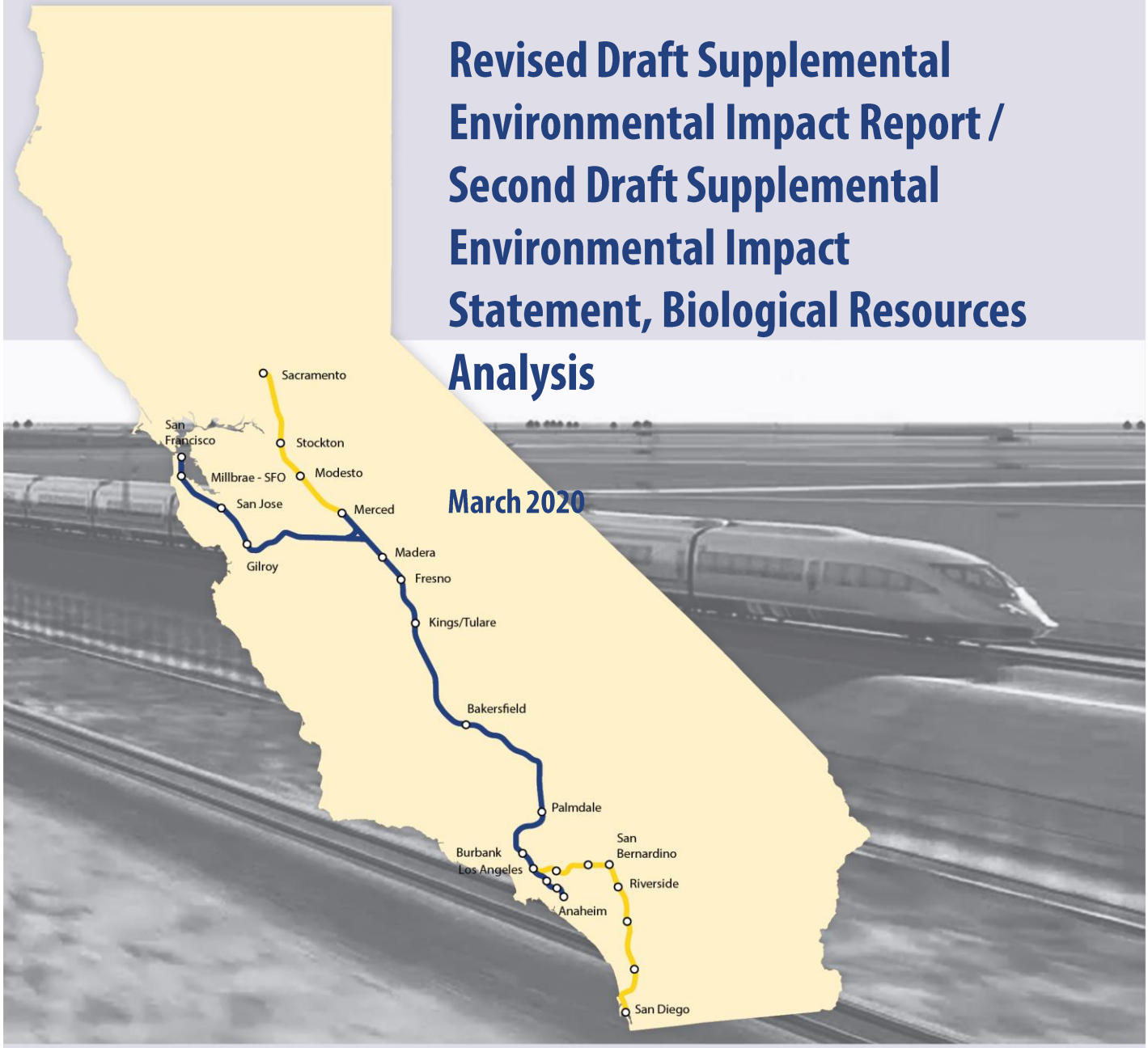
California High-Speed Rail Authority

Merced to Fresno Section: Central Valley Wye

Revised Draft Supplemental Environmental Impact Report / Second Draft Supplemental Environmental Impact Statement, Biological Resources Analysis

March 2020



CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

Merced to Fresno Section: Central Valley Wye

Revised Draft Supplemental Environmental Impact Report / Second Draft Supplemental Environmental Impact Statement, Biological Resources Analysis

Prepared by the

California High-Speed Rail Authority

1 New Central Valley Wye Environmental Document Focused Primarily on Content Concerning One Newly-Listed Candidate Species

The California High-Speed Rail Authority (Authority) is issuing a limited revision of its previously published Draft Supplemental Environmental Impact Report and Environmental Impact Statement (Draft Supplemental EIR/EIS) pursuant to the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019 and executed by the Federal Railroad Administration and the State of California.

This document is entitled "Merced to Fresno Section: Central Valley Wye Revised Draft Supplemental Environmental Impact Report/Second Draft Supplemental Environmental Impact Statement" (referred to below as "Revised/Second Draft Supplemental EIR/EIS").

Following the Authority's publication of the Draft Supplemental EIR/EIS for CEQA purposes in May 2019 and subsequent publication of the Draft Supplemental EIR/EIS for NEPA purposes in September 2019, the Authority learned of the new listing by the State of California Department of Fish and Wildlife of a bumblebee species that may be present in the relevant resource study area for the Central Valley Wye alternatives.

The California Fish and Game Commission provided notice on June 18, 2019 that four bumble bee species are candidate species as defined by Section 2068 of the Fish and Game Code. Only one such species, the Crotch bumble bee (*Bombus crotchii*) is assumed to be present in the resource study area for the Central Valley Wye alternatives based on historic records as well as the presence of suitable habitat for the species.

Both CEQA and NEPA provide guidance on the recirculation and supplementation of published environmental documents. Pursuant to pertinent requirements of both laws,[1] the Authority, as lead CEQA and NEPA agency for the Merced to Fresno Section: Central Valley Wye, is issuing this Revised/Second Draft Supplemental EIR/EIS limited to the portions of the Draft Supplemental EIR/EIS that require revision based on the new information about the Crotch bumble bee candidate species. New information includes background information, methodology, impact analysis, and mitigation measures.

[1] CEQA Guidelines Section 15088.5(c) and 40 Code of Federal Regulations 1502.9(C)(1)(ii).

The section and appendix comprising the Revised/Second Draft Supplemental EIR/EIS are:

1. Section 3.7, Biological Resources and Wetlands, with text updates as noted below
2. Section 3.19.6.6, Cumulative Impacts, Biological Resources and Wetlands, with text as presented in the Draft Supplemental EIR/EIS
3. Appendix 3.7-C-2, Biological Resources and Wetlands Special-Status Wildlife, reflecting updates associated with the Crotch bumble bee

Within Section 3.7, substantive changes related to the Crotch bumble bee were made in the following sections.

- Section 3.7.5.3, Methods for NEPA and CEQA Impact Analysis
- Section 3.7.6.3, Special-Status Species
- Section 3.7.7, Environmental Consequences
  - Table 3.7-13 Direct Impacts on Special-Status Wildlife Species Habitat by Central Valley Wye Alternative (acres)
  - Construction Impacts
    - Impact BIO#3 Direct Impacts on Special-Status Wildlife – Invertebrates
    - Impact BIO#4 Indirect Impacts on Special-Status Wildlife – Invertebrates
  - Operations Impacts
    - Impact BIO#27 Direct Impacts on Special-Status Wildlife – Invertebrates
    - Impact BIO#28 Indirect Impacts on Special-Status Wildlife – Invertebrates
- Section 3.7.8 Mitigation Measures
  - BIO-MM#54: Conduct Surveys and Implement Avoidance Measures for Crotch Bumble Bee
  - BIO-MM#55: Provide Compensatory Mitigation for Impacts on Crotch Bumble Bee

The Authority reviewed other sections of the Draft Supplemental EIR/EIS and found, based on research and a review of the evidence, that no other substantive changes would be required, including Section 3.19, Cumulative Impacts. The Crotch bumble bee's candidacy status was specifically considered relative to the discussion of cumulative effects in Section 3.19.6.6, Biological Resources and Wetlands. The identification of the San Joaquin Valley as the Resource Study Area for special status species applies to the Crotch bumble bee, as does the description of the cumulative condition relative to special-status plants and wildlife and special status plant communities. The discussion of the contribution of the Central Valley Wye Alternatives to loss of suitable habitat for special status species, including California annual grassland and other special-status plant communities would also apply to the Crotch bumble bee habitats of California annual grassland and scrub. Section 3.19.6.6 refers back to the mitigation measures in Section 3.7 to ensure that the Central Valley Wye alternatives would not result in cumulatively considerable contributions to the cumulative impacts on special status species and habitats. As augmented by the new mitigation measures for Crotch bumble bee added to the revised Section 3.7, the text and conclusions remain accurate. For these reasons, the current text in Section 3.19.6.6 requires no revision to address the Crotch bumble bee. For the reader's convenience, Section 3.19.6.6 has been included without change for reference, with an introductory page explaining why it has not changed.

Section 3.7 includes new mitigation measures related to the Crotch bumble bee. These will be incorporated into the Mitigation Monitoring and Reporting Program and Enforcement Plan (to be included as part of the CEQA/NEPA decision documents).

The text of Section 3.7.4.1, Coordination with Regulatory Agencies for NEPA and CEQA Compliance, has also been revised to reflect that the United States Department of Fish and Wildlife and the National Marine Fisheries Service issued biological opinions for the project, thereby concluding the consultation requirements under Section 7 of the United States Endangered Species Act. At the time of publication of the Draft Supplemental EIR/EIS, the text stated that these biological opinions were anticipated from both federal agencies. In this document, Section 3.7.4.1 has been revised with the dates the Authority received

biological opinions from each agency. These biological opinions will be published as appendices with the Record of Decision for the project.

2 California High-Speed Rail Authority as NEPA Lead Agency

Following execution of a memorandum of understanding with the Federal Railroad Administration (FRA) on July 23, 2019, the Authority is the NEPA lead agency. The Authority noted this in its September 2019 NEPA distribution of the Draft Supplemental EIR/EIS, and further noted that the Draft Supplemental EIR/EIS nevertheless retained numerous text references to FRA and its earlier role as NEPA lead agency. However, the text of this Revised/Second Draft Supplemental EIR/EIS has been updated to reflect the Authority's assumption of NEPA lead agency status. The Authority will make similar revisions throughout the Final Supplemental EIR/EIS, expected for publication in summer 2020.

3 Publication of the Revised Draft Supplemental EIR/Second Draft Supplemental EIS

Pursuant to both CEQA and NEPA requirements, this Revised/Second Draft Supplemental EIR/EIS is being released for a 45-day public review period, which is equivalent to the required public review periods for the CEQA and NEPA distributions of the Draft Supplemental EIR/EIS. The Authority is also providing notification in a similar manner as the CEQA and NEPA distributions to property owners and/or occupants, stakeholders, and other interested parties. Notifications will be published in the same newspapers as were notices for the CEQA and NEPA distributions, including four English-language and two Spanish language newspapers.

4 Next Steps

The Authority welcomes comments on the content of the Revised/Second Draft Supplemental EIR/EIS. The public review period will begin on Friday, March 13, 2020, and end on Monday, April 27, 2020. Please see the Notice of Availability for the Revised/Second Draft Supplemental EIR/EIS for details on how to comment.

During the CEQA and NEPA comment periods, the Authority received 75 comment submittals through a combination of letters, e-mails, comment cards, as well as oral comments provided at the CEQA and NEPA public hearings. These submittals yielded a total of more than 600 discrete comments. The Final Supplemental EIR/EIS will include the Authority's responses to these earlier comments plus responses to any comments received on the Crotch bumble bee information in this Revised/Second Draft Supplemental EIR/EIS.

The Authority anticipates publishing the Final Supplemental EIR/EIS in summer 2020. The Final Supplemental EIR/EIS will include the Authority's responses to the CEQA and NEPA comments received on the previously circulated Draft Supplemental EIR/EIS, in addition to responses to comments received on this Revised/Second Draft Supplemental EIR/EIS.

The Authority Board will consider whether to certify the Final Supplemental EIR and approve the preferred alternative pursuant to CEQA. In addition, the Authority, as NEPA lead agency, will also consider whether to issue a Record of Decision approving the preferred alternative, which best serves the purpose and need for the Central Valley Wye and minimizes economic, social, and environmental impacts.

California High-Speed Rail: Merced to Fresno Section: Central Valley Wye

Revised Draft Supplemental Environmental Impact Report / Second Draft Supplemental Environmental Impact Statement, Biological Resources Analysis

Pursuant to:
California Environmental Quality Act, P.R.C. 21000 et seq.,
State of California CEQA Guidelines, California Administrative Code, 15000 et seq., and
National Environmental Policy Act (42 U.S.C. 4332 et seq.),
40 C.F.R. Part 1500, 64 Fed. Reg. 28545, 49 U.S.C. 303 and 23 U.S.C. 327

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Date: February 24, 2020

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March 2020

California High-Speed Rail Authority. March 2020. Merced to Fresno Section: Central Valley Wye *California High-Speed Rail (HSR) Revised/Second Draft Supplemental EIR/EIS.* Sacramento, CA

The California High Speed Rail Authority (Authority), as state lead agency under the California Environmental Quality Act (CEQA) and federal lead agency pursuant to National Environmental Policy Act (NEPA) assignment (23 U.S.C. 327), is releasing this Revised Draft Supplemental Environmental Impact Report/Second Draft Supplemental Environmental Impact Statement as further described below.

Abstract: This *California High-Speed Rail, Merced to Fresno Section: Central Valley Wye Revised Draft Supplemental Environmental Impact Report/Second Draft Supplemental Environmental Impact Statement, Biological Resources Analysis* (Revised/Second Draft Supplemental EIR/EIS) considers, describes, and summarizes the environmental impacts of a portion of the Merced to Fresno Section project—the Central Valley Wye, an approximately 51- to 55-mile portion of the larger 800-mile California High-Speed Rail system planned throughout California, on the Crotch bumble bee (*Bombus crotchii*). On June 18, 2019, the California Fish and Game Commission provided notice that four bumble bee species are candidate species as defined by Section 2068 of the Fish and Game Code. One such species, the Crotch bumble bee, is assumed to be present in the resource study area for the Central Valley Wye alternatives based on historic records as well as the presence of suitable habitat for the species.

The high-speed rail system will connect the major population centers of Sacramento, the San Francisco Bay Area, the Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. As part of the Merced to Fresno Section of the statewide high-speed rail system, the Central Valley Wye would create the east-west high-speed rail connection between the San Jose to Merced Section to the west and the north-south Merced to Fresno Section to the east. This Revised/Second Draft Supplemental EIR/EIS is a supplement to both the Merced to Fresno Section: Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) (2012) and the Merced to Fresno Section, Central Valley Wye Draft Supplemental EIR/EIS (2019). The Merced to Fresno Final EIR/EIS identified the Hybrid Alternative as the preferred alternative, for the north/south alignment of the high-speed rail, but did not select a preferred alternative for the Central Valley Wye. The Authority Board of Directors certified the Merced to Fresno Final EIR/EIS under CEQA on May 3, 2012, and filed a Notice of Determination on May 4, 2012. The Federal Railroad Administration (FRA) issued a record of decision (ROD) on September 18, 2012, and the Surface Transportation Board issued a ROD on June 13, 2013. Although the Authority Board of Directors and FRA approved portions of the Hybrid Alternative outside the wye for the north/south alignment of the high-speed rail and the Downtown Merced and Downtown Fresno Mariposa Street station locations, these approvals, deferred a decision on the area known as the “wye connection”, that is, the east-west high-speed rail connection between the San Jose to Merced Section to the west and the north-south Merced to Fresno Section to the east, to allow for additional environmental analysis, which is the intent of this document.

The need for the HSR system exists statewide, with specific attributes of regional areas contributing to this need. The Merced to Fresno Section is an essential component of the statewide HSR system and directly relates to the population growth and increased intercity travel demand over the next 20 years and beyond and the increased travel delays and congestion that would result on California’s highways and at its airports. Four alternatives were considered in the Draft Supplemental EIR/ EIS as well as this Revised/Second Draft Supplemental EIR/EIS:

- State Route (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.

In this Revised/Second Draft Supplemental EIR/EIS, the Authority continues to identify the Preferred Alternative (CEQA Proposed Project) as the SR 152 (North) to Road 11 Wye Alternative. The Authority has incorporated into the Central Valley Wye alternatives impact avoidance and minimization features (IAMF): standard practices, actions, and design features. The IAMFs are considered part of the project. Potential environmental impacts of the alternatives include air pollutant emissions; increases in noise and vibration; displacement of commercial, residential, and agricultural properties; community and neighborhood disruption; impacts on historic and archaeological sites; visual impacts; impacts on sensitive biological resources and wetlands; and cumulative impacts. Mitigation measures have been developed to avoid or reduce significant impacts identified in the Revised/Second Draft Supplemental EIR/EIS.

This Revised/Second Draft Supplemental EIR/EIS is being made available to the public in accordance with CEQA and NEPA.

Visit the Authority's website, where you can:

- View and download the Revised/Second Draft Supplemental EIR/EIS and the original Draft Supplemental EIR/EIS.
- Request an electronic copy of the Revised/Second Draft Supplemental EIR/EIS as well as the original Draft Supplemental EIR/EIS.
- Find a location near you to review a copy of the Revised/Second Draft Supplemental EIR/EIS as well as the original Draft Supplemental EIR/EIS.

Printed and electronic copies have been placed in the main public libraries and/or other locations in the following cities and communities: Madera, Merced, Chowchilla, and Fresno. Printed and electronic copies of the Revised/Second Draft Supplemental EIR/EIS, along with electronic copies of the original Draft Supplemental EIR/EIS, associated technical reports, and the Merced to Fresno Final EIR/EIS, also are available for review during business hours at the Authority's offices in Sacramento and Fresno.

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 Revised Draft Supplemental Environmental Impact Report (EIR)/Second Draft Supplemental Environmental Impact Statement (EIS), Biological Resources Analysis,* (Revised/Second Draft 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 (RSAs). 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.

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 on the California High-Speed Rail Authority's (Authority) website: https://www.hsr.ca.gov/programs/environmental/eis_eir/draft_supplemental_merced_fresno.aspx.

Additional details on biological resources and wetlands were provided in the following appendices in Volume II of the Draft Supplemental EIR/EIS. Of these, only Appendix 3.7-C has been updated and is thus included as part of this Revised/Second Draft Supplemental EIR/EIS:

- Appendix 2-C, Applicable Design Standards, provides the list of relevant design standards for the Central Valley Wye alternatives.
- Appendix 2-D.4, Biological Resources Survey Summary, provides a summary of the existing condition and potential impacts on biological resources.

[1] The Biological Resources and Wetlands Technical Report was finalized in 2016; however, the content of the Draft Supplemental EIR/EIS and this Revised/Second Draft Supplemental EIR/EIS have 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 and the Revised/Second Draft Supplemental EIR/EIS is more current than the information presented in the technical report.

- 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 and National Marine Fisheries Service. 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 Revised/Second Draft 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 this Revised/Second Draft 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 Revised/Second Draft 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).

Definition of Resources

The following are definitions for biological resources and wetlands analyzed in this Revised/Second Draft 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 (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]) are assumed to fall under the jurisdiction of the USACE. Confirmation of these aquatic resources as jurisdictional by the USACE, the SWRCB, or the CDFW will occur through applicable regulatory processes, which, in the case of the USACE, has been integrated with the National Environmental Policy Act (NEPA)/CEQA process to reduce duplication of effort (see Section 3.7.4.2, Clean Water Act Section 404(b)(1) Guidelines for further information on NEPA/CEQA integration). On April 27, 2018, verification of these waters as federally jurisdictional was obtained from USACE. These are definitions of the categories that are included in the jurisdictional aquatic resources sections:
  - **Waters of the United States.** The federal Clean Water Act (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 Revised/Second Draft 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**. The CDFW has not promulgated regulations further defining its jurisdiction under California Fish and Game Code Section 1600 et seq. However, the CDFW jurisdiction generally includes rivers, lakes, and streams. 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 (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, riparian areas are the vegetated areas between a seasonal riverine feature and the outer drip line of the adjacent vegetation. 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 is 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 (i.e., 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 Revised/Second Draft 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):

- Federal Endangered Species Act (FESA) of 1973 (16 U.S.C. § 1531 et seq.)
- Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.)
- Clean Water Act (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); U.S. Fish and Wildlife Service (USFWS); National Marine Fisheries Service (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:
  - California Endangered Species Act (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	
2030 Merced County General Plan (2013)	Merced County adopted the *2030 Merced County General Plan* 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: ▪ 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 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.

Policy Title	Summary
City of Chowchilla	
City of Chowchilla 2040 General Plan, Open Space and Conservation Element, Biological Resources Section (2011)	The City of Chowchilla adopted the general plan *City of Chowchilla 2040 General Plan* 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): ▪ 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 OS 13.8: Lighting associated with new and redevelopment projects adjacent to Ash Sough or Berenda Slough shall be designed to repent 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.

Policy Title	Summary
Stanislaus County (for a portion of a network upgrade component only)	
Stanislaus County General Plan (2016)	The *Stanislaus County General Plan* was adopted on August 23, 2016. The Stanislaus General Plan includes the following policies: ▪ 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	
Merced Vision 2030 General Plan (2015)	The *Merced Vision 2030 General Plan* was adopted by the City Council on January 3, 2012, and includes the following policies in the Open Space Conservation and Recreation Element. ▪ 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)	
Waterford Vision 2025 General Plan (2006)	The Waterford City Council adopted the Waterford Vision 2025 General Plan 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. ▪ 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 3.1.3.3, Compatibility with Plans and Laws, CEQA and NEPA regulations[2] require a discussion of inconsistencies or conflicts between a proposed undertaking and federal, state, regional, or local plans and laws. As such, this Revised/Second Draft 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 Clean Water Act, 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

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

and laws include the federal Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, the U.S. Fish and Wildlife Coordination Act, the Migratory Bird Treaty Act, 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 California Endangered Species Act, Fully Protected Species, Bird Protections, and Lake and Streambed Alteration).

- Management plans such as the Omnibus Public Management Act, which includes the San Joaquin River Restoration Program.

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 lead state agency proposing to construct and operate the high-speed rail (HSR) system, is required to comply with all federal and state laws, regulations, and to secure all applicable federal and state permits prior to initiating construction on the selected alternative. Similarly, as NEPA lead agency, the Authority is required to comply with all federal laws and regulations. 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 US(EPA) 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 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 applications to ensure compliance with the Section 404(b)(1) Guidelines, to provide the basis for a future Section 401 water quality certification, and to integrate NEPA analysis and the 404(b)(1) analysis:

- 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 received 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 was prepared and submitted to the USEPA and USACE for review in early 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 Area[1]		
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. This area was physically surveyed, if access was available. 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.
Indirect Impacts	Project footprints plus 250 feet	
Indirect Bisected Impacts[2] (vernal pool species)	Project footprints plus the entirety of vernal pool coverage	
Auxiliary Habitat Study Area[3]		
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 Area[3]		
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.

Resource Study Area	Area of Impact	General Description
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 Area[4]		
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.

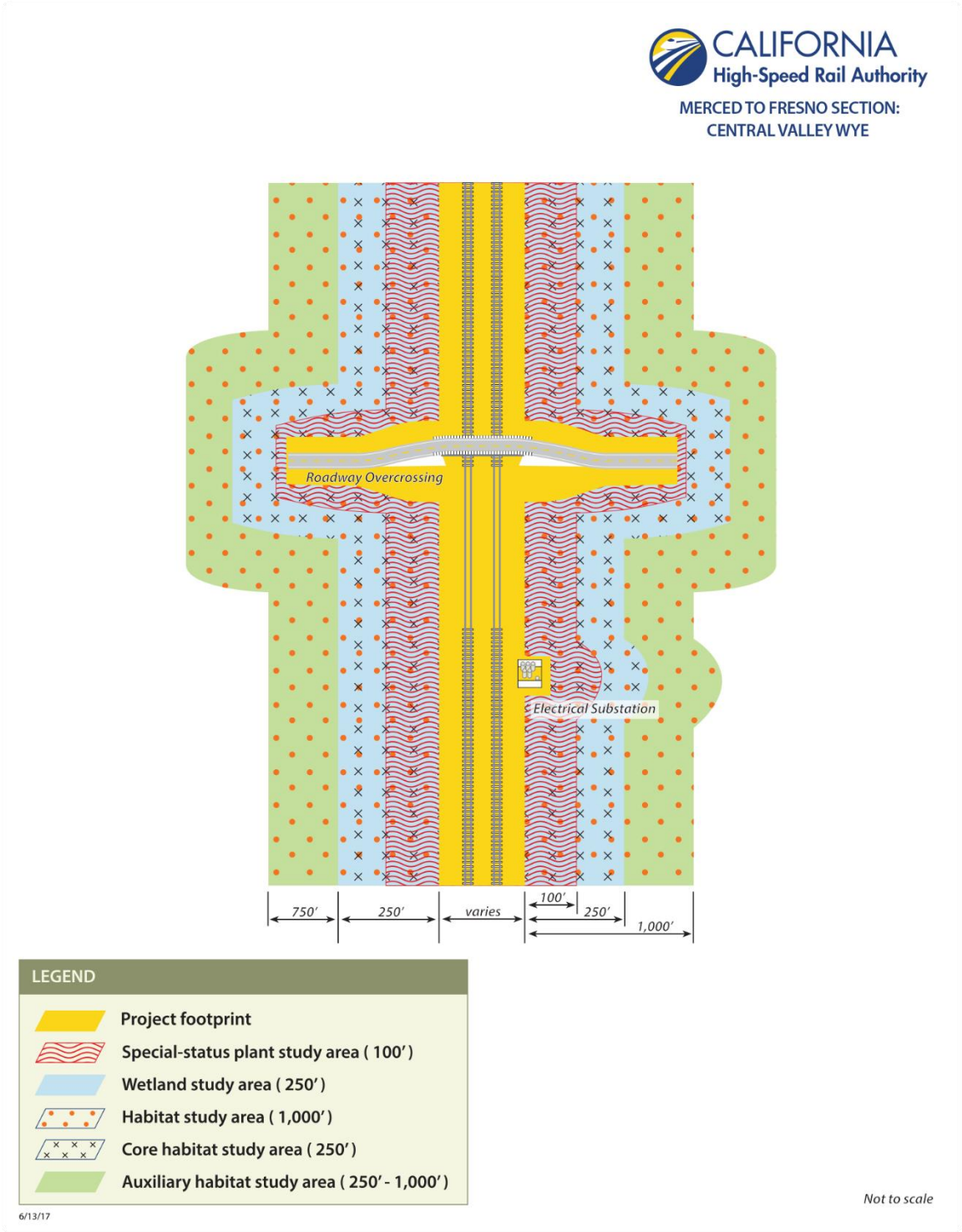
Source: Authority, 2018

[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).



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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. IAMFs applicable to biological resources and wetlands include:

- BIO-IAMF#1, Project Biologist
- BIO-IAMF#2, Agency Access
- BIO-IAMF#3, Construction Period Worker Environmental Awareness Program (WEAP) Training
- BIO-IAMF#4, Operation and Maintenance Period Worker Environmental Awareness Program (WEAP) Training
- BIO-IAMF#5, Prepare and Implement a Restoration and Revegetation Plan
- BIO-IAMF#6, Prepare and Implement a Biological Resources Management Plan
- BIO-IAMF#7, Prepare and Implement an Annual Vegetation Management Plan
- BIO-IAMF#8, Prepare and Implement a Weed Control Plan
- BIO-IAMF#9, Security Fence Maintenance Plan
- BIO-IAMF#10, Construction Work Windows
- BIO-IAMF#11, Conduct Biological Monitoring during Construction Activities
- BIO-IAMF#12, “Take” Notification and Reporting
- BIO-IAMF#13, Environmentally Sensitive Areas, Wildlife Exclusion Fencing, and Non-Disturbance Zones
- BIO-IAMF#14, Monofilament Restrictions
- BIO-IAMF#15, Avoidance of Entrapment
- BIO-IAMF#16, Artificial Dens Associated with Wildlife Exclusion Fencing and Non-Disturbance Zones
- BIO-IAMF#17, Equipment Staging Areas
- BIO-IAMF#18, Construction Utility Requirements and Waste Disposal
- BIO-IAMF#19, Cleaning of Construction Equipment
- BIO-IAMF#20, Dewatering and Water Diversion
- BIO-IAMF#21, Vehicle Traffic and Construction Site Speed Limits
- BIO-IAMF#22, Work Stoppage
- BIO-IAMF#23, Compliance Reporting
- BIO-IAMF#24, Construction Site Housekeeping
- BIO-IAMF#25, Wildlife Crossings
- BIO-IAMF#26, General Nesting Season Restrictions
- BIO-IAMF#27, Conservation Dogs

- HYD-IAMF#1: Storm Water 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

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 Revised/Second Draft 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 (CNDDB) or within the following U.S. Geological Survey 7.5-minute quadrangles (quads) (22-quad search area):[3]

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

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

[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)
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
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 and FRA, 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.
- **CNDDB**—A list of special-status plant species was prepared through a two-fold inquiry of the CNDDB 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 CNDDB 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.
- **CNDDB**—A list of special-status wildlife species was prepared through a two-fold inquiry of the CNDDB 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 electrical interconnections and network upgrade components (CDFW 2014a, CDFW 2016a). The list of CNDDB-reported special-status species is provided in Appendix 3.7-B and Appendix 2.D-4. An additional GIS query of the CNDDB specifically for Crotch bumble bee (not tracked by CNDDB prior to its candicy 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 CNDDB 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 CNDDB.

- **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*], Suckly cuckoo bumble bee [*Bombus suckleyi*], and western bumble bee [*Bombus occidentialis 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 unit 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
- CNDDB 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 right of ways, 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. 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 CNDDB 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 Electrical Interconnections and Network Upgrades (EINU).

The California Natural Diversity Database (CNDDB) and iNaturalist[6] both contain records documenting the distribution of Crotch bumble bee. There are no CNDDB occurrences or iNaturalist observations of Crotch bumble bee in the project footprint for the Central Valley Wye

[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 CNDDB 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.

(including EINU Sites 6 and 7). The CNDDB[7] includes three records for Crotch bumble bee within 15 miles of the CVY and EINU (7 miles to the closest CVY 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 CVY and EINU (4 miles to the closest EINU project footprint and 15 miles to the closest CVY project footprint). These observations include a May 2019 occurrence located slightly north and west of Wood Ranch and west of I-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.

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. 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 impacted 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.

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

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. 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)
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, 2018

CRAM works by scoring four key attributes: Buffer and Landscape Context, Hydrology, Physical Structure, and Biotic Structure. All CRAM modules assess these four attributes, using various metrics and submetrics to address wetland class-specific relationships. In all modules, the CRAM "Index Score," or overall score, is calculated as the average of the four attribute scores. 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).

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. 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 wetlands 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 Electrical Interconnections and Network Upgrades. 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	1,166.07	1,841.87	4,142.72
Inactive Agriculture	77.82	161.51	172.85	61.32	185.34	146.92	81.65	179.57	157.15	56.25	143.27	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	814.39	2,012.12	2,966.44
Pastures	26.11	84.52	127.29	57.38	383.25	130.84	28.27	69.34	46.09	21.58	69.72	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
Subtotal:	*2,545.85*	*5,477.87*	*9,551.97*	*3,119.14*	*8,793.00*	*10,090.31*	*2,492.88*	*5,801.13*	*10,291.30*	*2,486.87*	*5,328.19*	*9,022.37*
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	84.32	146.81	174.91
Transportation Corridor	289.28	272.39	392.64	343.41	398.79	401.93	134.09	254.59	411.83	242.55	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	116.75	296.85
Subtotal:	*542.14*	*739.74*	*848.38*	*683.91*	*1,104.75*	*1,091.74*	*296.33*	*626.28*	*698.38*	*463.14*	*662.58*	*720.62*

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	3.19	14.38
Ruderal	39.00	122.59	77.58	54.19	177.93	97.07	25.07	100.37	18.27	38.34	121.13	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
Subtotal:	*144.77*	*341.86*	*408.61*	*190.25*	*760.20*	*442.25*	*65.50*	*241.76*	*137.36*	*122.25*	*310.72*	*401.89*
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
Subtotal:	*1.09*	*3.99*	*29.80*	*2.17*	*17.60*	*48.15*	*1.70*	*1.78*	*16.85*	*0.69*	*3.75*	*31.15*

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	150.20	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	15.63	38.84
Subtotal:	*38.09*	*195.67*	*179.93*	*35.36*	*266.75*	*204.43*	*43.34*	*184.78*	*122.59*	*29.26*	*190.98*	*179.25*
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**	**6,496.22**	**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 2010–2017. 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.

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 Revised/Second Draft 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 (*Zenaida 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	*Castilleja campestris* subsp. *Succulenta*	Threatened	Endangered
Hoover's spurge	*Chamaesyce hooveri*	Threatened	—
Palmate-bracted bird's-beak	*Chloropyron palmatum*	Endangered	Endangered
Delta button-celery	*Eryngium racemosum*	—	Endangered
Boggs Lake hedge-hyssop	*Gratiola heterosepala*	—	Endangered
San Joaquin wooly-threads	*Monolopia congdonii*	Endangered	—
Colusa grass	*Neostapfia colusana*	Threatened	Endangered
San Joaquin Valley Orcutt grass	*Orcuttia inaequalis*	Threatened	Endangered
hairy Orcutt grass	*Orcuttia pilosa*	Threatened	Endangered
Hartweg's golden sunburst	*Pseudobahia bahiifolia*	Endangered	Endangered
Keck's checkerbloom	*Sidalcea keckii*	Endangered	—
Greene's tuctoria	*Tuctoria greenei*	Endangered	—
Other Special-Status Plant Species[1]			
Alkali milk-vetch	*Astragalus tener* var. *tener*	—	—
Heartscale	*Astragalus cordulata* var. *cordulata*	—	—
Crownscale	*Astragalus coronata* var. *coronata*	—	—
Lost Hills crownscale	*Atriplex coronata var. vallicola*	—	—
Lesser saltscale	*Atriplex minuscula*	—	—
Vernal pool smallscale	*Atriplex persistens*	—	—
Subtle orache	*Atriplex subtilis*	—	—
Round-leaved filaree	*California macrophylla*	—	—
Hoover's calycadenia	*Calycadenia hooveri*	—	—
Lemmon's jewelflower	*Caulanthus lemmonii*	—	—
Parry's rough tarplant	*Centromadia parryi subsp. rudis*	—	—
Hispid bird's-beak	*Chloropyron molle subsp. hispidum*	—	—
Beaked clarkia	*Clarkia rostrata*	—	—
Hoover's cryptantha	*Cryptantha hooveri*	—	—
Peruvian dodder	*Cuscuta obtusiflora var. glandulosa*	—	—
Hall's tarplant	*Deinandra halliana*	—	—
Ewan's larkspur	*Delphinium hansenii subsp. ewanianum*	—	—
Recurved larkspur	*Delphinium recurvatum*	—	—
Dwarf downingia	*Downingia pusilla*	—	—

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

Source: 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 94 special-status wildlife species for their potential to occur in the habitat study area. Of the 94 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 66 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	*Branchinecta conservatio*	FE, CH	—
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT, CH	—

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

Common Name	Scientific Name	Federal Status[1]	State Status[2]
Chinook salmon—Central Valley fall/late-fall run evolutionarily significant unit	*Oncorhynchus tshawytscha*	FSC	CSC
Amphibians			
Western spadefoot	*Spea hammondii*	—	CSC
Reptiles			
Western pond turtle	*Actinemys marmorata*	—	CSC
Silvery legless lizard[3]	*Anniella pulchra*	—	CSC
San Joaquin coachwhip[3]	*Masticophis flagellum ruddocki*	—	CSC
Blainville's horned lizard	*Phrynosoma blainvillii*	—	CSC
Birds			
Grasshopper sparrow	*Ammodramus savannarum*	BCC	CSC
Golden eagle	*Aquila chrysaetos*	BGEPA	FP
Short-eared owl	*Asio flammeus*	—	CSC
Long-eared owl	*Asio otus*	—	CSC
Western burrowing owl	*Athene cunicularia*	BCC	CSC
Redhead	*Aythya americana*	—	CSC
Barrow's goldeneye[3]	*Bucephala islandica*	—	CSC
Red knot	*Calidris canutus roselaari*	BCC	–
Costa's hummingbird	*Calypte costae*	BCC	–
Lawrence's goldfinch	*Carduelis lawrencei*	BCC	—
Mountain plover	*Charadrius montanus*		CSC
Black tern	*Chlidonias niger*	—	CSC
Northern harrier	*Circus cyaneus*	—	CSC
Fulvous whistling-duck	*Dendrocygna bicolor*	—	CSC
Yellow warbler	*Dendroica petechia brewsteri*	BCC	CSC
White-tailed kite	*Elanus leucurus*	—	FP
Lesser sandhill crane	*Grus canadensis*	—	CSC
Yellow-breasted chat	*Icteria virens*	—	CSC
Least bittern	*Ixobrychus exilis*	—	CSC
Loggerhead shrike	*Lanius ludovicianus*	BCC	CSC
Marbled godwit[3]	*Limosa fedoa*	BCC	—

Common Name	Scientific Name	Federal Status[1]	State Status[2]
Song sparrow ("Modesto" population)[3]	*Melospiza melodia*	—	CSC
Long-billed curlew	*Numenius americanus*	BCC	—
Whimbrel	*Numenius phaeopus*	BCC	—
American white pelican	*Pelecanus erythrorhynchos*	—	CSC
Yellow-billed magpie	*Pica nuttalli*	BCC	—
Nuttall's woodpecker	*Picoides nuttallii*	BCC	—
Spotted towhee[3]	*Pipilo maculates*	BCC	—
Oregon vesper sparrow	*Pooecetes gramineus affinis*	—	CSC
Purple martin	*Progne subis*	—	CSC
Yellow-headed blackbird	*Xanthocephalus*	—	CSC
Mammals			
Pallid bat	*Antrozous pallidus*	—	CSC
Ringtail	*Bassariscus astutus*	—	FP
Western mastiff bat	*Eumops perotis californicus*	—	CSC
Western red bat	*Lasiurus blossevillii*	—	CSC
American badger	*Taxidea taxus*	—	CSC

Source: CDFW, 2016a and 2019; USFWS, 2017
This table incorporates information from the Biological Resources and Wetlands Technical Report (Authority and FRA 2016a) and Appendix 2-D.4
[1] Federal 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
[2] State 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
[3] Species specific to electrical interconnection and network upgrade components only

The four Central Valley Wye alternatives provide suitable habitat for the 66 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.

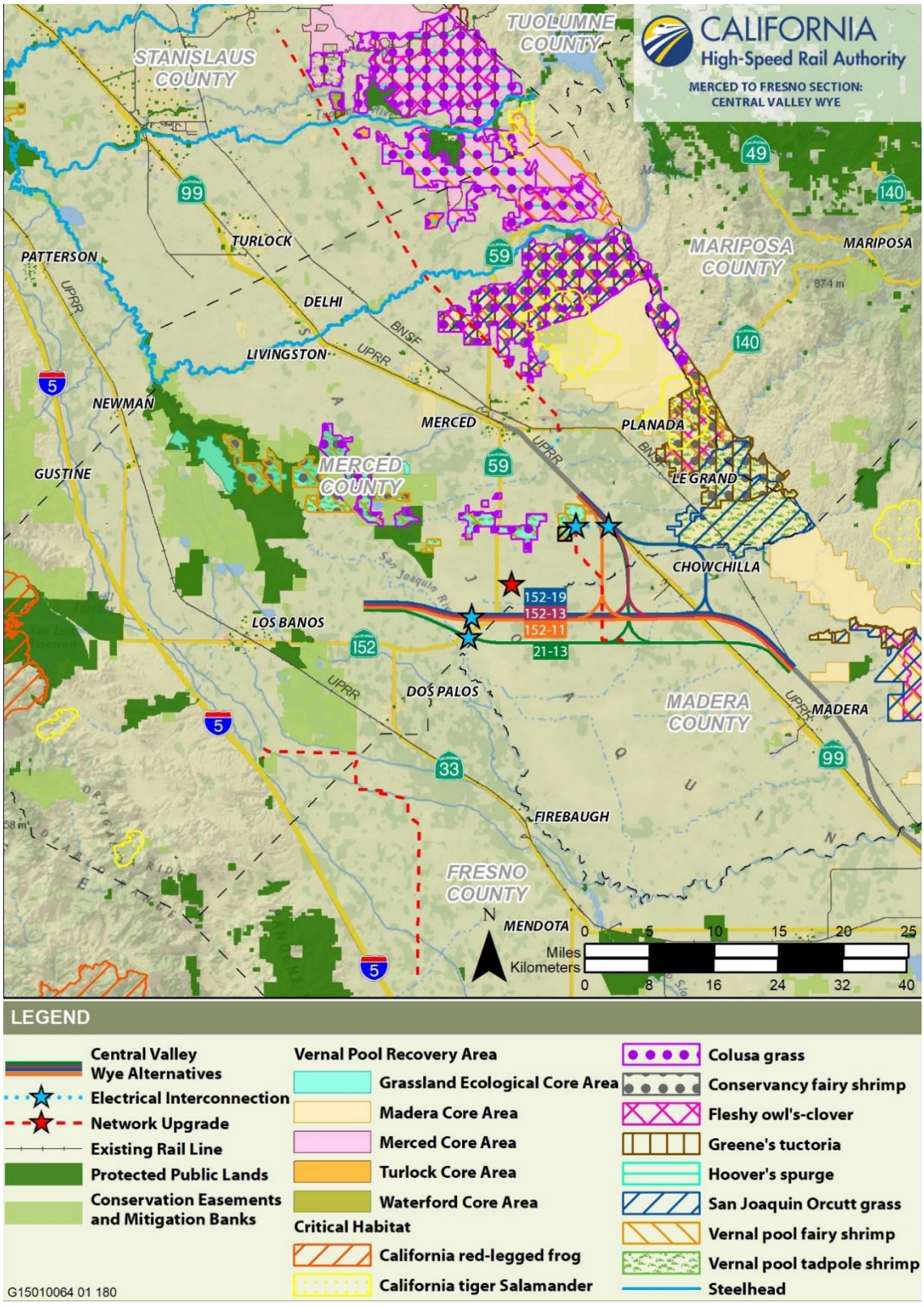
The San Joaquin River crosses the western portion of the habitat study area for all four alternatives and provides habitat for Kern brook lamprey, fall-run Chinook salmon, Central Valley steelhead, hardhead, and San Joaquin roach. In addition, an experimental population of spring-run Chinook salmon is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



Source: Authority and FRA, 2016a; USFWS, 2005, 2015; WES, 2016

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

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 Pools	Yes
Freshwater Marsh	Coastal and Valley Freshwater Marsh	Yes
Valley Sink Scrub	Desert Sink Scrub	Yes

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

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	5.43	0.36	0.38	0.36-5.43
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	4.05	3.17-20.04
Palustrine Forested Wetland[3]	0.34	0.00	0.00	0.00	0.00-0.34
Subtotal	*13.42*	*50.65*	*19.54*	*11.73*	*11.73-50.65*
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

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]
Constructed Basins	23.90	45.31	19.85	22.75	19.85-45.31
Constructed Watercourses	169.25	192.16	166.22	164.59	164.59-192.16
Subtotal	*233.76*	*302.11*	*235.23*	*220.24*	*220.24-302.11*
Grand Total	**247.18**	**352.76**	**254.76**	**231.97**	**231.97-352.76**

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.

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 the California Department of Water Resources 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. Interim flow releases for water years 2010 through 2012 have been completed for the purpose of data collection (USBR 2010). USBR (2013) analyzed the impacts of flows for 2013 to 2017 in a draft Environmental Assessment. 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. Since flows were restored, this segment provides a migratory corridor for salmonids.

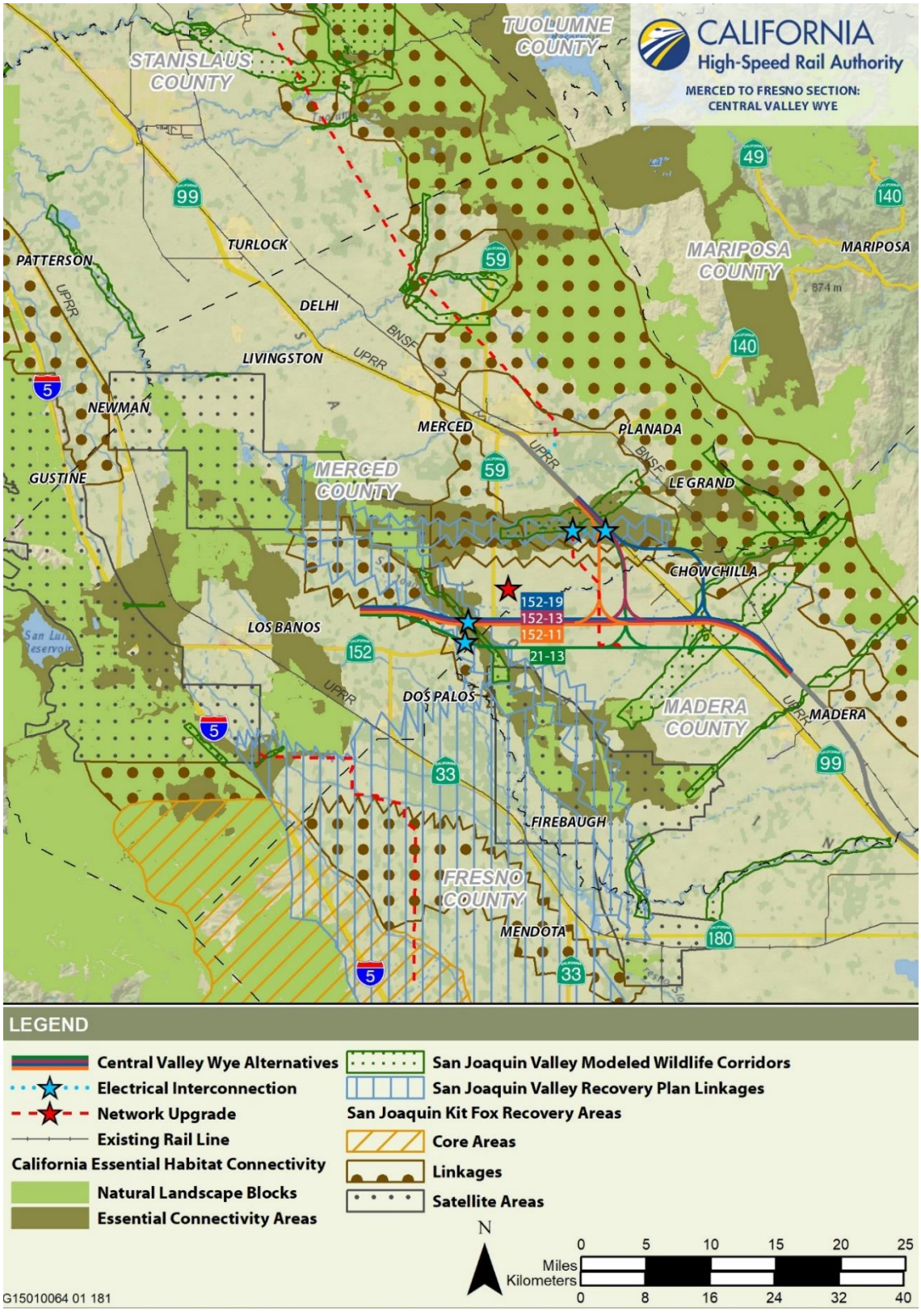
3.7.6.5 Wildlife Movement Corridors

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.



Source: Authority and FRA, 2016a; 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 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. 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.

3.7.7.4 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 wooly-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 wooly-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-sepaled 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, numerous IAMFs are incorporated as part of the Central Valley Wye alternatives to avoid and minimize impacts. One of these IAMFs stipulates that the Authority would develop and implement requirements to identify special-status plants (i.e., individual plants or colonies) to be avoided during construction. BIO-IAMF#13 has been incorporated into the Central Valley Wye alternatives, which would require the Authority to delineate environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field using measures such as flagging or fencing. In addition to this, under any of the Central Valley Wye alternatives, the Authority would require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3). This would avoid some, but not all, direct impacts on special-status plants because it would establish that contractors be aware of and avoid affecting special-status plant occurrences during construction.

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 and 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.

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#1: Conduct Protocol-Level 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#2: 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#3: Prepare and Implement a Habitat Management Plan, BIO-MM#4: Off-Site Habitat Restoration, Enhancement, and Preservation, and BIO-MM#45: Compensate for Impacts on Special-Status 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#1 through BIO-MM#4 and BIO-MM#45. 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 develop and implement a weed control plan (BIO-IAMF#8) to minimize and avoid the spread of weeds during ground-disturbing activities. BIO-IAMF#13 would provide

contractor awareness of and avoidance of sensitive biological resources adjacent to but outside the project footprint of the alternative selected for construction by delineating environmentally sensitive areas and environmentally restricted areas. This would help minimize indirect impacts on special-status plants and other native vegetation occurring outside of but adjacent to the project footprints under any of the Central Valley Wye alternatives. Also included in the Central Valley Wye alternatives are provisions for minimizing the spread of invasive plants within or adjacent to sensitive habitat areas as defined by the project biologist by confirming that vehicles are free 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#19). These and other provisions would be included in a weed control plan (IAMF#8) that specifies the associated requirements for construction contractors. 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#1 would require surveys to identify special-status plants in areas where permission to enter was not granted prior to construction, thereby minimizing or avoiding disturbance of plant species. BIO-MM#2 would provide for the removal of special-status plant species prior to disturbance. BIO-MM#3, BIO-MM#4, and BIO-MM#45 would provide for on-site and off-site restoration and preservation of special-status plant species and other native plants, respectively. With implementation of BIO-MM#1 through BIO-MM#4 and BIO-MM#45, 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 Alternative[1] (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**
Fish[2]						
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
		Subtotal	*0.96*	*2.17*	*1.58*	*0.69*
	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
		Subtotal	*188.43*	*313.14*	*113.08*	*155.57*
	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
		Subtotal	*0.96*	*2.17*	*1.58*	*0.69*
	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
		Subtotal	*44.29*	*69.75*	*15.44*	*28.37*
	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
		Subtotal	*10.96*	*14.07*	*11.57*	*8.24*
		Direct Permanent	70.02	70.85	28.87	48.63
		Direct Temporary	10.63	39.95	10.18	10.04

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	*Subtotal*	*80.65*	*110.80*	*39.04*	*58.67*
	Total		**91.61**	**124.87**	**50.61**	**66.91**
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	11.28
		Total	**43.42**	**42.05**	**20.18**	**37.45**
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	68.43
		Total	**203.77**	**283.26**	**124.44**	**176.33**
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
		Subtotal	*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
		Subtotal	*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	2,563.60
		Direct Temporary	656.90	1,227.35	485.80	536.24
		Total	**3,269.56**	**4,031.34**	**2,897.38**	**3,099.84**
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
		Subtotal	*1.92*	*1.60*	*2.97*	*1.53*
	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	1,247.54
		Direct Temporary	351.82	484.75	271.32	291.90
		Subtotal	*1,674.56*	*1,699.02*	*1,336.46*	*1,539.44*
	Total		**1,676.48**	**1,700.62**	**1,339.43**	**1,540.98**
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
		Subtotal	*1.57*	*0.54*	*2.55*	*0.86*
	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	1,209.93
		Direct Temporary	380.98	480.50	299.25	321.77
		Subtotal	*1,664.50*	*1,686.93*	*1,326.49*	*1,531.70*
	Total		**1,666.06**	**1,687.47**	**1,329.05**	**1,532.56**

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	153.03
		Subtotal	*782.77*	*1,288.11*	*1,080.22*	*815.92*
	Foraging: BAR, AGS, FAF, FIC, INA, PAS, ROC, RUD, SEW, TRC,	Direct Permanent	1,360.91	1,206.27	1,104.75	1,287.30
		Direct Temporary	302.93	479.99	221.16	243.73
		Subtotal	*1,663.83*	*1,686.26*	*1,325.91*	*1,531.03*
	Nesting/ Foraging: TRC	Direct Permanent	205.26	208.44	104.18	179.66
		Direct Temporary	83.54	134.50	29.43	62.41
		Subtotal	*288.80*	*342.93*	*133.61*	*242.07*
	Total		**2,735.40**	**3,317.30**	**2,539.74**	**2,589.02**
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	1,271.55
		Direct Temporary	251.01	403.48	170.08	192.86
		Total	**1,592.02**	**1,577.09**	**1,253.12**	**1,464.40**
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	1,286.91
		Direct Temporary	291.82	468.47	209.61	232.60
		Total	**1,652.04**	**1,673.28**	**1,313.42**	**1,519.51**
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
		Subtotal	*1.92*	*1.60*	*2.97*	*1.53*
	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
		Subtotal	*6.77*	*8.22*	*5.88*	*5.11*
	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
		Subtotal	*29.82*	*30.31*	*38.40*	*22.14*
	Foraging: AGS, DAI, INA, MIR, OTR, PAS, VP	Direct Permanent	212.88	173.12	129.68	158.47
		Direct Temporary	50.75	111.21	32.52	27.79
		Subtotal	*263.63*	*284.33*	*162.20*	*186.25*
	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	140.27
		Subtotal	*1,198.35*	*1,112.23*	*905.85*	*1,166.56*
	Total		**1,491.80**	**1,426.87**	**1,106.45**	**1,374.96**
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	1,107.01
		Direct Temporary	386.15	887.98	281.92	332.68
		Total	**1,520.99**	**2,239.00**	**1,462.82**	**1,439.70**
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	1,373.83
		Direct Temporary	361.62	595.93	217.61	289.39
		Total	**1,795.28**	**1,905.13**	**1,274.60**	**1,663.22**
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
		Subtotal	*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	1,261.55
		Direct Temporary	296.08	474.84	212.61	236.99
		Subtotal	*1,626.52*	*1,666.71*	*1,285.65*	*1,498.54*
	Total		**1,693.41**	**1,763.04**	**1,361.71**	**1,551.40**

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
		Subtotal	*1,149.12*	*1,631.04*	*1,291.38*	*1,135.55*
	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	1,290.54
		Direct Temporary	250.52	356.57	169.59	192.37
		Subtotal	*1,610.52*	*1,556.12*	*1,271.62*	*1,482.90*
	Total		**2,759.65**	**3,187.16**	**2,563.00**	**2,618.45**
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	2,567.14
		Direct Temporary	656.90	1,227.35	485.80	536.24
		Total	**3,273.10**	**4,031.34**	**2,900.92**	**3,103.38**
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	2,567.14
		Direct Temporary	656.90	1,227.35	485.80	536.24
		Total	**3,273.10**	**4,031.34**	**2,900.92**	**3,103.38**

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	2,567.14
		Direct Temporary	656.90	1,226.96	485.80	536.24
		Total	**3,273.10**	**4,029.74**	**2,900.92**	**3,103.38**
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	169.69
		Direct Temporary	97.08	218.08	77.81	86.00
		Total	**309.50**	**406.65**	**237.21**	**255.69**
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
		Subtotal	*20.54*	*19.70*	*30.23*	*15.17*
	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
		Subtotal	*129.06*	*190.10*	*63.82*	*102.94*
	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	233.28
		Subtotal	*1,102.12*	*1,615.23*	*1,417.33*	*1,060.77*
	Total		**1,251.71**	**1,825.02**	**1,511.38**	**1,178.88**

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 and FRA, 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.

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).

As part of the design of any of the Central Valley Wye alternatives, the Authority would develop and implement requirements to identify special-status invertebrate habitat (i.e., vernal pools, elderberry shrubs, and annual grassland and valley sink scrub) to be avoided during ground-disturbing activities, and document the field delineation and installation of all environmentally sensitive areas and wildlife exclusion fencing to the mitigation manager and the Authority prior to construction (BIO-IAMF#13). Therefore, the design of all of the Central Valley Wye alternatives would avoid or minimize impacts on vernal pools, including changes in the retention or infiltration of runoff, disturbance of the underlying hardpan soils of these habitats, and potential increase in siltation and turbidity from grading, vehicle traffic, contaminants, and other related ground-disturbing activities. The design of all of the Central Valley Wye alternatives would also avoid or minimize the alteration of local topography, direction of runoff, and flow volume in the watershed of specific vernal pools (BIO-IAMF#6). This would prevent or minimize 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. 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. Under any of the Central Valley Wye alternatives, the Authority would implement mitigation measures BIO-MM#5: Conduct Pre-Construction Sampling and Assessment for Vernal Pool Fauna and BIO-MM#6: 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 best management practices (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 Protection would include BMPs to reduce impacts on vernal pools within temporary impact areas. BIO-MM#3, BIO-MM#4, BIO-MM#46: Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp, and BIO-MM#47: Compensate for Impacts on Valley Elderberry Longhorn Beetle would allow for on-site and off-site restoration and preservation of special-status invertebrate species habitat. The Authority would also implement BIO-MM#54: Conduct Surveys and Implement Avoidance Measures for Crotch Bumble Bee, which will identify occupied habitat and avoid and minimize impacts on individuals. BIO-MM#55: Compensate for Impacts on Crotch Bumble Bee habitat, would also provide for the off-site preservation of suitable habitat. With implementation of BIO-MM#3 through BIO-MM#7, BIO-MM#46, BIO-MM#47, BIO-MM#54, and BIO-MM#55, 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.

As a feature of all of the Central Valley Wye alternatives, the Authority would prepare and implement a weed control plan (BIO-IAMF#8) to minimize and avoid the spread of weeds during ground-disturbing activities. Delineation of environmentally restricted areas (BIO-IAMF#13) would provide for the identification of, contractor awareness of, and avoidance of sensitive biological resources adjacent to but outside the project footprints. The features of all of the Central Valley Wye alternatives would also 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#19). 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.

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. The Authority would also prepare a dewatering plan for review and approval by the resource agencies, which would include appropriate measures to minimize turbidity and siltation (BIO-IAMF#20). 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 also implement mitigation measures to further reduce direct impacts on special-status fish species. BIO-MM#8**:** Implement Fish Rescue Plan inside Cofferdam would provide a plan for fish rescue when water depths are low within the cofferdam. BIO-MM#43: Measure Pile Driving Sound Pressure requires monitoring of underwater sound

pressure levels from pile-driving during construction of the bridge over San Joaquin River to reduce fish mortality. BIO-MM#3 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#3, BIO-MM#4, BIO-MM#8, and BIO-MM#43, the impact under CEQA would be less than significant for any of the Central Valley Wye alternatives because impacts on special-status fish species and their habitat from habitat degradation or modification and the potential for mortality would be reduced and there would not be a substantial adverse effect from habitat degradation or modification on special-status fish.

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.

As a feature of all 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#24). The Authority would also prepare a dewatering plan for review and approval by the resource agencies, which would include appropriate measures to minimize turbidity and siltation (BIO-IAMF#20). 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 (114.66acres) 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 a feature of all of the Central Valley Wye alternatives, the Authority would implement IAMFs to avoid and minimize direct impacts on special-status amphibians. BIO-IAMF#6 would require that the biological resources management plan (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. Wildlife exclusion fencing would be installed around the perimeter of environmentally sensitive areas to prevent special-status amphibians from entering the work area, reducing the likelihood of injury or mortality (BIO-IAMF#13). 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#14).

In addition, 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 (BIO-IAMF#15). 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#15). Speed limits of 15 miles per hour would be established in construction zones to reduce the likelihood of special-status amphibian mortality from vehicle strikes (BIO-IAMF#21).

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#9: Conduct Pre-Construction

Surveys for Special-Status Reptile and Amphibian Species and BIO-MM#10: Conduct Special-Status Reptile and Amphibian Monitoring, Avoidance, and Relocation 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 Protocol and Pre-Construction Surveys for California Tiger Salamander and BIO-MM#12: California Tiger Salamander Exclusion Fencing 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#3, BIO-MM#4, and BIO-MM#48: Compensate for Impacts on California Tiger Salamander would allow for on-site and off-site restoration and preservation of special-status amphibian species. With implementation of BIO-MM#3, BIO-MM#4, BIO-MM#48, and BIO-MM#9 through BIO-MM#13, 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 a feature of the Central Valley Wye alternatives, the Authority would prepare and implement a weed control plan (BIO-IAMF#8) to minimize and avoid the spread of weeds during ground-disturbing activities. Delineation of environmentally sensitive areas (BIO-IAMF#13) would provide for the identification of, contractor awareness of, and avoidance of sensitive biological resources adjacent to but outside the project footprint of the alternative selected for construction. 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#19). 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 retile 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 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 (66.91 acres), blunt-nosed leopard lizard (37.45 acres), Blainville's horned lizard (176.33 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 a feature of all of the Central Valley Wye alternatives, 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#6). The design of the Central Valley Wye alternatives would install wildlife exclusion fencing around the perimeter of environmentally

sensitive areas to prevent special-status reptiles from entering the work area, reducing the likelihood of injury or mortality (BIO-IAMF#13). 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#14). 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 (BIO-IAMF#15). 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. 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#21).

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 subjected to mortality, injury, or entrapment. 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#9 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: Phased Pre-Construction Surveys 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 and submit a memorandum documenting

compliance. 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 Monitor for Giant Garter Snake 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#42: Blunt-nosed Leopard Lizard Avoidance would require development and implementation of appropriate measures to avoid take of blunt-nosed leopard lizard. BIO-MM#3, BIO-MM#4, and BIO-MM#49: Compensate for Impacts on Blunt-nosed Leopard Lizard and Nelson's Antelope Squirrel would allow for on-site and off-site restoration and preservation of special-status reptile species.

With implementation of BIO-MM#9, BIO-MM#10, BIO-MM#14 through BIO-MM#23, as well as BIO-MM#3, BIO-MM#4, BIO-MM#42, BIO-MM#49, and BIO-MM#53: Compensate for Destruction of Giant Garter Snake Habitat, 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 part of the design of the Central Valley Wye alternatives, the Authority would prepare and implement a weed control plan (BIO-IAMF#8) to minimize and avoid the spread of weeds during ground-disturbing activities. Delineation of environmentally restricted areas (BIO-IAMF#13) would provide for the identification of, contractor awareness of, and avoidance of sensitive biological resources adjacent to but outside the project footprint selected for construction. 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#19). The Central Valley Wye alternatives would include effective measures to minimize the spread of weeds during construction activities and to avoid sensitive areas, 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 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 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. 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 on 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 a feature of all of the Central Valley Wye alternatives, the Authority would develop and implement requirements to identify special-status bird nests to be avoided during construction

and to guarantee that the project biologist or agency-approved biologist would conduct a pre-construction nesting bird survey during the nesting bird season, generally between February 1 and September 1 (BIO-IAMF#26). If active nests were found, the Authority would develop site-specific measures to avoid impacts on the nests. The design of the Central Valley Wye alternatives would minimize direct impacts, 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.

The design of the Central Valley Wye alternatives would avoid some, but not all, direct impacts on special-status birds because it would safeguard that construction would not result in the reproductive failure of any active nests within or adjacent to the project footprint of the alternative selected for construction (BIO-IAMF#26).

Despite these 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 design characteristics of all of the Central Valley Wye alternatives would include effective measures to identify and avoid special-status bird nests during construction and conduct a pre-construction nesting bird survey. These measures would reduce but not avoid impacts on nesting and foraging habitat for special-status birds. In addition, the Authority would implement mitigation measures to reduce impacts on special-status birds. BIO-MM#24: 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#25: 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 Protocol and Pre-construction Surveys for Swainson's Hawks and BIO-MM#27: Swainson's Hawk Nest Avoidance and Monitoring 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#50, Compensate for Loss of Swainson's Hawk Nesting Trees. BIO-MM#29: Conduct Protocol-level Surveys for Burrowing Owls and BIO-MM#30: Burrowing Owl Avoidance and Minimization would require a qualified, agency-approved biologist to conduct protocol-level surveys and prepare a memorandum identifying how BMPs would be implemented related to burrowing owl avoidance and minimization features. BIO-MM#51, Compensate for Loss of Burrowing Owl Active Burrows and Habitat, describes how active burrows permanently lost during construction would be mitigated. BIO-MM#3 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#24 through BIO-MM#30, as well as BIO-MM#3, BIO-MM#4, BIO-MM#50, and BIO-MM#51, 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. 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 a feature of all of the Central Valley Wye alternatives, the Authority would develop and implement general nesting season restrictions (BIO-IAMF#26) which would minimize the impacts of permanent or temporary displacement of special-status bird species. This would avoid disturbance; fragmentation; displacement; interference with daily movement, foraging, and dispersal of these bird species; and would avoid reduced reproductive success and increased mortality through the exposure of nests to predators and the elements. 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 develop and implement general nesting season restrictions, preventing permanent or temporary displacement, 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 a feature of the Central Valley Wye alternatives, the Authority would develop and implement requirements to install artificial dens along wildlife exclusion fencing to enable special-status mammal and other terrestrial wildlife movement through work areas during construction (BIO-IAMF#16). 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 3,103.38 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 (1,178.88 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 255.69 acres of direct impact on American badger habitats, respectively.

- **Ringtail**—Mortality and injury of ringtail could occur from individuals being crushed by construction equipment working in riparian habitats. 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#31: Conduct Pre-construction Surveys for Special-Status Bat Species and BIO-MM#32: Bat Avoidance and Relocation 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 prepare a memorandum identifying 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: Bat Exclusion and Deterrence would require the project biologist to prepare a memorandum identifying 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: Conduct Pre-Construction Surveys for American Badger and Ringtail and BIO-MM#35: American Badger and Ringtail Avoidance 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 Protocol-level 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 prepare a memorandum identifying how BMPs related to construction activity would be implemented to minimize impacts on San Joaquin kit fox. 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#3 and BIO-MM#4 would allow for on-site and off-site restoration and preservation of special-status mammal species habitat, respectively. BIO-MM#52: Compensate for Destruction of San Joaquin Kit Fox Habitat describes how the permanent loss of San Joaquin kit fox habitat would be mitigated.

With implementation of BIO-MM#3, BIO-MM#4, BIO-MM#31 through BIO-MM#38, BIO-MM#41, and BIO-MM#52, 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 a feature of all of the Central Valley Wye alternatives, the Authority would prepare a wildlife corridor assessment identifying how facilitation of animal movement is accomplished in the design segment (BIO-IAMF#25) so wildlife movement opportunities are considered during project design. 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 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#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 prepare a memorandum identifying 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 prepare a memorandum identifying 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#3 and BIO-MM#4 would allow for on-site and off-site restoration and preservation of special-status mammal species habitat, respectively. BIO-MM#52 describes how the permanent loss of San Joaquin kit fox habitat would be mitigated. With implementation of BIO-MM#3, BIO-MM#4, BIO-MM#31 through BIO-MM#38, BIO-MM#40, BIO-MM#41, and BIO-MM#52, 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	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	Total Range of Impact[1]
Vernal Pool	0.18	0.19	0.10	0.19	0.10-0.19
Indirect Bisected Vernal Pool[2]	0.04	0.04	0.64	0.04	0.04-0.64
Mixed Riparian	0.36	1.06	0.42	0.68	0.36-1.06
Other Riparian	1.44	0.54	2.43	0.86	0.54-2.43
Seasonal Wetlands	0.78	1.99	1.47	0.49	0.49-1.99
Palustrine Forested Wetland	0.12	0.00	0.12	0.00	0.00-0.12
Valley Sink Scrub	4.26	4.26	4.26	4.26	4.26-4.26
Total	**7.19**	**8.07**	**9.45**	**6.52**	**6.52-9.45**

Source: Authority and FRA, 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. 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 activities associated with all of the Central Valley Wye alternatives would require delineation of environmentally sensitive areas or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#13) prior to starting construction. Such features of the Central Valley Wye alternatives would thus minimize the impacts of removing vegetation for construction. 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. 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#1 and BIO-MM#2, 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#3 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#1 through 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 part of the design of all of the Central Valley Wye alternatives, the Authority would prepare and implement a weed control plan (BIO-IAMF#8) 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. Implementation of BIO-IAMF#19 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. Construction speed limits would minimize special-status plant community exposure to dust (BIO-IAMF#21), and construction site BMPs (BIO-IAMF#24) would include measures to reduce fire risk during construction (e.g., smoking prohibitions, not parking equipment over dry vegetation).

During construction, the Authority would require that contractors return excavated soils to their original locations to be used as backfill (BIO-IAMF#18) to reduce indirect impacts on sensitive natural communities. Contractors would also be required to clean construction equipment prior to construction and prior to being moved onto any site, which would reduce the potential for the introduction of nonnative plants to become established following construction (BIO-IAMF#19). 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#1 and BIO-MM#2 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#3 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#1 through 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 Clean Water Act, 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).

Construction activities associated with all of the Central Valley Wye alternatives would require preparation and implementation of a restoration and revegetation plan (BIO-IAMF#5), preparation and implementation of a BRMP (BIO-IAMF#6), preparation of a dewatering plan (BIO-IAMF#20), preparation of a stormwater management plan (HYD-IAMF#1), preparation of a flood protection plan (HYD-IAMF#2), preparation of stormwater pollution prevention plans (HYD-IAMF#3 and HYD-IAMF#4), and delineation of environmentally sensitive areas or environmentally restricted areas prior to starting construction (BIO-IAMF#13). During construction, a biological monitor would be present on site to verify permit compliance and when establishing environmentally sensitive areas (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#19). 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

[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.

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 (13.69 acres) of all areas considered jurisdictional under Section 1600 et seq. (i.e., riparian habitats and stream habitats) would result from construction of the SR 152 (North) to Road 19 Wye Alternative, whereas the least direct impact (9.28 acres) on areas considered jurisdictional under Section 1600 et seq. would result from the SR 152 (North) to Road 11 Wye Alternative (Table 3.7-16). Construction of the Avenue 21 to Road 19 Wye Alternative and the SR 152 (North) to Road 13 Wye Alternative would result in 12.93 acres and 11.99 acres of direct impact on areas considered jurisdictional 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
Subtotal[3]	*1.00*	*0.13*	*1.13*	*1.69*	*0.52*	*2.21*	*1.76*	*0.58*	*2.34*	*0.62*	*0.11*	*0.72*	*0.72-2.34*
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	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
Subtotal	*28.26*	*9.82*	*38.08*	*25.71*	*9.65*	*35.36*	*34.19*	*9.15*	*43.34*	*22.11*	*7.15*	*29.26*	*29.26-43.34*
Grand Total[3]	**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
Subtotal	*1.49*	*0.43*	*1.92*	*1.21*	*0.39*	*1.60*	*2.11*	*0.86*	*2.97*	*1.15*	*0.38*	*1.53*	*1.15-1.92*
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
Subtotal	*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*
Grand Total	**7.83**	**4.15**	**11.99**	**9.05**	**4.64**	**13.69**	**7.12**	**5.81**	**12.93**	**5.88**	**3.40**	**9.28**	**9.28-13.69**

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 jurisdictional 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 (regulated under California Fish and Game Code Section 1600 et seq. for their wildlife habitat value) 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#3, BIO-MM#4, and BIO-MM#44: Compensate for Permanent and Temporary Impacts on Aquatic Resources 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#3, BIO-MM#4, and BIO-MM#44, 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 jurisdiction 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. As a feature of the Central Valley Wye alternatives, the Authority would 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#24). The Authority would also prepare a dewatering plan for review and approval by the resource agencies, which would include appropriate measures to minimize turbidity and siltation (BIO-IAMF#20). 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 Alternative would have less direct impact (2.94 acres of mapped critical habitat and 0.21 acre of aquatic habitat within that area).

As a feature of all of the Central Valley Wye alternatives, the Authority would identify vernal pools to be avoided during construction (BIO-IAMF#6), 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. 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#3, BIO-MM#4, and BIO-MM#44 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#3, BIO-MM#4, and BIO-MM#44, 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.

As a feature of all of the Central Valley Wye alternatives, the Authority would prepare and implement a weed control plan (BIO-IAMF#8) 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. The design of the Central Valley Wye alternatives 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 sure that invasive plant seeds are not carried between construction work areas (BIO-IAMF#19). As a feature of the Central Valley Wye alternatives, 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#24). 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. As a feature of the Central Valley Wye alternatives, the Authority would require that the project biologist consult with the USFWS and CDFW to identify appropriate work windows for federally listed species, including federally listed fish in the San Joaquin River (BIO-IAMF#10). If work cannot be conducted when the channel lacks flowing or standing water, additional measures would be required in accordance with permit conditions in the NMFS biological opinion and Section 1602 Streambed Alteration Agreement. 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#20). 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. None of the Central Valley Wye alternatives would modify the physical characteristics of 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 California Department of Water Resources 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#8 would provide a plan for fish rescue if water depths were low within the cofferdam. BIO-MM#3 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#3, BIO-MM#4, and BIO-MM#8, 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.

As a feature of any of the Central Valley Wye alternatives, the Authority would require the contractor to 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#24). The contractor would also 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#20). 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 (BIO-IAMF#25) (see Section 2.2.3, Description 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.

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 a feature of the Central Valley Wye alternatives, the Authority would require the creation of wildlife-crossing features to facilitate wildlife movement and reduce impacts on wildlife corridors (BIO-IAMF#25). The Authority would coordinate with recognized wildlife corridor specialists, the regional consultants, and the engineering team to analyze and identify applicable landscape and habitat variables to both accommodate animal movement and to create linkages to core habitat areas. This process would propose measures to facilitate safe animal passage and minimize habitat fragmentation by providing for landscape-level habitat connectivity. The configuration of wildlife crossing infrastructure would be determined through consideration of known corridors, habitat quality, species requirements, movement patterns, existing barriers to movement, topography, and drainage patterns, as well habitat enhancement opportunities. Therefore, the design of the Central Valley Wye alternatives would minimize the impacts of interference with established wildlife movement corridors; restricted crossing opportunities; degradation of linkages, which may no longer provide food, cover, or ease of travel for many species; increased competition for resources; and the potential for isolation of populations. These measures would reduce but not avoid direct impacts on wildlife movement corridors.

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 design characteristics of the Central Valley Wye alternatives would include effective measures to require the creation of wildlife-crossing features to facilitate wildlife movement and reduce impacts such as restricted crossing opportunities and degradation of linkages. These measures would reduce but not avoid direct impacts on wildlife movement corridors. The Authority would implement mitigation measures to minimize the impacts on wildlife movement corridors. Prior to the construction of the linear barriers and security fencing, BIO-IAMF#25 would require a wildlife corridor assessment to analyze and identify 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#39, Install

Flashing or Slats within Security Fencing, 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#25 and BIO-MM#39, 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.

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**.**

3.7.7.5 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 3.7.7.5, Operations Impacts, operations of all Central Valley Wye alternatives would be the same for all alternatives.

Under any of the Central Valley Wye alternatives, the Authority would require maintenance personnel to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#4), including those that would avoid incidental trampling or crushing and spills. 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 and the identification and avoidance of habitats through the delineation of environmentally restricted areas. In addition, the Authority would prepare an annual vegetation control plan that would list "sensitive areas" in vegetation control areas (BIO-IAMF#7) to minimize chemical and nonchemical (e.g., mowing or trimming) impacts on vegetation. Therefore, the design of the Central Valley Wye alternatives would minimize the 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 procedures for avoiding impacts, and sensitive areas would be delineated to minimize or avoid impacts on vegetation.

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 3.7.7.5, 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.

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 applied by certified pesticide applicators in accordance with all requirements of the California Department of Pesticide Regulation and County Agricultural Commissioners. In addition, the Authority would prepare an annual vegetation control plan (BIO-IAMF#7) and weed control plan (BIO-IAMF#8) that would consist of site-specific vegetation and weed control methods and areas (BIO-IAMF#7) to minimize chemical impacts on vegetation. 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 (TPSSs), switching stations, and substations may involve storage of oil and other materials; maintenance of these materials would be required. The Authority would 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#4). 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 of 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. 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. As noted in Section 3.7.7.5, operations of all Central Valley Wye alternatives would be the same for all alternatives.

Under any of the Central Valley Wye alternatives, the Authority would require maintenance personnel to attend a WEAP training and certify they understand the regulatory requirements and procedures necessary to protect biological resources (BIO-IAMF#4), including those that would avoid incidental trampling or crushing and spills. Removal of young elderberry shrubs before they become established in the right-of-way over the duration of operations could reduce the long-term habitat of the valley elderberry longhorn beetle by inhibiting recruitment of young elderberry shrubs into the canopy. 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 and the identification and avoidance of habitats through the delineation of environmentally restricted areas. In addition, the Authority would prepare an annual vegetation control plan that lists "sensitive areas" in vegetation control areas (BIO-IAMF#7) to minimize chemical and nonchemical (e.g., mowing or trimming) impacts on vegetation. 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 3.7.7.5, operations of all Central Valley Wye alternatives would be the same for all alternatives.

As a feature of the Central Valley Wye alternatives, 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 and measures to control erosion and chemical spills that could drift into adjacent or downstream habitats. In addition, maintenance vehicle speed limits would be established in coordination with the project biologist for designated areas, including areas with potential special-status species habitat, to minimize dust emissions and related impacts on special-status invertebrate habitat (BIO-IAMF#21). 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 3.7.7.5, operations of all Central Valley Wye alternatives would be the same for all alternatives.

Under any of the Central Valley Wye alternatives, the Authority would prepare an annual vegetation control plan that would list “sensitive areas” in vegetation control areas (BIO-#7). This would therefore minimize chemical and nonchemical (e.g., mowing or trimming) impacts on vegetation that provides habitat for special-status fish species.

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 3.7.7.5, 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 and certify they understand the regulatory requirements and procedures necessary to protect biological resources (BIO-IAMF#4). 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,

measures for erosion and siltation control, and design features to maintain pre-project hydrology (HYD-IAMF#3). 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 3.7.7.5, 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 and certify they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#4). Speed limits would be established for maintenance vehicles in coordination with the project biologist for designated areas, including areas with potential special-status species habitat (BIO-#21). 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 and the identification and avoidance of habitats through the delineation of environmentally restricted areas. In addition, the Authority would prepare an annual vegetation control plan that would list “sensitive areas” in vegetation control areas (BIO-IAMF#7) to minimize chemical and nonchemical (e.g., mowing or trimming) impacts on special-status species. The technology for the HSR system does not require large amounts of lubricants or hazardous materials for operations, compared to diesel locomotive fuel tanks. TPSSs, switching stations, and substations would require maintenance activities involving oil and other materials for equipment storage. The Authority would 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#4). 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 3.7.7.5, these impacts would be the same for all Central Valley Wye 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). 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, and specifications on the purpose, type, frequency and extent of chemical use for insect and disease control operations. Pesticide and herbicide applications would be applied by certified pesticide applicators in accordance with all requirements of the California Department of Pesticide Regulation and County Agricultural Commissioners. In addition, the Authority would prepare an annual vegetation control plan (BIO-IAMF#7) and weed control plan (BIO-IAMF#8) that would consist of site-specific vegetation and weed control methods and areas (BIO-IAMF#7) to minimize chemical impacts on special-status species. The technology for the HSR system does not require large amounts of lubricants or hazardous materials for operations, compared to diesel locomotive fuel tanks. TPSSs, switching stations, and substations would require maintenance activities of oil and other materials for equipment storage. The Authority would 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 materials 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#4). 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 3.7.7.5, 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 and certify they understand the regulatory requirements and procedures necessary to protect biological resources (BIO-IAMF#4). WEAP training minimizes the likelihood that individual special-status bird species would be injured or killed during operations activities because all workers would be educated about which species they are likely to encounter while working and provided with clear procedures for how to avoid harming special-status bird species and nests. 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 and the identification and avoidance of habitats through the delineation of environmentally restricted areas. In addition, the Authority would prepare an annual vegetation control plan that would list “sensitive areas” in vegetation control areas (BIO-IAMF#7) to minimize chemical and nonchemical (e.g., mowing or trimming) impacts on special-status species. In addition, speed limits would be established in coordination with the project biologist for designated areas, including areas with potential special-status species habitat (BIO-IAMF#21). 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

All Central Valley Wye alternatives would include activities that could result in indirect impacts on active nests, such as nest failure or abandonment, avoidance behavior by some species in response to increased noise and lighting, and startle and motion disturbances during HSR operation and maintenance activities. While the source of such impacts may occur seasonally or intermittently, the duration of the impact on nesting birds would be long-term or permanent. As noted in Section 3.7.7.5, operations of all Central Valley Wye alternatives would be the same for all alternatives.

Under any of the Central Valley Wye alternatives, the Authority would require maintenance personnel to attend a WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#4). This training would reduce the likelihood of inadvertent indirect impacts on special-status birds that may result from the operation 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. 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 and the identification and avoidance of habitats through the delineation of environmentally restricted areas. 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 3.7.7.5, 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.

Under any Central Valley Wye alternative, the Authority would require that maintenance personnel attend a WEAP training and certify they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#4). This WEAP training would minimize the likelihood that individual special-status mammals would be injured or killed during operations activities because all workers would be educated about which species they are likely to encounter while working and provided with clear procedures for how to avoid harming special-status mammals. 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 and the identification and avoidance of habitats through the delineation of

environmentally restricted areas. In addition, the Authority would prepare an annual vegetation control plan that would list "sensitive areas" in vegetation control areas (BIO-IAMF#7) to minimize chemical and nonchemical (e.g., mowing or trimming) impacts on vegetation. 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 3.7.7.5, operations of all Central Valley Wye alternatives would be the same for all alternatives.

Maintenance criteria would be included as part of the BRMP (BIO-IAMF#6), which would include measures for the protection of special-status mammals and the identification and avoidance of habitats through the delineation of environmentally restricted areas. The Authority would prepare an annual vegetation control plan that would list "sensitive areas" in vegetation control areas (BIO-IAMF#7) to minimize chemical and nonchemical (e.g., mowing or trimming) impacts on vegetation that may provide habitat for special-status mammals. In addition, the Authority would require maintenance personnel to attend a WEAP training to gain knowledge of biological resources and associated regulatory requirements (BIO-IAMF#4) and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources. 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 3.7.7.5, 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 and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#4). Therefore, the design of the Central Valley Wye alternatives would minimize the impacts of trampling and crushing of special-status plant communities because maintenance personnel would be aware of their presence in the vicinity and know the procedures to avoid impacts while conducting maintenance activities.

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 3.7.7.5, operations of all Central Valley Wye alternatives would be the same for all alternatives.

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 and measures for erosion and siltation control. The Authority would prepare and implement a weed control plan (BIO-IAMF#8) to minimize and avoid the spread of weeds during construction activities. Construction speed limits (BIO-IAMF#21) would minimize special-status plant community exposure to dust, and construction site BMPs (BIO-IAMF#24) would include measures to reduce fire risk during construction (e.g., smoking prohibitions, not parking equipment over dry vegetation). During construction, the Authority would make certain that contractors return

excavated soils to their original locations to be used as backfill (BIO-IAMF#18) to reduce indirect impacts on sensitive natural communities. The contractor would also be required to clean moving equipment prior to construction and prior to being moved onto any site, which would reduce the potential for the introduction of nonnative plants to become established in new areas following construction (BIO-IAMF#19). 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 3.7.7.5, operations of all Central Valley Wye alternatives would be the same for all alternatives.

Under any of the Central Valley Wye alternatives, the Authority would require maintenance personnel to attend a WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#4). WEAP training minimizes the likelihood that jurisdictional aquatic resources would be contaminated during operations activities because all workers would be educated about which features they are likely to encounter while working and provided with clear procedures for how to avoid jurisdictional aquatic resources. Pesticide and herbicide application would be applied by certified pesticide applicators in accordance with all requirements of the California Department of Pesticide Regulation and County Agricultural Commissioners. In addition, the Authority would prepare an annual vegetation control plan (BIO-IAMF#7) and weed control plan (BIO-IAMF#8) that would consist of site-specific vegetation and weed control methods and areas (BIO-IAMF#7) to minimize chemical impacts on vegetation. The technology for the HSR system does not require large amounts of lubricants or hazardous materials for operations, compared to diesel locomotive fuel tanks. TPSSs, switching stations, and substations would require maintenance activities of oil and other materials for equipment storage. The Authority would 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#4). 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 3.7.7.5, operations of all Central Valley Wye alternatives would be the same for all alternatives.

Under any of the Central Valley Wye 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). 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 jurisdictional waters and measures for erosion and siltation control. Therefore, the design of the Central Valley Wye alternatives would minimize impacts during operations by training maintenance personnel to gain of 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 3.7.7.5, operations of all Central Valley Wye alternatives would be the same for all alternatives.

Under any of the Central Valley Wye alternatives, the Authority would require maintenance personnel to attend a WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#4). 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. In addition, the Authority would prepare an annual vegetation control plan (BIO-IAMF#7) and weed control plan (BIO-IAMF#8) that would consist of site-specific vegetation and weed control methods and areas (BIO-IAMF#7) to minimize chemical impacts on vegetation. The technology for the HSR system does not require large amounts of lubricants or hazardous materials for operations, compared to diesel locomotive fuel tanks. TPSSs, switching stations, and substations would require maintenance activities involving oil and other materials for equipment storage. The Authority would 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#4). 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. In addition, the Authority would prepare an annual vegetation control plan (BIO-IAMF#7) and weed control plan (BIO-IAMF#8) that would consist of site-specific vegetation and weed control methods and areas (BIO-IAMF#7) to minimize chemical impacts on vegetation. The technology for the HSR system does not require large amounts of lubricants or hazardous materials for operations, compared to diesel locomotive fuel tanks. TPSSs, switching stations, and substations would require maintenance activities involving oil and other materials for equipment storage. The Authority would 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#4). 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.

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 3.7.7.5, 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 and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#4). 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 EFH, specifications on the purpose, type, frequency, and extent of chemical use for insect and disease control operations, and measures for erosion and siltation control. 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.

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#1: Conduct Protocol-Level Pre-construction Surveys for Special-Status Plant Species and Special-Status Plant Communities

Prior to construction (any ground-disturbing activity), the project biologist would conduct protocol-level, pre-construction botanical surveys for special-status plant species and special-status plant communities in all potentially suitable habitats where permission to enter was not granted prior to construction. The surveys would be conducted during the appropriate blooming period(s) for the species before the start of ground-disturbing activities for salvage and relocation activities. The project biologist would mark the locations of all special-status plant species and special-status

plant communities observed for the contractor to avoid. Locations would be marked on site, and where feasible on plans. Before the start of ground-disturbing activities, all populations of special-status plant species and special-status plant communities identified during pre-construction surveys outside of the project footprint but within 100 feet would be protected and delineated by the contractor (directed by the project biologist) as environmentally restricted areas. As appropriate, the project biologist would update the mapping of special-status plant species or plant communities within the project footprint based on resource agency permits.

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 through a memorandum to the mitigation manager and 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 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#2: 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 would prepare a special-status plant species management plan to address monitoring, salvage, relocation, and propagation of special-status plant species. The relocation or propagation of plants and seeds would be performed at a suitable mitigation site approved by the appropriate regulatory agencies, and as appropriate per species. The plan would include provisions that address the techniques, locations, and procedures required for the successful establishment of the plant populations. The plan would include provisions for performance (such as percent survival 50–85 percent, depending on species and habitat and percent absolute cover of highly invasive species, as defined by the California Invasive Plant Council (less than 5 percent)), that address survivability requirements, maintenance, monitoring, implementation, and the annual reporting requirements. Permit conditions issued by the appropriate resource agencies (e.g., USFWS, CDFW) would guide the development of the plan and performance standards. The project biologist would submit the plan to the mitigation manager and Authority for review and approval.

This mitigation measure is anticipated to be effective because it salvages unavoidable 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#2 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#3: Prepare and Implement a Habitat Mitigation Plan

As part of the applicable USFWS, USACE, SWRCB, and CDFW regulatory processes, the Authority or its designee would prepare a habitat mitigation plan (HMP) to mitigate for temporary and permanent impacts on biological and/or aquatic resources prior to construction. Where applicable, the HMP would detail performance standards, including percent cover of native species, survivability, canopy cover requirements, wildlife utilization, the acreage basis, restoration ratios, and the combination of on-site and off-site mitigation. Preference would be given for mitigation in the same watershed where the impact occurs. The Authority or its designee would work with the USFWS, USACE, SWRCB, and CDFW (regulatory agencies) to develop appropriate avoidance, minimization, mitigation, and monitoring measures to be incorporated into the HMP. The intent of the HMP is to mitigate for the lost functions and values of impacts on jurisdictional waters consistent with resource agency requirements and conditions presented in Section 404 of the CWA. It is also anticipated that because state-listed species such as California tiger salamander, Colusa grass, vernal pool branchiopods, San Joaquin kit fox, giant garter snake, and Swainson's hawk occur in or near these habitats, the HMP would serve to mitigate for federally and state-listed species for the purposes of meeting the standards of Section 7 of FESA and CESA 2081. The Authority would prepare a memorandum documenting compliance. In the HMP, the Authority or its designee would incorporate the following standard requirements consistent with regulatory agency guidelines:

- Description of the project impact/site
- Goal(s) (i.e., functions and values) of the compensatory mitigation project
- Description of the proposed compensatory mitigation site(s)
- Implementation plan for the proposed compensatory mitigation site
- Maintenance activities during the monitoring period
- Monitoring plan for the compensatory mitigation site
- Contingency measures

Additionally, the following would be included at a minimum for the implementation plan:

- Site analysis for appropriate soils and hydrology.
- Site preparation specifications based on site analysis, including but not limited to grading and weeding.
- Soil and plant material salvage from impact areas, as appropriate to the timing of impact and restoration as well as the location of restoration sites.
- Specifications for plant and seed material appropriate to the locality of the mitigation site.
- Specifications for site maintenance to establish the habitats, including but not limited to weeding and temporary irrigation.

Habitat restoration, enhancement, and establishment activities would be conducted on some of the compensatory (i.e., selected permittee-responsible) mitigation sites to achieve certain mitigation goals. A detailed design of the mitigation habitats would be created in coordination with the permit agencies and be described in the HMP. The primary engineering and construction contractors would coordinate with the project biologist to implement construction in a manner that minimizes disturbance of such areas to the extent feasible. Temporary fencing would be used during construction to avoid sensitive biological resources that are adjacent to construction areas and can be avoided.

Where applicable, performance standards would be identified to determine the effectiveness of the mitigation, and success criteria may be developed where required by regulation. Where applicable, replacement planting/seeding would be implemented if monitoring demonstrates that performance goals or success criteria are not met during a particular monitoring interval. The

project biologist would oversee the implementation of all HMP elements and monitor consistent with the prescribed maintenance and performance monitoring requirements. The project biologist would prepare annual monitoring reports for 5 years (or less if success criteria were met as described earlier) or other documentation prescribed in the resource agency permits. In addition, the project biologist would document compliance and submit to the mitigation manager.

This mitigation measure is anticipated to be effective because it creates an HMP to protect, restore, and monitor mitigation lands that provide suitable habitat for the special-status species affected by the Central Valley Wye alternatives. The HMP would establish monitoring success criteria to gauge the effectiveness of restoration and function of the mitigation lands. The mitigation lands, their management, and monitoring per the HMP serve to allow for intended ecologic function of compensation habitat for sensitive habitat and special-status species habitat loss related to the Central Valley Wye alternatives. BIO-MM#3 would involve the planning and preservation of habitat for the benefit of multiple species and resources. Overall, the impacts of this measure would be beneficial to biological resources because the Authority would further consider impacts and would implement strategies to avoid temporary impacts during mitigation and restoration activities. The measure requires the acquisition of suitable additional lands outside the Central Valley Wye alternatives footprint to mitigate impacts. These lands may be converted from other current uses, such as agriculture, which could have potential 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.

BIO-MM#4: Off-Site Habitat Restoration, Enhancement, and Preservation

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: Project Biologist
- BIO-IAMF#2: Agency Access
- BIO-IAMF#3: Construction Period WEAP Training
- BIO-IAMF#11: Conduct Biological Monitoring during Construction Activities
- BIO-IAMF#12: "Take" Notification and Reporting
- BIO-IAMF#13: Environmentally Sensitive Areas, Wildlife Exclusion Fencing and Non-Disturbance Zones
- BIO-IAMF#14: Monofilament Restrictions
- BIO-IAMF#15: Avoidance of Entrapment
- BIO-IAMF#17: Equipment Staging Areas
- BIO-IAMF#19: Cleaning of Construction Equipment
- BIO-IAMF#20: Dewatering and Water Diversion

- BIO-IAMF#21: Vehicle Traffic and Construction Site Speed Limits
- BIO-IAMF#22: Work Stoppage
- BIO-IAMF#23: Compliance Reporting
- BIO-IAMF#24: Construction Site Housekeeping
- BIO-IAMF#26: General Nesting Season Restrictions
- BIO-MM#1: Conduct Protocol-Level Pre-construction Surveys for Special-Status Plant Species and Special-Status Plant Communities
- BIO-MM#5: Conduct Pre-Construction Sampling and Assessment for Vernal Pool Fauna
- BIO-MM#6: Seasonal Vernal Pool Work Restriction
- BIO-MM#7: Implement and Monitor Vernal Pool Protection
- BIO-MM#9: Conduct Pre-Construction Surveys for Special-Status Reptile and Amphibian Species
- BIO-MM#11: Conduct Protocol and Pre-Construction Surveys for California Tiger Salamander
- BIO-MM#12: California Tiger Salamander Exclusion Fencing
- BIO-MM#13: Conduct Emergence and Larval Surveys for Western Spadefoot Toad
- 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#24: Conduct Pre-construction Surveys and Monitoring for Raptors
- BIO-MM#26: Conduct Protocol and Pre-construction Surveys for Swainson's Hawks
- BIO-MM#27: Swainson's Hawk Nest Avoidance and Monitoring
- BIO-MM#29: Conduct Protocol-level Surveys for Burrowing Owls
- BIO-MM#30: Burrowing Owl Avoidance and Minimization
- BIO-MM#34: Conduct Pre-Construction Surveys for American Badger and Ringtail
- BIO-MM#35: American Badger and Ringtail Avoidance
- BIO-MM#36: Conduct Protocol-level 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 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 prepare a memorandum of 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	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.
Air Quality and Global Climate Change	Yes, for criteria pollutant emissions. Construction vehicle exhaust and vehicle trips during management activities would contribute to diesel particulate emissions. 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. 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. 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.
Noise and Vibration	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

Resource Type	Potential for Impacts
Electromagnetic Fields and Electromagnetic Interference	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.
Public Utilities and Energy	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. 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. Mitigation sites would not require construction or expansion of wastewater treatment facilities or stormwater drainage facilities.
Hydrology and Water Resources	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. 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. 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.
Geology, Soils, Seismicity, and Paleontological Resources	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. 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. 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.

Resource Type	Potential for Impacts
Hazardous Materials and Wastes	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. 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. 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.
Safety and Security	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.
Socioeconomics and Communities	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.
Land Use and Development	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.
Agricultural Farmland	Yes. The partial or complete conversion of these mitigation sites to biological habitat could result in the loss of existing farmland or ranchland, including designated Important Farmland. 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.
Parks, Recreation, and Open Space	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.
Aesthetics and Visual Resources	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.

Resource Type	Potential for Impacts
Cultural Resources	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. 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.

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 Revised/Second Draft Supplemental EIR/EIS.

BIO-MM#5: Conduct Pre-Construction Sampling and Assessment for Vernal Pool Fauna.

Prior to construction (any ground-disturbing activity), the project biologist would conduct pre-construction aquatic assessment and sampling in seasonal wetlands and vernal pools within the project footprint, and from those that lie within 250 feet of the project footprint (where permission to enter is available), consistent with the most recent USFWS vernal pool survey guidelines. The approved biologists would visit the sites after initial storm events to determine when seasonal wetlands and vernal pools have been inundated consistent with USFWS guidance. A seasonal wetland/vernal pool is considered to be inundated when it holds greater than 3 centimeters of standing water 24 hours after a rain event. Approximately 2 weeks after the pools are inundated, the biologists would conduct general aquatic surveys in appropriate seasonal wetland and vernal pool habitats. The sampling is an assessment that would be useful in understanding the species present and would help guide the implementation of performance standards for vernal pools that are created, restored, or enhanced on compensatory mitigation sites to be identified in the HMP (see BIO-MM#3). At a minimum, vernal pools counted as compensatory mitigation would demonstrate equivalent or greater species richness (i.e., number of native vernal pool invertebrate species) than affected pools. The project biologist would submit a report to the mitigation manager and Authority or its designee within 30 days of completing the fieldwork. The report would provide the documentation and the results of the sampling, including the results of the data collection and a comparison with the performance standards.

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 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#6: Seasonal Vernal Pool Work Restriction

Prior to construction (any ground-disturbing activity), the project biologist would prepare a memorandum describing the BMPs to be implemented for seasonal avoidance of special-status vernal pool branchiopods and other vernal-pool-dependent species (e.g., western spadefoot, California tiger salamander). The contractor would not work within 250 feet of suitable aquatic habitats (e.g., vernal pools, seasonal wetlands), if known special-status species were located within these habitats, from October 15 to June 1 (corresponding to the rainy season), or as determined through informal or formal consultation with the USFWS or USACE. Ground-disturbing activities may begin once the habitat is no longer inundated for the season and it is after April 15 and no special-status species are present. If any work remains to be completed after October 15, the contractor (under the direction of the project biologist) would install exclusion fencing and erosion control measures in those areas where construction activities need to be completed. The project biologist would document compliance through monthly memoranda to the mitigation manager and Authority during the establishment of the fencing activities.

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 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#7: Implement and Monitor Vernal Pool Protection

Prior to construction, the project biologist would prepare a memorandum describing the BMPs to be implemented to reduce impacts on vernal pools within temporary impact areas. The contractor would erect and maintain the exclusion fencing as described in the various environmental permits. For impacts on vernal pools within the temporary project footprint that cannot be avoided, the contractor, under the guidance of the Regulatory Specialist (Waters), a designee of the project biologist with relevant Clean Water Act and wetland expertise, would place rinsed gravel within the affected vernal pools and would cover the affected vernal pools with geotextile fabric during one dry season period and before the start of ground-disturbing activities to minimize damage to the soils and protect the contours (Lichter and Lindsey 1994). The contractor, under the direction of the Regulatory Specialist (Waters), would collect a representative sampling of soils from the vernal pools before initiating ground-disturbing activities within the vernal pools. The representative soil samples would contain viable plant seeds and vernal pool branchiopod cysts to be preserved from the vernal pools. These samples may be incorporated into other vernal pools, as applicable, with USFWS or CDFW consultation. The contractor would implement these measures within temporary impact areas adjacent to or within the project footprint. Resource agency consultations with the USFWS and USACE would occur as needed and based on permit conditions. The regulatory specialist (waters) would submit a memorandum on a monthly basis to the mitigation manager and Authority to document compliance with this measure. The contractor would obtain approval from USACE before implementation of BIO-MM#7, for any unanticipated temporary impacts on vernal pools. As determined by the project biologist if unanticipated temporary impacts last more than one full wet-dry season cycle, off-site mitigation would be implemented.

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 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#8: Implement Fish Rescue Plan inside Cofferdam

Installation of a cofferdam and dewatering on a site during construction could result in fish stranding. The project biologist would develop and implement a fish rescue plan for review and approval by the Authority and which would be acceptable to the CDFW and NMFS. The plan would contain, but would not be limited to, the following measures:

- The contractor would require that a qualified fisheries biologist with a current CDFW Scientific Collecting Permit conduct the fish rescue and relocation efforts behind the cofferdam. The fish rescue effort would be implemented during the dewatering of the areas behind the cofferdam(s) and involve capture and return of those fish to suitable habitat within adjacent waterways. The area would first be seined, followed by electrofishing to remove fish that are behind the cofferdam. A fisheries biologist would be on-site during initial pumping (dewatering) to monitor compliance with the plan.
- The contractor would monitor the progress of dewatering and allow the fish rescue to occur prior to completely closing the cofferdam and again when water depths reach approximately 2 feet. The NMFS and CDFW would be notified at least 48 hours prior to the start of fish rescue efforts. Information on the species, number, and sizes of fish collected would be

recorded during the fish rescue and provided in a letter report to be submitted within 30 days after the fish rescue to the NMFS and CDFW.

- The fish rescue plan would contain methods for minimizing the risk of stress and mortality due to capture and handling of fish removed from the construction site and returned to adjacent waterways.
- Implementation of the fish rescue plan would minimize potential impacts on listed fish species (if present) associated with fish stranding during dewatering activities related to the construction activities.
- The design-build team would work systematically with NMFS to establish design hydrology and demonstrate minimal hydraulic impacts from design.
- The San Joaquin River bridge crossing would be designed with the planned increase in flow due to the SJRRP and would remain or effectively minimize any appreciable changes in scour, sediment transport, deposition, or changes in geomorphic process that could alter habitat conditions in a manner that would impede the reestablishment of Central Valley spring-run Chinook salmon.
- The Authority along with the design-build team would present a final San Joaquin crossing plan prior to any site preparation or mobilization of work on or near the San Joaquin River. If final design refinements were deemed substantial changes from the original product description that have an effect on listed species not previously considered, FESA Section 7 consultation would be reinitiated.
- Use quarry stone, cobblestone, or other equivalent for erosion control along river and streams, complemented with native riparian plantings or other natural stabilization alternatives that would restore and maintain a natural riparian corridor, where feasible.
- 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, designs crossings and infrastructure to allow increased flow in the San Joaquin River that would allow increased sediment sorting and improved aquatic habitat conditions for aquatic fauna, and guides bank stabilization and riparian re-vegetation methods to create habitat conditions to benefit aquatic fauna. BIO-MM#8 would have impacts 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#9: Conduct Pre-Construction Surveys for Special-Status Reptile and Amphibian Species

Prior to construction (any ground-disturbing activity), the project biologist would conduct pre-construction surveys in suitable habitats to determine the presence or absence of special-status reptile and amphibian species 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 areas, environmentally restricted areas, and wildlife exclusion fencing. The project biologist would submit a memorandum, on a monthly basis, to the mitigation manager and Authority to document compliance with this measure.

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 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#10: Conduct Special-Status Reptile and Amphibian Monitoring, Avoidance, and Relocation

During construction (any ground-disturbing activities), the biological monitor(s) would observe all construction activities in habitat that supports special-status reptiles and amphibians. If suitable habitat was present and environmentally sensitive areas are deemed necessary, the biological monitor(s) would conduct a clearance survey within the area for special-status reptiles and amphibians after the wildlife exclusion fencing is installed. If a special-status reptile or amphibian were present during construction, the contractor would avoid or relocate the special-status reptile or amphibian species. The project biologist would establish nondisturbance exclusion zones (i.e., wildlife exclusion fencing [e.g., a silt fence or similar material]) in areas where special-status reptiles and amphibians are believed to be present. Such exclusion zones would be buffered from active construction areas by no less than 50-feet. Otherwise, the biological monitor(s) would relocate special-status reptiles or amphibians (other than California tiger salamander) found in the environmentally sensitive area or project footprint to an area outside the project footprint as determined through consultation with USFWS or CDFW. As necessary, clearance surveys would be conducted daily. The project biologist would submit a memorandum, on a monthly basis, to the mitigation manager and Authority to document compliance with this measure.

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 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#11: Conduct Protocol and Pre-Construction Surveys for California Tiger Salamander

Prior to ground disturbance, the project biologist would identify potential breeding habitat within 1.24 miles (2 km) of the project footprint and barriers that would isolate breeding habitat from the footprint if any, and would survey breeding habitat in the project footprint 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 methods identified in consultation with and approved by USFWS and CDFW. Surveys would be phased with build-out of the Central Valley Wye alternatives. In the event that California tiger salamanders are found within the project footprint during pre-construction surveys, the project biologist would contact the USFWS and CDFW to identify appropriate avoidance and minimization features to be implemented for this species, including configuration of and specifications for the exclusion fencing described under BIO-MM#12. The project biologist would submit a memorandum, on a monthly basis, to the mitigation manager and Authority to document compliance with this measure.

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 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#12: California Tiger Salamander Exclusion Fencing

Prior to construction (any ground-disturbing activity), the contractor, under the direction of the project biologist, would install and maintain wildlife exclusion fencing along the perimeter of the project footprint within the California tiger salamander suitable habitat areas identified during the surveys described under BIO-MM#11 and in accordance with BIO-IAMF#13. The biological monitor(s) would monitor the exclusion fencing to make sure that no take of California tiger salamander or destruction of their potential habitat outside of the project footprint occurs. Wildlife exclusion fencing must be inspected by a biological monitor at least twice weekly on nonconsecutive days outside of the breeding season. Barriers would be inspected daily following any rain event and during months when juvenile California tiger salamanders are most likely emigrating from their breeding ponds in search of burrows in surrounding upland habitat. Wildlife exclusion fencing would be installed by the contractor with turn-arounds at any access openings needed in the fencing, to redirect central California tiger salamanders away from openings.

The contractor would not conduct construction activities within 250 feet of potential California tiger salamander breeding habitat (as determined by the project biologist) during the wet season (October 15 through June 1); however, construction activities may begin once the burrow habitat is no longer inundated for the season and it is after April 15. BIO-MM#12 would have temporary impacts on special-status wildlife, primarily by disrupting their normal behavior and movements. Overall, this measure would be beneficial because it would minimize the chance of wildlife entering a work area and being injured or killed. Implementation of this mitigation measure would not result in additional physical disturbance outside the project footprint (implementation would occur on the edge of the project footprint).

The project biologist would submit a memorandum, on a monthly basis to the mitigation manager and Authority to document compliance with this measure.

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 within 250 feet of suitable California tiger salamander breeding habitat 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 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#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 submit a memorandum to the mitigation manager documenting 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

Prior to construction (any ground-disturbing activity), the project biologist would conduct protocol-level surveys in suitable habitats for the blunt-nosed leopard lizard (i.e., barren, California annual grassland, and ruderal cover types within known range) within one year of each construction phase. These surveys would be conducted in accordance with the *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard* (CDFG 2004). The project biologist would submit a memorandum, on a monthly basis, to the mitigation manager and Authority to document compliance with this measure.

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 250 feet of the project footprint, informing the species' avoidance, protective fencing placement, and mitigation. 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#15: Phased Pre-Construction Surveys for Blunt-Nosed Leopard Lizard

If protocol-level surveys were completed more than 30 days prior to construction, the project biologist would conduct visual pre-construction surveys in areas of potential blunt-nosed leopard lizard habitat no more than 30 days before ground-disturbing activities. The project biological monitor would conduct daily clearance surveys before construction activities. The project biologist would submit a memorandum, on a monthly basis to the mitigation manager and Authority to document compliance with this measure. In the event a blunt-nosed leopard lizard is observed in the work area, work would not proceed until the lizard leaves of its own accord or as otherwise determined in consultation with the USFWS and CDFW.

BIO-MM#15 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 avoid 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 a 250-foot buffer around the project footprint, informing the species' avoidance, protective fencing placement, and mitigation. 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#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 memorandum to the mitigation manager 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 memorandum to the mitigation manager 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. 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 submit a memorandum to the mitigation manager documenting 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-IAMF#13). 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 Monitor for Giant Garter Snake

Prior to any construction in or within 200 feet of giant garter snake aquatic habitat, a biological monitor (designated by the project biologist) would conduct a pre-construction survey for giant garter snake within 24 hours before construction. The biological monitor would remain on-site for the duration of construction in or within 200 feet of potential aquatic habitat. As described under BIO-MM#19, environmentally sensitive area fencing would be installed along the upper bank of all aquatic habitat within the project footprint. At least 14 days prior to the start of construction, the project biologist would notify the USFWS via email that work has started and describe construction activities, including locations; this email would not be a request for authorization, but rather a notification to the USFWS that work has begun. If any giant garter snakes are encountered during construction, the Biological Monitor would stop work until they determine that work can continue without the snake(s) being harmed, or the snake moves out of the immediate work area on its own. Pre-construction surveys would 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[10] 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. The project biologist would submit a memorandum, on a weekly basis or at other appropriate intervals, to the Authority to document compliance with this measure.

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. The project biologist would submit a memorandum, on a monthly basis to the Authority to document compliance.

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

[10] The range of the San Joaquin coachwhip is limited to the Site 6—El Nido, Oro Loma–Panoche Junction 115 kV Power Line and Site 6—El Nido, Los Banos–Oro Loma–Canal 70 kV Power Line components, common to all Central Valley Wye alternatives.

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#24: Conduct Pre-construction Surveys and Monitoring for Raptors

Prior to construction (any ground-disturbing activity) and no more than 14 days before the start of ground-disturbing activities, the project biologist would conduct visual pre-construction surveys where suitable habitats are present for nesting raptors if construction and habitat removal activities are scheduled to occur during the bird-breeding season (February 1 to September 1). Surveys would be conducted in areas within the project footprint and, where permissible, within 500 feet of the project footprint for raptor species (not Fully Protected species) and 0.5 mile of the project footprint for Fully Protected raptor species. The required survey dates would be modified based on local conditions. If breeding raptors with active nests were found, the contractor, as directed by the project biologist, would delineate a 500-foot buffer 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 the nest fails (as determined by the project biologist). If fully protected raptors (e.g., white tailed-kite) with active nests were 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). Adjustments to the buffer(s) would require prior approval by the USFWS or CDFW. The project biologist would submit a memorandum, on a monthly basis during bird breeding season to the mitigation manager and Authority to document compliance with this measure.

BIO-MM#24 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 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 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#25: Bird Protection

Prior to construction (any ground-disturbing activity), the project biologist would verify that the catenary system, masts, and other structures such as fencing are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee 2006) and *Reducing Avian Collisions with Power Lines: State of the Art in 2012* (Avian Power Line Interaction Committee 2012). All infrastructure associated with the Central Valley Wye alternatives, including catenary system, security fencing, viaduct structures, signal towers, etc., would be designed to discourage perching and collisions. Examples include Nixalite® bird spikes and Fliteline® deterrent systems. The project biologist would check the final design drawings and submit a memorandum to the mitigation manager and Authority to document compliance with this measure. BIO-MM#26 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 Protocol and Pre-construction Surveys for Swainson's Hawks

Prior to construction (any ground-disturbing activity), the project biologist would conduct pre-construction surveys for Swainson's hawks as described in the Swainson's Hawk Technical Advisory Committee (SHTAC) *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (SHTAC Survey Recommendations) (SHTAC 2000). Surveys would be performed during the nesting season (March 1 through August 1) in the year before ground-disturbing activities within the project footprint and within a 0.5-mile buffer, where access is permitted. The pre-construction nest surveys following the SHTAC Survey Recommendations (SHTAC 2000) would be phased with build-out of the Central Valley Wye alternatives. The pre-construction surveys would determine the status (i.e., active, inactive) of observed nests. The project biologist would submit a memorandum, on a monthly basis during the nesting season, to the mitigation manager and Authority to document compliance with this measure. Overall, this measure would be beneficial and would allow the Central Valley Wye alternatives to avoid the removal of occupied nests. Implementation of this measure would not result in additional physical disturbance outside the project footprint.

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 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#27: Swainson's Hawk Nest Avoidance and Monitoring

Prior to construction (any ground-disturbing activity), if active Swainson's hawk nests (defined as a nest used one or more times in the last five years) were found within 0.5-mile of the project footprint during the nesting season (March 1 to August 1), the active nests within the 0.5-mile buffer of the project footprint would be monitored daily by the biological monitor(s) to assess whether the nest is occupied. If the nest were occupied, the health and status of the nest would be monitored until the young fledge or for the length of construction, whichever occurs first. The project biologist in conjunction with the contractor would implement buffers restricting construction activities, following CDFW's *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California* (CDFG 1994). Adjustments to the buffer(s) may be made in consultation with CDFW. The project biologist would submit a memorandum, on a monthly basis during the nesting season to the mitigation manager and Authority to document compliance with this measure. Overall, this measure would be beneficial and would allow the Central Valley Wye alternatives to avoid the removal of occupied nests. Implementation of this measure would not result in additional physical disturbance outside the project footprint.

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 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#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 submit a memorandum, on a monthly basis during the nesting season, to the mitigation manager and Authority 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 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#29: Conduct Protocol-level Surveys for Burrowing Owls

Prior to construction (any ground-disturbing activity), a qualified, agency-approved biologist, designated by the project biologist, would conduct protocol-level surveys in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). The project biologist or designee would conduct these surveys at appropriate timeframes within suitable habitat located in the project footprint. These surveys would be conducted within suitable habitat of the project footprint and within an approximately 500-foot buffer. The project biologist would submit a memorandum, on a monthly basis during the appropriate timeframes referenced in this measure to the mitigation manager and Authority to document compliance with this measure.

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 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#30: Burrowing Owl Avoidance and Minimization

Prior to construction (any ground-disturbing activity), the project biologist would prepare a memorandum identifying how BMPs would be implemented related to burrowing owl avoidance and minimization features. Avoidance and minimization features would follow CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). During the nesting season (February 1 through August 31) occupied burrows found during the protocol-level survey described under BIO-MM#29 would not be disturbed unless it is verified that either the adults have not begun egg-laying and incubation or the juveniles from the occupied burrows are foraging independently and are capable of independent survival (as determined by the project biologist).

Unless otherwise authorized by CDFW, the contractor, as directed by the project biologist, would establish buffers (as an environmentally sensitive area) between the construction work area and occupied burrowing owl nesting sites. During the nesting season (until August 31), an approximately 650-foot buffer around the nest site would be delineated. Adjustments to the buffer(s) would require prior approval by CDFW.

Eviction of burrowing owls outside the nesting season may be permitted pending evaluation of eviction plans and receipt of formal written approval from the CDFW authorizing the eviction. If burrowing owls must be moved from the project footprint, the project biologist would undertake passive relocation measures, including monitoring, in accordance with CDFW's (CDFG 2012) guidelines.

The project biologist would submit a memorandum, on a monthly basis during the nesting season to the mitigation manager and Authority to document compliance with this measure.

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 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#31: Conduct Pre-construction Surveys for Special-Status Bat Species

Prior to construction and 30 days before the start of ground-disturbing activities, a qualified, agency-approved biologist, designated by the project biologist, would conduct a visual and acoustic pre-construction survey for roosting bats at potential roost sites (e.g., bridges, abandoned structures to be demolished, trees with large cavities or dense foliage to be removed). A minimum of one day and one evening would be included in the visual pre-construction survey. The project biologist, in coordination with the mitigation manager and Authority, would contact CDFW if any hibernation roosts or active nurseries were identified within or immediately adjacent to the project footprint, as appropriate. The project biologist would submit a memorandum, on a monthly basis, to the mitigation manager and Authority to document compliance with this measure.

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 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#32: Bat Avoidance and Relocation

Prior to construction the project biologist would prepare a memorandum identifying how BMPs would be implemented during ground-disturbing activities if active or hibernation roosts were found during the pre-construction surveys described under BIO-MM#31. Avoidance is the preferred BMP. If avoidance of the hibernation roost were not feasible, the project biologist would prepare a relocation plan and coordinate the construction of an alternative bat roost with CDFW. The contractor, under the direction of the project biologist would implement the Bat Roost Relocation Plan before the commencement of construction activities (any ground-disturbing activities). The contractor, under the supervision of the biological monitors, would remove roosts with approval from CDFW before hibernation begins (October 31), or after young are flying (July 31), using accepted exclusion and deterrence techniques. The timeline to remove vacated roosts is between August 1 and October 31. All efforts to avoid disturbance to maternity roosts would be made during construction activities. The project biologist would submit a memorandum to the mitigation manager and Authority, on a monthly basis, to document compliance with this measure. 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 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#33: Bat Exclusion and Deterrence

Prior to construction, the project biologist would prepare a memorandum identifying how BMPs related to ground-disturbing activities would be implemented if nonbreeding or nonhibernating individuals or groups of bats were found within the project footprint during the pre-construction surveys described under BIO-MM#31. If bats were found the project biologist would direct the contractor to safely exclude the bats by either opening the roosting area to change the lighting and airflow conditions or installing one-way doors or other appropriate methods specified by CDFW. The contractor would leave the roost undisturbed by activities for a minimum of one week after implementing exclusion or eviction activities. The contractor would not implement exclusion measures to evict bats from established maternity roosts or occupied hibernation roosts. The project biologist would submit a memorandum, on a monthly basis, to the mitigation manager and Authority to document compliance with this measure. 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 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#34: Conduct Pre-Construction Surveys for American Badger and Ringtail

Prior to construction (any ground-disturbing activity), the project biologist would conduct pre-construction surveys for American badger and ringtail dens within suitable habitats (riparian vegetation for both; barren, California annual grassland, inactive agriculture, pasture, and ruderal cover types for American badger only) in the project footprint. These surveys would be conducted no more than 30 days before the start of ground-disturbing activities and phased with build-out of the Central Valley Wye alternatives. The project biologist would submit a memorandum, on a monthly basis, to the mitigation manager and Authority to document compliance with this measure. BIO-MM#34 would have no impacts on American badgers or ringtails 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 and ringtail dens within the project footprint to avoid mortality or injury of individuals from construction activities, and guides future protective avoidance and relocation. 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#35: American Badger and Ringtail Avoidance

Prior to construction (any ground-disturbing activity), the contractor, under the direction of the project biologist, would establish a 50-foot buffer around occupied American badger and ringtail dens found during the pre-construction surveys described under BIO-MM#34. The contractor and project biologist would establish a 100-foot buffer around maternity dens through the pup-rearing season (American badger: February 15 through July 1; Ringtail: May 1 through June 15). Adjustments to the buffer(s) would require prior approval by CDFW as coordinated by the project biologist, under the supervision of the mitigation manager. The project biologist would submit a memorandum, on a monthly basis, to the mitigation manager and Authority to document compliance with this measure.

This mitigation measure is anticipated to be effective because it avoids occupied and maternity badger and ringtail dens within the project footprint during construction activities to allow young to develop, and badgers 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 American badgers and ringtails because it would allow the Central Valley Wye alternatives to avoid the loss of these 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 Protocol-level Pre-construction Surveys for San Joaquin Kit Fox

Prior to construction (any ground-disturbing activity), the project biologist would conduct pre-construction surveys in accordance with USFWS' *San Joaquin Kit Fox Survey Protocol for the Northern Range* (USFWS 1999a). Pre-construction surveys for the kit fox would be conducted between May 1 and September 30 within the core habitat study area in suitable habitat areas (annual grassland, pasture, barren, and compatible-use agricultural lands as determined by project biologist) to identify known or potential San Joaquin kit fox dens. If any burrows were found during preconstruction surveys, potentially occupied burrows/complexes would be visibly flagged and a 50-foot avoidance buffer would be implemented. Pre-construction surveys would be conducted by a USFWS-approved project biologist within 30 days before the start of construction (any ground-disturbing activities) and would be phased with build-out of the Central Valley Wye alternatives. The project biologist would submit a memorandum, on a monthly basis to the mitigation manager and Authority to document compliance with this measure.

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

Prior to construction, the project biologist would prepare a memorandum identifying how BMPs related to construction activity would be implemented to minimize impacts on San Joaquin kit fox. The contractor, under direction of the project biologist, would implement BMPs in accordance with USFWS' *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011) to minimize ground disturbance-related impacts on this species. The project biologist would submit a memorandum, on a monthly basis, to the mitigation manager and Authority to document compliance with this measure.

This mitigation measure is anticipated to be effective because it identifies and implements BMPs to avoid active San Joaquin kit fox dens within 250 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 submit a memorandum, on a monthly basis, to the mitigation manager and Authority 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#39: Install Flashing or Slats within Security Fencing

Prior to operation and maintenance, the contractor, under the direction of the contractor's project biologist, would install permanent security fencing consistent with the final design along portions of the Central Valley Wye alternatives that are adjacent to wildlife movement corridors and natural habitats (e.g., annual grassland). The security fencing would be enhanced with flashing or slats

for 6 inches below ground surface to 12 inches above to prevent special-status reptiles and mammals from moving into the right-of-way. The project biologist would verify that the installation is consistent with the designated terms and conditions in the applicable permits. The design of the reptile and mammal-proof fencing and the exact locations where reptile and mammal-proof fencing would be installed would be determined in consultation with USFWS and CDFW. The project biologist would submit a memorandum, documenting security fence implementation, to the mitigation manager and Authority to document compliance with this measure.

This mitigation measure is anticipated to be effective because it implements fencing to exclude special-status mammals and reptiles from 250 feet of the project footprint to prevent mortality or injury of individuals from construction activities. BIO-MM#39 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. The project biologist would submit a memorandum, on a monthly basis, to the mitigation manager and Authority to document compliance with this measure. 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. 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 or the Site—6 El Nido, Los Banos–Oro Loma–Canal 70 kV Power Line, common to all Central Valley Wye alternatives.

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 submit a memorandum, on a monthly basis, to the mitigation manager and Authority 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: Blunt-nosed Leopard Lizard Avoidance

Prior to construction (any ground-disturbing activity) the contractor's project biologist would prepare a memorandum identifying how best management practices related to construction activity in areas with known occurrences of blunt-nosed leopard lizards or blunt-nosed leopard lizard signs are present (as determined by the project biologist) would be implemented consistent with USFWS and CDFW guidance.

If blunt-nosed leopard lizards were observed at any time during surveys, phased pre-construction surveys, or during construction, USFWS and CDFW would be contacted. Appropriate measures to avoid take of the species would be established through consultation with the USFWS and CDFW and the contractor would then implement them. The project biologist would submit a memorandum (can be coordinated with Environmental Mitigation Management and Assessment submittals), on a monthly basis to the mitigation manager and Authority to document compliance with this measure.

This mitigation measure is anticipated to be effective because it identifies procedures for avoiding take of blunt-nosed leopard lizards during construction. Overall, this measure would be beneficial to blunt-nosed leopard lizards 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#43: Measure Pile Driving Sound Pressure

The following measure would be implemented to avoid and minimize potential impacts that could otherwise result from in-water pile-driving activities on the San Joaquin River:

- Underwater sound monitoring would be performed during pile-driving activities. A biological monitor or acoustic monitor would be present during work to monitor construction activities and compliance with terms and conditions of permits.
- Sheet piling would be driven by vibratory or nonimpact methods (i.e., hydraulic) that result in sound pressures below threshold levels to the extent feasible.

- Pile driving would be conducted only during daylight hours and initially would use low energy levels and reduced impact frequency. Applied energy and frequency would be gradually increased until necessary full force and frequency are achieved.
- The project biologist would develop a plan for pile-driving activities in water to minimize impacts on fish and would allow sufficient time in the schedule for coordination with regulatory agencies as discussed in the 2012 Biological Opinion (USFWS 2012). Measures would be implemented to minimize underwater sound pressures to levels below thresholds for peak pressure and accumulated sound exposure levels. Threshold levels established by the NMFS that would not be exceeded are as follows:
  - Peak Pressure = 206 decibels
  - Accumulated sound exposure levels = 183 decibels

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#43 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#44: Compensate for Permanent and Temporary Impacts on Jurisdictional Aquatic Resources

The contractor on behalf of the Authority would initiate mitigation for permanent and temporary impacts on jurisdictional aquatic resources as provided for in the final compensatory mitigation plan approved by the USACE. Regulatory compliance for jurisdictional aquatic resources includes relevant terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and California Fish and Game Code Section 1600 et seq. Streambed Alteration Agreement. Compensation would include aquatic resources restoration, establishment, enhancement, or preservation through one or more of the following methods:

- Purchase of credits from an agency-approved mitigation bank
- Fee-title-acquisition of natural resource regulatory agency-approved property
- Permittee-responsible mitigation through the establishment, re-establishment, restoration, enhancement, or preservation of aquatic resources and the establishment of a conservation easement or other permanent site protection method, along with financial assurance for long-term management of the property-specific conservation values
- In lieu fee contribution determined through negotiation and consultation with the various natural resource regulatory agencies

The following ratios are proposed as a minimum for compensation for permanent impacts; final ratios would be determined in consultation with the appropriate agencies:

- Vernal pools: 2:1
- Seasonal wetlands: between 1.1:1 and 1.5:1 based on impact type and function and values lost
  - 1:1 offsite for permanent impacts
  - 1:1 onsite and 0.1:1 to 0.5:1 offsite for temporary impacts

The Authority would mitigate impacts on jurisdictional aquatic resources by replacing, creating, restoring, enhancing or preserving aquatic resource at the ratios presented in this measure or other ratios, as determined in consultation with the appropriate agencies, which compensates for functions and values lost. The Authority would consider modifying the vernal pool mitigation ratios based on site-specific conditions and the specific life history requirements of vernal pool branchiopods, California tiger salamander, and western spadefoot. Where an HSR alternative affects an existing conservation area, the Authority would modify the mitigation ratio to meet the

vernal pool mitigation requirement. Either the affected portion of the conservation area would be relocated or compensation would be provided to the holder of the conservation area in accordance with the Uniform Relocation and Real Property Policy Act of 1970, as amended. Through the HMP reporting program and the applicable terms and conditions from the USACE 404 Permit and the California Fish and Game Code 1600 et seq. Streambed Alteration Agreement, the Authority or its designee would submit documentation of compliance to the regulatory agencies.

The proposed mitigation is anticipated to be effective because it provides compensatory mitigation for wetland impacts. However, the ultimate determination for the exact amount of mitigation that will be required will be made by the USACE and other regulatory agencies using specific mitigation ratio setting procedures and guidance and considering site-specific factors. 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#45: Compensate for Impacts on Special-Status Plant Species

The Authority would mitigate the impacts on special-status plants in accordance with the USFWS biological opinion by implementing the following measures:

Compensation for federally listed plant species that are observed within the project footprint and that cannot be avoided would be compensated at a 1:1 ratio based on actual acres of direct impacts through the following approach:

a. Identification of suitable sites to receive the listed plants.
    i. Refuges, reserves, federal or state lands, and public/private mitigation banks.
    ii. Authority-proposed permittee-responsible mitigation sites.
    iii. Other locations approved by USFWS.
b. Collection of seeds, plant materials, and top soil from the project footprint before construction impacts.

The Authority or its designee would submit a memorandum to the USFWS and or CDFW to document compliance with this measure.

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 are anticipated.

BIO-MM#46: Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

The Authority would initiate mitigation for direct and indirect impacts, including temporary and permanent, on vernal pool branchiopod habitat through compensation determined in consultation with the USFWS and USACE under FESA Section 7. Compensation for vernal pool branchiopod habitat (e.g., vernal pools, seasonal wetlands) is addressed under BIO-MM#44. The Authority or its designee would submit a memorandum to the USFWS to document compliance with this measure.

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 are anticipated.

BIO-MM#47: Compensate for Impacts on Valley Elderberry Longhorn Beetle

The Authority would initiate compensatory mitigation for the valley elderberry longhorn beetle, including transplantation and replacement of elderberry shrubs and maintenance for replacement shrubs following the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999b). The performance criteria include a minimum survival rate of at least 60 percent of the elderberry plants, and 60 percent of the associated native plants must be maintained throughout

the monitoring period. If survival drops below 60 percent, failed plantings would be replaced. The Authority would submit a memorandum to the USFWS to document compliance with this measure.

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 are anticipated.

BIO-MM#48: Compensate for Impacts on California Tiger Salamander

The Authority in consultation with the USFWS would determine if compensatory mitigation is required to offset the loss of habitat for California tiger salamander. Permanent and temporary impacts on California tiger salamander habitat would be mitigated at minimum ratios of 1:1 (acres preserved, enhanced, or restored: acres affected) and 0.5:1, respectively. If required, compensatory mitigation could include one of the following:

- Purchase of credits from an agency-approved mitigation bank.
- Acquire with a fee-title natural resource regulatory agency-approved property.
- Purchase or establish a conservation easement with an endowment for long-term management of the property-specific conservation values.
- Make an in-lieu fee contribution determined through negotiation and consultation with USFWS.

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 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 are anticipated.

BIO-MM#49: Compensate for Impacts on Blunt-nosed Leopard Lizard and Nelson's Antelope Squirrel

Prior to construction (any ground-disturbing activity in blunt nosed leopard lizard or Nelson's antelope squirrel habitat), the Authority would determine compensatory mitigation to offset the permanent and temporary loss of suitable habitat for the blunt-nosed leopard lizard and Nelson's antelope squirrel through consultation with the USFWS and/or CDFW. Permanent and temporary impacts would be mitigated at minimum ratios of 1:1 (acres preserved, enhanced, or restored: acres affected) and 0.5:1, respectively.

Compensatory mitigation could include one of the following:

- Purchase of credits from an agency-approved mitigation bank.
- Fee-title-acquisition of natural resource regulatory agency-approved property.
- Purchase or establishment of a conservation easement with an endowment for long-term management of the property-specific conservation values.
- In-lieu fee contribution determined through negotiation and consultation with USFWS.

The Authority would submit a memorandum to the USFWS and or CDFW to document compliance with this measure.

This mitigation measure is anticipated to be effective because it provides minimum compensatory mitigation standards 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 are anticipated.

BIO-MM#50: Compensate for Loss of Swainson's Hawk Nesting Trees

The Authority would provide compensatory mitigation specific to the Central Valley Wye alternatives that replaces nesting trees and provides natural lands for foraging. Compensatory mitigation for Swainson's hawk would be based on the number of trees with "active" nests that are removed by construction activities, or where construction activities create habitat modification that leads to a reduction in reproductive success, or nest abandonment. If construction occurs within 0.5 mile of a documented or observed active nest, the Authority would acquire and preserve 150 acres of natural habitat, per active nest tree removed by construction activities, or where construction activities create habitat modification that leads to reduced reproductive success or nest abandonment. At a minimum, the habitat preserved would contain trees suitable to support nesting and natural foraging habitat for Swainson's hawk. The Authority would submit a memorandum to the CDFW to document compliance with this measure.

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 are anticipated.

BIO-MM#51: Compensate for Loss of Burrowing Owl Active Burrows and Habitat

To compensate for permanent impacts on nesting, occupied, and satellite burrows and/or burrowing owl habitat, the Authority would provide compensatory mitigation based on CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). Occupied burrows permanently affected by construction would be mitigated at a minimum 1:1 ratio, and any lands proposed as compensatory mitigation for burrowing owls must demonstrate burrowing owl occupancy. The Authority would submit a memorandum to the CDFW to document compliance with this measure.

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 are anticipated.

BIO-MM#52: Compensate for Destruction of San Joaquin Kit Fox Habitat

The Authority would mitigate the destruction of San Joaquin kit fox habitat by the purchase of suitable, approved habitat (USFWS and CDFW). Habitat would be replaced at a minimum ratio of 1:1 for natural lands and a ratio of 0.1:1 for suitable urban or agricultural lands 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 San Joaquin kit fox in accordance with the USFWS Biological Opinion and/or CDFW 2081(b). 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 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 are anticipated.

BIO-MM#53: Compensate for Destruction of 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 are anticipated.

BIO-MM#54: 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 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 the surveys conducted within 1 year prior to construction identify occupied Crotch bumble bee habitat within the project footprint, 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 20 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#55: Provide Compensatory Mitigation for Impacts on Crotch Bumble Bee

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#54) 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 are anticipated.

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			

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#9: Direct Impacts on Special-Status Wildlife—Reptiles				
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) 13.16 (T)
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) 11.28 (T)
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) 68.43 (T)
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)	2,563.60 (P) 536.24 (T)
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)	1,248.69 (P) 292.29 (T)
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)	1,210.70 (P) 321.86 (T)
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)	2,129.86 (P) 459.16 (T)
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)	1,271.55 (P) 192.86 (T)

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 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)	1,286.91 (P) 232.60 (T)
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)	1,200.16 (P) 174.80 (T)
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)	1,107.01 (P) 332.68 (T)
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)	1,373.83 (P) 289.39 (T)
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)	1,303.87 (P) 247.53 (T)
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)	2,210.65 (P) 407.80 (T)
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)	2,567.14 (P) 536.24 (T)
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)	2,567.14 (P) 536.24 (T)
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)	169.69 (P) 86.00 (T)

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 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) 252.52 (T)
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			

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#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			
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	7.83 (P) 4.15 (T)	9.05 (P) 4.64 (T)	7.12 (P) 5.81 (T)	5.88 (P) 3.40 (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

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 crownscale. 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, Central Valley Wye Alternatives. 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

CEQA Impacts	Impact Description and CEQA Level of Significance	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#1 BIO-MM#2 BIO-MM#3 BIO-MM#4 BIO-MM#45	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#1 BIO-MM#2 BIO-MM#3 BIO-MM#4 BIO-MM#45	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#3 BIO-MM#4 BIO-MM#5 BIO-MM#6 BIO-MM#7 BIO-MM#46 BIO-MM#47 BIO-MM#54 BIO-MM#55	Less than significant for all Central Valley Wye alternatives
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

CEQA Impacts	Impact Description and CEQA Level of Significance	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
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#3 BIO-MM#4 BIO-MM#8 BIO-MM#43	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#3 BIO-MM#4 BIO-MM#9 BIO-MM#10 BIO-MM#11 BIO-MM#12 BIO-MM#13 BIO-MM#48	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
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#3 BIO-MM#4 BIO-MM#9 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#42 BIO-MM#49 BIO-MM#53	Less than significant for all Central Valley Wye alternatives

CEQA Impacts	Impact Description and CEQA Level of Significance	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
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#3 BIO-MM#4 BIO-MM#24 BIO-MM#25 BIO-MM#26 BIO-MM#27 BIO-MM#28 BIO-MM#29 BIO-MM#30 BIO-MM#50 BIO-MM#51	Less than significant for all Central Valley Wye alternatives
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 under all Central Valley Wye alternatives	BIO-MM#3 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 BIO-MM#40 BIO-MM#41 BIO-MM#52	Less than significant for all Central Valley Wye alternatives

CEQA Impacts	Impact Description and CEQA Level of Significance	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
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#3 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 BIO-MM#40 BIO-MM#41 BIO-MM#52	Less than significant for all Central Valley Wye alternatives
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#1 BIO-MM#2 BIO-MM#3 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#1 BIO-MM#2 BIO-MM#3 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 under all Central Valley Wye alternatives	BIO-MM#1 BIO-MM#2 BIO-MM#3 BIO-MM#4 BIO-MM#44	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

CEQA Impacts	Impact Description and CEQA Level of Significance	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
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 Wye ▪ SR 152 (North) to Road 11 Wye	BIO-MM#3 BIO-MM#4 BIO-MM#44	Less than significant for all Central Valley Wye alternatives
	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 the following Central Valley Wye alternatives: ▪ SR 152 (North) to Road 19 Wye ▪ SR 152 (North) to Road 11 Wye	BIO-MM#3 BIO-MM#4 BIO-MM#8	Less than significant for all Central Valley Wye alternatives
	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#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

CEQA Impacts	Impact Description and CEQA Level of Significance	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
Wildlife Movement Corridor Impacts			
Impact BIO#23: Direct Impacts on Wildlife Movement Corridors	Significant	BIO-MM#39	Less than significant for all Central Valley Wye alternatives
Impact BIO#24: Indirect Impacts on Wildlife Movement Corridors	Significant	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	No mitigation measures are required	Not applicable
Impact BIO#26: Indirect Impacts on Special-Status Plants	Less than significant	No mitigation measures are required	Not applicable
Special-Status Wildlife Impacts			
Impact BIO#27: Direct Impacts on Special-Status Wildlife – Invertebrates	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#28: Indirect Impacts on Special-Status Wildlife—Invertebrates	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#29: Direct Impacts on Special-Status Wildlife—Fish	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#30: Indirect Impacts on Special-Status Wildlife—Fish	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#31: Direct Impacts on Special-Status Wildlife—Amphibians and Reptiles	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#32: Indirect Impacts on Special-Status Wildlife—Amphibians and Reptiles	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#33: Direct Impacts on Special-Status Wildlife—Birds	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#34: Indirect Impacts on Special-Status Wildlife—Birds	Less than significant	No mitigation measures are required	Not applicable

CEQA Impacts	Impact Description and CEQA Level of Significance	Mitigation Measure(s)	CEQA Level of Significance after Mitigation
Impact BIO#35: Direct Impacts on Special-Status Wildlife—Mammals	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#36: Indirect Impacts on Special-Status Wildlife—Mammals	Less than significant	No mitigation measures are required	Not applicable
Special-Status Plant Community Impacts			
Impact BIO#37: Direct Impacts on Special-Status Plant Communities	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#38: Indirect Impacts on Special-Status Plant Communities	Less than significant	No mitigation measures are required	Not applicable
Jurisdictional Aquatic Resources Impacts			
Impact BIO#39: Direct Impacts on Aquatic Resources	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#40: Indirect Impacts on Aquatic Resources	Less than significant	No mitigation measures are required	Not applicable
Critical Habitat Impacts			
Impact BIO#41: Direct Impacts on Critical Habitat	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#42: Indirect Impacts on Critical Habitat	Less than significant	No mitigation measures are required	Not applicable
Essential Fish Habitat Impacts			
Impact BIO#43: Direct Impacts on Essential Fish Habitat	Less than significant	No mitigation measures are required	Not applicable
Impact BIO#44: Indirect Impacts on Essential Fish Habitat	Less than significant	No mitigation measures are required	Not applicable
Wildlife Movement Corridor Impacts			
Impact BIO#45: Indirect Impacts on Wildlife Movement Corridors	Less than significant	No mitigation measures are required	Not applicable

Source: Authority, 2020

Excerpt from Section 3.19.6.6 Cumulative Impacts, Biological Resources and Wetlands

New information on the Crotch bumble bee's candidacy status under the California Endangered Species Act was specifically considered relative to the discussion of cumulative effects in Section 3.19.6.6, Biological Resources and Wetlands. As described in Section 3.19.6.6, the cumulative RSA for special-status species is the San Joaquin Valley. As also described in Section 3.19.6.6, the cumulative RSA was selected to consider a broad, regional consideration of cumulative impacts, and because they capture impacts on biological resources associated with construction and operations of the Central Valley Wye alternatives and regional impacts on biological resources associated with development projects affecting similar habitat types. The cumulative RSA was considered for Crotch bumble bee and was considered to be appropriate, because it is similar to the other biological resources and special-status species affected by the Central Valley Wye Alternatives. Additionally, biologists reviewed the discussion of cumulative conditions, specifically considering the Crotch bumble bee and found that it is also applicable and appropriate for this species and requires no changes.

Within the discussion of the contribution of the Central Valley Wye Alternatives to the loss of suitable habitat for special status species, Section 3.19.6.6, generally considers effects on all special status species together (i.e., as one biological resources topic, cumulatively). The discussion of the contribution of the Central Valley Wye Alternatives to loss of suitable habitat for special status species, including California annual grassland and other special-status plant communities would also apply to the Crotch bumble bee habitats of California annual grassland and scrub, and therefore no specific changes are necessary to specifically address Crotch bumble bee. Section 3.19.6.6 refers back to the mitigation measures in Section 3.7, which now includes mitigation measures to avoid, minimize, and mitigate impacts on habitat for Crotch bumble bee. As noted in Section 3.19.6.6, the mitigation measures ensure that the Central Valley Wye alternatives would not result in cumulatively considerable contributions to the cumulative impacts on special status species and habitats. As augmented by the new mitigation measures for Crotch bumble bee added to the revised Section 3.7, the text and conclusions remain accurate. For these reasons, the current text in Section 3.19 requires no revision to address the Crotch bumble bee.

3.19 Cumulative Impacts

3.19.6.6 Biological Resources and Wetlands

Several resource subtopics are discussed in this subsection and the organization of the discussion has been modified from the format of other resource discussions for clarity and readability. This subsection presents individual discussions of the cumulative condition, the contribution of the Central Valley Wye alternatives, and a CEQA conclusion for six different subtopics: special-status plants and wildlife, special-status plant communities, jurisdictional aquatic resources, critical habitat, essential fish habitat, and wildlife movement corridors.

RSA

The cumulative RSA for habitat, special-status species, and wildlife movement is the San Joaquin Valley, which is larger than the RSAs described in Section 3.7, Biological Resources and Wetlands (see Table 3.7-2). The cumulative RSA for wetlands comprises the following subbasins of the San Joaquin River Basin—Middle San Joaquin-Lower Chowchilla, Fresno River, Lower San Joaquin River, Upper Merced and Upper Tuolumne watersheds (U.S. Geologic Survey 8-digit Hydrologic Unit Codes 18040001, 18040002,18040007, 18040008, and 18040009, respectively)—which is also larger than the RSA described in Section 3.7 (defined for direct impacts as the project footprints, and defined for indirect impacts as the project footprints plus a 250-foot buffer and the entirety of vernal pool coverage). These cumulative RSAs were selected to develop a broad, regional consideration of cumulative impacts, and because they capture impacts on biological resources associated with construction and operations of the Central Valley Wye alternatives and regional impacts on biological resources associated with development projects affecting similar habitat types and occurring within neighboring watersheds.

Special-Status Plants and Wildlife

Cumulative Condition

As discussed in Section 3.7, large areas of valley grasslands, saltbush scrub, palustrine wetlands, valley foothill hardwoods, and extensive riparian woodlands have been either lost to development or have been converted to agricultural production. The historical trend of converting or altering these natural communities has compromised the biological complexity of the region and has been a factor in the listing by federal and state agencies of special-status species. Within the cumulative RSA, the majority of land is actively used for agriculture, and urban areas are the second most common type of land use. Native vegetation in these areas is absent or highly disturbed. As a result, any occurrences of special-status plant or wildlife species are considered sensitive resources under the existing, altered conditions of the cumulative RSAs. Under the cumulative condition, ongoing urban development and agricultural practices are expected to continue within the cumulative RSAs. Urban development stemming from the population increase through 2040 would result in the conversion of large areas of land that is presently used for agriculture or is undeveloped to accommodate housing, commercial, office, transportation, parks, and schools. Several large planned development projects such as Yosemite Ranch Estates' 2,500-lot development in Merced County and the 2,062-acre Gateway Village and Gunner Ranch Specific Plans in Madera County would contribute to development in the RSA. Planned transportation projects such as the widening of SR 99 south of Madera, reconstruction of the SR 99/SR 233 interchange, construction of the SR 152 Los Banos bypass, the Central Valley Wye alternatives, and the HSR Merced to Fresno and Fresno to Bakersfield Sections are located within the RSA. Together, the Central Valley Wye alternatives, development planned under land use plans, planned transportation improvements, agricultural and dairy farm expansions, adjacent HSR sections and relevant additional future projects identified in Appendix 3.19-A and 3.19-B constitute the cumulative condition relevant to special-status plants and wildlife.

The permanent conversion of existing land uses to residential, commercial, agricultural, and transportation uses would result in cumulative impacts on special-status plant and wildlife species within the cumulative RSA for these resources. These cumulative impacts would be mostly likely to occur for 46 plant species determined to have a moderate to high potential to occur in the special-

status plant RSA (see Table 3.7-6). Additionally, construction of these projects could result in land disturbance, increased vehicle traffic, and topography alteration, which could lead to disturbance, injury, or mortality of various special-status wildlife species and their respective habitats.

Operation of these planned projects could result in additional cumulative impacts. For example, operation of transportation projects could result in the loss of individual members of special-status species through maintenance and mowing of roadside embankments, or from the death of animals trying to cross transportation facilities. Indirect habitat degradation could occur near developed sites such as through as nighttime lighting that illuminates sensitive habitat areas, or from trash blown from nearby residential and commercial areas. Taken together, these cumulative operations impacts would be considered a cumulative impact on special-status species and habitat.

These species are protected by law and any planned development or transportation projects would be required to incorporate measures to minimize disturbance of special-status species, such as by conducting protocol-level surveys; salvaging, relocating, and propagating identified species; and restoring potential habitat areas after construction. Additionally, the Central Valley Wye alternatives include requirements that would avoid or minimize many of the direct and indirect impacts associated with construction of the HSR system. For example, the IAMFs identified in Section 3.7 include measures to delineate environmentally sensitive and restrictive areas to avoid and minimize the potential direct disturbance of special-status species during construction, and would minimize the indirect impact on special-status plants and other native vegetation occurring outside of the project footprints by requiring the cleaning of construction equipment and incorporating a weed control plan to minimize the spread of invasive species. Other planned development and transportation projects would have in place similar measures to minimize impacts. While these measures would minimize project-specific impacts, they would not completely avoid destruction of habitat or loss of individual members of the species and these effects would combine within the RSA to result in a cumulative impact.

Contribution of the Central Valley Wye Alternatives

As described in Section 3.7, construction of the Central Valley Wye alternatives would result in the removal of vegetation for the placement of permanent infrastructure during construction, and the removal of vegetation within temporary impact areas and from construction vehicles, and disturbance of vegetation from personnel (i.e., trampling, covering, and crushing individual plants, plant populations, or suitable potential habitat for special-status species). The contribution of the Central Valley Wye alternatives to this cumulative impact would vary depending on the alternative and the type of habit affected by each alternative. For example, the SR 152 (North) to Road 19 Wye Alternative would have the greatest potential to contribute to impacts on 16 special-status plant species associated with California annual grassland while the Avenue 21 to Road 13 Wye Alternative would have the greatest potential to contribute to cumulative impacts on 12 special-status plant species associated with aquatic and wetland vegetation (see Section 3.7.7, Environmental Consequences). Mitigation measures would require protocol-level surveys to identify individual members of a species that could be avoided, relocated, or propagated. They would also involve the preparation and implementation of a habitat mitigation plan to offset impacts on habitat for special-status species by creating, restoring, enhancing, and/or preserving habitat that provides the same functions and values as habitat permanently affected by construction. With the implementation of this mitigation, the Central Valley Wye alternatives' incremental contribution from construction to this cumulative impact is not cumulatively considerable.

Operations of the Central Valley Wye alternatives would avoid or minimize the potential for impacts from maintenance activities that have the potential to trample or crush plant communities and wildlife. These impacts would be avoided through the IAMFs identified in Section 3.7, which would require that maintenance personnel attend a worker environmental awareness program (WEAP) training to understand and identify sensitive biological resources and associated regulatory requirements. Additionally, the Central Valley Wye alternatives would provide wildlife crossings and would not include nighttime lighting. These measures would avoid and/or minimize the potential for trampling or other destruction of special-status plant species or habitat and

minimize the potential for impacts on special-status wildlife species by training maintenance personnel to understand environmental compliance issues. Therefore, it is not anticipated that the Central Valley Wye alternatives would contribute to a cumulative operations impact.

CEQA Conclusion

The historical trend of land use changes in the RSA has led to large-scale alteration and removal of the habitat of numerous special-status plant and wildlife species, and ongoing development continues to degrade remaining habitat. All four of the Central Valley Wye alternatives would result in the removal of vegetation for the placement of permanent infrastructure during construction, and the removal of vegetation within temporary impact areas and from construction activities. The mitigation proposed to address impacts to species habitat includes habitat preservation in combination with restoration and enhancement, would maintain or result in an improvement over existing conditions within the RSA. With implementation of the mitigation measures identified in Section 3.7.8, the Central Valley Wye alternatives would not result in a cumulatively considerable contribution to significant cumulative impacts during construction. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because IAMFs incorporated into the Central Valley Wye alternatives would avoid or minimize the potential for trampling or other destruction of special-status plant and wildlife species and their habitats.

Special-Status Plant Communities

Cumulative Condition

Construction of development and transportation projects within the cumulative RSA would result in removal or disruption of plants and vegetation, which could lead to direct and indirect impacts on special-status plant communities from trampling and crushing of plants. Construction activities that directly affect vernal pools, riparian plant communities, seasonal wetlands, and palustrine forested special-status plant communities would result in the removal or disruption of special-status plant communities by construction vehicles and personnel. See the previous discussion under Special-Status Plants and Wildlife for a description of the cumulative condition and the planned development and transportation projects that would contribute to these cumulative impacts.

Many of these habitat areas and species are protected by law and any development or transportation projects would be required to incorporate measures to minimize disturbance of special-status species, such as by conducting protocol-level surveys, avoiding identified areas found to contain special-status plant communities, and restoring potential habitat areas after construction. Furthermore, these projects may be required to provide mitigation, including compensatory mitigation, for impacts on special-status plants, as required by state and federal law (e.g., CEQA, the federal Endangered Species Act, the California Endangered Species Act, and indirectly through the Clean Water Act). For the Central Valley Wye alternatives, IAMFs included in the project design (identified in Section 3.7) would require various controls during construction, such as identifying and delineating habitat features and other environmentally sensitive areas on final construction plans and in the field; controlling weeds, monitoring measures, cleaning construction equipment to prevent the spread of weeds; and limiting vehicle traffic and construction site speeds to avoid and minimize the potential direct disturbance of special-status plant communities during construction. While these measures would reduce individual impacts, they would not completely avoid degradation of special-status plant communities during construction and these impacts would combine within the RSA to result in a cumulative impact. Operation of these planned projects could result in additional cumulative impacts on plant communities. For example, operation of development projects could result in the degradation of plant communities through the spread of non-native and invasive plant species.

Contribution of the Central Valley Wye Alternatives

IAMFs and mitigation measures identified in Section 3.7.8 would minimize disturbance of special-status plant communities by conducting protocol-level surveys to identify special-status plants in areas where permission was not previously granted to allow for removal prior to disturbance; salvaging, relocating, and propagating; incorporating a habitat management plan; and restoring and preserving

(on-site and off-site) of special-status plant species. The incorporation of these measures would avoid some direct and indirect impacts on special-status plant communities; however, some impacts on special-status plant communities would still occur and could combine with the individual impacts of other projects. The contribution to this cumulative impact would vary depending on the alternative selected and the type of habit affected by each alternative. For example, the SR 152 (North) to Road 19 Wye Alternative would have the most impacts on mixed riparian plant communities (1.06 acres) compared to the SR 152 (North) to Road 13 Wye Alternative (0.36 acre). In contrast, 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 (see Table 3.7-14 in Section 3.7.7). Mitigation measures would require protocol-level surveys to identify individual members of a species that could be avoided, relocated, or propagated. They would also involve the preparation and implementation of a habitat mitigation plan to offset impacts on habitat for special-status species by creating, restoring, enhancing, and/or preserving habitat that provides the same functions and values as habitat permanently affected by construction. With the implementation of this mitigation, the Central Valley Wye alternatives' incremental contribution from construction to this cumulative impact is not cumulatively considerable.

Operations of the Central Valley Wye alternatives would require periodic removal of vegetation and disturbance of plants caused by an increase of maintenance activity. The IAMFs identified in Section 3.7 would require maintenance personnel to attend a WEAP training to understand and identify sensitive biological resources and associated regulatory requirements. Therefore, it is not anticipated that the Central Valley Wye alternatives would contribute to cumulative impacts during operations.

CEQA Conclusion

The historical trend of land use changes in the RSA has led to large-scale alteration and removal of special-status plant communities, and ongoing development continues to degrade remaining habitat. All four of the Central Valley Wye alternatives would result in the disturbance or removal of vegetation within special-status plant communities for the placement of permanent infrastructure during construction, and the removal of vegetation within temporary impact areas and from construction activities. The mitigation proposed to address impacts to special-status plant communities includes habitat preservation in combination with restoration and enhancement, which would maintain or result in an improvement over existing conditions within the RSA. With implementation of the mitigation measures identified in Section 3.7.8, the Central Valley Wye alternatives would not result in a cumulatively considerable contribution to significant cumulative impacts during construction. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because IAMFs incorporated into the Central Valley Wye alternatives would avoid or minimize the potential for trampling or other destruction of special-status plant communities.

Jurisdictional Aquatic Resources

Cumulative Condition

Construction of development and transportation projects within the cumulative RSA for aquatic resources would result in the discharge of fill into federal and state jurisdictional wetlands and other waters under Section 404 of the Clean Water Act, and under Section 1600 et seq. of the California Fish and Game Code (including seasonal wetlands, vernal pools, canals, ditches, lacustrine wetlands, retention and detention basins, riparian, and seasonal riverine areas), which could lead to impacts on jurisdictional aquatic resources, including through the removal or modification of local hydrology, and redirection of flow. Areas potentially affected include seasonal wetlands, canals, ditches, lacustrine wetlands, retention and detention basins, riparian, and seasonal riverine complexes. While the discharge of fill material into waters is regulated by state and federal agencies, such discharges may be authorized under certain circumstances.

Under the cumulative condition, ongoing urban development would result in the conversion of large areas of agricultural or undeveloped land to accommodate housing, commercial, office, transportation, parks, and schools. Several large planned development projects such as Yosemite Ranch Estates' 2,500-lot development in Merced County and the 2,062-acre Gateway Village and Gunner Ranch Specific Plans in Madera County would contribute to development in the RSA and could result in some fill of wetlands or other impacts on jurisdictional aquatic resources. Linear transportation projects, such as the widening of SR 99, construction of the SR 152 Los Banos bypass, the Central Valley Wye alternatives, and the HSR Merced to Fresno and Fresno to Bakersfield Sections, are likely to contribute to cumulative impacts on jurisdictional aquatic resources because their linear footprints would result in crossing multiple waterways. Over time, fill activities related to these individual projects can result in a cumulative reduction in jurisdictional areas and these would be considered cumulative impacts. Operation of these planned projects could result in additional cumulative impacts on jurisdictional aquatic resources. For example, operation of development and transportation projects could result in changes in local hydrology and drainage that could degrade nearby waters or introduce non-native and invasive species.

Contribution of the Central Valley Wye Alternatives

Construction activities associated with all four of the Central Valley Wye alternatives would contribute to these cumulative impacts. As presented in Table 3.7-15 and Table 3.7-16, the greatest extent of direct impact (2.34 acres) on all types of jurisdictional wetlands combined would result from construction of the Avenue 21 to Road 13 Wye Alternative, whereas the least direct impact (0.72 acres) on jurisdictional wetlands would result from construction of the SR 152 (North) to Road 11 Wye Alternative. The greatest extent of direct impact (43.34 acres) on all types of jurisdictional other waters combined would result from construction of the Avenue 21 to Road 13 Wye Alternative, whereas the least direct impact (29.26 acres) on jurisdictional other waters would result from construction of the SR 152 (North) to Road 11 Wye Alternative. As presented in Table 3.7-16, the greatest extent of direct impact (2.97 acres) on all types of riparian habitats considered jurisdictional under Section 1600 et seq. of the California Fish and Game Code combined would result from construction of the Avenue 21 to Road 13 Wye Alternative, whereas the least direct impact (1.53 acres) on jurisdictional riparian habitats would result from construction of the SR 152 (North) to Road 11 Wye Alternative. The greatest extent of direct impact (13.69 acres) on all types of streams and riparian areas considered jurisdictional under Section 1600 et seq. of the California Fish and Game Code would result from construction of the SR 152 (North) to Road 19 Wye Alternative, whereas the least direct impact (9.28 acres) on all types of jurisdictional streams and riparian areas would result from construction of the SR 152 (North) to Road 11 Wye Alternative. Mitigation measures identified in Section 3.7.8 would compensate for permanent and temporary impacts on jurisdictional waters through creation, restoration, enhancement, and preservation of wetlands, which would prevent reduction of or degradation of jurisdictional wetlands. This action would be consistent with the USACE "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. These features would also minimize turbidity and siltation and ground disturbing activities by incorporating a dewatering plan and construction site best management practices (BMP).

Operations of the Central Valley Wye alternatives would require maintenance and vehicular activity near jurisdictional aquatic resources. The IAMFs identified in Section 3.7 would require maintenance personnel to attend a WEAP training to understand and identify sensitive biological resources and associated regulatory requirements. With these measures in place, the likelihood of accidental spills, introduction of contaminants/pollutants, and degradation of jurisdictional waters would be minimized and, therefore, it is not anticipated that the Central Valley Wye alternatives would contribute to this cumulative impact during operations.

Mitigation measures identified in Section 3.7.8 would compensate for these cumulative impacts on jurisdictional waters by providing for on-site and off-site mitigation by creating, restoring, enhancing, and preserving "in kind" wetlands or other waters that provide the same functions and values as those permanently affected by construction and implementing a habitat management plan. The implementation of these measures would compensate for direct and indirect impacts on

jurisdictional aquatic resources. Other projects would also likely be required to compensate for loss of jurisdictional aquatic resources, particularly wetlands, pursuant to the requirements of Section 404 of the Clean Water Act. The mitigation measures proposed for the Central Valley Wye alternatives and compliance with the USACE "no net loss of wetlands" policy would avoid a contribution this cumulative impact.

CEQA Conclusion

The historical trend of land use changes in the RSA has led to large-scale removal and degradation of aquatic resources, and ongoing development continues to degrade remaining aquatic resources. All four of the Central Valley Wye alternatives would result in impacts to jurisdictional aquatic resources. With implementation of mitigation measures identified in Section 3.7.8, the Central Valley Wye alternatives would result in no net loss of jurisdictional aquatic resources; therefore, there would not be cumulatively considerable contribution to significant cumulative impacts during construction. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because IAMFs incorporated into the Central Valley Wye alternatives would avoid the degradation or removal of remaining aquatic resources.

Critical Habitat

Cumulative Condition

Construction of transportation and development projects within the cumulative RSA could result in the destruction or degradation of federally designated critical habitat. Critical habitat areas have been designated within the cumulative RSA for eight species, including plant and aquatic species. Although some of these upland critical habitat areas are largely protected from development, some loss or degradation of critical habitat areas, such as of vernal pools, are anticipated under the cumulative condition and would be considered cumulative impacts. Additionally, indirect impacts of planned development and transportation projects could also combine to contribute to these impacts, such as through the spread of invasive species that could compromise the habitat value of these critical habitat areas. See the previous discussion under Special-Status Plants and Wildlife for a description of the cumulative condition and the planned development and transportation projects that would contribute to these cumulative impacts. Operation of these planned projects could result in additional cumulative impacts on critical habitat areas. For example, operation of development and transportation projects could result in changes in local hydrology and drainage that could degrade nearby vernal pools or introduce non-native and invasive species.

Contribution of the Central Valley Wye Alternatives

Critical habitat areas 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) exists within the vicinity of the Central Valley Wye alternatives. As discussed in Section 3.7, there would be impacts critical habitat associated with vernal pool species from construction of two of the Central Valley Wye alternatives, SR 152 (North) to Road 19 Wye Alternative (4.72 acres), and the SR 152 (North) to Road 11 Wye Alternative (0.21 acre). The Site 7—Le Grand Junction/Sandy Mush Road, Warnerville – Wilson 230 kV Transmission Line associated with the SR 152 (North) to Road 19 Wyes Alternative would also have indirect impacts to Central Valley steelhead critical habitat. As shown in Table 3.7-10, 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 IAMFs identified in Section 3.7 would identify critical habitat and minimize, although not avoid, direct impacts on special-status plant communities from construction. While these critical habitat areas are protected by law to reduce impacts from HSR and other projects, this designation does not forbid development or construction, and these two alternatives would contribute to this cumulative impact during construction.

Operations of the Central Valley Wye alternatives would require maintenance and increased vehicular activity near critical habitats. The IAMFs identified in Section 3.7 would require maintenance personnel to attend a WEAP training to understand and identify sensitive biological resources and associated regulatory requirements. With these measures in place, the likelihood accidental spills, introduction of contaminants/pollutants, and degradation of, or direct impacts on, critical habitat would be minimized. Therefore, it is not anticipated that any of the Central Valley Wye alternatives would contribute to this cumulative impact during operations. Mitigation measures identified in Section 3.7.8 would require on-site and off-site restoration and preservation of critical habitat by creating, restoring, enhancing, and preserving habitat that provides the same functions and values as those permanently affected by construction. With these measures and the delineation of habitat features as environmental site assessments during final construction plans and in the field, the likelihood of direct removal or effect on the long-term viability of critical habitat would be minimized. Therefore, the incremental contribution related to the construction of the SR 152 (North) to Road 19 Wye and SR 152 (North) to Road 11 Wye Alternatives to this cumulative impact is not cumulatively considerable.

CEQA Conclusion

The historical trend of land use changes in the RSA has led to large-scale alteration and removal of critical habitat, and ongoing development continues to degrade remaining habitat. Two of the Central Valley Wye alternatives would contribute to significant cumulative impacts on critical habitat areas for vernal pool associated species, and one of the two would also contribute to significant cumulative impacts on critical habitat for Central Valley steelhead. With implementation of mitigation measures identified in Section 3.7.8, these impacts would be reduced and there would not be cumulatively considerable contributions to significant cumulative impacts during construction. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because IAMFs incorporated into the Central Valley Wye alternatives would minimize the potential for direct and indirect impacts to critical habitat. Therefore, CEQA does not require additional mitigation.

Essential Fish Habitat

Cumulative Condition

Essential fish habitat (EFH) occurs in the San Joaquin River, which flows south to north across the cumulative RSA to the east of Los Banos. A segment of the river within the RSA is designated as EFH for the recovery of Pacific (Chinook) Salmon by the National Oceanic and Atmospheric Administration. Since 2009, the San Joaquin River Restoration Program has been initiating the restoration of flows conducive to Chinook salmon through a series of restoration programs and projects, including the Mendota Pool Bypass and Reach 2B Improvements, Reach 4B and Eastside Bypass, Arroyo Canal, and Sack Dam, which are resulting in beneficial effects on quality of the EFH. Construction of bridges and aerial structures over the San Joaquin River from projects such as the Central Valley Wye alternatives, widening of SR 99 south of Madera, and proposed improvements to SR 152 could result in direct and indirect impacts on EFH in the San Joaquin River through construction along riverbanks and through increased turbidity and siltation. Existing permitting requirements for in-water work and stormwater pollution prevention regulations would reduce potential impacts but there could still be cumulative impacts related to increased turbidity and siltation resulting from construction. These cumulative impacts are limited to construction activity along the riverbanks and no impacts associated with operations or maintenance activities are anticipated under the cumulative condition.

Contribution of the Central Valley Wye Alternatives

For the Central Valley Wye alternatives, construction over the San Joaquin River would increase turbidity and siltation and would contribute to cumulative impacts on EFH. The IAMFs identified in Section 3.7 would require that the project biologist consult with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife 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 and/or standing water, a dewatering plan would be

required in consultation with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife. Prior to construction, a dewatering plan would be required for review and approval by the resource agencies. The plan would include appropriate measures to minimize turbidity and siltation. The implementation of these measures would minimize some direct impacts on EFH; however, the degradation of EFH by the Central Valley Wye alternatives during construction would be unavoidable and there would be a cumulatively considerable contribution to these cumulative 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.

Operations of the Central Valley Wye alternatives could require periodic maintenance and increased vehicular activity near streams or rivers with EFH which could result in increased turbidity and siltation. The IAMFs identified in Section 3.7 would require that maintenance personnel attend a WEAP training to understand and identify sensitive biological resources and associated regulatory requirements. With these measures in place, the likelihood for accidental spills, introduction of contaminants/pollutants, and degradation of, or direct impacts on, EFH would be minimized. They would also minimize the impacts on water quality from increased erosion, sedimentation, siltation, and runoff caused by 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 because of increased human activity; and the introduction of noxious plant species from increased human activity/disturbance. These IAMFs would minimize impacts and there would not be cumulative impacts during operations.

Mitigation measures identified in Section 3.7.8 would require on-site and off-site restoration and preservation of fish habitat and a plan for fish rescue. With these mitigation measures, the Central Valley Wye alternatives' incremental contribution from construction to this cumulative impact is not cumulatively considerable.

CEQA Conclusion

Cumulative projects in the RSA could increase the turbidity and siltation in the San Joaquin River, degrading EFH. All four of the Central Valley Wye alternatives would result in cumulatively considerable contributions to significant cumulative impacts on EFH. With implementation of mitigation measures identified in Section 3.7.8, these impacts would be reduced and there would not be cumulatively considerable contributions to significant cumulative impacts during construction. Therefore, CEQA does not require additional mitigation. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because IAMFs incorporated into the Central Valley Wye alternatives would minimize the potential for accidental discharge of pollutants to the San Joaquin River, therefore avoiding impacts to EFH.

Wildlife Movement Corridors

Cumulative Condition

Several major known habitat linkages provide wildlife movement within the cumulative RSA, including the Eastman Lake–Bear Creek essential connectivity areas (ECA), Ash Slough–Merced National Wildlife Refuge ECA, San Luis Canal-Kesterson National Wildlife Refuge ECA, Sandy Mush Road Area, and other modeled wildlife corridors. Construction of development and transportation improvement projects could create barriers within natural lands such that they would interfere with the movement of wildlife species. These mapped wildlife movement corridors cover large areas that are currently divided by roads and influenced by agricultural activities and nearby development. Proposed improvements to roadways and development along major arterials, such as for Highway 152, would introduce new features into the landscape that could degrade these wildlife movement corridors during construction and operations.

The Central Valley Wye alternatives include IAMFs that would require the creation of wildlife-crossing features at frequent intervals and along sensitive areas to facilitate wildlife movement and minimize or avoid impacts on wildlife corridors. The incorporation of these measures would

minimize the impacts of interfering with established wildlife movement corridors and other impacts relating to the potential for isolation of populations. In areas where the Central Valley Wye alternatives would cross existing barriers to wildlife movements, such as roads and the UPRR right-of-way, there would be an opportunity to improve existing wildlife movement opportunities. While these design features could improve wildlife movement in some areas, overall opportunities for wildlife movement within the cumulative RSA would be diminished. Therefore, there would be a cumulative impact on known and modeled wildlife corridors.

Contribution of the Central Valley Wye Alternatives

As discussed in Section 3.7, the Central Valley Wye alternatives would affect known and modeled wildlife corridors from construction. The SR 152 (North) to Road 19 Wye Alternative would have the greatest potential impact 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 impact on wildlife movement corridors. By including wildlife-crossing features in the project design, the Central Valley Wye alternatives are expected to maintain existing wildlife movement corridors within the project footprints. Impacts would still occur and would be temporary, lasting from 1 to 2 months, up to 3 years during construction, and there could be permanent impacts from the introduction of the new linear infrastructure. These impacts could combine with those from other construction projects and disrupt seasonal migrations and animal foraging and mating opportunities. Therefore, any of the Central Valley Wye alternatives' contributions to these cumulative impacts would be considerable. Feasible mitigation measures have been identified in Section 3.7.8, and no additional mitigation is proposed. There would still be cumulative impacts from construction after mitigation.

During operations, maintenance activities are not expected to affect wildlife movement corridors because activities would be dispersed over time and location, diluting potential impacts. Impacts on wildlife movement corridors from operations would include disturbance from the passage of trains (noise, motion, and startle effects). As discussed in Section 3.7.7.5 in Impact BIO#45, Indirect Impacts on Wildlife Movement Corridors, the level of impact 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. In general, for the Central Valley Wye alternatives, these potential effects would be limited as a result of the short duration of train passes and the infrequent use of the wildlife crossings by wildlife. Therefore, while disturbance to wildlife corridors from operations could combine with other regional projects' impacts to disrupt normal movement within wildlife corridors, the Central Valley Wye alternatives' contributions to these cumulative impacts would not be cumulatively considerable.

CEQA Conclusion

Existing linear features and development divide wildlife movement corridors in the RSA, and cumulative projects. Existing and planned linear transportation projects and other development within the RSA could degrade wildlife movement features through the introduction of new barriers into the landscape and thereby further limiting wildlife movement, resulting in significant cumulative impacts on known and modeled wildlife corridors. The Central Valley Wye alternatives would include IAMFs and mitigation measures that would maintain wildlife-crossing opportunities by requiring the creation of wildlife-crossing features at frequent intervals and along sensitive areas to facilitate wildlife movement and minimize or avoid impacts on wildlife corridors. With implementation of mitigation measures identified in Section 3.7.8, there would not be cumulatively considerable contributions to significant cumulative impacts during construction. Operations of the Central Valley Wye alternatives would not result in cumulatively considerable contributions to significant cumulative impacts because operations and maintenance activities would be dispersed over time and place and the potential disturbance to wildlife would be limited as a result of the short duration of train passes and infrequent use of the wildlife crossings by wildlife. Therefore, CEQA does not require mitigation.

California High-Speed Rail Authority

Merced to Fresno Section: Central Valley Wye

Appendix to the Revised Draft Supplemental Environmental Impact Report / Second Draft Supplemental Environmental Impact Statement, Biological Resources Analysis



Revised Appendix 3.7-C-2: Biological Resources and Wetlands: Special-Status Wildlife

March 2020

CALIFORNIA High-Speed Rail Authority

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

Table 1 Special-Status Wildlife Species with Potential to Occur in the Resource Study Area

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Invertebrates				
Conservancy fairy shrimp *Branchinecta conservatio*	E	–	Found in large, turbid pools in the northern 2/3 of the Central Valley; inhabits static pools located in swales formed by old, braided alluvium, filled by winter/spring rains, last until June. Primary constituent elements of critical habitat include: complexes of swales and pools with intermittently or continuously flowing surface water; depressional features that become inundated by winter rains and continuously hold water for a minimum of 19 days; and sources of food and habitat structure within pools.	Potential to Occur: The RSA lies within the known range of the species and vernal pools are present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).
Conservancy fairy shrimp *Critical Habitat* *Branchinecta conservatio*				No critical habitat for this species occurs in the Wildlife RSA.
Longhorn fairy shrimp *Branchinecta longiantenna*	E	–	Inhabits vernal pools, seasonally ponded areas within vernal swales, and ephemeral freshwater habitats.	No Potential to Occur: There is a reported occurrence approximately 8 miles west of the western-most point of the project footprint in a road-side ditch two miles north of Los Banos (Occurrence 10; CDFW 2016). This occurrence is considered by the USFWS as an anomaly and not a sustainable population since only one individual was detected (USFWS 2007).
Longhorn fairy shrimp *Critical Habitat* *Branchinecta longiantenna*				No critical habitat for this species occurs in the Wildlife RSA.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Vernal pool fairy shrimp *Branchinecta lynchi*	T	–	Vernal pools; inhabit small, clear-water sandstone depression pools and grassed swale, earth slump, or basalt-flow depression pools. Primary constituent elements of critical habitat include: complexes of swales and pools with intermittently or continuously flowing surface water; depressional features that become inundated by winter rains and continuously hold water for a minimum of 18 days; and sources of food and habitat structure within pools.	Potential to Occur: The RSA lies within the known range of the species and vernal pools are present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).
Vernal pool fairy shrimp *Critical Habitat* *Branchinecta lynchi*				Designated critical habitat for this species occurs within the project footprint.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	T	–	Elderberry shrubs with stem diameters of >1 inch. Species always found close to host plant. Larvae may remain in stems for up to 2 years.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).
Valley elderberry longhorn beetle *Critical Habitat* *Desmocerus californicus dimorphus*				No critical habitat for this species occurs in the project footprint.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Vernal pool tadpole shrimp *Lepidurus packardi*	E	–	Seasonal pools in unplowed grassland with old alluvial soils underlain by hardpan or in sandstone depressions, water in the pools has very low alkalinity and conductivity. Primary constituent elements of critical habitat include: complexes of swales and pools with intermittently or continuously flowing surface water; depressional features that become inundated by winter rains and continuously hold water for a minimum of 41 days; and sources of food and habitat structure within pools.	Potential to Occur: The RSA lies within the known range of the species and vernal pools are present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).
Vernal pool tadpole shrimp *Critical Habitat* *Lepidurus packardi*				Designated critical habitat for this species occurs within the project footprint.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Crotch bumble bee	–	CE	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. 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).	Potential to Occur: The RSA lies within the known range of the species and suitable grassland and scrub habitat types are present in the resource study area.
Fish				
Kern brook lamprey *Lampetra hubbsi*	–	CSC	Silty backwaters of rivers. Ammocoetes favor substrates of mud and sand and adults need riffle habitat with gravel for spawning (Moyle 2002).	Potential to Occur: Kern brook lamprey could occur in the San Joaquin River during the winter months when flows are adequate. The San Joaquin River would be used as a migratory corridor to eastside tributaries.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Central Valley steelhead *Oncorhynchus mykiss*	T	CSC	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 7.8 to 18°C (Moyle 2002). Habitat types are riffles, runs, and pools.	Potential to Occur: Steelhead could occur in the San Joaquin River during the winter months when flows are adequate. The San Joaquin River would be used as a migratory corridor to eastside tributaries such as the Merced River.
Central Valley spring-run Chinook salmon *Oncorhynchus tshawytscha*	T	T	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5°C. Habitat types are riffles, runs, and pools. (Moyle 2002).	Potential to Occur: Spring-run Chinook salmon do not currently occur in the San Joaquin River due to lack of flow. They would be introduced in the future when restoration actions begin.
Winter-run Chinook salmon *Oncorhynchus tshawytscha*	E	E	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5°C. Habitat types are riffles, runs, and pools. (Moyle 2002).	No Potential to Occur. The RSA lies outside of the known range of the species.
Chinook salmon – Central Valley fall/late-fall run ESU *Oncorhynchus tshawytscha*	SC	CSC	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5°C. Habitat types are riffles, runs, and pools (Moyle 2002).	Potential to Occur: Fall-run Chinook salmon could occur in the San Joaquin River during the winter months when flows are adequate. The San Joaquin River would be used as a migratory corridor to eastside tributaries such as the Merced River.
Delta smelt *Hypomesus transpacificus*	T	T	Occurs in estuary habitat in the Delta where fresh and brackish water mix in the salinity range of 2–7 parts per thousand (Moyle 2002).	No Potential to Occur. The RSA lies outside of the known range of the species.
Hardhead *Mylopharodon conocephalus*	–	CSC	Reside in low to mid-elevation streams and prefer clear, deep pools and runs with slow velocities. Also occur in reservoirs.	Potential to Occur: Hardhead could occur in the San Joaquin River during months where river flow is adequate.
San Joaquin roach *Lavinia symmetricus*	–	CSC	Found in a wide variety of habitats such as small, warm streams to cold, clear streams. Mainly use pool or slow-moving water habitat with other native fish species (Moyle 2002).	Potential to Occur: Roach could occur in the San Joaquin River during months where river flow is adequate.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Amphibians				
California tiger salamander *Ambystoma californiense*	T	T	Requires vernal pools or other seasonal water sources that remain inundated for a minimum of 12 weeks for breeding. Suitable upland habitat includes annual grasslands and grassy understory of valley-foothill hardwood habitats (i.e., oak-savanna). Requires mammal burrows or other underground refuges.	Potential to Occur: The RSA lies within the known range of the species and suitable aquatic and upland habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).
California tiger salamander *Critical Habitat* *Ambystoma californiense*				No critical habitat for this species occurs in the project footprint.
Yellow-blotched salamander *Ensatina eschescoltzii croceator*	–	CSC		No Potential to Occur: The RSA lies outside of the known range of the species.
California red-legged frog *Rana draytonii*	T	CSC	Pools in marshes, streams, ponds, with emergent vegetation, and typically without predatory fish; require adequate hibernacula such as small mammal burrows and moist leaf litter.	No Potential to Occur: The RSA lies outside of the known range of the species.
California red-legged frog Critical Habitat *Rana draytonii*				No critical habitat for this species occurs in the project footprint.
Northern leopard frog *Lithobates pipiens*	–	CSC	Permanent aquatic habitat such as creeks, wet meadows, and ponds with emergent and submergent vegetation for breeding and overwintering. Nearby dense grass or forb dominated habitats with moist soil for foraging.	No Potential to Occur: The RSA lies outside of the known range of the species.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Foothill yellow-legged frog *Rana boylii*	–	CSC	Occurs in Klamath Mountains; Cascade, north and south Coast, and Transverse Ranges; and Sierra Nevada up to approximately 6,000 feet. Creeks or rivers in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along edge. Usually found near riffles with rocks and sunny banks nearby.	No Potential to Occur: The RSA lies outside of the known range of the species.
Western spadefoot *Spea hammondii*	–	CSC	Grassland and valley-foothill hardwood woodlands, vernal pools, or seasonal wetlands are essential for egg laying.	Potential to Occur: The RSA lies within the known range of the species and suitable aquatic and upland habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are reported occurrences of this species within the project footprint (CDFW 2016).
Reptiles				
Western pond turtle *Actinemys marmorata*	–	CSC	Ponds, marshes, rivers, streams, irrigation ditches, vernal pools. Needs basking sites such as partially submerged logs or rocks, and suitable upland habit (sandy banks or grassy open fields) for egg laying. Fresh, brackish, or saltwater conditions.	Potential to Occur: The RSA lies within the known range of the species and suitable aquatic and upland habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are reported occurrences of this species within the project footprint (CDFW 2016).
Blunt-nosed leopard lizard *Gambelia sila*	E	E/FP	Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts; they do not excavate their own burrows.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Silvery legless lizard *Anniella pulchrapulchra*	–	CSC	Semi-stabilized sand dunes, areas with sandy soil, and high moisture content, vegetated with oak or pine-oak woodland, chaparral; also wooded stream edges, and occasionally desert-scrub. Bush lupine often is an indicator of suitable conditions. Often found in leaf litter, and under rocks, logs, and driftwood.	No Potential to Occur: The RSA lies outside of the known range of the species.
Coast horned lizard *Phrynosoma blainvilli*i	–	CSC	Sandy loam areas and on alkali flats. Dietary specialists dependent on ants, as well as beetles and other seasonally abundant insects. Forages on the ground in open areas, usually between shrubs and often near an ant nest. Uses small mammal burrows or burrows under surface objects during periods of extended inactivity or hibernation.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Giant garter snake *Thamnophis gigas*	T	T	Found in freshwater marshes and low-gradient streams. Prefers habitat with dense emergent vegetation, deep and shallow pools of water that persist throughout the seasonal cycle of activity, open areas along water margins, and upland habitat with access to structures suitable for hibernation and escape from flooding. Has adapted to drainage canals and irrigation ditches.	Potential to Occur: The RSA lies within the known range of the species and suitable aquatic and upland habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are reported occurrences of this species within the project footprint (CDFW 2016).
San Joaquin whipsnake *Masticophis flagellum ruddocki*	–	CSC	Open, dry, treeless areas, including grassland and saltbush scrub. Takes refuge in rodent burrows, under shaded vegetation, and under surface objects.	No Potential to Occur: The RSA lies outside of the known range of the species.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Birds				
American white pelican *Pelecanus erythrorhynchos*	–	CSC	Historically, nested at large lakes throughout California; only breeding colonies in the state occur at lower Klamath National Wildlife Refuge, Siskiyou County, and at Clear Lake, Modoc County; winters along the California coast from southern Sonoma County. Frequents freshwater lakes with islands for breeding; inhabits river sloughs, freshwater marshes, salt ponds, and coastal bays during the rest of the year.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Least bittern *Ixobrychus exilis*	–	CSC	Marshes and along pond edges, where tules and rushes can provide cover; nests are built low in the tules over the water.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Redhead *Aythya americana*	–	CSC	Habitat includes shallow freshwater lakes, ponds, and marshes. The body of water needs to be at least 28 inches deep so that they can dive.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Fulvous whistling-duck *Dendrocygna bicolor*	–	CSC	Habitat includes shallow freshwater and coastal marshes. Shows a preference for rice fields and tall-grass areas flooded to a depth of <0.5 m.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Golden eagle *Aquila chrysaetos*	BGEPA	FP	Nests on cliff ledges and large trees in open areas. Forages in open areas such as grassland, low scrub, or open woodlands.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Swainson's hawk *Buteo swainsoni*	–	ST	Nests in larger trees adjacent to grasslands and agricultural fields where it forages.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are several reported CNDDB occurrences within project footprint (CDFW 2016) and project biologists observed nesting in the project footprint during the 2015 nesting season.
Northern harrier *Cirus cyaneus*	–	CSC	Nests on ground in shrubby vegetation, usually near wet areas. Forages in grasslands, wetlands, and other open areas.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016), though the species was observed in the RSA during the 2014 reconnaissance field survey.
White-tailed kite *Elanus leucurus*	–	FP	Open grasslands with scattered trees for nesting and perching. They often nest in trees adjacent to open areas.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
American peregrine falcon *Falco peregrinus anatum*	Delisted, BCC	E/FP	Nests and roosts on protected ledges of high cliffs, preys on birds.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
California condor *Gymnogyps californianus*	E	E	Requires large blocks of open savanna, grasslands, and foothill chaparral with large trees, cliffs, and snags for roosting and nesting.	No Potential to Occur: The RSA lies outside of the known range of the species.
California condor *Critical Habitat* *Gymnogyps californianus*				No critical habitat for this species occurs in the project footprint.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Bald eagle *Haliaeetus leucocephalus*	Delisted/BGEPA, BCC	E/FP	Ocean shore, lake margins and rivers; mostly nests within 1 mile of water. Nests in large old growth or dominant live trees with open branches, especially ponderosa pine.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).
Yellow rail *Coturnicops noveboracensis*	BCC	CSC	Historical records of nests in Mono County east of the Sierra Nevada and formerly Marin County on the coast; winter records also on the coast from Humboldt County to Orange County. Utilizes grassy marshes and wet meadows, building well-concealed firm grass cup nests. Especially secretive and seldom seen.	No Potential to Occur: The RSA lies outside of the known range of the species.
Black rail *Laterallus jamaicensis*	BCC	T/FP	Permanent resident in the San Francisco Bay and east-ward through the Delta into Placer, Sacramento, and San Joaquin Counties; small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial Counties. Uses matted dead marsh grasses and thick plant stands for cover and concealment. Builds cup nest of loose grasses on ground. Secretive and very rarely seen.	No Potential to Occur: The RSA lies outside of the known range of the species.
Lesser sandhill crane *Grus canadensis*	--	CSC	Forages on waste seed and other grains on agricultural fields. Also consumes invertebrates and small vertebrates. Winter visitors only in the Central Valley.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016), though the species was observed in the RSA during the 2014 reconnaissance field survey

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Greater sandhill crane *Grus canadensis tabida*	–	T/FP	Forages on waste seed and other grains on agricultural fields. Also consumes invertebrates and small vertebrates. Winter visitors only in the Central Valley.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016), though the species was observed in the RSA during the 2014 reconnaissance field survey.
Long-billed curlew *Numenius americanus*	BCC	–	Nests in northeastern California in Modoc, Siskiyou, and Lassen Counties. Winters along the coast and in interior valleys west of Sierra Nevada; during migration frequents lake and river shores, mudflats, salt marshes, and sandy beaches. Uses a grass-lined nest in a hollow on the ground.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Whimbrel *Numenius phaeopus*	BCC	–	Breeds in Arctic tundra in Alaska and Canada, especially near coast; uses coastal salt meadows, mudflats, and grassy shoreline slopes during migration. Winters in central and southern California. Nests in clumps of moss or grassy depressions on the ground.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Red knot *Calidris canutus roselaari*	BCC	–	Breeds in Siberia and northwestern Alaska and winters in Florida, Panama, and Venezuela. Nests on wet, low tundra to dry slopes and ridges. Common locally along sandy beaches and occasionally in the Central Valley during migration. Does not nest in California.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Western snowy plover (inland population) *Charadrius alexandrines nivosus*	T	CSC	Occurs year round in California. Inhabits beaches, dry mud or salt flats, sandy shores of rivers, lakes, and ponds. Nests primarily on coastal beaches, but known to nest in the Central Valley. Breeds in loose colonies. Federal listing applies only to the Pacific coastal population. CDFG "Species of Special Concern" designation refers to both the coastal and interior populations.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Mountain plover *Charadrius montanus*	PT	CSC	Does not breed in California; winters in the Central Valley south of Yuba County, along the coast in parts of San Luis Obispo, Santa Barbara, Ventura, and San Diego Counties; parts of Imperial, Riverside, Kern, and Los Angeles Counties	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).
Black tern *Chlidonias niger*	–	CSC	Spring and summer resident of the Central Valley, Salton Sea, and northeastern California where suitable emergent wetlands occur. Occurs in freshwater wetlands, lakes, ponds, moist grasslands, and agricultural fields; feeds mainly on fish and invertebrates while hovering over water.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint.
Short-billed dowitcher *Limnodromus griseus*	BCC	–	Breeds in southern Alaska and parts of Canada and winters along coast from California and Virginia southward. Nests on moist tundra or beside forest pools; visits mudflats, creeks, salt marshes, and tidal estuaries during migration and in winter. Nest is a depression on the ground lined with grass and moss.	No Potential to Occur: The RSA lies outside of the known range of the species.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Marbled godwit *Limosa fedoa*	BCC	–	Breeds on the central plains from Saskatchewan to Minnesota and winters on coasts from California and Virginia southward and along Gulf Coast. Nests on grassy plains; visits salt marshes, tidal creeks, mudflats, and sea beaches on migration. Creates a nest in a slight depression lined with grass on the ground and nests in loose colonies.	No Potential to Occur: The RSA lies outside of the known range of the species.
Xantu's murrelet *Synthiloramphus hypoleucus*	C, BCC	T	Breeds on offshore islands of Baja California and southern California; occasionally wanders north to Vancouver Island. An ocean-going species; nests in colonies on rocky sea islands, laying its eggs among boulders or in crevices off of island beaches.	No Potential to Occur: The RSA lies outside of the known range of the species.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	C, BCC	E	Occurs year round in California range. Inhabits beaches, dry mud or salt flats, sandy shores of rivers, lakes, and ponds. Nests primarily on coastal beaches, but known to nest in the Central Valley. Breeds in loose colonies. Federal listing applies only to the Pacific coastal population. CDFG "Species of Special Concern" designation refers to both the coastal and interior populations.	No Potential to Occur: The habitat study area lies within the historical range of the western yellow-billed cuckoo; however, the current distribution of the species in the Central Valley is primarily restricted to isolated breeding populations along the Sacramento River and in the upper Kern River watershed; the habitat study area lies outside of the species' currently accepted range.
Short-eared owl *Asio flammeus*	–	CSC	Freshwater and salt marshes, lowland meadows, and irrigated alfalfa fields; needs dense tules or tall grass for nesting and daytime roosts.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Long-eared owl *Asio otus*	–	CSC	Nests in abandoned crow, hawk, or magpie nests, usually in dense riparian stands of willows, cottonwoods, live oaks, or conifers.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016)
Western burrowing owl *Athene cunicularia*	BCC	CSC	Nests and winters in grassland and sparse shrubland habitats throughout California; also can be found in habitats disturbed by human activity; uses abandoned burrows of burrowing mammals for shelter and nest sites.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).
Flammulated owl *Otus flammeolus*	BCC	–	Breeds in southern British Columbia south to southern California, Arizona, New Mexico, and western Texas. Winters south of United States. Inhabits coniferous woodlands and forest edges in the Northwest and dry ponderosa pine woods in the Southwest. Nests in a tree hollow or deserted woodpecker hole.	No Potential to Occur: The RSA lies outside of the known range of the species.
Spotted owl *Strix occidentalisoccidentalis*	BCC	CSC	Occurs throughout its historic range in California, extending along the west side of the Sierra Nevada, some eastern Sierra portions, areas of the central Coast range, and in all major mountains of southern California. Inhabits old-growth coniferous forests and densely wooded canyons. Nests in a natural tree or canyon wall cavity or an abandoned hawk's nest.	No Potential to Occur: The RSA lies outside of the known range of the species.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Costa's hummingbird *Calypte costae*	BCC	–	Primarily found in southern California but may nest locally along the western edge of the San Joaquin Valley. Found in shrub habitats and areas with trees. Nest is a delicately woven cup, with leaves or lichens fastened to the outside, built low on a protected branch of a bush or small tree.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Allen's hummingbird *Selasphorus sasin*	BCC	–	Breeds along coast from southern Oregon to southern California and is a resident of southern California. Also winters in Mexico. Prefers coastal chaparral, brushland, and edges of redwood forests. Nest is a tightly woven cup placed on a sheltered branch.	No Potential to Occur: The RSA lies outside of the known range of the species.
Lewis's woodpecker *Melanerpes lewis*	BCC	–	Breeds in central California. Winters from southern British Columbia and Oregon to Colorado and south to northern Mexico; wanders east to the Great Plains. Prefers open pine-oak woodlands, oak or cottonwood groves in grasslands, ponderosa pine country. Forms loose colonies nesting in cavities of dead stumps or tree limbs, often at a considerable height.	No Potential to Occur: The RSA lies outside of the known range of the species.
White-headed woodpecker *Picoides albolarvatus*	BCC	–	Resident from extreme south-central British Columbia, northeastern Washington, and Idaho, south to southern California and western Nevada. Prefers ponderosa pine belts of the mountains; also in subalpine belts of firs. Nest cavities are in a pine stub or snag, often close to the ground.	No Potential to Occur: The RSA lies outside of the known range of the species.

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Nuttall's woodpecker *Picoides nuttallii*	BCC	–	Resident from northern California to Baja California. Prefers canyon scrub oaks, oak woodlands, and streamside growth. Nests in holes excavated in a thin dead branch of an oak or cottonwood, or even a large, thick-stemmed elderberry bush.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area.
Loggerhead shrike *Lanius ludovicianus*	BCC	CSC	Breeds and forages in open habitats interspersed with shrubs and small trees, including disturbed habitats.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016), though the species was observed in the RSA during the 2014 reconnaissance field survey footprint.
Least bell's vireo *Vireo bellii pusillus*	E	E	Riparian thickets either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground.	Potential to Occur: The habitat study area lies within the historical range of the least bell's vireo; however, the current distribution of the species is primarily restricted to riverine systems in southern California; The species was extirpated from the Central Valley in the 1940's. However, in 2005, a breeding pair was observed in the San Joaquin Wildlife Refuge. There is potential for this species to nest in the habitat study area in the future. There are no CNDDB reported occurrences of this species within 10 miles of the project footprint (CDFW 2016).
Yellow-billed magpie *Pica nuttalli*	BCC	–	Resident in California's Central Valley and adjacent foothills. Common in oak savannas, oak woods, riverside growth, ranches, and suburbs. Nests in colonies in tall trees with dense foliage and builds nests of twigs and sticks.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Purple martin *Progne subis*	–	CSC	Nests in abandoned woodpecker holes in oaks, cottonwoods, and other deciduous trees in a variety of wooded and riparian habitats. Also nests in vertical drainage holes under elevated freeways and highway bridges.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Oak titmouse *Baeolophus inornatus*	BCC	–	Resident from southern Oregon south to Baja California. Prefers live oaks and deciduous growths of all kinds. Nests in tree cavities, fence post holes, or crevices of old buildings. Nest is composed of grasses, fur, and some feathers.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area.
Cactus wren *Campylorhynchus brunneicapillus*	BCC	–	Resident in southern California. Prefers desert thickets and cacti. Nest is a mass of fine grass and straw with a side entrance, lined with feathers and hair and placed in the top of a thorny desert shrub or spiny cactus.	No Potential to Occur: The RSA lies outside of the known range of the species.
Le Conte's thrasher *Toxostoma lecontei*	BCC	CSC	Permanent resident within California range. Commonly found on very dry and lightly vegetated plains with desert scrub, particularly saltbush and creosote bush. Nests in thick, dense, and thorny desert shrubs or cholla cacti.	No Potential to Occur: The RSA lies outside of the known range of the species.
Yellow warbler *Dendroica petechia brewsteri*	BCC	CSC	Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral; may also use oaks, conifers, and urban areas near stream courses.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Yellow-breasted chat *Icteria virens*	–	CSC	Nests in dense riparian thickets of willow and other brushy tangles, including briars and stream thickets near watercourses.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Grasshopper sparrow *Ammodramus savannarum*	BCC	CSC	Occurs in dry, dense grasslands, especially those with a variety of grasses and tall forbs and scattered shrubs for singing perches. Nests in slight depressions in dense grasslands.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Oregon vesper sparrow *Pooecetes gramineus affinis*	–	CSC	Winters in California. Grassland wintering habitat characterized as mainly open ground with little vegetation, or short grass and low annuals, including stubble fields, meadows, and road edges.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Black-chinned sparrow *Spizella atrogularis*	BCC	–	Breeds from central California, southern Nevada, southern Utah, Arizona, southern New Mexico, and western Texas southward and winters along Mexican border. Prefers low, dense chaparral, mountain slopes; and sagebrush. Nest is a grass-lined cup well concealed in a low bush.	No Potential to Occur: The RSA lies outside of the known range of the species.
Tricolored blackbird *Agelaius tricolor*	–	T	Nests next to open water where there is extensive emergent vegetation, blackberry, or wild rose bushes; frequently forages in grain fields.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	–	CSC	Nest over persistent water in freshwater emergent wetlands with dense vegetation adjacent to deep water, and along borders of lake or ponds.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Lawrence's goldfinch *Carduelis lawrencei*	BCC	–	Breeds in central and southern California, west of Sierra Nevada and south into Baja California; winters south and east to extreme western Texas. Prefers dry grassy slopes with weed patches, chaparral, and open woodlands. Nest is a tightly woven cup in a low tree or bush.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Mammals				
Pallid bat *Antrozous pallidus*	–	CSC	Forages in open areas of grasslands, shrublands, woodlands, and forests from sea level up through mixed conifers. Roosts in crevasses in trees, structures, and rock.	Potential to Occur: The RSA lies within the known range of the species and suitable roosting and foraging habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
Townsend's big-eared bat *Corynorhinus townsendiitownsendii*	–	CT/CSC	Forages in arid areas and open coniferous forests. Roosts in rocky areas with caves or tunnels.	No Potential to Occur: The habitat study area lies within the known range of the species and but does not contain suitable roosting habitat.
Western mastiff bat *Eumops perotis californicus*	–	CSC	Roosts in crevices in cliff faces, high buildings, and tunnels. Forages in arid, semi-arid habitat — coniferous and deciduous woodlands, coastal scrub, grasslands, chaparral, etc.	Potential to Occur: The RSA lies within the known range of the species and suitable foraging habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).
Western red bat *Lasiurus blossevillii*	–	CSC	Roost primarily in trees, prefers habitat edges and mosaics with trees that are protected above and open below for foraging.	Potential to Occur: The RSA lies within the known range of the species and suitable roosting and foraging habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).

Common Name Scientific Name	Federal Status[1]	State Status[2]	Preferred Habitat	Potential to Occur
Ringtail *Bassariscus astutus*	–	FP	Occurs primarily in riparian habitats but also known from most forest and shrub habitats from lower to mid elevations. Usually found near water.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are no reported CNDDB occurrences within 10 miles of the project footprint (CDFW 2016).
American badger *Taxidea taxus*	–	CSC	Grasslands, savannas, and mountain meadows near timberline are preferred. Principal requirements: sufficient food, friable soils, and relatively open, uncultivated ground. Preys primarily on burrowing rodents such as gophers, ground squirrels, marmots, and kangaroo rats.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016a).
Fresno kangaroo rat *Dipodomys nitratoides exilis*	E	E	Sandy or saline soils in chenopod scrub and annual grassland communities on the Valley floor. Recently they have been found only in alkali sink communities.	No Potential to Occur: The habitat study area lies outside the species' current range and suitable habitat is not present (CDFW 2016).
San Joaquin kit fox *Vulpes macrotis mutica*	E	T	Annual grassland or grassy open stages with scattered shrubby vegetation; needs loose-textured sandy soils for burrowing, and suitable prey base.	Potential to Occur: The RSA lies within the known range of the species and suitable habitat is present in the resource study area. There are reported CNDDB occurrences within 10 miles of the project footprint, though there are no reported occurrences of this species within the project footprint (CDFW 2016).

Sources: CDFW 2016; Moyle 2002; USFWS 2007
[1] Federal Status
C(E) = Candidate for Endangered listing status
C(T) = Candidate for Threatened listing status
C(T/E) = Candidate for Threatened or Endangered listing status
SC = Special Concern
FE = Endangered
FT = Threatened
BGEPA = Protected under the Bald and Golden Eagle Protection Act
BCC = Birds of Conservation Concern designated by the U.S. Fish and Wildlife Service.
[2] State Status
SE = Endangered
ST = Threatened
CT = Candidate for Threatened listing status
CE = Candidate for Endangered listing status
CSC = California Species of Special Concern designated by the California Department of Fish and Game.
FP = Fully Protected species designated by the California Department of Fish and Game.
CDFG = California Department of Fish and Game
CDFW = California Department of Fish and Wildlife
CNDDB = California Natural Diversity Database
RSA = Resource study area USFWS = U.S. Fish and Wildlife Service

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CNDDB	California Natural Diversity Database
USFWS	U.S. Fish and Wildlife Service

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