alternative would have the least potential for impacts on Crotch bumble bee.

The SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 19 Wye Alternative would equally have the greatest potential for impacts on six special-status fish species associated with natural watercourses and other riparian (San Joaquin River only) land cover types. The Avenue 21 to Road 13 Wye Alternative would have the least potential for impacts on these fish species.

Relative to the other Central Valley Wye alternatives, the SR 152 (North) to Road 19 Wye Alternative would have the greatest potential for impacts on California tiger salamander and western spadefoot, followed by, in decreasing magnitude of impact potential, by the SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative. The Avenue 21 to Road 13 Wye Alternative would have the least potential for impacts on these two special-status amphibians.

Relative to the other Central Valley Wye alternatives, the SR 152 (North) to Road 13 Wye Alternative would have the greatest potential for impacts on blunt-nosed leopard lizard. The SR 152 (North) to Road 13 Wye Alternative would not result in the greatest or least potential for impacts on Western pond turtle, Blainville's horned lizard, giant garter snake, or silvery legless lizard. The SR 152 (North) to Road 19 Wye Alternative would have the greatest potential for impacts on Western pond turtle, Blainville's horned lizard, giant garter snake, and silvery legless lizard. The Avenue 21 to Road 13 Wye Alternative would have the least potential for impacts on Western pond turtle, blunt-nosed leopard lizard, and Blainville's horned lizard. The SR 152 (North) to Road 11 Wye Alternative would have the least potential for impacts on giant garter snake. All four Central Valley Wye alternatives would have equal potential for impacts on San Joaquin coachwhip, and three of the Central Valley Wye alternatives (excluding the SR 152 (North) to Road 19 Wye Alternative) would have equal potential for impacts on silvery legless lizard.

Relative to the other Central Valley Wye alternatives, the SR 152 (North) to Road 13 Wye Alternative would have the greatest potential for impacts on the following special-status birds identified in Table 3.7-18: greater sandhill crane and tricolored blackbird. The SR 152 (North) to Road 19 Wye Alternative would have the greatest potential for impacts on the following special-status birds/groups of birds identified in Table 3.7-18: American peregrine falcon, bald eagle, golden eagle, Swainson's hawk, western snowy plover, least Bell's vireo, western burrowing owl, ground nesting birds, wading birds/shorebirds/ducks, and tree nesting birds. The Avenue 21 to Road 13 Wye Alternative would have the least potential for impacts on American peregrine falcon, bald eagle, golden eagle, Swainson's hawk, greater sandhill crane, western snowy plover, tricolored blackbird, ground nesting birds, wading birds/shorebirds/ducks, and tree nesting birds; whereas the SR 152 (North) to Road 11 Wye Alternative would have the least potential for impacts on least Bell's vireo and western burrowing owl.

Relative to the other Central Valley Wye alternatives, the SR 152 (North) to Road 19 Wye Alternative would have the greatest potential for impacts on special-status bats, followed, in decreasing magnitude of impact potential, by the SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative. The Avenue 21 to Road 13 Wye Alternative would have the least potential for impacts on special status bats, relative to the other Central Valley Wye alternatives.

Relative to the other Central Valley Wye alternatives, the SR 152 (North) to Road 19 Wye Alternative would have the greatest potential for impacts on American badger and San Joaquin kit fox. The Avenue 21 to Road 13 Wye Alternative would have the greatest potential for impacts on ringtail, but the least potential for impacts on American badger. The SR 152 (North) to Road 11 Wye Alternative would have the least potential for impacts on ringtail and San Joaquin kit fox.

All four Central Valley Wye alternatives would have equal potential for impacts on two special-status rodents (giant kangaroo rat and Nelson's antelope squirrel). The SR 152 (North) to Road 13 Wye Alternative would have the greatest potential for impacts on Fresno kangaroo rat, followed, in decreasing magnitude of impact potential, by the SR 152 (North) to Road 19 Wye Alternative and the SR 152 (North) to Road 11 Wye Alternative. The Avenue 21 to Road 13 Wye Alternative would have the least potential for impacts on Fresno kangaroo rat, relative to the other Central Valley Wye alternatives.

3.7.9.3 Special-Status Plant Communities

Three of the Central Valley Wye alternatives (SR 152 (North) to Road 13 Wye, SR 152 (North) to Road 19 Wye, and SR 152 (North) to Road 11 Wye) would have nearly equal potential for direct impacts on vernal pools and equally low potential to bisect vernal pools. The Avenue 21 to Road 13 Wye Alternative has the lowest potential for direct impacts on vernal pools but the greatest potential to bisect vernal pools, relative to the other Central Valley Wye alternatives.

Relative to other Central Valley Wye alternatives, the SR 152 (North) to Road 19 Wye Alternative would have the greatest potential for impacts on the mixed riparian and seasonal wetland plant communities. The Avenue 21 to Road 13 Wye Alternative would have the greatest potential for impacts on the “other riparian” plant community. The SR 152 (North) to Road 19 Wye Alternative would have the least potential for impacts on the “other riparian” plant community. The SR 152 (North) to Road 11 Wye Alternative would have the least potential for impacts on the seasonal wetland plant community.

Two of the Central Valley Wye alternatives (SR 152 (North) to Road 13 Wye Alternative and Avenue 21 to Road 13 Wye Alternative) have equal potential for impacts on the palustrine forested wetland community, while the other two Central Valley Wye alternatives (SR 152 (North) to Road 19 Wye Alternative and SR 152 (North) to Road 11 Wye Alternative) have no potential for impacts on this plant community. All four Central Valley Wye alternatives have equal potential for impacts on the valley sink scrub plant community.

3.7.9.4 Jurisdictional Aquatic Resources

The Avenue 21 to Road 13 Wye Alternative would have the greatest potential for impacts on jurisdictional aquatic resources, relative to the other Central Valley Wye alternatives, followed, in decreasing magnitude of potential impact, by the SR 152 (North) to Road 13 Wye Alternative and the SR 152 (North) to Road 19 Wye Alternative. The SR 152 (North) to Road 11 Wye Alternative would have the least potential for impacts on jurisdictional aquatic resources.

3.7.9.5 Critical Habitat

The SR 152 (North) to Road 19 Wye Alternative would have the greatest potential for impacts on critical habitat, while the SR 152 (North) to Road 13 Wye Alternative and the Avenue 21 to Road 13 Wye Alternative have no potential for impacts on critical habitat associated with vernal pool invertebrates. The SR 152 (North) to Road 11 Wye Alternative would potentially affect critical habitat associated with vernal pool invertebrates.

3.7.9.6 Essential Fish Habitat

Direct impacts on EFH (San Joaquin River) would occur from the placement of piers and the bridge over the river. Temporary impacts during construction would include noise, dust, and vibration impacts. The extent of direct impacts on EFH for each alternative would depend upon the final design to determine the exact distance of each aquatic crossing, the shading potential and the number of piers installed within or over EFH.

3.7.9.7 Wildlife Movement Corridors

The SR 152 (North) to Road 19 Wye Alternative would have the greatest potential impacts on wildlife movement corridors because it would affect the greatest area of land compared to the other three alternatives, especially within the Eastman Lake–Bear Creek ECA. The SR 152 (North) to Road 11 Wye Alternative would have the least potential impacts on wildlife movement corridors. Relative to one another, the SR 152 (North) to Road 13 Wye Alternative and the Avenue 21 to Road 13 Wye Alternative would have similar potential impacts on wildlife movement corridors.

Operations and maintenance activities would be identical or very similar for all of the Central Valley Wye alternatives; therefore, all four Central Valley Wye alternatives have similar potential for operations impacts on special-status plant species, special-status wildlife species, special-

status plant communities, jurisdictional waters, critical habitats, EFH, and wildlife movement corridors.

3.7.10 CEQA Significance Conclusions

Table 3.7-19 provides a summary of the CEQA determinations of significance for all construction and operations impacts discussed in Section 3.7.7.3. If there are differences in impacts before or after mitigation between the four Central Valley Wye alternatives, it is noted in the table. Where there is no difference in the CEQA level of significance before and after mitigation for a particular impact, the level of significance for the impact is the same for all Central Valley Wye alternatives.

Table 3.7-19 CEQA Significance Conclusions for Biological Resources and Wetlands for the Central Valley Wye Alternatives

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
Construction			
Special-Status Plant Impacts			
Impact BIO#1: Direct Impacts on Special-Status Plant Species	Significant: Take and removal of special-status plants and habitat for all Central Valley Wye alternatives	BIO-MM#1a BIO-MM#1b BIO-MM#1c BIO-MM#2a BIO-MM#2b BIO-MM#3a BIO-MM#3b BIO-MM#4 BIO-MM#43	Less than significant for all Central Valley Wye alternatives
Impact BIO#2: Indirect Impacts on Special-Status Plant Species	Significant: Indirect impacts on special-status plants and habitat within 100 feet of construction for all Central Valley Wye alternatives	BIO-MM#1a BIO-MM#1b BIO-MM#1c BIO-MM#2a BIO-MM#2b BIO-MM#3a BIO-MM#3b BIO-MM#4	Less than significant for all Central Valley Wye alternatives
Special-Status Wildlife Impacts			
Impact BIO#3: Direct Impacts on Special-Status Wildlife—Invertebrates	Significant: Direct impacts on land cover types that support vernal pools, elderberry shrub plants, and annual grasslands and valley sink scrub used by Crotch bumble bee for all Central Valley Wye alternatives	BIO-MM#1a BIO-MM#1b BIO-MM#2a BIO-MM#3b BIO-MM#4 BIO-MM#5 BIO-MM#6 BIO-MM#7 BIO-MM#9a BIO-MM#44	Less than significant for all Central Valley Wye alternatives

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
		BIO-MM#45 BIO-MM#52 BIO-MM#53	
Impact BIO#4: Indirect Impacts on Special-Status Wildlife—Invertebrates	Less than Significant: Indirect impacts minimized through BMPs and IAMFs to protect water quality for all Central Valley Wye alternatives	No mitigation measures are required	Not applicable
Impact BIO#5: Direct Impacts on Special-Status Wildlife—Fish	Significant: Direct impacts related to construction within and adjacent to San Joaquin River for all Central Valley Wye alternatives	BIO-MM#3b BIO-MM#4 BIO-MM#8a BIO-MM#8b BIO-MM#8c BIO-MM#8d BIO-MM#9a BIO-MM#42	Less than significant for all Central Valley Wye alternatives
Impact BIO#6: Indirect Impacts on Special-Status Wildlife—Fish	Less than significant: Indirect impacts minimized through BMPs and IAMFs to protect water quality for all Central Valley Wye alternatives	No mitigation measures are required	Not applicable
Impact BIO#7: Direct Impacts on Special-Status Wildlife—Amphibians	Significant: Temporary and permanent impacts on upland and aquatic habitat for two special-status species for all Central Valley Wye alternatives	BIO-MM#1a BIO-MM#1b BIO-MM#2a BIO-MM#3b BIO-MM#4 BIO-MM#9a BIO-MM#9b BIO-MM#10 BIO-MM#11 BIO-MM#12 BIO-MM#13 BIO-MM#46	Less than significant for all Central Valley Wye alternatives
Impact BIO#8: Indirect Impacts on Special-Status Wildlife—Amphibians	Less than significant: Indirect impacts minimized through IAMFs to avoid dispersion of invasive species and delineate environmentally sensitive areas for all Central Valley Wye alternatives	No mitigation measures are required	Not applicable

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
Impact BIO#9: Direct Impacts on Special-Status Wildlife—Reptiles	Significant: Temporary and permanent impacts on to upland and aquatic habitat for 5 special-status species under all Central Valley Wye alternatives	BIO-MM#1a BIO-MM#1b BIO-MM#2a BIO-MM#3b BIO-MM#4 BIO-MM#9a BIO-MM#9b BIO-MM#10 BIO-MM#14 BIO-MM#15 BIO-MM#16 BIO-MM#17 BIO-MM#18 BIO-MM#19 BIO-MM#20 BIO-MM#21 BIO-MM#22 BIO-MM#23 BIO-MM#47 BIO-MM#51	Less than significant for all Central Valley Wye alternatives
Impact BIO#10: Indirect Impacts on Special-Status Wildlife—Reptiles	Less than significant: Indirect impacts minimized through IAMFs to avoid dispersion of invasive species and delineate environmentally sensitive areas for all Central Valley Wye alternatives	No mitigation measures are required	Not applicable
Impact BIO#11: Direct Impacts on Special-Status Wildlife—Birds	Significant: Temporary and permanent impacts on foraging and nesting habitat for 12 special-status species under all Central Valley Wye alternatives	BIO-MM#1a BIO-MM#1b BIO-MM#2a BIO-MM#3b BIO-MM#4 BIO-MM#9a BIO-MM#24a BIO-MM#24b BIO-MM#25a BIO-MM#25b BIO-MM#25c BIO-MM#26 BIO-MM#27 BIO-MM#28 BIO-MM#29	Less than significant for all Central Valley Wye alternatives

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
		BIO-MM#30 BIO-MM#48 BIO-MM#49	
Impact BIO#12: Indirect Impacts on Special-Status Wildlife— Birds	Less than significant: Temporary construction disturbance to nesting activities minimized through IAMF to develop nesting season restrictions for all Central Valley Wye alternatives	No mitigation measures are required	Not applicable
Impact BIO#13: Direct Impacts on Special-Status Wildlife— Mammals	Significant: Temporary and permanent disturbance and/or conversion of roosting, foraging, denning and movement habitat for eight species for all Central Valley Wye alternatives	BIO-MM#1a BIO-MM#1b BIO-MM#2a BIO-MM#3b BIO-MM#4 BIO-MM#9a BIO-MM#31 BIO-MM#32 BIO-MM#33 BIO-MM#34 BIO-MM#35 BIO-MM#36 BIO-MM#37 BIO-MM#38 BIO-MM#39a BIO-MM#39b BIO-MM#40 BIO-MM#41 BIO-MM#50	Less than significant for all Central Valley Wye alternatives
Impact BIO#14: Indirect Impacts on Special-Status Wildlife— Mammals	Significant: Temporary ground disturbance and disruption of foraging, roosting, denning, sheltering, and breeding behavior due to construction activities. IAMFs would reduce these impacts but residual impacts would remain and would be significant before mitigation for all Central Valley Wye alternatives	BIO-MM#1a BIO-MM#1b BIO-MM#2a BIO-MM#3b BIO-MM#4 BIO-MM#31 BIO-MM#32 BIO-MM#33 BIO-MM#34 BIO-MM#35 BIO-MM#36 BIO-MM#37 BIO-MM#38	Less than significant for all Central Valley Wye alternatives

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
		BIO-MM#39a BIO-MM#39b BIO-MM#40 BIO-MM#41 BIO-MM#50	
Special-Status Plant Community Impacts			
Impact BIO#15: Direct Impacts on Special-Status Plant Communities	Significant: Direct temporary and permanent impacts for all Central Valley Wye alternatives related to ground disturbance during construction, particularly to riparian and valley sink scrub plant communities	BIO-MM#1a BIO-MM#1b BIO-MM#1c BIO-MM#2a BIO-MM#2b BIO-MM#3b BIO-MM#4	Less than significant for all Central Valley Wye alternatives
Impact BIO#16: Indirect Impacts on Special-Status Plant Communities	Significant: Temporary indirect impacts for all Central Valley Wye alternatives due to construction through increased cover of invasive plant species, construction dust, and an increased risk of fire.	BIO-MM#1a BIO-MM#1b BIO-MM#1c BIO-MM#2a BIO-MM#2b BIO-MM#3b BIO-MM#4	Less than significant for all Central Valley Wye alternatives
Jurisdictional Aquatic Resources Impacts			
Impact BIO#17: Direct Impacts on Jurisdictional Aquatic Resources	Significant: Temporary and permanent direct impacts related to removal or modification of jurisdictional aquatic features for all Central Valley Wye alternatives	BIO-MM#1a BIO-MM#1b BIO-MM#2a BIO-MM#3a BIO-MM#4	Less than significant for all Central Valley Wye alternatives
Impact BIO#18: Indirect Impacts on Jurisdictional Aquatic Resources	Less than significant: Indirect temporary impacts minimized through BMPs and IAMFs to protect water quality for all Central Valley Wye alternatives	No mitigation measures are required	Not applicable
Critical Habitat Impacts			
Impact BIO#19: Direct Impacts on Critical Habitat	Significant: direct impact on critical habitat for two Central Valley Wye alternatives, particularly habitat supporting vernal pool species, for the following Central Valley Wye alternatives: SR 152 (North) to Road 19	BIO-MM#3b BIO-MM#4	Less than significant for all Central Valley Wye alternatives

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
	Wye SR 152 (North) to Road 11 Wye		
	No impact for the following Central Valley Wye alternatives: SR 152 (North) to Road 13 Wye Avenue 21 to Road 13 Wye	No mitigation measures are required	Not applicable
Impact BIO#20: Indirect Impacts on Critical Habitat	Less than significant: Indirect impacts minimized through IAMFs to avoid dispersion of invasive species and delineate environmentally sensitive areas for all Central Valley Wye alternatives	No mitigation measures are required	Not applicable
Essential Fish Habitat Impacts			
Impact BIO#21: Direct Impacts on Essential Fish Habitat	Significant: Direct impact on EFH for all Central Valley Wye alternatives	BIO-MM#1a BIO-MM#1b BIO-MM#2a BIO-MM#3b BIO-MM#4 BIO-MM#8a BIO-MM#8b BIO-MM#8c BIO-MM#8d BIO-MM#42	Less than significant for all Central Valley Wye alternatives
Impact BIO#22: Indirect Impacts on Essential Fish Habitat	Less than significant: Indirect temporary impacts minimized through BMPs and IAMFs to protect water quality for all Central Valley Wye alternatives	No mitigation measures are required	Not applicable
Wildlife Movement Corridor Impacts			
Impact BIO#23: Direct Impacts on Wildlife Movement Corridors	Significant for all Central Valley Wye Alternatives	BIO-MM#25c BIO-MM#38 BIO-MM#39a BIO-MM#39b	Less than significant for all Central Valley Wye alternatives

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
Impact BIO#24: Indirect Impacts on Wildlife Movement Corridors	Significant for all Central Valley Wye Alternatives	AVR-MM#2 NV-MM#1	Less than significant for all Central Valley Wye alternatives
Operations			
Special-Status Plant Impacts			
Impact BIO#25: Direct Impacts on Special-Status Plants	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#26: Indirect Impacts on Special-Status Plants	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Special-Status Wildlife Impacts			
Impact BIO#27: Direct Impacts on Special-Status Wildlife – Invertebrates	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#28: Indirect Impacts on Special-Status Wildlife— Invertebrates	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#29: Direct Impacts on Special-Status Wildlife—Fish	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#30: Indirect Impacts on Special-Status Wildlife—Fish	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#31: Direct Impacts on Special-Status Wildlife— Amphibians and Reptiles	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#32: Indirect Impacts on Special-Status Wildlife— Amphibians and Reptiles	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#33: Direct Impacts on Special-Status Wildlife— Birds	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#34: Indirect Impacts on Special-Status Wildlife— Birds	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#35: Direct Impacts on Special-Status Wildlife— Mammals	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#36: Indirect Impacts on Special-Status Wildlife— Mammals	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
Special-Status Plant Community Impacts			
Impact BIO#37: Direct Impacts on Special-Status Plant Communities	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#38: Indirect Impacts on Special-Status Plant Communities	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Jurisdictional Aquatic Resources Impacts			
Impact BIO#39: Direct Impacts on Aquatic Resources	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#40: Indirect Impacts on Aquatic Resources	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Critical Habitat Impacts			
Impact BIO#41: Direct Impacts on Critical Habitat	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#42: Indirect Impacts on Critical Habitat	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Essential Fish Habitat Impacts			
Impact BIO#43: Direct Impacts on Essential Fish Habitat	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Impact BIO#44: Indirect Impacts on Essential Fish Habitat	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable
Wildlife Movement Corridor Impacts			
Impact BIO#45: Indirect Impacts on Wildlife Movement Corridors	Less than significant for all Central Valley Wye Alternatives	No mitigation measures are required	Not applicable

Source: Authority, 2019