3.7 Biological Resources and Wetlands

3.7.1 Introduction

This section describes the regulatory setting and the affected environment for biological resources, the potential impacts on these resources that would result from implementing the project, and the measures that would reduce such impacts. The term "biological resources" includes special-status plant and wildlife species, habitats of concern (including special-status plant communities, jurisdictional waters, critical habitat, conservation areas [i.e., Recovery Plan areas for federally listed species, conservation easements, public lands, conservation banks, and Habitat Conservation Plans], and protected trees), and wildlife movement corridors. This section summarizes detailed information contained in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a). Additional information regarding biological resources is included in the following sections:

- Section 3.4, Noise and Vibration, discusses noise and vibration that would occur in the project vicinity from the operation of the project. Potential impacts on wildlife due to project noise and vibration are based on information provided in the *High-Speed Ground Transportation Noise and Vibration Impact Assessment Manual* (FRA 2005).

- Section 3.8, Hydrology and Water Resources, discusses existing surface water hydrology, water quality, groundwater, and floodplains, and identifies potential impacts on these resources for each alternative.

- Section 3.14, Agricultural Lands, discusses the range of impacts on agricultural lands that may overlap with the biological conditions discussed and evaluated in this section and addresses potential impacts on pollinating bees.

- Section 3.18, Regional Growth, includes a discussion of growth-inducing impacts.

- Section 3.19, Cumulative Impacts, describes the cumulative impacts of this and other past, present, and reasonably foreseeable future projects.

The Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) documents for the Proposed California High-Speed Train System (Statewide Program EIR/EIS) (Authority and FRA 2005) concluded the project would have a significant impact on biological resources and committed to mitigation strategies and design practices to reduce effects.

3.7.1.1 Key Definitions

Key definitions of special-status species, special-status plant communities, and jurisdictional waters are provided below. Each of these resources is further defined in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Special-Status Species: Special-status species are plants and animals that are legally protected under the federal Endangered Species Act of 1973 (federal ESA), the California Endangered Species Act (CESA), the California Native Plant Protection Act, and/or other regulations, such as those species that meet the definitions of rare, threatened, or endangered under CEQA Guidelines Sections 15380 and 15125. The special-status species designation does not extend to bird species protected under the Migratory Bird Treaty Act (U.S.C. Sections 703 to 712); however, impacts to these species are discussed under special-status wildlife species sections of this document. Further detail can be found in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Special-Status Plant Communities: Special-status plant communities are determined to be significant and/or to represent rare vegetation types (California Natural Diversity Database [CNDDB] [CDFG 2012a]) or to have limited distribution statewide or within a county or region. These communities are often vulnerable to the environmental effects of projects (CDFG 2000). A list of special-status plant communities in California is maintained by the California Department of Fish and Game (CDFG) in the *Vegetation Classification and Mapping Program: Natural Communities List* (CDFG 2010a). Additional information can be found in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Jurisdictional Waters: Wetlands and other waters in the project vicinity, including waters of the United States (water of the U.S.), waters of the state, and state streambeds and lakes, are regulated by the federal government (U.S. Army Corps of Engineers [USACE]) and the State of California (State Water Resources Control Board [SWRCB] and CDFG). When considering wetlands and other waters, these features are collectively termed jurisdictional waters. Wetlands and other waters as delineated during the jurisdictional delineation (see the *Fresno to Bakersfield Preliminary Jurisdictional Waters and Wetlands Delineation Report* [Authority and FRA 2011]) are assumed to fall under the jurisdiction of the USACE, SWRCB, and CDFG for purposes of this discussion. Confirmation of these waters as jurisdictional by the USACE, SWRCB, and CDFG will be conducted when the regulatory permitting process is conducted. Definitions of the categories that are included in the jurisdictional waters sections are presented below.

- **Waters of the U.S.**: The federal Clean Water Act (CWA) defines waters of the U.S. 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 U.S.; (5) tributaries to the foregoing types of waters; and (6) wetlands adjacent to the foregoing waters (33 CFR 328.3[a]). Wetlands are a sub-classification of waters of the U.S., as described below. The term other waters of the U.S. is used to describe waters of the U.S. exclusive of wetlands.

  - **Wetlands**: According to the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008b), three criteria must be satisfied to classify an area as a jurisdictional wetland: (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 (Section 13050[e] of the California Water Code) 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 regulations under federal law are considered waters of the state and regulated accordingly. On March 9, 2012, the California Water Boards released a preliminary draft of their Wetland Area Protection Policy, which includes a proposed wetland definition. Under their definition, an area is a wetland if, under normal circumstances, it (1) is continuously or recurrently inundated with shallow water or saturated within the upper substrate; (2) has anaerobic conditions within the upper substrate caused by such hydrology; and (3) either lacks vegetation or the vegetation is dominated by

hydrophytes (SWRCB 2012). Because this definition is still in draft form, the term wetland as used in this document refers to the USACE definition of wetlands, given above. Within this document, all waters of the state, except riparian areas, are classified as wetlands or other waters of the U.S.

- **State Lakes and Streambeds**: The CDFG has not released an official definition of lake or streambed jurisdiction and therefore the extent of areas regulated under Section 1602 remains undefined. However, CDFG jurisdiction generally includes the streambed and bank, together with the adjacent floodplain and riparian vegetation. This riparian area is classified as waters of the state in this document.

3.7.2 Laws, Regulations, and Orders

This section provides a summary of federal, state, and local laws, regulations, and agency jurisdiction and management guidance that apply to biological resources. Table 3.7-1 lists federal laws and regulations and Table 3.7-2 lists state laws and regulations. For full definitions and a discussion of the permits and actions required to comply with the laws and regulations listed below, refer to the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

3.7.2.1 Federal

Table 3.7-1
Federal Laws and Regulations

Policy Title	Summary
Federal	
Endangered Species Act of 1973 (federal ESA) (42 U.S.C. 4321 et seq.)	The federal ESA and subsequent amendments provide guidance for conserving federally listed species and the ecosystems upon which they depend. Section 9 (Prohibited Acts): Section 9 of the federal ESA and its implementing regulations prohibit the "take" of any fish or wildlife species listed under the federal ESA as endangered or threatened, unless otherwise authorized by federal regulations. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Take includes the modification of a listed species' habitat. Section 9, prohibits a number of specified activities with respect to endangered and threatened plants as well as adverse modifications to critical habitat. Section 7 (Interagency Consultation and Biological Assessments): Section 7 of the federal ESA requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) or the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS), as appropriate, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered fish, wildlife, or plant species or result in the destruction or adverse modification of designated critical habitat for any such species. Section 10 (Habitat Conservation Plans): Section 10 of the federal ESA provides a process by which nonfederal entities may obtain an Incidental Take Permit from the USFWS or NMFS for otherwise lawful activities that might incidentally result in "take" of endangered or threatened species, subject to specific conditions.

Table 3.7-1
Federal Laws and Regulations

Policy Title	Summary
Magnuson-Stevens Fishery Conservation and Management Act (U.S.C. Section 1801 et seq.)	The amended Magnuson-Stevens Fishery Conservation and Management Act, also known as the Sustainable Fisheries Act (Public Law 104-297), requires that all federal agencies consult with NMFS on activities or proposed activities authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat of commercially managed marine and anadromous fish species.
Clean Water Act (CWA)	The federal CWA serves as the primary federal law protecting the quality of the nation's surface waters, including wetlands. Section 401: Under the CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the U.S. must obtain certification from the state in which the discharge would originate or from the interstate water pollution control agency with jurisdiction over affected waters. Section 402: Under the CWA Section 402, all point source discharges, including, but not limited to, construction-related stormwater discharges to surface waters are regulated through the National Pollutant Discharge Elimination System (NPDES) program. Project sponsors must obtain an NPDES permit from the SWRCB. Section 404: Under the CWA Section 404, the USACE and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredged and fill materials into the waters of the U.S. Project sponsors must obtain a permit from USACE for discharges of dredged or fill materials into jurisdictional waters over which the USACE determines that it will exert jurisdiction.
Rivers and Harbors Act of 1899	Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the USACE for the construction of any structure in or over any navigable waters of the U.S.
U.S. Fish and Wildlife Coordination Act (16 U.S.C. Sections 661 to 667[e] et seq.)	The U.S. Fish and Wildlife Coordination Act applies to any federal project where any body of water is impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with USFWS and the appropriate state wildlife agency.
Migratory Bird Treaty Act (16 U.S.C. Sections 703 to 712)	The Migratory Bird Treaty Act (MBTA) protects selected species of birds that cross international boundaries (i.e., species that occur in more than one country at some point during their life cycle). The law prohibits the take of such species, including the removal of nests, eggs, and feathers.
Migratory Bird Treaty Reform Act (Division E, Title I, Section 143 of the Consolidated Appropriations Act, 2005, PL 108–447)	The Migratory Bird Treaty Reform Act amends the MBTA (16 U.S.C. Sections 703 to 712) such that nonnative birds or birds that have been introduced by humans to the United States or its territories are excluded from protection under the Act. It defines a native migratory bird as a species present in the United States and its territories as a result of natural biological or ecological processes.
Bald and Golden Eagle Protection Act (16 U.S.C. Sections 668 to 668[d], 54 Statute 250)	The Bald and Golden Eagle Protection Act prohibits the destruction of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) and their occupied and unoccupied nests.

Table 3.7-1
Federal Laws and Regulations

Policy Title	Summary
Protection of Wetlands (Executive Order 11990)	Executive Order 11990 aims to avoid direct or indirect impacts to wetlands from Federal or federally approved projects when a practicable alternative is available. If wetland impacts cannot be avoided, all practicable measures to minimize harm must be included.
Protection of Migratory Bird Populations (Executive Order 13186)	Executive Order 13186 directs each federal agency taking actions that have or may have adverse impact on migratory bird populations to work with USFWS to develop a memorandum of understanding that will promote the conservation of migratory bird populations.
Invasive Species (Executive Order 13112)	Executive Order 13112 requires federal agencies to work cooperatively to prevent and control the introduction and spread of invasive plants and animals.

3.7.2.2 State

Table 3.7-2
State Laws and Regulations

Policy Title	Summary
State	
California Endangered Species Act (California Fish and Game Code [CFGC] Sections 2050 to 2085)	CESA mandates that state agencies not approve a project that would jeopardize the continued existence of species if reasonable and prudent alternatives are available that would avoid a jeopardy finding. CESA also prohibits the take of any fish, wildlife or plant species listed as endangered or threatened, or designated as candidates for listing, under CESA. Take refers to mortality or injury of the listed species itself and not the modification of a listed species habitat. Similar to the federal ESA, CESA contains a procedure for CDFG to issue an incidental take permit authorizing the take of listed and candidate species incidental to an otherwise lawful activity, subject to specified conditions.
California Fish and Game Code (CFGC)	Sections 3511, 4700, 5050, and 5515 (Fully Protected Species): The CFGC designates 37 fully protected species and prohibits the take or possession at any time of such species with certain limited exceptions. Sections 3503, 3503.5, and 3513 (Nesting Bird Protections): Section 3503 of the CFGC states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by code or any regulation made pursuant thereto. Section 3503.5 prohibits the take, possession, or needless destruction of any nests, eggs, or birds in the orders Falconiformes (New World vultures, hawks, eagles, ospreys, and falcons, among others) or Strigiformes (owls). 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. Section 1600 et seq. (Lake and Streambed Alteration): Section 1600 et seq. of the CFGC requires notifying the CDFG prior to any project activity undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel.

Table 3.7-2
State Laws and Regulations

Policy Title	Summary
Natural Communities Conservation Planning Act (CFGC Sections 2800 to 2835)	The Natural Communities Conservation Planning Act was enacted to encourage broad-based planning to provide for effective protection and conservation of the state's wildlife resources while continuing to allow appropriate development and growth. Natural Community Conservation Plans (NCCPs) may be implemented, which identifies measures necessary to conserve and manage natural biological diversity within the planning area, while allowing compatible and appropriate economic development, growth, and other human uses.
California Native Plant Protection Act (CFGC Sections 1900 to 1913)	The California Native Plant Protection Act (NPPA) requires all state agencies to use their authority to carry out programs to conserve endangered and rare native plants. The NPPA gives the CDFG the power to designate native plants as "endangered" or "rare" and prohibits the take of such plants, with certain exceptions.
Porter-Cologne Water Quality Control Act	Section 13260(a) of the California Water Code (Porter-Cologne Water Quality Control Act) requires any person discharging waste or proposing to discharge waste, other than to a community sewer system, within any region that could affect the quality of the waters of the state to file a Report of Waste Discharge (ROWD). The SWRCB is responsible for the implementation of the act.

3.7.2.3 Regional and Local

Local and regional municipal plans pertaining to the preservation and protection of biological resources are addressed in the various general plans for Fresno, Kings, Tulare, and Kern counties, and for the cities of Fresno, Corcoran, Wasco, Shafter, and Bakersfield. These plans address such issues as habitat, protection of wildlife, oak woodland conservation, and conservation of wetlands and riparian communities. The *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a) provides more detail on the local plans and policies that were identified and considered in the preparation of this analysis.

3.7.2.4 Habitat Conservation Plans in the Project Vicinity

A Habitat Conservation Plan (HCP) is a document that must accompany an incidental take permit request under Section 10 of the federal ESA. Three HCPs have been identified in the project vicinity: the *Metropolitan Bakersfield Habitat Conservation Plan* (MBHCP) (City of Bakersfield and Kern County 1994); the draft *Kern County Valley Floor Habitat Conservation Plan* (VFHCP) (Kern County Planning Department 2006); and the *Pacific Gas & Electric Company San Joaquin Valley Operations and Maintenance Habitat Conservation Plan* (Jones & Stokes 2006). Section 3.7.4 provides a summary of the applicable regional HCPs that protect biological resources and/or wetlands.

3.7.3 Methods for Evaluating Impacts

This section describes the methods used for evaluating potential impacts on biological resources. The study areas used to identify biological resources are defined, and the background review and field surveys are summarized. Both the background literature review and field surveys identified potential biological resources within the footprints of the proposed project alternatives. This section also defines the types of potential impacts of the proposed project alternatives, describes

the methods used to assess the various impacts, and presents the NEPA and CEQA criteria used to evaluate the significance of impacts.

3.7.3.1 Study Areas

The Fresno to Bakersfield Section study area described in Chapter 2 encompasses the entire potential area of disturbance associated with the construction footprint, including the proposed high-speed train (HST) right-of-way and associated facilities (traction power substations, switching and paralleling stations, and areas associated with modifying or relocating roadways for those facilities—including overcrossings and interchanges), heavy maintenance facility (HMF) sites, station alternatives, and construction areas (including laydown, storage, and similar areas [see the detailed description in Chapter 2]).

To address regulatory requirements and assess potential impacts to biological resources, the *Central Valley Biological Resources and Wetlands Survey Plan* (Authority and FRA [2009] 2011) established these varying biological resource study areas for the following types of resources:

- Habitat Study Area – Construction footprint plus a 1,000-foot buffer around project elements (review of aerial photos only if between 250 feet and 1,000 feet from 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:
  - The core Habitat Study Area includes the proposed construction footprint and a 250-foot buffer. This was the area that was physically surveyed.
  - The auxiliary Habitat Study Area, from the edge of the core area laterally 750 feet, was surveyed through extrapolation of observations made in the core Habitat Study Area from aerial photograph interpretation and in windshield surveys.
  - The supplemental Habitat Study Area extends laterally from the construction footprint up to 1.24 miles, depending on the target species, and identifies species-specific habitats based on aerial photograph interpretation and documented occurrences of the species, and on observations of special-status species and their habitats made in the field.
- Wetland Study Area – Construction footprint plus a 250-foot buffer to evaluate direct and indirect impacts on wetlands and special-status wildlife using vernal pools. Direct impacts on wetlands are within the construction footprint and indirect impacts are within the 250-foot buffer.
- Special-Status Plant Study Area – Construction footprint to evaluate direct and indirect impacts plus a 100-foot buffer to evaluate indirect impacts on sensitive plant resources (including special-status plants, special-status plant communities, protected trees, and elderberry shrubs).

3.7.3.2 Literature Review

Biological resources potentially occurring in the study areas were identified through queries of existing databases and agency information. The sources used are described below. Further detail can be found in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Special-Status Species and Special-Status Plant Communities

A list of special-status species designated and proposed critical habitat, special-status plant communities, and wildlife movement corridors known or potentially occurring in the project footprint was reviewed based on existing federal, state, and private databases and agency information. Database queries included all reported occurrences within 10 miles of the alternative alignments or potentially within the various U.S. Geological Survey 7.5-minute quadrangles (quads) that overlapped with the alternative alignments and their eight surrounding quads (collectively referred to as a nine-quad search area) for the Fresno to Bakersfield Section. The following data sources were reviewed:

- USFWS Sacramento Field Office Website: A list of federal candidate, proposed, threatened, and endangered special-status wildlife and plant species and their federally designated or proposed critical habitats known or having the potential to occur within a nine-quad search area around the Fresno to Bakersfield Section alternatives was generated (USFWS 2012).

- California Natural Diversity Database (CNDDB)/RareFind: A list of special-status plant and wildlife species, CDFG-designated special-status plant communities, and CNPS-listed special-status plant species was prepared through a two-fold inquiry consisting of a standard nine-quad search using the RareFind program and a geographic information system (GIS) mapping exercise of all occurrences within 10 miles of the alternative alignments. This two-fold inquiry was performed to ensure that all special-status species, including those listed by the CDFG as "sensitive," whose geographic location data had been suppressed, were captured in the query (CDFG 2012a).

- CNPS's Online Inventory of Rare and Endangered Plants of California: A list of CNPS special-status plant species that may occur in the nine-quad search area was generated using the online inventory database (CNPS 2012).

- California Wildlife Habitat Relationship (CWHR) System: The list of CDFG special-status wildlife species was augmented through a GIS exercise that overlaid the Fresno to Bakersfield alternatives with wildlife species (amphibians, reptiles, birds, and mammals) range maps available through the CWHR System (CDFG 2005). This query captured additional special-status species whose known geographic range occurs within 10 miles of the alternative alignments (CDFG 2008).

- USFWS Recovery Plans: Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS 1998), the Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005), and a number of Federal Register publications, public agency technical reports, survey guidelines, and other published reports.

- USFWS Birds of Conservation Concern (BCC) for Region 8 (California and Nevada) (USFWS 2008).

Jurisdictional Waters

A background review was conducted to identify locations of jurisdictional water features potentially present in the Wetland Study Area at both a watershed level and a project level. The geographic extent of the background review for jurisdictional waters consisted of an area defined by the centerline of the alternative alignments plus a 0.5-mile buffer. The 0.5-mile buffer was chosen to include jurisdictional waters that may be present and to encompass the general nature of the jurisdictional waters surrounding the alternative alignments. The background review was conducted using information available in the GIS and conventional sources to determine the potential locations, types, and extent of known jurisdictional waters. The background review relied on information from the following sources:

- Natural Resources Conservation Service Hydrologic Unit Code Basins dataset (USDA and NRCS 1999), which identifies watersheds in the region.
- *Water Quality Control Plan for the Tulare Lake Basin* (CVRWQCB 2004), which identifies watershed and sub-watershed areas, surface water features, and beneficial uses.
- National Wetlands Inventory (USFWS 2009a), which identifies the approximate location and type of wetlands at the project level.
- National Hydrography Dataset (USGS and EPA 1999), which identifies the approximate locations and types of rivers, streams, canals, ditches, and artificial paths at the project level.
- Holland Central Valley Vernal Pool Complexes data layer, also known as the CDFG Central Valley Vernal Pool Habitat dataset (Holland 2009a), which identifies vernal pool areas at the project level.
- Recent aerial photographs (ESRI 2009; DigitalGlobe 2009; Bing 2010).
- National List of Plant Species That Occur in Wetlands (Reed 1988).
- Soil surveys of Eastern Fresno, Tulare, Kings, and Kern Counties (USDA 1971, 1982, 1986, 1988).
- U.S. Geological Survey 7.5-minute (1:24,000) topographical quadrangle sheets (Fresno North, Malaga, Fresno South, Conejo, Caruthers, Burris Park, Laton, Remnoy, Waukena, Taylor Weir, Corcoran, Pixley, Alpaugh, Hacienda Ranch NE, Delano West, Allensworth, Pond, Famoso, Wasco, Oil Center, Oildale, Rosedale, Rio Bravo, Edison, Lamont, Gosford, and Stevens).
- Precipitation records, including current and annual average rainfall for the region (USDA and NRCS 2010).

Protected Trees

To identify the requirements for protected trees, county and city ordinances and codes were reviewed as well as available general plans and habitat conservation plans.

Wildlife Movement Corridors

Known wildlife movement corridors were identified through a review of published technical reports and information available from regulatory agencies. The following data sources were obtained and used as a preliminary guide to understanding the location and species-specific requirements of the wildlife movement corridors that have been identified in the vicinity of the Fresno to Bakersfield Section:

- 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.
- *South Coast Missing Linkage: A Linkage Design for the Tehachapi Connection* (Penrod et al. 2003), which provided a more in-depth analysis of the Bakersfield/Tehachapi region based on the earlier Missing Linkages report.
- *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998), San Joaquin Valley Endangered Species Recovery Program (ESRP 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 land blocks and essential connectivity areas.

3.7.3.3 Field Surveys

The potential for project impacts on biological resources depends largely on the presence of suitable habitat in and adjacent to areas that would be affected by the project. Project 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 study area. Access was granted to approximately 40% of the study area. 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 aerial signatures identified in high-resolution aerial imagery to map inaccessible areas. The primary field surveys discussed in this section were conducted in the spring and summer of 2010. Supplemental surveys were conducted in 2011 in response to engineering design changes and are discussed in the "Supplemental Surveys" section below.

The *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a) provides detailed descriptions of the various methods employed during the field surveys for biological resources. The various field surveys were conducted according to the methodologies described in the California High-Speed Train *Central Valley Biological Resources and Wetlands Survey Plan*, which was prepared, in part, for the Fresno to Bakersfield Section of the HST (Authority and FRA [2009] 2011).

Special-Status Plant Species and Special-Status Plant Communities

Field surveys for special-status plants and special-status plant communities were conducted during the growing season (March, April, and May 2010 and, in select areas, in June 2010) in accordance with the *CNPS Botanical Survey Guidelines* (CNPS 2001), the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (USFWS 1996), and the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009). In addition, where applicable, surveys for the five federally listed species, Bakersfield cactus (*Opuntia basilaris* var. *treleasei*), California jewelflower (*Caulanthus californicus*), Hoover's woolly-star (*Eriastrum hooveri*), Kern mallow (*Eremalche kernensis*), and San Joaquin woolly-threads (*Monopolies congdonii*) complied with the supplemental guidance provided in *General Rare Plant Survey Guidelines* and in the *Supplemental Survey Methods* (ESRP 2002). Additional supplemental surveys for botanical resources were conducted in 2010 and 2011 and are discussed below in the "Supplemental Surveys" section.

Habitat types identified during the field surveys were compared against the known habitat requirements for each special-status plant species and for special-status plant communities with potential to occur in the regional area. The potential for a particular special-status species and special-status plant community to occur within the Special-Status Plant Study Area was then assessed and ranked as either no potential, low potential, moderate potential, or high potential (Appendix 3.7-A, Attachment 1).

Fish Species

Special-status fish species (e.g., listed salmonids), other than the Kern brook lamprey (*Entosphenus hubbsi*), are not expected to occur in the Habitat Study Area. The Habitat Study

Area is outside the historical and current known geographic range of other special-status fish species, and suitable habitat is not present because of extensive water diversions and in-stream obstructions to migratory movement (see *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* [Authority and FRA 2012a]).

Habitat assessment field surveys for the only special-status fish species with potential to occur in the Habitat Study Area, the Kern brook lamprey, were conducted in areas in the species' known geographic range. The methodology employed is described in the following section, Special-Status Wildlife Species. No fish sampling was conducted.

Special-Status Wildlife Species

Field surveys were conducted in 2010 and 2011 to map and identify the habitats (i.e., biological communities and land use cover types) in the Habitat Study Area in accordance with *A Guide to Wildlife Habitats of California* (CDFG 1988) and the California Wildlife Habitat Relationship System (CDFG 2008). The California Wildlife Habitat Relationship System is a biological community-based model that associates California's wildlife species to standard habitats (e.g., biological communities that support plant and wildlife species) and rates suitability for reproduction, cover, and feeding. The field surveys were conducted to identify potentially suitable wildlife habitat for special-status wildlife species (Appendix 3.7-A, Attachment 2). Key habitat constituents mapped during field surveys included topography and the presence or absence of vegetative cover, foraging habitat, and migration barriers (i.e., canals and roadways). Focused surveys were not conducted. Detailed information, including recommendations for focused surveys, is presented in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Jurisdictional Delineations

Jurisdictional delineations were conducted on accessible parcels during the spring and summer of 2010. The jurisdictional delineation was conducted for the purpose of obtaining a Preliminary Jurisdictional Delineation according to USACE Regulatory Guidance Letter No. 08-02 (USACE 2008c). The delineation of wetlands and other waters did not require or attempt to determine the jurisdictional status of the various features. Wetlands in the Wetland Study Area were delineated using the methods described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008b). All wetlands were described using the Cowardin classification system (Cowardin et al. 1979).

Other waters of the U.S. in the Wetland Study Area were delineated using the methods described in *Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (USACE 2008a) and USACE Regulatory Guidance Letter No. 05-05, where appropriate (USACE 2005).

No formal guidelines exist for the identification of the extent of waters of the state (SWRCB or CDFG jurisdiction). The extent of state-regulated areas in some instances extends beyond that of waters of the U.S. (above the ordinary high-water mark). For example, isolated water bodies and stream channels up to the top of the stream bank or to the riparian drip line all qualify as waters of the state.

Methods associated with the wetland delineation study are discussed in detail in a separate *Fresno to Bakersfield Preliminary Jurisdictional Waters and Wetlands Delineation Report* (Authority and FRA 2011) and also in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a). Additional supplemental surveys were also conducted to delineate jurisdictional waters in 2010 and 2011. These surveys are discussed below in the "Supplemental Surveys" section.

Protected Trees

During surveys in 2010 and 2011, protected trees in the Special-Status Plant Study Area were identified based on regional and local regulations. Local and regional municipal plans pertaining to the preservation and protection of protected trees in the various general plans for Fresno, Kings, Tulare, and Kern counties and the Cities of Fresno, Corcoran, Wasco, Shafter, and Bakersfield are described in detail in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Wildlife Movement Corridors

Many wildlife species have the potential to use wildlife movement corridors and habitat linkages within the Habitat Study Area. Areas identified in the literature review (Penrod et al. 2001; Penrod et al. 2003; ESRP 2009; USFWS 1998; Spencer et al. 2010) were evaluated in the field in 2010 and 2011 (where access was permitted) and by aerial photography (where access was not allowed) to determine their utility as movement corridors for all wildlife, including those without special-status, on both a local and regional population level. The field surveys addressed the availability and suitability of these potential movement corridors for wildlife species and assessed corridor and habitat linkage quality at a landscape level. This evaluation was augmented, as feasible, by identifying additional areas, such as creeks and other drainages in the Habitat Study Area, which may be used by wildlife as movement corridors. For a more detailed discussion of the methods used to assess wildlife movement corridors in the Habitat Study Area, see Sections 3.3.4 and 3.4.7 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Supplemental Surveys

Supplemental biological resource surveys were conducted in the spring and summer of 2010 and spring and fall of 2011. These surveys were conducted in response to changes in engineering designs and to the addition of properties with permission to enter. During these surveys, multidisciplinary teams conducted surveys for jurisdictional waters and botanical and wildlife resources. For a more detailed discussion of the supplemental surveys see Section 3.4.8 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

3.7.3.4 Methods for Evaluating Impacts

The fundamental method for evaluating impacts included a process for qualifying or quantifying the direct and indirect impacts and for comparing those findings against the severity of the impact and/or a specific threshold. The severity of the impact is largely dependent on whether the impact is temporary (construction period impacts) or permanent (project impacts). For example, during the habitat assessment process, terrestrial and aquatic wildlife habitats were mapped within the Habitat Study Area (refer to Section 3.7.3.1, Study Areas). The plant community and cover-type mapping units were then overlaid on construction footprint maps using GIS applications. Acreages affected during the construction period and project operations were then calculated and presented in tabular form for evaluation purposes in Section 3.7.5, Environmental Consequences.

A similar GIS-related process was used for evaluating impacts on special-status species, although these impacts were based on the potential for occurrence in suitable habitat. Special-status species and their potential for occurrence are described in Appendix 3.7-A. Appendix 3.7-B also provides a range of potential impacts in acres on special-status species based on the specific affinity each species has to plant communities and land cover types identified within the study area. For wildlife movement, existing and accessible drainage corridor crossings (i.e., bridges and culverts) were assessed with respect to their relative function to facilitate wildlife movement

through the landscape. In this manner, the information presented can be quantified as appropriate and a comparative evaluation can be made. Qualitative discussions are provided for indirect impacts, such as noise, motion, and startle, and any potential hydrologic issues, such as erosion and sedimentation. For these indirect impacts on species' habitat, the severity is evaluated without having specific numeric or quantitative data.

Through coordination with the USACE and the EPA, the following approach was developed to evaluate impacts on jurisdictional waters. Impacts to jurisdictional waters were quantified through a detailed evaluation of the project activities and elements (e.g., stations, HST tracks, temporary construction areas) and the associated jurisdictional water type (e.g., canal/ditch, seasonal wetland). For the majority of jurisdictional waters, direct impacts were quantified in the manner described above by overlaying the mapped features on the construction footprint. However, due to their sensitivity to disturbance, vernal pools and swales are difficult to restore to pre-project conditions following temporary impacts. Therefore, all impacts on these features are considered permanent, and are therefore described solely under Project Impacts. For all jurisdictional water features, indirect impacts were quantified by calculating the acreage of the features that fall within 250 feet of the project footprint (including temporary and permanent disturbance areas). Because the impacts within this buffer would result from both temporary and permanent effects of the project, acreage calculations for indirect impacts include both construction period impacts and project impacts. These indirect impacts and their combined acreages are discussed under both construction period impacts and the project impacts. For vernal pools and swales, an additional category—indirect bisected—is presented under indirect impacts to quantify impacts to features that are bisected by the boundary of the project footprint (i.e., where a vernal pool or swale straddles the project footprint boundary). This category presents the acreage for the portion of these features that lies outside the project footprint, but within 250 feet.

Impacts are presented in Section 3.7.5 in a manner that allows for a comparison of the HST alternative alignments. The text and tables in Section 3.7.5 compare differences in impact acreages between an alternative alignment and its corresponding segment of the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment of the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment of the BNSF Alternative.

The significance of the impact and the mitigation proposed are based on the standards of significance outlined in the next two subsections (see Sections 3.7.3[E] and 3.7.3[F]). For each biological resource, a significance determination is presented for the BNSF Alternative and for each alternative alignment. Additional information regarding the methods used for evaluating impacts, including a detailed description of the qualitative and quantitative methods and the assumptions and limitations in determining the potential construction and operation impacts is provided in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

3.7.3.5 Methods for Evaluating Effects Under NEPA

Pursuant to NEPA regulations (40 CFR 1500–1508), project effects are evaluated based on the criteria of context and intensity. Context means the affected environment in which a proposed project occurs. Intensity refers to the severity of the effect, which is examined in terms of the type, quality, and sensitivity of the resource involved, location and extent of the effect, duration of the effect (short- or long-term), and other considerations. The intensity of adverse effects is described as negligible, moderate, or substantial. For biological resources, the terms negligible, moderate, and substantial are defined as follows:

- Effects with negligible intensity related to biological resources are defined as a slight change from existing biological conditions resulting in little or no regional effects and minor effects within seasonal shifts in populations, biotic communities, and wildlife movement patterns.

- Effects with moderate intensity are defined as incremental regional effects and measurable adverse loss of terrestrial/aquatic plant communities, jurisdictional waters/wetlands, special-status species, or removal of lands known to accommodate wildlife movement.

- Effects with substantial intensity are influential regional effects and relatively high intensity loss to terrestrial/aquatic plant communities, jurisdictional waters/wetlands, special-status species or wildlife movement corridors.

When there is no measurable effect, no impact is found to occur.

3.7.3.6 CEQA Significance Criteria

For the purposes of this project, the following thresholds are used to define a significant impact on biological resources. These thresholds are based on issues identified in Appendix G of the CEQA Guidelines. The project would result in a significant impact on biological resources if it 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 CDFG 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 CDFG or USFWS.

- Have a substantial adverse effect on federally protected wetlands, as defined by CWA Section 404 (including seasonal wetlands, canals, ditches, lacustrines, retention and detention basins, 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 Communities Conservation Plan (NCCP), or other approved local, regional, state, or federal HCP. Mandatory findings of significance within Section 15065 of the CEQA guidelines require the lead agency to determine whether a project may have a significant effect on the environment where substantial evidence indicates that negative impacts may occur to 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's 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 significance, based on guidelines or criteria in NEPA, CEQA, CWA, CESA, federal ESA, and regulatory guidance from 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.

3.7.4 Affected Environment

This section summarizes the existing biological resources within the study areas, which include regional setting, special-status species, habitats of concern (special-status plant communities, jurisdictional waters, critical habitat, essential fish habitat, conservation areas [i.e., recovery plans for federally listed species, conservation easements, public lands, conservation banks, HCP areas, and protected trees]), and wildlife movement corridors. There are no applicable regional plans or policies pertaining to biological resources within the Fresno to Bakersfield Section study area. More details are provided in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

3.7.4.1 Regional Setting

Historically, the Central Valley was characterized by California prairie, marshlands, valley oak savanna, and extensive riparian woodlands (Hickman 1993). Today, more than 80% of the Central Valley is covered by farms and ranches (NRCS 2006). Overall, the study areas are highly disturbed and fragmented because of urban, agricultural, railroad, highway, and local road land cover types. In a few areas, native vegetation remains relatively undisturbed, although invasive and nonnative plant species may occur 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.

Major land uses between Fresno and Bakersfield include urban (industrial, commercial, and residential), rural residential, and agricultural. Some undeveloped natural areas occur in the vicinity of Corcoran and Allensworth. Several public lands, including Pixley National Wildlife Refuge (NWR), Allensworth State Historic Park, and Allensworth Ecological Reserve (Allensworth ER), are located in or immediately adjacent to the study areas. These public lands are managed for a variety of reasons: historical preservation, jurisdictional waters, and special-status species.

The study areas are broadly located in the Tulare Lake Basin of the South San Joaquin Valley between SR 99 and Interstate 5. The Tulare Lake Basin has a drainage area of approximately 17,400 square miles. All of the streams and rivers located in the study areas have been dredged, culverted, diverted, dewatered, or channelized, or have had their active floodplains severely reduced. Most of the water is diverted into an extensive network of irrigation canals, ditches, and retention and detention basins.

3.7.4.2 Plant Communities and Land Cover Types

General Habitat Conditions – Terrestrial

The categories of terrestrial plant communities and land cover types that occur in the Habitat Study Area are summarized below, and are depicted on Figures A3-1a through A3-1o in Appendix 3.7-A, Attachment 3. The plant communities and land cover types identified in the Habitat Study Area include agricultural lands, developed areas, and natural and seminatural areas. Habitat conditions in the Habitat Study Area are discussed in detail in *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

The following descriptions of plant communities and land cover types are based on *A Guide to Wildlife Habitats of California* and the California Wildlife Habitat Relationship System (Mayer and Laudenslayer 1988; CDFG 2008).

Agricultural Lands

Eight types of agricultural land are found in the Habitat Study Area: cropland, dryland grain crops, irrigated grain crops, irrigated hayfield, irrigated row and field crops, deciduous orchard, evergreen orchard, and vineyard (depicted on Figures A3-1a through A3-1o, Appendix 3.7-A, Attachment 3). These land uses, along with urban land uses, characterize the overwhelming majority of land in the Habitat Study Area. Agricultural lands may provide marginal habitat for seasonal forage and refugia for a limited number of common species and special-status species. Ruderal plant species, which are defined as species that grow where the natural vegetation has been removed or significantly degraded by past or current human activity, are found in these agricultural land types, especially where these types were bordered by roads, canals, ditches, or other highly disturbed features. Vegetation in these areas is highly variable but often includes a mix of nonnative annual grasses such as ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), red brome (*Bromus madritensis* ssp. *rubens*), wild oats (*Avena* spp.), Italian ryegrass (*Lolium multiflorum*), smooth barley (*Hordeum murinum*), and weedy forbs such as bur clover (*Medicago polymorpha*), redstem filaree (*Erodium cicutarium*), yellow star thistle (*Centaurea solstitialis*), Russian thistle (*Salsola tragus*), tumbleweed, (*Amaranthus albus*), Johnson grass (*Sorghum jalapense*), and silver-leaf horsenettle (*Solanum elaeagnifolium*).

Some agricultural species have become naturalized outside the areas where they are planted. These include black mustard (*Brassica nigra*), rape mustard (*Brassica rapa*), Johnson grass (*Sorghum jalapense*), cultivated timothy (*Phleum pretense*), common barley (*Hordeum vulgare*), common wheat (*Triticum aestivum*), and peach (*Prunus persica*). Native species also occurring in ruderal areas in agricultural lands often consist of (*Distichlis spicata*), fiddleneck (*Amsinckia menziesii* var. *intermedia*), Canada horseweed (*Conyza canadensis*), annual sunflower (*Helianthus annuus*), alkali mallow (*Malva leprosa*), and tarplants (*Hemizonia* spp.). Field and row crops such as alfalfa provide foraging habitat for raptors, particularly Swainson's hawks (*Buteo swainsoni*). Fallow fields and inactive farmland may provide nesting habitat for several wildlife species including northern harrier (*Circus cyaneus*) and western burrowing owl (*Athene cunicularia*). These and other agricultural lands may provide foraging or dispersal habitat for loggerhead shrike (*Laniuslud ovicianus*), white-tailed kite (*Elanus leucurus*), and American badger (*Taxidea taxus*).

Developed Areas

Developed areas are characterized by various types of cover, including barren and urban (e.g., commercial/industrial, transportation corridors [depicted on Figures A3-1a through A3-1o, Appendix 3.7-A, Attachment 3]). These areas generally include landscaped areas, yards, and various outbuildings and provide low-quality resources for wildlife. However, certain species, such as the American peregrine falcon (*Falco peregrinus anatum*) and western mastiff bat (*Eumops*

perotis californicus) have adapted to developed areas and may use these areas for nesting or roosting habitat.

Ruderal and ornamental plant species, which are generally composed of nonnative species, are dominant in all these developed areas, particularly where land use was in transition and bare ground had recently been revealed, such as by roadsides, in median strips, and in vacant lots. Vegetation in these areas is highly variable, but generally includes nonnative grass species, including ripgut bromes (*Bromus* spp.), wild oats, Italian ryegrass, and smooth barley, and weedy forbs such as bur clover, redstem filaree, yellow star thistle, Italian thistle (*Carduus pycnocephalus*), black mustard, rape mustard, white goosefoot (*Chenopodium album*), stinking goosefoot (*Chenopodium vulvaria*), and silver-leaf horsenettle. Escaped ornamentals in these areas often include oleander (*Nerium oleander*), elms (*Ulmus* spp.), bachelor's buttons (*Centaurea cyanea*), spotted knapweed (*Centaurea maculosa*), butterfly bush (*Buddleja davidii*), Athel tree (*Tamarix aphylla*), tree tobacco (*Nicotiana glauca*), and Himalayan blackberry (*Rubus armeniacus*).

Barren

Barren areas are defined by the permanent absence of vegetation. Areas mapped as barren during the field survey include areas of bare earth resulting from industrial activities such as gravel extraction. Barren habitats support few native wildlife or plant species, although rock dove, Brewer's blackbird (*Euphagus cyanocephalus*), killdeer (*Charadrius vociferus*), and western fence lizard (*Sceloporus occidentalis*) were observed in barren areas during the field survey effort.

Urban

Urban areas include municipalities; industrial, residential, and agricultural structures (e.g., feedlots and poultry farms); and adjacent dedicated areas, such as yards, roads and road shoulders, highways, parking lots, and stockpiles. Both adaptive native species and nonnative wildlife species occur in urban centers of the Habitat Study Area. Within urban areas, mapped wetland features such as ditches and seasonal wetlands are present. In Bakersfield, special-status species like the San Joaquin kit fox have also become acclimated to developed urban areas (CDFG 2012a).

BNSF Urban

The BNSF Railway right-of-way travels along the length of the Central Valley in a north-south direction, extends south from Fresno through Hanford, and parallels SR 43 from north of Corcoran to the town of Greenacres just west of Bakersfield. In general, the BNSF Railway right-of-way is 50 feet wide, and the rail tracks are set on an embankment that is a minimum of 5 feet above the surrounding grade. The embankment is constructed of compacted soil and imported gravel fills. Numerous culverts bisect the base of the berms for drainage purposes. Crossings of larger drainages exist as freestanding bridges. Most road crossings of the BNSF Railway right-of-way consist of at-grade crossings that allow vehicles to drive over the berms and tracks.

For the purposes of this analysis, all developed lands (e.g., crop, urban) in the BNSF Railway right-of-way were mapped under the BNSF Urban classification. All areas of developed habitats (e.g., crop, urban) in the right-of-way are controlled by the BNSF Railway, which retains the right to modify land use (e.g., remove orchard trees or structures). All riverine, canal, and natural upland habitats (i.e., annual grassland, alkali desert scrub, and valley foothill riparian) in the BNSF Railway right-of-way were mapped as such and not as BNSF Urban.

At any given point along the BNSF Railway right-of-way, wildlife use is largely determined by adjacent habitats. However, in areas dominated by frequent soil disturbance, especially cropland

habitats, the railroad berms may provide habitat for burrowing animals. The BNSF Railway right-of-way contains mapped wetland features such as seasonal wetlands and vernal pools.

Natural and Seminatural Areas

The terms natural and seminatural areas are used to distinguish the land uses and plant communities described in the subsequent sections from communities where current human influences substantially influence the plant composition and structure. While the natural and seminatural plant communities have been altered to some extent by past and present human activities, the composition and structure of these communities are generally not actively managed or controlled. A distinction is also made between those habitats that are largely characterized by native plants and those in which the dominant plants are introduced species.

Natural and seminatural areas are characterized by various types of cover, including alkali desert scrub, annual grassland, valley oak woodland, valley foothill riparian, and pasture (depicted on Figures A3-1a to A3-1o in Appendix 3.7-A, Attachment 3). Ruderal plant species are found along the margins and sometimes within natural and semi-natural habitat types.

Alkali Desert Scrub

Alkali desert scrub vegetation in the Habitat Study Area is dominated by shrublands with understory cover of herbs and forbs, and by vernally inundated or saturated areas lacking a shrub layer (vernal pools). These latter areas are characterized by herbs and forbs interspersed with barren, vernally inundated, or saturated alkali patches. Primary plant species observed during the various surveys included spinescale saltbush (*Atriplex spinifera*), cattle saltbush (*Atriplex polycarpa*), iodine bush (*Allenrolfea occidentalis*), goldenbush (*Isocoma acradenia*), and bush seepweed (*Suaeda moquinii*).

Alkali desert scrub supports a wide variety of wildlife species including special-status species such as the blunt-nosed leopard lizard (*Gambelia sila*), the San Joaquin kit fox, the Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), and coast horned lizards *(Phrynosoma blainvillii*). Many wildlife species found in this habitat type are burrowers or burrow-dependent species, such as the western burrowing owl, western spadefoot toad (*Spea hammondii*), American badger, foxes (*Vulpes* sp.), coyote (*Canis latrans*), California ground squirrel (*Spermophilus beecheyi*), and a variety of kangaroo rats (*Dipodomys* spp.) species.

In the Habitat Study Area, this habitat was concentrated in the vicinity of Allensworth and in relatively undisturbed areas.

Annual Grassland

In the Habitat Study Area, annual grasslands are typically characterized by nonnative annual grass species. Dominant nonnative grass species include several species of brome (*Bromus* spp.), fescue (*Festuca* spp. and *Vulpia* spp.), oats (*Avena* spp.), and barley (*Hordeum* spp.). Native species, including goldfields and owl's clover (*Castilleja* spp.), may be present in annual grasslands, but typically in lower densities. Annual grasslands in the Habitat Study Area have typically experienced some level of past disturbance associated with various agriculture practices, row cropping, or grazing. Although these areas typically have a history of disturbance, they continue to provide suitable habitat for a number of special-status plant and wildlife species. Like alkali desert scrub habitats, annual grasslands that have experienced lower levels of disturbance often exhibit vernally inundated or saturated areas (vernal pools).

Valley Oak Woodland

Valley oak woodland in the Habitat Study Area was located along the floodplain of the Kings River and associated sloughs and side channels (in the Hanford West Bypass Alternatives). This habitat falls within the Habitat Study Area but not within the impact footprint; therefore, it will not be directly impacted. This habitat is characterized by well-spaced stands of mature valley oak (*Quercus lobata*) with little or no sub-canopy, and a well-developed herbaceous layer. Dominant herbaceous species include brome, annual fescues (*Vulpia* spp.), oats (*Avena* spp.), and barleys. Other herbaceous plants, including soap root (*Chlorogalum pomeridianum*), filaree, miner's lettuce, prickly ox-tongue (*Picris echioides*), and spiny sow thistle (*Sonchus asper*), may be present. In the Habitat Study Area, valley oak woodland may intergrade with valley foothill riparian vegetation, or may abruptly transition to developed areas such as cropland or orchard.

Valley oak woodland provides food, cover, nesting sites, and dispersal habitat for a wide variety of special-status wildlife species, including Swainson's hawk.

Valley Foothill Riparian

Valley foothill riparian biological communities in the study areas are located along the riparian corridors and associated floodplains or terraces of the Kings River, Cross Creek, Tule River, Poso Creek, and Kern River, and along their associated sloughs and side channels. These areas are characterized by tall trees, including Fremont cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*), and valley oak (*Quercus lobata*). Subcanopy trees include white alder (*Alnus rhombifolia*) and ash (*Fraxinus* sp.). Understory shrubs and herbaceous species typically include California blackberry *(Rubus ursinus)*, elderberry (*Sambucus* sp.), poison oak (*Toxicodendron diversilobum*), buttonbush (*Cephalanthus occidentalis*), willows (*Salix* spp.), rushes (*Juncus* spp.), mugwort (*Artemisia douglasiana*), poison hemlock (*Conium maculatum*), and stinging nettle (*Urticadioica* ssp. *holosericea*). In the study areas, an abrupt transition from valley foothill riparian vegetation to cropland or orchard results in narrow bands of riparian vegetation.

Valley foothill riparian habitat provides food, water, migration and dispersal corridors, and escape, nesting, and thermal cover for an abundance of wildlife. Riparian vegetation also supports physical and biological processes, including temperature regulation and valuable aquatic food web services (inputs for nutrient cycling and food availability). Protected insects like the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) are native to these habitats (CDFG 1988). Several sensitive natural communities overlap with this habitat type, including valley oak woodland, Fremont cottonwood forest, Goodding's willow thickets, and red willow thickets.

Pasture

Pastures are actively grazed fields associated with private property. Generally, these areas contain a mix of annual grasses, such as bromes, barley, oats, and annual fescues, with other herbaceous species. Typically, these areas are actively grazed by cattle or horses but not irrigated. These areas provide some potential to support special-status wildlife species and limited potential to support special-status plant species because of the high level of disturbance.

General Habitat Conditions – Aquatic

The categories of aquatic plant communities and land cover types that occur in the Habitat Study Area are summarized below, and are depicted on Figures A3-1a through A3-1o in Appendix 3.7-A, Attachment 3. Aquatic plant communities and cover types are based on the *Guide to Wildlife Habitats of California* and California Wildlife Habitat Relationship System (CDFG 1988, 2008), and include fresh emergent wetland, lacustrine, and riverine. All aquatic habitats provide physical and

biological support for food web services including nutrient cycling, and food production and availability for a variety of organisms. These aquatic habitats are equivalent to one, or a combination of two, jurisdictional water types mapped within the Wetland Study Area, which are described in more detail below under Jurisdictional Waters. Habitat conditions in the Habitat Study Area are discussed in detail in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report (*Authority and FRA 2012a).

Fresh Emergent Wetland

Fresh emergent wetlands occur in small patches associated with man-made structures, including detention basins, groundwater recharge reservoirs, and irrigation and drainage ditches. Typical species in these areas include willows, rushes, bulrushes (*Scirpus* spp.), cattails (*Typha* spp.), and docks (*Rumex* spp.). A large complex of fresh emergent wetland exists in the vicinity of Cross Creek. Fresh emergent wetlands outside the Cross Creek area are typically small vegetated areas that experience year-round ponding from irrigation water or, less frequently, from seasonal inundation during the winter rain events. Fresh emergent wetland habitat is equivalent to the emergent wetland jurisdictional waters type.

Lacustrine

Lacustrine areas are limited to man-made basins (e.g., retention/detention basins) used for water storage and groundwater recharge. They occur throughout the Habitat Study Area. These basins range in size from less than 1,000 square feet to hundreds of acres. They typically have earthen berms and little or no emergent vegetation. The Habitat Study Area has no natural permanent lakes. One observed large basin, which was partially bordered by a narrow band of willows, supported large colonies of nesting birds such as cormorants (*Phalacrocorax* spp.) and egrets (*Egretta* sp. or *Ardea* sp.). Other small basins had little or no sign of use by wildlife. Many of the smaller basins are surrounded by fences that limit wildlife access. Lacustrine habitat is equivalent to the jurisdictional waters type of the same name.

Riverine

Riverine areas consist of open-water or dry channel areas in canals and irrigation ditches, and open-water areas in the flow channel of rivers, such as the Kings and Kern rivers, and creeks, such as the Tule, Cross, and Poso. Because of extensive water diversion for agricultural purposes, riverine habitats in the Habitat Study Area do not exhibit natural flow regimes and may be dry throughout a given year. In these areas, vegetation is either absent or sparse along sandy bottoms because of water-level fluctuations, vehicle disturbance, or maintenance activities in an irrigation canal or ditch. Typical vegetation, when present, is dominated by weedy species such as mustards (*Brassicaceae*) and annual nonnative grasses. Riverine habitat is equivalent to two jurisdictional waters types: seasonal riverine and canals/ditches.

3.7.4.3 Native Fauna Assemblage

Although the impact analysis in this section focuses on special-status wildlife species, it is anticipated that impacts would occur on other native fauna within the project footprint. Native fauna observed during field surveys are discussed in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a). Typical native fauna observed during surveys included the great white 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*), white-faced ibis (*Plegadis chihi*) (seasonally present), American coot (*Fulica americana*) (seasonally abundant), California ground

squirrel (*Otospermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), and western fence lizard (*Sceloporus occidentalis*).

3.7.4.4 Special-Status Species

Based on the literature review, 55 special-status plant species and 112 special-status wildlife species were evaluated for their potential to occur (Appendix 3.7-A, Attachments 1 and 2). A list was compiled of the special-status plant and wildlife species with potential to occur in the region based on CNDDB and CNPS occurrence data, the presence or absence of suitable habitat identified in the Habitat Study Area, and the species' known geographic or elevation range. Each special-status species was ranked as having no potential, low potential, moderate potential, or high potential to occur. Special-status plant species with moderate or high potential to occur in the Special-Status Plant Study Area are listed in Table 3.7-3. Special-status wildlife species with moderate or high potential to occur in the Habitat Study Area are listed in Table 3.7-4. Special-status species and potential for occurrence within the biological resources study areas are described in more detail in Appendix 3.7-A, Attachments 1 and 2, and in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Table 3.7-3
Special-Status Plant Species with Potential to Occur in the Special-Status Plant Study Area

Scientific Name	Common Name	Federal Status[a]	State/CNPS Status[b]
Federally and State-Listed Species			
Atriplex tularensis	Bakersfield smallscale	—	SE/1B.1
Caulanthus californicus	California jewelflower	FE	SE/1B.1
Chamaesyce hooveri	Hoover's spurge	FT	1B.2
Monolopia congdonii	San Joaquin woolly-threads	FE	1B.2
Other Special-Status Plant Species			
Astragalus hornii var. *hornii*	Horn's milk-vetch	—	1B.1
Atriplex cordulata	Heartscale	—	1B.2
Atriplex coronata var. *vallicola*	Lost Hills crownscale	—	1B.2
Atriplex depressa	Brittlescale	—	1B.2
Atriplex erecticaulis	Earlimart orache	—	1B.2
Atriplex minuscula	Lesser saltscale	—	1B.1
Atriplex persistens	Vernal pool smallscale	—	1B.2
Atriplex subtilis	Subtle orache	—	1B.2
Calochortus striatus	Alkali mariposa lily	—	1B.2
Chloropyron molle ssp. *hispidum*	Hispid bird's beak	—	1B.1
Cirsium crassicaule	Slough thistle	—	1B.1
Delphinium recurvatum	Recurved larkspur	—	1B.2
Eriastrum hooveri	Hoover's woolly-star	FD	4.2

Table 3.7-3
Special-Status Plant Species with Potential to Occur in the Special-Status Plant Study Area

Scientific Name	Common Name	Federal Status[a]	State/CNPS Status[b]
Erodium macrophullum var. *macrophyllum*	Round-leaved filaree	—	1B.1
Eryngium spinosepalum	Spiny-sepaled button-celery	—	1B.2
Imperata brevifolia	California satintail	—	2.1
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	—	1B.1
Layia munzii	Munz's tidy-tips	—	1B.2
Myosurus minumus ssp. *apus*	Little mouse tail	—	3.1
Pterygoneurum californicum	California chalk moss	—	1B.1
Tortula californica	California screw moss	—	1B.2
Sagittaria sanfordii	Sanford's arrowhead	—	1B.2
Stylocline citroleum	Oil neststraw	—	1B.1
Stylocline masonii	Mason's neststraw	—	1B.1
Tropidocarpum californicum	King's gold	—	1B.1

Note:
"—" signifies "no status designation."
This table does not include special-status plant species that were determined to have "No Potential" or "Low Potential" to occur within the Special-Status Plant Study Area.
[a] Federal Status
FD: Delisted. Status to be monitored for 5 years
FE: Listed as endangered under the Endangered Species Act
FT: Listed as threatened under the Endangered Species Act
[b] State Status
SE: Listed as endangered under the California Endangered Species Act
ST: Listed as threatened under the California Endangered Species Act
CNPS
1B: Rare, threatened, or endangered in California and elsewhere
2: Rare, threatened, or endangered in California, but more common elsewhere
3: More information is needed
4: Limited distribution or infrequent throughout California
0.1: Seriously endangered in California
0.2: Fairly endangered in California
0.3: Not very endangered in California
Abbreviations:
CNPS = California Native Plant Society

Table 3.7-4
Special-Status Wildlife Species with Potential to Occur in the Habitat Study Area

Scientific Name	Common Name	Federal Status[a]	State Status[b]
Federally and State-Listed Species			
Branchinecta lynchi	*Vernal pool fairy shrimp*	FT, CH	—
Desmocerus californicus dimorphus	*Valley elderberry longhorn beetle*	FT	—
Lepidurus packardi	*Vernal pool tadpole shrimp*	FE	—
Ambystoma californiense	*California tiger salamander*	FT	ST
Gambelia (=Crotaphytus) sila	*Blunt-nosed leopard lizard*	FE	SE/FP
Aquila chrysaetos	*Golden eagle*	—	FP
Buteo swainsoni	*Swainson's hawk*	—	ST
Charadrius alexandrinus nivosus	*Western snowy plover*	FT	CSC
Elanus leucurus	*White-tailed kite*	—	FP
Falco peregrinus anatum	*American peregrine falcon*	Delisted	SE/FP
Grus canadensis tabida	*Greater sandhill crane*	—	ST/FP
Haliaeetus leucocephalus	*Bald eagle*	Delisted	SE/FP
Ammospermophilus nelsoni	*Nelson's (San Joaquin) antelope squirrel*	—	ST
Bassariscus astutus	*Ringtail*	—	FP
Dipodomys nitratoides exilis	*Fresno kangaroo rat*	FE	SE
Dipodomys nitratoides nitratoides	*Tipton kangaroo rat*	FE	SE
Vulpes macrotis mutica	*San Joaquin kit fox*	FE	ST
Other Special-Status Wildlife Species			
Entosphenus hubbsi	Kern brook lamprey	—	CSC
Spea (=Scaphiopus) hammondii	Western spadefoot toad	—	CSC
Actinemys (=Clemmys/Emys) marmorata	Western pond turtle	—	CSC
Anniella pulchra pulchra	Silvery legless lizard	—	CSC
Masticophis flagellum ruddocki	San Joaquin whipsnake	—	CSC
Phrynosoma blainvillii	Coast (California) horned lizard	—	CSC
Agelaius tricolor	Tricolored blackbird	—	CSC
Ammodramus savannarum	Grasshopper sparrow	—	CSC
Asio flammeus	Short-eared owl	—	CSC
Asio otus	Long-eared owl	—	CSC
Athene cunicularia	Western burrowing owl	—	CSC
Aythya americana	Redhead	—	CSC
Bassariscus astutus	Ringtail	—	FP

Table 3.7-4
Special-Status Wildlife Species with Potential to Occur in the Habitat Study Area

Scientific Name	Common Name	Federal Status[a]	State Status[b]
Baeolophus inornatus	Oak titmouse	BCC	—
Charadrius montanus	Mountain plover	—	CSC
Chlidonias niger	Black tern	—	CSC
Circus cyaneus	Northern harrier	—	CSC
Coturnicops noveboracensis	Yellow rail	BCC	CSC
Dendrocygna bicolor	Fulvous whistling duck	—	CSC
Dendroica petechia brewsteri	Yellow warbler	—	CSC
Grus canadensis canadensis	Lesser sandhill crane	—	CSC
Icteria virens	Yellow-breasted chat	—	CSC
Ixobrychus exilis	Least bittern	—	CSC
Lanius ludovicianus	Loggerhead shrike	—	CSC
Melanerpes lewis	Lewis's woodpecker	BCC	—
Numenius americanus	Long-billed curlew	BCC	—
Pica nuttalli	Yellow-billed magpie	BCC	—
Picoides nuttallii	Nuttall's woodpecker	BCC	—
Pooecetes gramineus affinis	Oregon vesper sparrow	—	CSC
Progne subis	Purple martin	—	CSC
Toxostoma lecontei	Le Conte's thrasher	—	CSC
Xanthocephalus xanthocephalus	Yellow-headed blackbird	—	CSC
Antrozous pallidus	Pallid bat	—	CSC
Chaetodipus californicus femoralis	Dulzura pocket mouse	—	CSC
Corynorhinus townsendii	Townsend's big-eared bat	—	CSC
Eumops perotis californicus	Western mastiff bat	—	CSC
Lasiurus blossevillii	Western red bat	—	CSC
Onychomys torridus tularensis	Tulare grasshopper mouse	—	CSC
Taxidea taxus	American badger	—	CSC

Notes:

[a] Federal Status
FE – Endangered
FT – Threatened
CH – Critical Habitat designated by the U.S. Fish and Wildlife Service
BCC – Birds of Conservation Concern designated by the U.S. Fish and Wildlife Service

[b] State Status
SE – Endangered
ST – Threatened
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

3.7.4.5 Habitats of Concern

Habitats of concern evaluated in the Habitat Study Area include special-status plant communities, jurisdictional waters, critical habitat, essential fish habitat, conservation areas (i.e., Recovery Plan areas for federally listed species, conservation easements, public lands, conservation banks, and HCPs), and wildlife movement corridors. Habitats of concern in the Habitat Study Area receive special protection by federal, state, and local regulations. These habitats of concern, discussed below, are depicted on Figures 3.7-1a and 3.7-1b.

Special-Status Plant Communities

For the purposes of this EIR/EIS, special-status plant communities consist of two types of vegetation assemblages: (1) riparian communities, which are dominated by native woody vegetation and are adjacent to rivers and streams; and (2) sensitive natural communities, as defined by the CDFG, which are communities of limited distribution statewide or within a county or region. One riparian community, valley foothill riparian, was identified in the Habitat Study Area (Figure 3.7-1a). The seven sensitive natural vegetation communities identified in the Special-Status Plant Study Area (Figure 3.7-1a) were:

- Black willow thickets (*Salix gooddingii* Woodland Alliance).
- Bush seepweed scrub (*Suaeda moquinii* Shrubland Alliance).
- Fremont cottonwood forest (*Populus fremontii* Forest Alliance)
- Iodine bush scrub (*Allenrolfea occidentalis* Shrubland Alliance.
- Red willow thickets (*Salix laevigata* Woodland Alliance).
- Valley oak woodland (*Quercus lobata* Woodland Alliance).
- Saltgrass flats (Distichlis spicata Herbaceous Alliance).

Special-status plant communities are described in more detail in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Jurisdictional Waters

Jurisdictional waters, including watercourses as described above, are afforded protection under federal and state laws by the USACE, CDFG, and SWRCB. Jurisdictional waters are generally considered an important resource for various plant and wildlife species and are discussed in Sections 3.7.5 and 3.7.6. Specifically, jurisdictional waters provide physical and biological support for food web services including nutrient cycling, and food production and availability for a variety of organisms. These sections discuss jurisdictional waters in relation to regulatory permitting requirements concerning temporary and permanent impacts during ground-disturbing activities.

Waters, including waters of the U.S., waters of the state, and state streambeds and lakes, which are considered jurisdictional, are described in Section 3.7.1.1, Key Definitions. Mitigation and compliance related to the CWA and Section 1600 of the CFGC are discussed in Section 3.7.7. The regulatory permitting process under the CWA and Section 1600 of the CFGC also triggers the need for compliance with the federal ESA, CESA, Section 402 of the CWA, MBTA, and Section 106 of the National Historic Preservation Act.

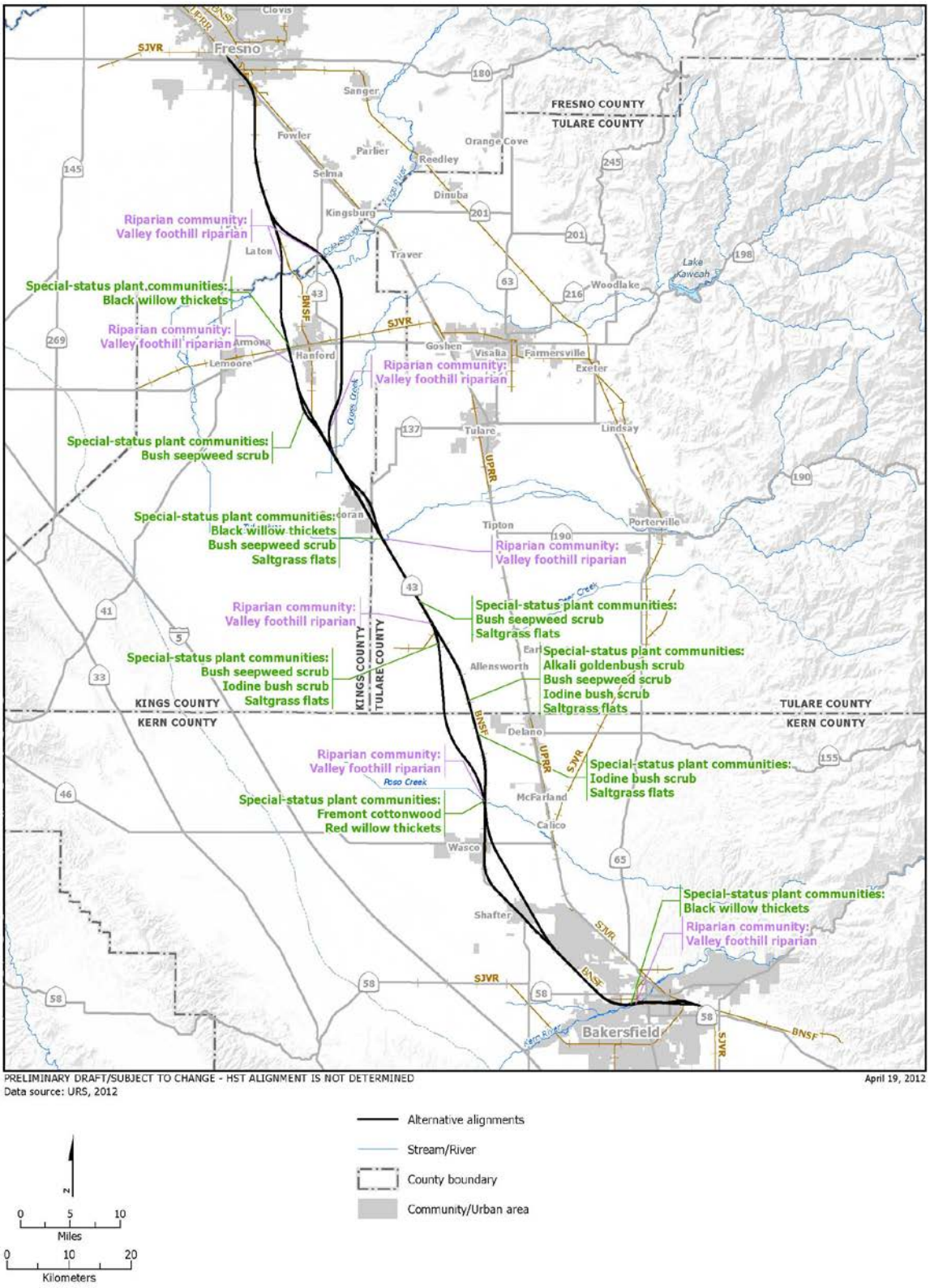

Figure 3.7-1a
Habitats of concern observed within the Special-Status Plant Study Area (special-status plant communities)

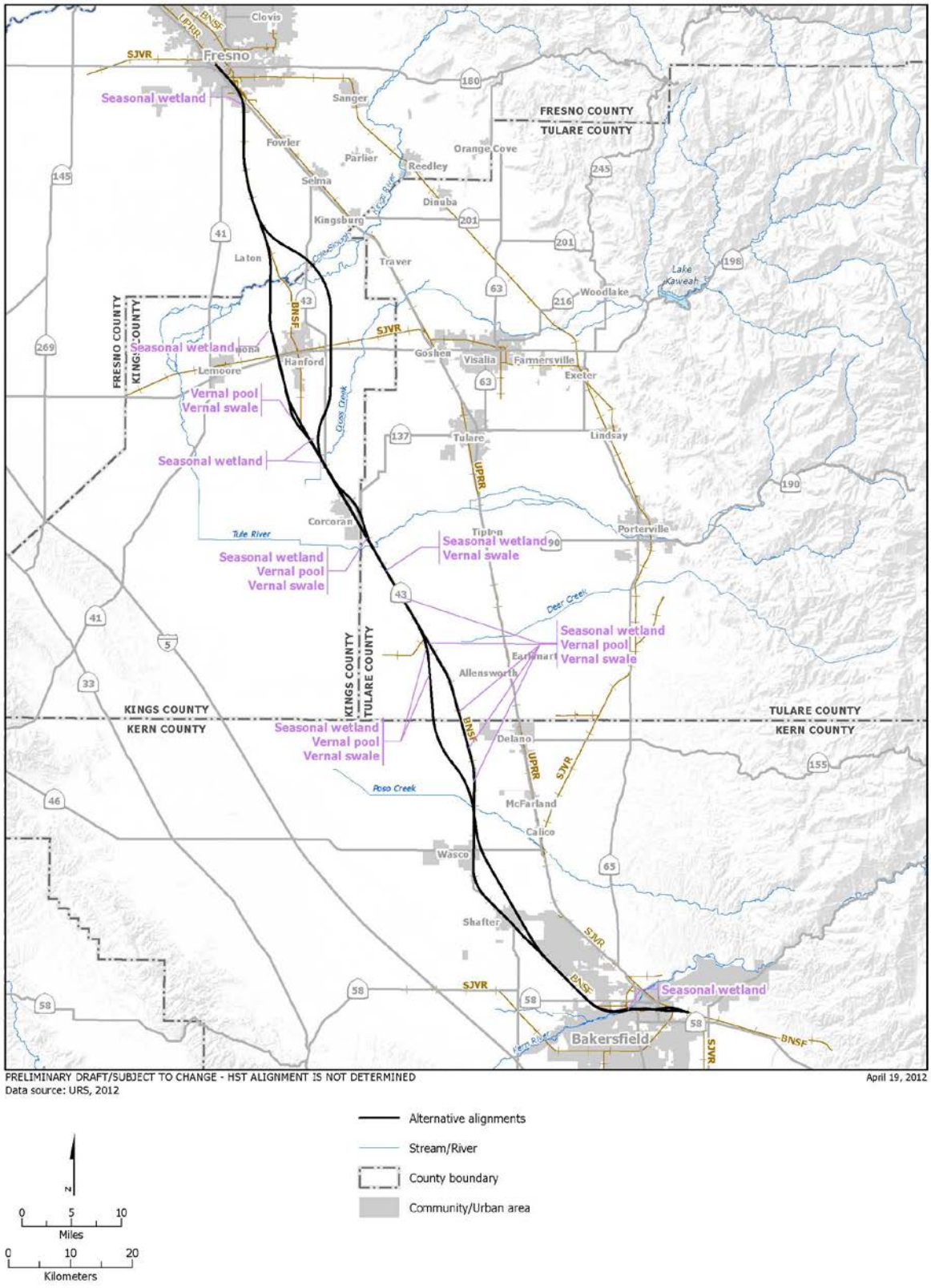

Figure 3.7-1b
Habitats of concern observed within the Wetlands Study Area (jurisdictional waters)

A number of jurisdictional waters were identified in the Wetland Study Area, including wetlands, other waters of the U.S., waters of the state, and state streambeds. Identified wetland features include seasonal wetlands, emergent wetlands, and vernal pools and swales. Other waters of the U.S. and waters of the state identified in the Wetland Study Area include canals/ditches, lacustrine, seasonal riverine and riparian. Many of the jurisdictional waters in the Wetland Study Area have been leveled, drained, and/or leveed to prevent flooding for agricultural purposes. The physical and biological characteristics of the substrate within various features are largely dictated by whether the feature is manipulated or natural. Manipulated features include all jurisdictional water features except vernal pools and swales. These manipulated features contain substrates that have been altered through excavation, filling, dredging, and accretion of sediments; these substrates typically range from sandy and coarse-loamy, to fine-silty, fine-loamy, and fines (depending on location in the study area). Natural features such as vernal pools and swales have substrates composed of natural alkaline soils, which are harsh environments for microbes and plants, and contain low levels of organic matter. The Wetland Study Area is notably devoid of gravel or rock substrate.

- **Canals/Ditches:** Canals and drainage and irrigation ditches occur throughout the Wetland Study Area. These man-made linear features are concrete-lined, or unlined and earthen, and range from approximately 10 to 50 feet in width. These features are typically devoid of vegetation. Their purpose is to transport large quantities of water, typically for agricultural purposes. A series of pumps is often used to transport water between canals, ditches, or under roads and other infrastructure. In general canals/ditches are in relatively poor ecological condition due to poor landscape position, have a highly manipulated hydrological regime, offer few biological resources to plants and wildlife, and are physically engineered to the extent that they are devoid of natural characteristics.

- **Emergent Wetlands:** Emergent wetlands occur in two locations: (1) west of the town of Hanford and (2) in Bakersfield. They are characterized by topographic depressions that flood frequently or hold ponded water long enough to support hydrophytic vegetation and typically feature hydric soils. The presence of vegetation is what separates these features from lacustrine. Emergent wetlands present in the Wetland Study Area appear to be man-made or highly manipulated. They are bounded by earthen walls and receive hydrologic input from surrounding canals, agricultural fields, and urban development. The emergent wetland within the footprint of the Hanford West Bypass 1 and 2 alternatives occurs in a large depression surrounded by riparian vegetation. It appears to receive input from the adjacent canal and may be a remnant of a historic natural drainage system. This emergent wetland offers some habitat for wading birds and waterfowl. The emergent wetlands in the footprint of the Bakersfield Alternatives are associated with lacustrine. They either comprise vegetated portions of basins or have replaced former basins that are now vegetated. In general, the emergent wetlands are in poor to fair ecological condition due to a poor landscape position, have a highly manipulated hydrologic regime, offer few biological resources to plants and wildlife, and are physically engineered to the extent that they retain few natural characteristics.

- **Lacustrine:** Lacustrine features include retention/detention basins and reservoirs. These features occur throughout the Wetland Study Area. Retention/detention basins are man-made features that are square, rectangular, round, or triangular in shape; often found with constructed earthen walls; and devoid of vegetation. These features are closely associated with agriculture activities, and in most instances are used as water storage (or retention) facilities. In urban areas, retention/detention basins are used to retain urban stormwater runoff. Surface water in the basins may be seasonal or perennial, depending on the location and use of the feature. Reservoirs are large, steep-sided, man-made impoundments that may contain either drinking water or irrigation water storage. These features are similar to, but generally larger than, retention/detention basins. One of reservoirs is the Tulare Lake Bed

Mitigation Site, which was developed and is maintained by the Kaweah Delta Water Conservation District for waterfowl. All of the reservoirs are large, perennially open-water features devoid of vegetation; however, these features provide important habitat for wading birds and waterfowl. In general, lacustrine features are in relatively poor ecological condition due to a disturbed environmental setting; have a highly manipulated hydrological regime, offer few biological resources to plants and wildlife, and are physically engineered to the extent that they are devoid of natural characteristics.

- **Riparian:** Riparian areas are generally associated with seasonal riverine features and occur in scattered locations throughout the Wetland Study Area. They are identified as waters of the state. Riparian comprises the habitat between a seasonal riverine feature and the outer drip line of riparian vegetation along Murphy Slough, Kings River, Cole Slough, Mussel Slough, Oak Slough, Tule River, Deer Creek, Poso Creek, Kern River, and other unnamed waterways. Riparian areas in the Wetland Study Area are characterized by cottonwood, sycamore, valley oak, and willow trees. Riparian vegetation supports physical and biological processes, including temperature regulation and valuable aquatic food web services (inputs for nutrient cycling and food availability). Riparian areas are generally in relatively fair to good ecological condition; are associated with waterways that have varying levels of hydrologic manipulation; provide fair to good biological resources for plants and wildlife; and due to existing land uses in the region, have been physically reduced and restricted to narrow areas along seasonal riverine features.

- **Seasonal Riverine:** Seasonal riverine waterways occur as discrete features throughout the Wetland Study Area, and include Kings River Complex, Mussel Slough, Oak Slough, Cross Creek, Tule River, Deer Creek, Poso Creek, Kern River, and other unnamed waterways. Many of these features originate in the Sierra Nevada in relatively intact ecosystems. Although their hydrology is affected by water storage and hydroelectric development in the headwaters, the upper reaches of these streams are less affected by water developments than the reaches in the Wetland Study Area. By the time these features reach the Wetland Study Area, they are highly manipulated for municipal and agricultural purposes, and much of their surface water and groundwater has been diverted, pumped, or captured. Descriptions of the major waterways are also provided in Section 3.8, Hydrology and Water Resources (see Section 3.8.4.2, Regional Hydrology and Water Quality) and the *Fresno to Bakersfield Section: Hydrology and Water Resources Technical Report* (Authority and FRA 2012b).

  Banks and floodplains of many seasonal riverine waterways in the Wetland Study Area have been channelized, and extensive adjacent riparian vegetation has been removed or confined by surrounding land use. Typically these features are seasonally dry and have streambeds that are unvegetated and comprised of sandy or gravelly substrate. For these reasons, seasonal riverine features are in fair to good ecological condition due to landscape positions that have connectivity upstream and downstream. They function with altered and natural hydrological regimes, provide some biological resources to plants and wildlife, and are physically altered, which reduces their natural characteristics.

- **Seasonal Wetlands:** Seasonal wetlands occur in scattered locations throughout the Wetland Study Area, but are concentrated in the area between the towns of Corcoran and Wasco. The majority of the seasonal wetlands present in the Wetland Study Area were found within the BNSF right-of-way. They typically occur in disturbed habitats, including fallow agricultural areas, drainage ditches along the BNSF right-of-way, the margins of retention/detention basins, active agricultural fields, and roadside ditches. Seasonal wetlands are predominantly vegetated with hydrophytic plants, occur in topographic depressions, and have soils with sufficient clay content or compaction to support seasonal ponding. In manipulated areas, inundation is hydrologically controlled by pumps, weirs, and/or storm drain systems year-round. In more natural areas, inundation or saturation occurs during the

winter and spring seasons as the result of rainfall and surface runoff. During the summer and fall months, seasonal wetlands are dry. Although they share a similar hydrologic regime, seasonal wetlands are distinguished from vernal pools by their lack of the distinctive floristic components and distinctive claypans or hardpans. In general, seasonal wetlands are in relatively fair ecological condition due to a poor landscape position, function with altered and natural hydrological regimes, provide some biological resources to plants and wildlife, and are physically altered, which reduces their natural characteristics.

- **Vernal Pools and Swales:** Vernal pools and swales occur in scattered locations throughout the Wetland Study Area, but are concentrated in the area between the towns of Corcoran and Wasco. They form as a result of the saline-sodic soils present in the Wetland Study Area. Vernal pools are shallow depressions with claypan or hardpan bottoms (fine-grained silts or clays) that retain water during the rainy season. These ponded pools support a community of hydrophytic plants endemic to vernal pools. Vernal swales are linear shallow depressions that receive hydrologic input from vernal pools. A network of pools and swales forms a vernal complex; such complexes are found in abundance in the vicinity of Allensworth.

  Vernal pools and swales located immediately adjacent to the BNSF tracks were probably man-made, are likely affected by routine maintenance of the right-of-way, and are hydrologically altered. For these reasons, these features are generally in fair ecological condition. The remaining vernal aquatic resources provide a number of aquatic and biological functions and services. In general, these features are in good ecological condition because they are in natural landscapes away from developed land uses; function within a natural hydrological regime, though some features are affected by a number of hydrological barriers (e.g., BNSF right-of-way, SR 43); provide considerable biological resources to plants and wildlife; and have an unaltered, natural physical structure.

Jurisdictional waters are described in more detail in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a) and Section 3.8, Hydrology and Water Resources (see Section 3.8.4.2, Regional Hydrology and Water Quality), which provide detailed descriptions of the major surface water features found in the region.

Critical Habitat

Critical habitat, as defined by the federal ESA, includes designated areas that provide federally listed species with suitable habitat that includes the geographical locations and physical features essential to the conservation of a particular species. The federal ESA defines conservation as “all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter [the federal ESA] are no longer necessary” (16 U.S.C. Section 1532[3]). The Fresno to Bakersfield HST project does not overlap any designated or proposed critical habitat units.

Designated critical habitat for the vernal pool fairy shrimp is present in the Habitat Study Area for the vernal pool tadpole shrimp, as shown on Figure 3.7-1c. In the vicinity of the town of Allensworth, the BNSF Alternative is within 250 feet of Critical Habitat Unit 27B and Critical Habitat Unit 27C. However, the Fresno to Bakersfield HST project is separated physically and hydraulically from Critical Habitat Unit 27C by the presence of the existing SR 43 and BNSF right-of-way, and is primarily separated from Critical Habitat Unit 27B by this existing infrastructure.

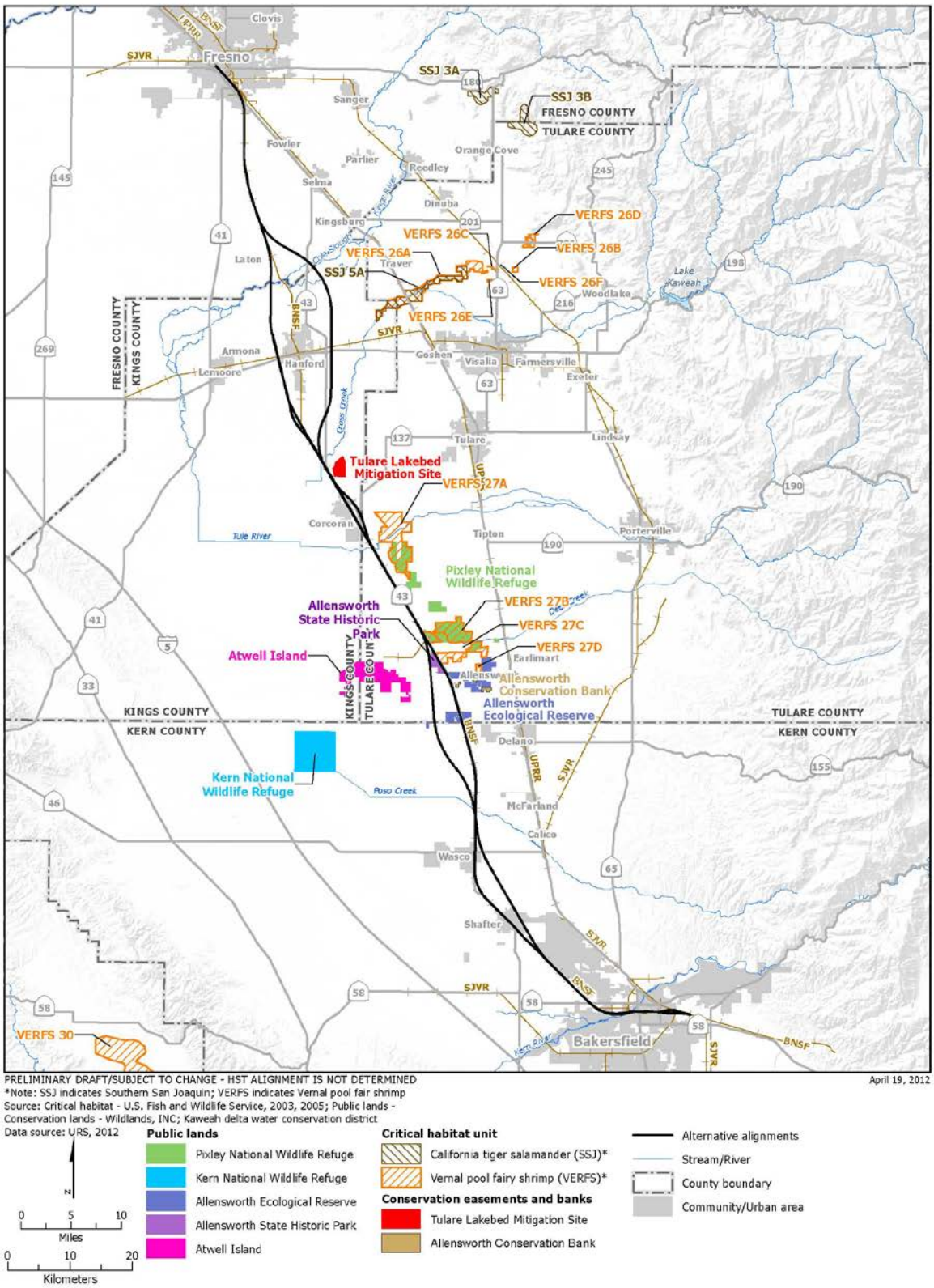

Figure 3.7-1c
Habitats of concern (critical habitat, public lands, conservation easements and banks)

Where Critical Habitat Unit 27B crosses SR 43 and the BNSF right-of-way, it is composed of ruderal and annual grassland habitat that does not contain the Primary Constituent Elements for this species (i.e., vernal pools, swales, and other ephemeral wetlands and depressions). No direct or indirect impacts on vernal pool fairy shrimp critical habitat are anticipated as a result of the project; therefore, critical habitat for the vernal pool fairy shrimp is not discussed further in this document. Critical habitat is described in more detail in the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Essential Fish Habitat

No federally managed fish species covered by the Magnuson-Stevens Fisheries Conservation and Management Act have the potential to occur in the Habitat Study Area. Therefore, the Fresno to Bakersfield HST project does not overlap essential fish habitat, and essential fish habitat is not discussed further in this document.

Conservation Areas

Conservation areas include Recovery Plans for federally listed species, conservation easements, public lands, conservation banks, and HCPs.

Recovery Plans for Federally Listed Species

Two recovery plans address federally protected species with the potential to occur in the region: *Recovery Plan for Vernal Pool Ecosystems for California and Southern Oregon* (USFWS 2005) and *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). Table 3.7-5 presents the special-status species included in the recovery plans that have the potential to occur in the alternative alignments.

The study areas overlap core vernal pool areas identified by the *Recovery Plan for Vernal Pool Ecosystems for California and Southern Oregon* (USFWS 2005) near the Pixley NWR and Allensworth ER, as shown on Figure 3.7-1d, and satellite and linkage areas identified by the *Recovery Plan for Upland Species of the San Joaquin Valley, California*, as also shown on Figure 3.7-1d. However, the Fresno to Bakersfield HST project is separated physically and hydraulically by the presence of the existing SR 43, the BNSF right-of-way, and existing infrastructure from the core vernal pool areas of the *Recovery Plan for Vernal Pool Ecosystems for California and Southern Oregon* (USFWS 2005). No direct or indirect impacts on these core vernal pool areas are anticipated as a result of the project; therefore, the recovery areas identified in the *Recovery Plan for Vernal Pool Ecosystems for California and Southern Oregon* (USFWS 2005) are not discussed further in this document.

Table 3.7-5
Special-Status Species Included in Recovery Plans

Recovery Plan	Wildlife Species	Plant Species
Recovery Plan for Vernal Pool Ecosystems in California and Southern Oregon, San Joaquin Valley Vernal Pool Regional	Vernal pool fairy shrimp, vernal pool tadpole shrimp, western spadefoot toad	Hoover's spurge (*Chamaesyce hooveri*), San Joaquin Valley vernal pool smallscale (*Atriplex persistens*), Lost Hills crownscale (*Atriplex coronata* var. *vallicola*), little mouse tail (*Myosurus minimus* ssp. *apus*), Orcutt grass (*Orcuttiana equalis*), Green's tuctoria (*Tuctoria greenei*)
Recovery Plan for Upland Species of the San Joaquin Valley, California[b]	Blunt-nosed leopard lizard, Nelson's (San Joaquin) antelope squirrel (*Ammospermophilus* sp.), Fresno kangaroo rat (*Dipodomys nitratoides exilis*), Tipton kangaroo rat, San Joaquin kit fox, Le Conte's thrasher (*Toxostoma le contei*), Tulare grasshopper mouse (*Onychomys torridus tularensis*)	Bakersfield smallscale (Atriplex tularensis), California jewelflower (*Caulanthus californicus*), Kern mallow (*Eremalche kernensis*), San Joaquin woolly threads (*Lembertia congdonii*), Bakersfield cactus (*Opuntia basilaris* var. *treleasei*), lesser saltscale (*Atriplex minuscule*), Hoover's woolly-star (*Eriastrum hooveri*), spiny-sepaled button-celery (*spiny sepal eryngo)*, Munz's tidy-tips (*Layia munzii)*, Comanche Point layia (*Layia leucopappa*), Panoche peppergrass (*Lepidium jaredii* ssp. *album*)

[a] USFWS 2005.
[b] USFWS 1998.

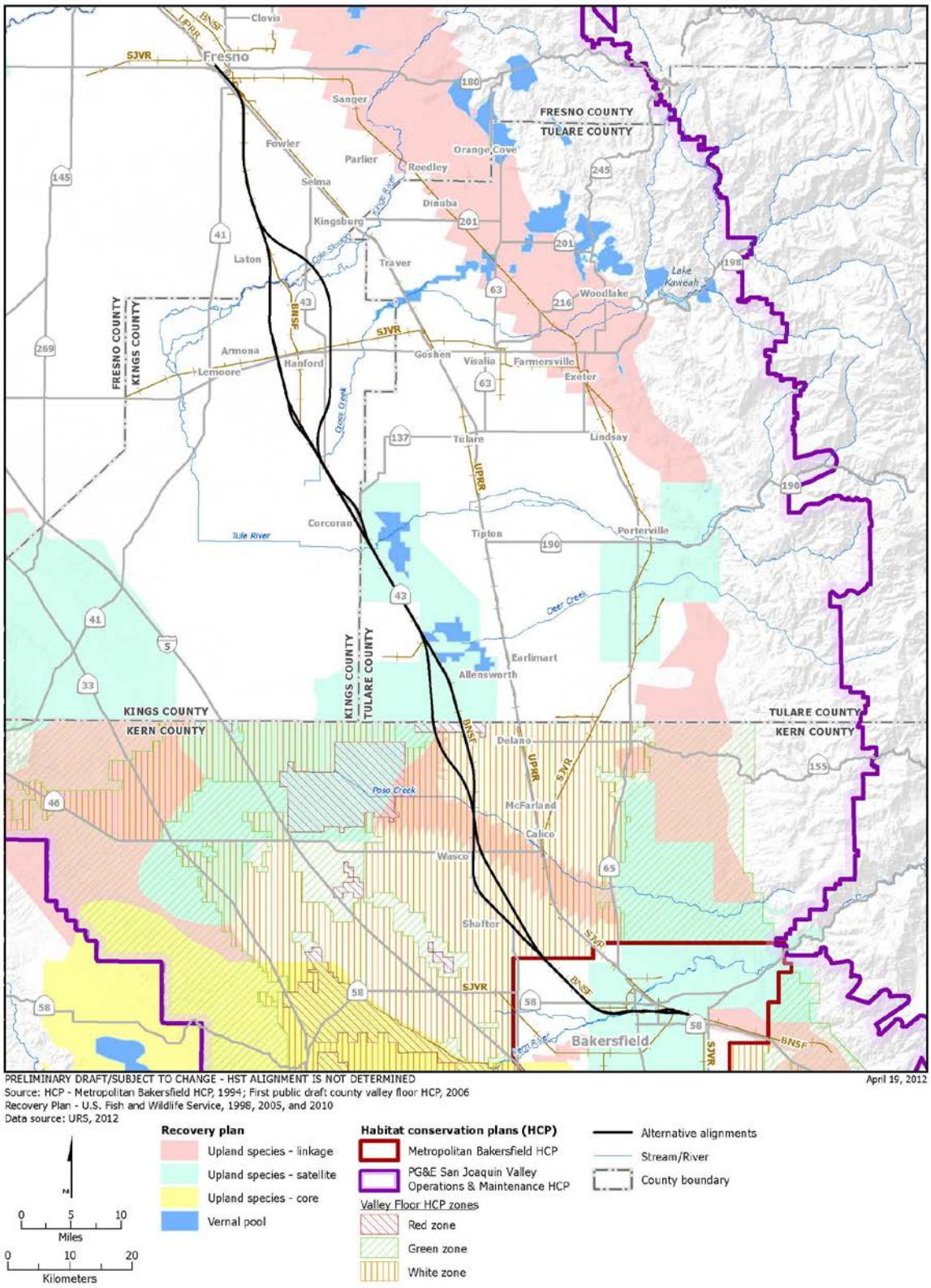

Figure 3.7-1d
Habitats of concern (recovery plans and habitat conservation plans)

Conservation Easement

Tulare Lakebed Mitigation Site

The Tulare Lakebed Mitigation Site, a conservation easement in the vicinity of Cross Creek, is located near the study area (Figure 3.7-1c). The Tulare Lakebed Mitigation Site was placed into a conservation easement as mitigation for the Lake Kaweah Enlargement Project, and it provides habitat for shorebirds and other migrating water fowl. The site was developed and is maintained by the Kaweah Delta Water Conservation District. The conservation area is approximately 1,300 acres (Figure 3.7-1c). The Fresno to Bakersfield HST alignment alternatives were designed to avoid the Tulare Lakebed Mitigation Site; therefore, the Tulare Lakebed Mitigation Site is not discussed further in this document.

Public Lands

Pixley National Wildlife Refuge

The Pixley NWR is located in Tulare County, just south of the Tule River (Figure 3.7-1c). The 6,389-acre refuge represents one of the few remaining examples of the grasslands, vernal pools, and playas that once bordered historic Tulare Lake. Over 100 bird and 6 reptile species use the refuge. Approximately 300 acres of managed wetlands provide habitat for migratory waterfowl and shorebirds. The primary management focus of the USFWS for the refuge is to maintain and restore native habitats, including wetlands and upland habitat (USFWS 2009b). The Pixley NWR is located near the HST alternatives (i.e., the BNSF Alternative and the Allensworth Bypass [1,000 feet west of Pixley NWR]), but the HST alternatives do not overlap this NWR (Figure 3.7-1c). The construction of the HST alternatives would not result in direct impacts. Because of the considerable distance and the existing SR 43 and BNSF barriers, no indirect impacts are expected to occur to this NWR. For additional information about Pixley NWR, see Section 3.15, Parks, Recreation, and Open Space.

Colonel Allensworth State Historic Park

The Colonel Allensworth State Historic Park (Allensworth SHP) is located in Tulare County, near the town of Allensworth, which was the only California town to be founded, financed, and governed by African-Americans. The 240-acre historical park contains several homes, a bakery, a blacksmith area, a drugstore, a barber shop, a post office, a library, an hotel, a schoolhouse, a Baptist church, a restaurant, various farm buildings, and several other buildings, which were reconstructed to reflect the 1908 to 1918 historical period (California State Parks 2009). The primary management focus is the preservation, development, and interpretation of resources of the historical community of Allensworth. The BNSF Alternative is located on the far eastern boundary of the Allensworth SHP. The Allensworth Bypass Alternative would occur approximately 0.5 mile west of the Allensworth ER (Figure 3.7-1c). Construction period impacts and project impacts on Allensworth SHP are discussed in Section 3.15, Parks, Recreation, and Open Space.

Allensworth Ecological Reserve

Allensworth ER is managed by the CDFG and is composed of a number of fragmented parcels in southern Tulare County and northern Kern County (Figure 3.7-1c). The approximate 5,056 acres in the Allensworth ER contain a number of biological resources, including special-status plant communities, wetlands, and special-status plant and wildlife species. The reserve is open to the public for wildlife viewing (CDFG 2010b). A portion of the Allensworth ER immediately west of the SR 43 is located in the footprint of the BNSF Alternative. For additional information about the Allensworth ER, see Section 3.15, Parks, Recreation, and Open Space.

Kern National Wildlife Refuge

The Kern NWR is located in Tulare County, west of Delano at the southern end of the San Joaquin Valley (Figure 3.7-1c). The 11,249-acre refuge contains seasonal wetlands, a riparian corridor, valley grasslands, alkali playa, and valley sink scrub habitats. Approximately 6,500 acres of managed wetlands provide habitat for wintering and migrating waterfowl and shorebirds. Upland areas (3,600 acres) are reserved as habitat for federally listed species such as the Tipton kangaroo rat, blunt-nosed leopard lizard, and San Joaquin kit fox. The primary management focus of the USFWS for the refuge is to maintain and restore native habitats, including wetlands and historic valley upland habitat (USFWS 2011). The Kern NWR is located 9.8 miles west of the HST alternatives (i.e., the Allensworth Bypass Alternative). The HST alternatives do not overlap this NWR (Figure 3.7-1c), and the construction of the HST alternatives would not result in direct or indirect impacts on this public land: therefore, the Kern NWR is not discussed further in this document.

Atwell Island Land Retirement Demonstration Project

The Atwell Island Land Retirement Demonstration Project (Atwell Island) lies between the Pixley NWR and Kern NWR. This 7,000-acre area is located in Kings and Tulare County, south of the town of Alpaugh, in the southeastern portion of what was once Tulare Lake. Atwell Island contains a number of biological resources, including special-status plant communities, wetlands, and special-status wildlife species. It is an agglomeration of land, water, and other property interests purchased from willing sellers by a federal interagency team. This area is currently managed by the Bureau of Land Management with the primary management goal of restoring native valley grasslands, wetlands, and alkali sink habitats on what was once marginal agricultural land. The project provides habitat corridor connections with the surrounding protected lands of the Pixley NWR, Kern NWR, Allensworth Ecological Reserve, and Sand Ridge (BLM 2011; USDOI 2010). Atwell Island is located west of SR 43 and is 2 miles west of the Allensworth Bypass Alternative; therefore, the HST alternatives do not overlap this area (Figure 3.7-1c). Because of the considerable distance, no direct or indirect impacts are expected to occur to Atwell Island; therefore, the Atwell Island Restoration Project is not discussed further in this document. Landscape level impacts on wildlife movement and migration corridors in the region, including the SR 43/ SR 155 linkage and the Deer Creek-Sand Ridge linkage located in the vicinity of Atwell Island, are evaluated in Section 3.7.5.

Conservation Bank

Allensworth Conservation Bank

Conservation banks are large blocks of land that are preserved, restored, and enhanced for the purpose of mitigating for projects that take special-status species, wetlands, or other vegetated biological communities. One conservation bank, the Allensworth Conservation Bank, is located in the project vicinity; however, this bank is outside the study areas (see Figure 3.7-1c).

Habitat Conservation Plans

As stated earlier, a habitat conservation plan must accompany an incidental take permit under Section 10 of the federal ESA. Three conservation plans have been identified in the project vicinity and are described below (see Figure 3.7-1d).

Metropolitan Bakersfield Habitat Conservation Plan (MBHCP): The MBHCP is a joint program of the City of Bakersfield and Kern County (Chapter 17.62 of the Kern County Ordinances) to assist urban development applicants in complying with federal and state endangered species regulations (City of Bakersfield and Kern County 1994). The program uses mitigation fees paid by applicants for grading or building permits to fund the purchase and

maintenance of habitat land to compensate for the impact of urban development on endangered species habitat. Kern County and the City of Bakersfield have entered into a legal agreement with the CDFG and the USFWS detailing obligations under the MBHCP. The incidental take permit associated with the MBHCP will expire in August 2014; however, an application for an extension has been submitted. Additionally, the City of Bakersfield plans to work with Kern County to develop a new habitat conservation plan and natural communities conservation plan for the MBHCP area.

The provisions of the MBHCP include mitigation ratios that must be met to ensure adequate mitigation for permitted land conversion activities. Adequate mitigation requires the greater of either a 1:1 ratio for open (non-urban) land conversion or a 3:1 ratio for natural land (a subset of open land that excludes agricultural lands) conversion. Additionally, the MBHCP identifies two Conceptual Focus Areas located in the northeastern and southwestern portions of the plan area that contain the majority of the natural land within the plan area and that are the most appropriate locations for preserves.

Pacific Gas and Electric Company San Joaquin Valley Operations and Maintenance Habitat Conservation Plan: The Pacific Gas & Electric Company San Joaquin Valley Operations and Maintenance Habitat Conservation Plan (Jones & Stokes 2006) was developed to allow the Pacific Gas and Electric Company to conduct operations and maintenance activities within the 12.1-million-acre plan area, while minimizing, avoiding, and compensating for possible direct, indirect, and cumulative adverse effects on threatened and endangered species. The plan outlines three mechanisms to limit impacts of the Pacific Gas and Electric Company's operations and maintenance activities: general avoidance and minimization measures, species surveys to trigger additional avoidance and minimization measures, and compensation for unavoidable impacts. However, this habitat conservation plan is an operations and maintenance plan that only applies to Pacific Gas and Electric facilities and, therefore, does not apply to this project and is not further discussed in this document.

First Public Draft—Kern County Valley Floor Habitat Conservation Plan (VFHCP): The draft VFHCP is a long-term program designed to conserve federally protected species, state-protected species, and/or other species of concern (Kern County Planning Department 2006). In the current draft, the VFHCP establishes the conditions under which Kern County; the California Division of Oil, Gas, and Geothermal Resources; and other program beneficiaries may seek authorization to allow the taking of multiple federally and state-protected species incidental to development and other land use activities. Once adopted, the VFHCP will be a voluntary program that provides an option for project proponents to comply with the federal ESA and CESA. Other options, such as complying with the federal ESA through Section 7 consultation or through consultation with the CDFG, are allowed.

The VFHCP has not been officially adopted and is currently in draft form. Therefore, the project is not required to avoid conflicts with the provisions of the plan, and the VFHCP is not discussed further in this document.

Protected Trees

Mapping of more than 1,500 trees in the Special-Status Plant Study Area was based on field surveys and GIS analysis of potential tree locations. A number of these trees are protected under the various local ordinances, regulations, and policies. Where possible, these trees have been categorized based on whether they are native and on local government policies, ordinances, and regulations. Many of the trees identified are landscape and ornamental trees that are located in the urban environment throughout the Special-Status Plant Study Area. Native trees observed (that are afforded protection) include valley oaks and Fremont cottonwoods. The *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA

2012a) contains more details regarding the methods, types, and locations of protected trees in the Special-Status Plant Study Area.

Additional trees may be present in areas where permission to enter was not granted. While the tree counts must be considered approximate, they remain useful for a comparison of the alternatives under consideration.

3.7.4.6 Wildlife Movement Corridors

Habitat linkages are planning areas that, among other services, provide broad connections for wildlife movement between two or more habitat areas. The term "habitat linkage" is commonly used as a synonym for a wildlife movement corridor. However, wildlife movement corridors are physical connections that allow wildlife to move between patches of suitable habitat. Multiple habitat linkages that could potentially function as wildlife movement corridors have been identified as part of recent state- and regional-level studies addressing connectivity and wildlife movement in California (Penrod et al. 2001; Penrod et al. 2003; ESRP 2009; USFWS 1998; Spencer et al. 2010). Collectively, these studies identify seven major linkage areas that intersect the HST alternatives (shown on Figure 3.7-2) and that could serve as movement corridors at the following general locations:

- Kings River linkage (connectivity choke-point linkage).
- St. John's River–Cross Creek linkage (landscape linkage).
- SR 43/SR 155 linkage (missing linkage).
- Tule River linkage (connectivity choke-point linkage).
- Deer Creek–Sand Ridge linkage (connectivity choke-point/missing linkage).
- Poso Creek linkage (missing linkage).
- Kern River linkage (connectivity choke-point linkage).

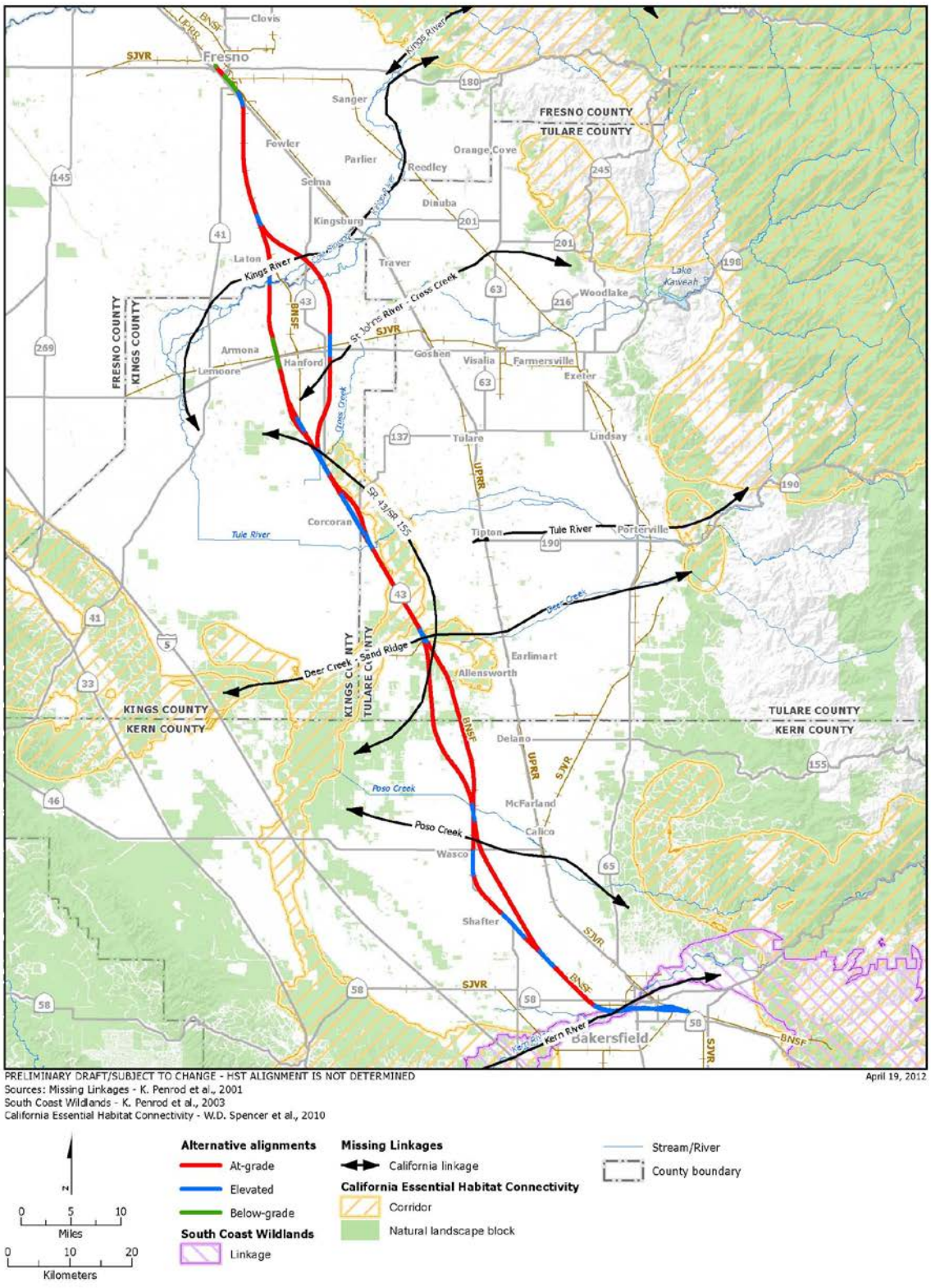

Figure 3.7-2
Wildlife movement corridors

Each linkage was characterized as connectivity choke-point, landscape, or missing linkage during the 2001 *Missing Linkages Conference*. The conference involved a multidisciplinary team of agency personnel, conservation scientists, and university scientists. The goal of the conference was to designate the most important corridors in California and assign conservation priorities to each corridor based on biological value and current threats. A landscape linkage is an area not currently constricted and identified as essential for the functioning of an eco-region. A connectivity choke point is a narrow, affected, or otherwise tenuous habitat linkage connecting two or more habitat blocks. A missing linkage is a linkage that currently provides little to no connectivity (e.g., due to intervening development, roadways, etc.) but could provide connectivity in the future if enhanced or restored (Penrod et al. 2001). These seven linkages are described below. For a more detailed discussion of these linkages and opportunities for local wildlife movement, see the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

The Kings River linkage is primarily an east-west linkage that follows the Kings River drainage (Penrod et al. 2001) and is approximately 60 miles long. This linkage may provide suitable habitat for a variety of special-status species. The Kings River riparian corridor linkage intersects the BNSF Alternative.

The St. John's River–Cross Creek linkage is a north-south linkage that follows the Cross Creek riparian corridor (Penrod et al. 2001) and is approximately 36 miles long. The primary habitat types in this linkage were identified as valley oak, riparian forest, mixed riparian forest, grassland, and alkali sink. Conservation opportunities are good because the land is currently part of a formal conservation plan. The *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998) and conservation partnership potentials are already in place between the CDFG, Corcoran Irrigation District, and the Endangered Species Recovery Program (Penrod et al. 2001). The Cross Creek riparian corridor linkage intersects the BNSF and Corcoran Bypass alternatives.

The Tule River linkage is primarily an east-west linkage that follows the Tule River drainage (Penrod et al. 2001), and is approximately 25 miles long. This linkage connects to natural lands within the SR 43/SR 155 linkage and consists of patchy valley foothill riparian, grassland and vernal pool habitat over 25 miles throughout the eastern portion of the Central Valley, although it is confined to the riparian corridor where it intersects the BNSF Alternative. This linkage may provide suitable habitat for a variety of special-status species.

The SR 43/SR 155 linkage is primarily a north-south linkage, which closely follows SR 43 and SR 155. This linkage connects, among other natural areas, the Kern NWR, the Pixley NWR, and other undisturbed tracts of land scattered throughout the San Joaquin Valley (Penrod et al. 2001). The SR 43/SR 155 linkage also connects the Pixley/Allensworth, Lost Hills, and Semitropic Ridge satellite areas, which are identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). The SR 43/SR 155 linkage is approximately 20 miles long. The primary habitat types in the linkage were identified as alkali sink scrub, valley grassland, and saltbush scrub. The major land cover types are agriculture and natural vegetation. The most significant barriers to wildlife movement are natural habitat gaps up to several miles long. Given that several thousand acres in this area need to be restored from agricultural land to natural communities for this linkage to function, the need for restoration in this area is extensive (Penrod et al. 2001).

The Deer Creek–Sand Ridge linkage, which was identified in the vicinity of Allensworth, is a primarily east-west linkage that connects the Sequoia Foothills core area with the Kreyenhagan and Kettleman Hills core area identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). The Deer Creek–Sand Ridge linkage also intersects portions of the Pixley/Allensworth, Lost Hills, and Semitropic Ridge satellite areas identified in the

Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS 1998) and two essential connectivity areas identified by the *California Essential Habitat Connectivity* project that connect the Pixley/Allensworth reserves with the Carrizo Plain/Kettleman Hills natural landscape blocks (Spencer et al. 2010). The Deer Creek–Sand Ridge linkage is approximately 25 miles long. The primary habitat types present in the linkage are riparian, grassland, vernal pool marshes, and dunes. The Allensworth area linkage intersects the BNSF Alternative (near Allensworth) and the Allensworth Bypass Alternative.

The Poso Creek linkage is primarily an east-west linkage that follows the Poso Creek riparian corridor, (Penrod et al. 2001) and is approximately 35 miles long. This linkage connects the northeast Bakersfield to the Kreyenhagan and Kettleman Hills populations of the San Joaquin kit fox, identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). The Poso Creek linkage was also identified in the Recovery Plan as a linkage connecting populations of San Joaquin kit fox between Bakersfield and the Pixley/Allensworth, Lost Hills, and Semitropic Ridge areas that run along Poso Creek (USFWS 1998). Major habitat types in the linkage were identified as riparian and upland habitat, and the major land cover type in and surrounding the linkage is agricultural. Major barriers to wildlife include gaps in habitat cover from 1 to 5 miles in length. The features that currently facilitate wildlife movement include underpasses as well as bridges over a major highway (SR 99). The Poso Creek linkage intersects the BNSF and Wasco-Shafter Bypass alternatives.

The Kern River linkage is primarily an east-west linkage that follows the Kern River riparian corridor (Penrod et al. 2001) and is approximately 30 miles long. This linkage connects natural lands identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998) that support special-status species (e.g., the Carrizo Plain National Monument) to Bakersfield and the Sierra Nevada foothills. Major habitat types in the linkage were identified as riparian and upland, and the major land-cover types were natural vegetation, agricultural land, and urban development. The most significant barriers to wildlife movement were identified as gaps in riparian habitat and water impoundments, which potentially restrict the movement of terrestrial species across areas that formerly had only intermittent water flow (Penrod et al. 2001). The linkage is currently part of the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). The Kern River riparian corridor linkage intersects the BNSF, Bakersfield South, and Bakersfield Hybrid alternatives.

The Pacific Flyway is a common route of bird migration that extends along the west coast of North and South America from Alaska to Patagonia, and from pelagic areas of the Eastern Pacific to the Great Basin. This flyway spans most of California, including the project footprint. Migratory birds travel along this route in spring and fall to reach breeding and overwintering grounds. Such birds may occur transiently in the project footprint, or use areas of suitable habitat for breeding or overwintering. The *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a) provides a detailed summary of the six major linkage areas, and describes the key species used to identify the linkage areas.

3.7.5 Environmental Consequences

3.7.5.1 Overview

Under the No Project Alternative, existing development trends affecting biological resources are expected to continue and to further directly degrade some natural systems because development, such as new residential communities and transportation infrastructure, would convert undeveloped habitat to other uses. In addition, development would indirectly degrade remaining habitat through pollution, noise, and dust. Special-status species would be threatened with mortality from vehicle strikes, and development would result in increased loss, fragmentation, or impact on habitats of concern and wildlife movement corridors.

The HST alternative alignments (i.e., the BNSF, Hanford West Bypass 1, Hanford West Bypass 2, Corcoran Elevated, Corcoran Bypass, Allensworth Bypass, Wasco-Shafter Bypass, Bakersfield South, and Bakersfield Hybrid alternatives), HMF alternatives, and station alternatives would result in direct and indirect impacts on biological resources as a result of both construction period (temporary) impacts and project (permanent) impacts. The construction of HST alternatives would result in temporary direct or indirect impacts through the disturbance or removal of lands that have been determined to support or could potentially support special-status species, affect habitats of concern, or interfere with wildlife movement corridors. Project activities associated with the HST alternatives would result in permanent direct and indirect impacts on special-status species and habitats of concern, and would obstruct wildlife movement corridors.

A description of potential direct and indirect impacts is provided for each impact to biological resources. The nature of these impacts and their magnitude (i.e., the impact acreage) are used to determine the intensity of the impact under NEPA, and the significance of the impact under CEQA.

The overall effect determinations for the Hanford West Bypass 1, Hanford West Bypass 2, Corcoran Elevated, Corcoran Bypass, Allensworth Bypass, Wasco-Shafter Bypass, Bakersfield South, and Bakersfield Hybrid alternatives are generally similar to the corresponding segments of the BNSF Alternative. However, in one instance, the anticipated effects of the project on a particular resource are reduced by the use of the alternative when combined with the remaining segments of the BNSF Alternative. Specifically, the use of the Allensworth Bypass Alternative, as opposed to the corresponding segment of the BNSF Alternative, would reduce impacts and result in no effect on the Allensworth Ecological Reserve.

The determinations for the HMF alternatives and the station alternatives are independent of each other.

Construction of any of the HST alternative alignments, the HMF alternatives, and the station alternatives would require permitting under federal, state, and local regulatory processes, including the federal CWA (Sections 401, 402, and 404), California Fish and Game Code (Streambed Alteration Agreement/Section 1600), California ESA (2081 Incidental Take Permit), and the federal ESA (Section 7).

3.7.5.2 No Project Alternative

Under the No Project Alternative, existing trends affecting biological resources are expected to continue or worsen, including habitat loss from development, mortality from vehicle strikes, habitat degradation from pollution (e.g., polluted runoff from stormwater, inadvertent spills of hazardous materials), and noise and dust from development. Existing regulatory programs, such as the CWA and conservation programs (e.g., establishment of conservation easements and mitigation banks), would continue to abate the amount of habitat loss and degradation, if feasible. Effects that are expected to continue to occur are as follows:

- Changes in crop production and rotation would continue to improve or degrade habitat conditions for species that forage or nest on farmland.

- Transportation agencies would implement programmed and funded improvements to the intercity transportation system through 2035 (see Section 3.2, Transportation). In some cases, widening existing corridors or new improvements could result in additional impacts on biological resources. Each of these improvement projects would be subject to environmental impact analysis and evaluation of the impacts of habitat loss, habitat degradation, and “take” of special-status species. Impacts on biological resources and jurisdictional waters would be mitigated as part of those projects, including avoidance of “take” during construction,

minimization of impacts during construction and operation, restoration of disturbed sites, and preservation of compensatory habitat.

- Development pressure would continue in Fresno, Kings, Tulare, and Kern counties based on adopted general and specific plans (see Section 3.13, Station Planning, Land Use, and Development, and Section 3.18, Regional Growth). Low-density development on the urban fringe would likely continue and potentially result in the loss of habitat in these currently undeveloped areas, including high-value habitat such as wetlands and riparian areas. Current and future conservation easements on properties near urban boundaries would protect some areas. Impacts on biological resources and jurisdictional waters would be avoided, reduced, and in accordance with permit requirements for the development projects, be mitigated through the preservation of compensatory habitat and restoration of disturbed sites.

  For example, some local projects that are in various stages of planning include the development of a 900-acre sand-and-gravel-extraction operation; the 220-acre expansion of the Sanger-Centerville aggregate mining operation; a regional shopping center; and an 889-acre residential, commercial, and recreational development in Bakersfield. These and similar projects will continue to have some impact on the wildlife, wetlands (including vernal pools), native vegetation, oak woodland, and nonnative grassland biological resources in local areas between Fresno and Bakersfield.

In addition, the historical trend of converting native plant communities to agricultural production has compromised the biological complexity of the region. With continued growth and development under the No Project Alternative, the loss of native plant communities will likely continue. Foreseeable projects that are planned, committed, or are otherwise part of a general plan or specific plan would continue the trend of converting open spaces with native plant communities to more urban uses.

3.7.5.3 High-Speed Train Alternatives

This section describes the potential effects on biological resources for the HST alternatives. Mitigation measures for effects and impacts on biological resources are listed in Section 3.7.7. Impacts associated with construction activities would result in temporary impacts; whereas track, structures, and facilities built for the project and its operation would result in permanent impacts on biological resources. Construction period impacts and project (permanent) impacts are defined in Section 3.1.

Impacts during the construction period of the HST alternatives are considered to be temporary; construction period impacts, such as the use of staging areas, would cease once construction is completed. Subsequent mitigation would restore the land to an appropriate previous state. However, due to the length of the construction period, it is unlikely that impacts on certain jurisdictional water features (vernal pools and swales) could be restored to preconstruction conditions; therefore, construction period impacts on these features are considered permanent and are quantified with project impacts. Project impacts, such as removal of special-status plant communities and other land-cover types necessary for the HST right-of-way and associated facilities, are considered to be permanent. This section evaluates the direct and indirect impacts that would result from both construction and project activities of each HST alternative on biological resources. Biological resources are described below in four categories: (1) special-status plant species, (2) special-status wildlife species, (3) habitats of concern, and (4) wildlife movement corridors.

The construction period includes the purchasing of rights-of-way, construction and testing of the HSTs, and is anticipated to be completed within 7 years. Typically, heavy construction timelines

(e.g., grading, excavating, constructing the HST railbed, and laying the track) would be accomplished within a 3- to 4-year period.

Construction Period Impacts – Common Biological Resource Impacts

Biological resources occurring adjacent to and within the construction footprint are expected to incur direct and indirect impacts from construction activities. Direct impacts on biological resources would result from construction activities within temporary impact areas of the construction footprint (i.e., staging areas, temporary access roads). Indirect impacts would occur within and adjacent to the construction footprint. The types of direct and indirect impacts would be common across all HST alternatives, and are discussed below for each resource.

Construction period impacts on natural lands could result in temporary direct and indirect effects on a number of biological resources, including special-status plant and wildlife species, habitats of concern (encompasses jurisdictional waters), and wildlife movement corridors (Table 3.7-6). Urban and agricultural lands affected by construction period activities are not expected to provide conditions that support special-status plant species or special-status plant communities, to provide preferred habitat for special-status wildlife species, to support high-quality jurisdictional waters, or to facilitate the movement or migration of wildlife species. However, these areas often contain degraded or marginal habitats for a number of special-status wildlife species; and in some instances, support jurisdictional waters (specifically retention and detention basins) and are used for movement and migration by a number of wildlife species. Direct, and in some instances indirect, impacts associated with urban, agricultural, and natural lands are described for the various biological resources. For a more complete description of the impacts on agricultural lands, see Section 3.14, Agricultural Lands.

Table 3.7-6

Communities Potentially Affected by the Alternative Alignments (acres): Construction Period Impacts[a,b] (Temporary Impacts)

Community Type		High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Acreage / Difference Compared to Corresponding BNSF Area[a]										
Terrestrial Communities	Barren	251.42	0.05 / -85.73	0.05 / -85.73	— / -85.78	— / -85.78	12.98 / +12.98	—	—	— / -0.07	162.79 / -1.84	162.79 / -1.84
	Urban	339.33	15.95 / -6.37	15.74 / -6.58	25.92 / +3.60	25.71 / +3.39	24.81 / +10.55	18.21 / +3.96	0.63 / -4.94	42.94 / -66.89	77.24 / +4.59	84.95 / +12.30
	Agricultural Lands	1402.72	78.81 / -322.98	72.82 / -328.97	157.69 / -244.10	151.70 / -250.10	320.26 / +0.04	350.60 / +30.38	147.30 / +14.71	306.68 / -218.83	—	—
	Annual Grassland	43.09	14.38 / +14.08	12.52 / +12.22	16.65 / +16.35	14.79 / +14.50	0.36 / +0.36	0.11 / +0.11	4.07 / +2.48	1.10 / +0.07	32.62 / -2.74	34.63 / -0.74
	Valley Foothill Riparian	0.24	0.82 / +0.74	0.82 / +0.74	0.82 / +0.74	0.82 / +0.74	—	0.47 / +0.47	0.17 / +0.14	—	0.34 / +0.22	0.36 / +0.24
	Alkali Desert Scrub	4.59	—	—	—	—	—	—	—	—	4.04 / -0.54	4.04 / -0.54
	Pasture	5.94	0.10 / -5.29	0.10 / -5.29	0.10 / -5.29	0.10 / -5.29	—	—	—	—	0.24 / -0.01	0.24 / -0.01
Aquatic Communities	Fresh Emergent Wetland[d]	—	—	—	—	—	—	—	—	—	—	—
	Riverine[e]	4.42	0.62 / +0.11	0.62 / +0.11	0.72 / +0.22	0.72 / +0.22	0.90 / +0.02	1.16 / +0.28	0.10 / +0.08	0.06 / +0.04	1.67 / +0.20	1.62 / +0.15
	Lacustrine[f]	7.53	—	—	—	—	—	3.55 / +3.55	2.45 / +1.14	1.10 / -1.50	1.91 / -0.64	1.91 / -0.64

Notes:

[a] All impacts were calculated based on 15% engineering design construction footprint.

[b] See Appendix 3.7-B, Attachments 1, 2, and 3 for more detailed comparisons. The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.

[c] — = No impact or not applicable

[d] Fresh Emergent Wetland is equivalent to the jurisdictional waters feature emergent wetland.

[e] Riverine includes two jurisdictional waters feature types: seasonal riverine and canals/ditches.

[f] Lacustrine is equivalent to the jurisdictional waters lacustrine.

The following sections discuss the effects of the HST alternatives on biological resources (i.e., on special-status plant species, special-status wildlife species, habitats of concern, and wildlife movement corridors). Although there are areas of temporary impact associated with the HMF alternatives and station alternatives, these impact areas overlap areas of permanent impact; therefore, impacts to these areas are considered permanent. Permanent direct and indirect impacts on biological resources associated with the HMF and station alternatives are discussed in the Project Impact section.

Impact Bio #1 – Construction Effects on Special-Status Plant Species

Special-status plant species have the potential to occur across all HST alternatives. Appendix 3.7-A, Attachment 1, lists these species and discusses their potential for occurrence within the footprint of each HST alternative. The potential for occurrence is designated as no potential, low, moderate, or high, based on the presence of suitable habitat, the range of the species, and the proximity of known occurrences of the species. Where access was granted, focused special-status plant surveys were conducted. Where access was not granted, the determination of effects on special-status plants reflects a conservative approach: if suitable habitat was determined to be present, the special-status plant species associated with that habitat with potential to occur (Appendix 3.7-A, Attachment 1) were also assumed to be present.

Based on the field surveys, two special-status plant species are known to occur within the construction footprint and would be adversely affected by construction activities: heartscale (*Atriplex cordulata*) and little mouse tail (*Myosurus minimus* ssp. *apus*) (see Figure 3.7-3).

In addition to the species that have been observed within the Special-Status Plant Study Area, special-status plant species have the potential to occur in areas of suitable habitat in parcels that have not been surveyed. These species include federally and/or state-listed species and species listed by the CNPS, all of which are considered rare in California. If these species do occur in the construction footprint, they would be subject to the same adverse effects as those described below for species known to occur.

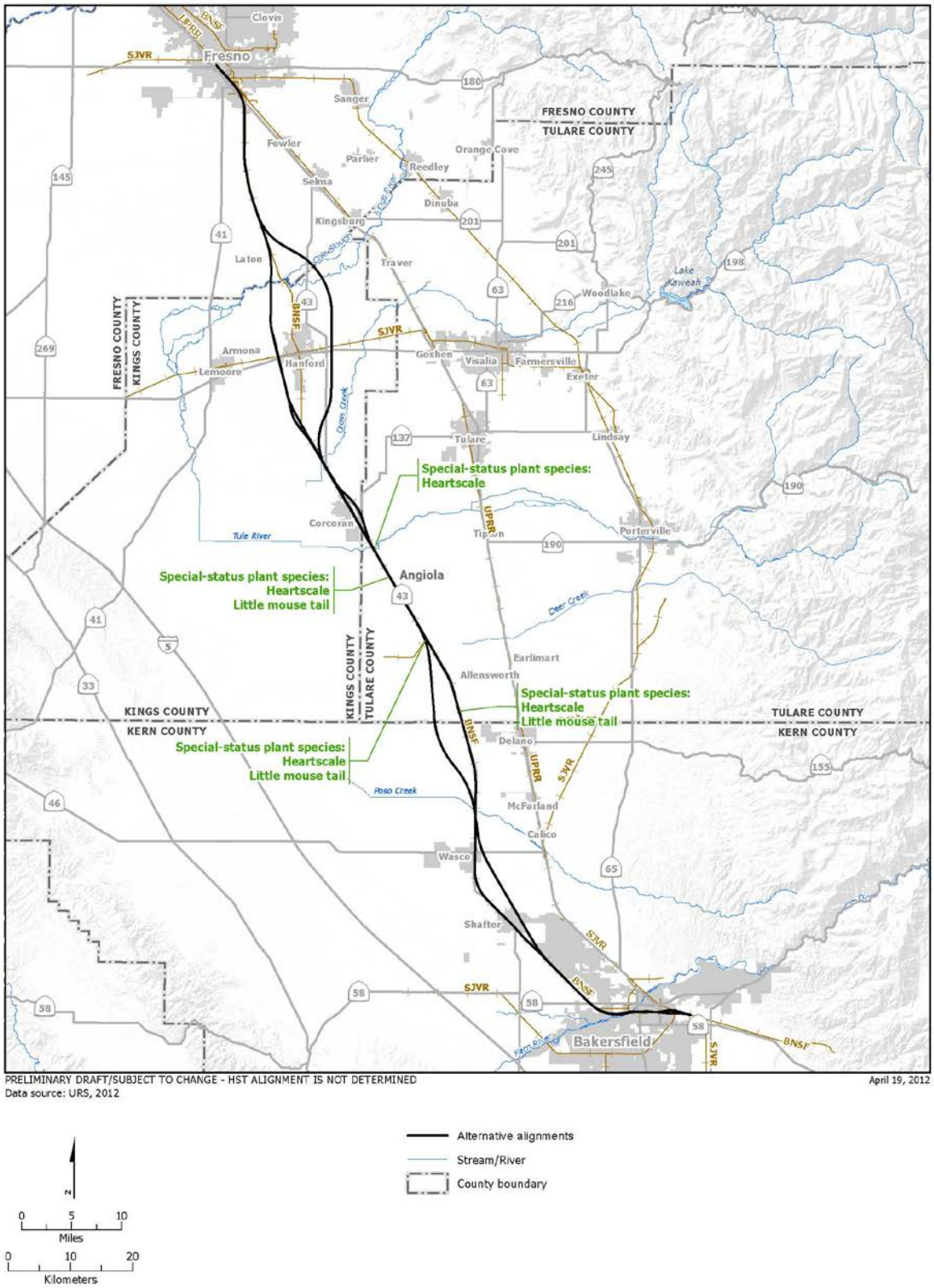

Figure 3.7-3
Special-status species (plants) within the Special-Status Plant Study Area

Direct (Bio#1) Impacts during Construction Period

Direct impacts on special-status plant species and native plant species may occur as a result of construction crews removing vegetation within temporary impact areas, and from construction vehicles and personnel disturbing vegetation (i.e., trampling, covering, and crushing individual plants, populations, or suitable potential habitat for special-status plant species).

Indirect (Bio#1) Impacts during Construction Period

Indirect impacts on special-status plant species and native plant species would potentially include erosion, siltation, and runoff into natural and constructed watercourses; soil and water contamination from construction equipment leaks; construction dust affecting plants by reducing their photosynthetic capability (especially during flowering periods); and an increased risk of fire (e.g., construction equipment use and smoking by construction workers) in adjacent open spaces.

BNSF Alternative

Two species of special-status plant—heartscale and little mouse tail—have been identified within the BNSF Alternative. However, only one of these species was identified in the temporary impact area of the construction footprint; a small population of heartscale is located within an area of construction period (i.e., temporary) impacts. Additionally, special-status plant species could occur in unsurveyed, potentially suitable habitats within the temporary impact areas of the construction footprint of the BNSF Alternative. Attachment 1 in Appendix 3.7-B is a table that reports and compares, by alternative, the acres of impact on special-status plant species that would result from construction and project activities.

Construction of the BNSF Alternative would result in relatively high intensity loss of special-status plant species and their habitats due to impacts on two known special-status species and considerable acreage of suitable habitat. Therefore, construction of the BNSF Alternative would result in an effect of substantial intensity under NEPA on special-status plant species and their habitats. The impact would be significant under CEQA.

Hanford West Bypass 1 Alternative

No special-status plant species were identified in the temporary impact areas of the at-grade or below-grade options of the Hanford West Bypass 1 Alternative, but unsurveyed habitats that have low potential to support special-status plant species are present (see Appendix 3.7-B, Attachment 1). Most of the land in the Hanford West Bypass 1 Alternative is agricultural (Table 3.7-6), including the unsurveyed habitats, which are small and have no to low potential of supporting special-status plant species (Appendix 3.7-A, Attachment 1). Neither the Hanford West Bypass 1 nor the corresponding segment of the BNSF Alternative would result in temporary impacts on observed special-status plant species. However, the Hanford West Bypass 1 would result in slightly more temporary impacts on unsurveyed habitats that have a low potential to support special-status plant species than the corresponding segment of the BNSF Alternative. If special-status plant species are present in these habitats, the construction period impacts of the Hanford West Bypass 1 Alternative would directly and indirectly result in temporary impacts on these species.

Because no special-status plant species were observed in the Hanford West Bypass 1 Alternative and the unsurveyed habitat present has a low potential to support special-status plant species, construction of the Hanford West Bypass 1 Alternative would result in a slight change from existing biological conditions and little or no regional effects. Therefore, the construction period impacts of the Hanford West Bypass 1 Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant species.

Hanford West Bypass 2 Alternative

No special-status plant species were identified in the temporary impact areas of the at-grade or below-grade options of the Hanford West Bypass 2 Alternative, but unsurveyed habitats that have the potential to support special-status plant species are present (Appendix 3.7-B, Attachment 1). Most of the land in the Hanford West Bypass 2 Alternative is agricultural (Table 3.7-6), including the unsurveyed habitats, which are small and have no to low potential of supporting special-status plant species. Neither the Hanford West Bypass 2 Alternative nor the corresponding segment of the BNSF Alternative would result in temporary impacts on observed special-status plant species. However, the Hanford West Bypass 2 Alternative would result in slightly more temporary impacts on unsurveyed habitats that have a low potential to support special-status plant species than the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1). If special-status plant species are present in these habitats, the construction period impacts of the Hanford West Bypass 2 would directly and indirectly result in temporary impacts on these species.

Because no special-status plant species were observed in the Hanford West Bypass 2 Alternative and the unsurveyed habitat present has a low potential to support special-status plant species, construction of the Hanford West Bypass 2 Alternative would result in a slight change from existing biological conditions and little or no regional effects. Therefore, the construction period impacts of the Hanford West Bypass 2 Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant species.

Corcoran Elevated Alternative

No special-status plant species were identified in the temporary impact areas of the Corcoran Elevated Alternative, but habitats that have the potential to support special-status plant species are present (Appendix 3.7-B, Attachment 1). These habitats are mainly in urban and agricultural lands (Table 3.7-6) that have no to low potential of supporting special-status plant species. Neither the Corcoran Elevated Alternative nor the corresponding segment of the BNSF Alternative would result in temporary impacts on special-status plant species; however, the Corcoran Elevated Alternative would result in a negligible increase in temporary impacts on habitats that have a low potential to support special-status plant species than its corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1). If special-status plant species are present in these habitats, construction period impacts under the Corcoran Elevated Alternative could directly and indirectly result in temporary impacts on these species.

Because no special-status plant species were observed in the Corcoran Elevated Alternative and the unsurveyed habitat present has a low potential to support special-status plant species, construction of the Corcoran Elevated Alternative would result in a slight change from existing biological conditions and little or no regional effects. Therefore, the construction period impacts of the Corcoran Elevated Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant species.

Corcoran Bypass Alternative

No special-status plant species were identified in the temporary impact areas of the Corcoran Bypass Alternative, although unsurveyed habitats that have the potential to support special-status plant species are present (Appendix 3.7-B, Attachment 1). Neither the construction activities of the Corcoran Bypass Alternative nor those of the corresponding segment of the BNSF Alternative would result in temporary impacts on observed special-status plant species. The Corcoran Bypass would result in a minor increase in temporary impacts on unsurveyed habitats that have the potential to support special-status plant species compared to the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1). However, if special-status plant

species are present in unsurveyed habitats, the construction period impacts of the Corcoran Bypass Alternative would directly and indirectly result in temporary impacts on these species.

Because no special-status plant species were observed in the Corcoran Bypass Alternative and the unsurveyed habitat present has a low potential to support special-status plant species, construction of the Corcoran Bypass Alternative would result in a slight change from existing biological conditions and little or no regional effects. Therefore, the construction period impacts of the Corcoran Bypass Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant species.

Allensworth Bypass Alternative

No special-status plant species were identified in the temporary impact areas of the Allensworth Bypass Alternative, although unsurveyed habitats that have the potential to support special-status plant species do occur (Appendix 3.7-B, Attachment 1). If special-status plant species are present in unsurveyed habitats, construction period impacts of the Allensworth Bypass Alternative would directly and indirectly result in temporary impacts on these species.

Neither the Allensworth Bypass Alternative nor the corresponding segment of the BNSF Alternative would result in temporary impacts on observed special-status plant species (Appendix 3.7-B, Attachment 1). The Allensworth Bypass Alternative would result in larger temporary direct impacts on unsurveyed habitats that have the potential to support special-status plant species than the corresponding BNSF Alternative.

Although no special-status plant species were observed in the temporary impact areas of the Allensworth Bypass Alternative, measurable adverse loss to special-status plant species may occur due to impacts to habitat with the potential to support special-status plant species. Therefore, construction period impacts of the Allensworth Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant species.

Wasco-Shafter Bypass Alternative

No special-status plant species were identified in the temporary impact areas of the Wasco-Shafter Bypass Alternative, although unsurveyed habitats that have low potential to support special-status plant species do occur (Appendix 3.7-B, Attachment 1). Suitable habitat for most special-status plant species is limited in the Wasco-Shafter Bypass Alternative (and in the corresponding segment of the BNSF Alternative) (Table 3.7-6) by a number of factors, including the conversion of natural lands to agricultural land uses. While suitable habitat is limited, special-status plant species have up to a moderate potential of being present in suitable unsurveyed habitats. If special-status plant species are present in suitable unsurveyed habitats, construction period impacts under the Wasco-Shafter Bypass Alternative would directly and indirectly result in temporary impacts on these species.

The Wasco-Shafter Bypass Alternative would result in larger temporary impacts on unsurveyed habitats that have the potential to support special-status plant species than the corresponding BNSF Alternative (Appendix 3.7-B, Attachment 1). Because the habitats in both alternatives are disturbed, fragmented, and of low quality, the potential for special-status plant species to occur is low.

Although no special-status plant species were observed in the temporary impact areas of the Wasco-Shafter Bypass Alternative, measurable adverse loss to special-status plant species may occur due to impacts to habitat with the potential to support special-status plant species. Therefore, construction period impacts of the Wasco-Shafter Bypass Alternative would result in

an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant species.

Bakersfield South Alternative

No known occurrences of special-status plant species exist in the temporary impact areas of the Bakersfield South Alternative, although unsurveyed habitats that have the potential to support special-status plant species do occur (Appendix 3.7-B, Attachment 1). Although annual grassland is present in the Bakersfield South Alternative (and in its corresponding segment of the BNSF Alternative) (Table 3.7-6), suitable habitat for most special-status plant species is limited by a number of factors, including fragmentation and disturbance due to development (urbanization) that encompasses residential, commercial, and industrial purposes. Both the Bakersfield South Alternative and the corresponding BNSF Alternative segment are located in a highly urbanized portion of metropolitan Bakersfield. While suitable habitat is limited, special-status plant species have a moderate potential of being present in unsurveyed suitable habitats (Appendix 3.7-A, Attachment 1). If special-status plant species are present in suitable unsurveyed habitats, construction period impacts of the Bakersfield South Alternative would directly and indirectly result in temporary impacts on special-status plant species (Appendix 3.7-B, Attachment 1).

The Bakersfield South Alternative would result in slightly larger temporary direct impacts on habitats that have the potential to support special-status plant species than would its corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1).

Although no special-status plant species were observed in the Bakersfield South Alternative, relatively high intensity loss to special-status plant species may occur due to impacts to large amounts of unsurveyed habitats that have the potential to support special-status plant species. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status plant species and their habitats.

Bakersfield Hybrid Alternative

No known occurrences of special-status plant species exist in the temporary impact areas of the Bakersfield Hybrid Alternative, although unsurveyed habitats that have the potential to support special-status plant species do occur (Appendix 3.7-B, Attachment 1). Although annual grassland is present in the Bakersfield Hybrid Alternative (and in its corresponding segment of the BNSF Alternative) (Table 3.7-6), suitable habitat for most special-status plant species is limited by a number of factors, including fragmentation and disturbance due to development (urbanization) that encompasses residential, commercial, and industrial purposes. Both the Bakersfield Hybrid Alternative and the corresponding BNSF Alternative segment are located in a highly urbanized portion of metropolitan Bakersfield. While suitable habitat is limited, special-status plant species have a moderate potential of being present in unsurveyed suitable habitats (Appendix 3.7-A, Attachment 1). If special-status plant species are present in suitable unsurveyed habitats, construction period impacts of the Bakersfield Hybrid Alternative would directly and indirectly result in temporary impacts on special-status plant species (Appendix 3.7-B, Attachment 1).

The Bakersfield Hybrid Alternative would result in somewhat larger temporary direct impacts on habitats that have the potential to support special-status plant species than would its corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1).

Although no special-status plant species were observed in the Bakersfield Hybrid Alternative, relatively high intensity loss to special-status plant species may occur due to impacts to large amounts of unsurveyed habitats that have the potential to support special-status plant species. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an

effect of substantial intensity under NEPA, and in a significant impact under CEQA, on special-status plant species and their habitats.

Impact Bio #2 – Construction Effects on Special-Status Wildlife Species

Wildlife habitat and land cover types in the construction footprint have the potential to support a variety of special-status wildlife species. Construction activities have the potential to disturb the life cycles of these special-status species. The following section discusses impacts, direct and indirect, to special-status wildlife species and native fauna resulting from construction.

Fifty-four special-status wildlife species were determined to have a low, moderate, or high potential of occurring in at least one HST alternative. Appendix 3.7-A, Attachment 2 lists these species and discusses their potential for occurrence within the HST alternatives. The presence of and potential for special-status wildlife species to occur in a particular habitat is linked to the physical characteristics of the landscape. For instance, amphibians such as the California tiger salamander and western spadefoot toad require standing water to complete their life cycle. However, amphibious species may be linked to aquatic resources for a limited time during their breeding season and may spend significant amounts of time away from aquatic resources. No protocol surveys for special-status wildlife species were conducted. Determinations of the effects on special-status wildlife species assume that if suitable habitat was present, then the associated special-status wildlife species is also present. Observations of special-status wildlife species from 2010 and 2011 field surveys are shown on Figure 3.7-4.

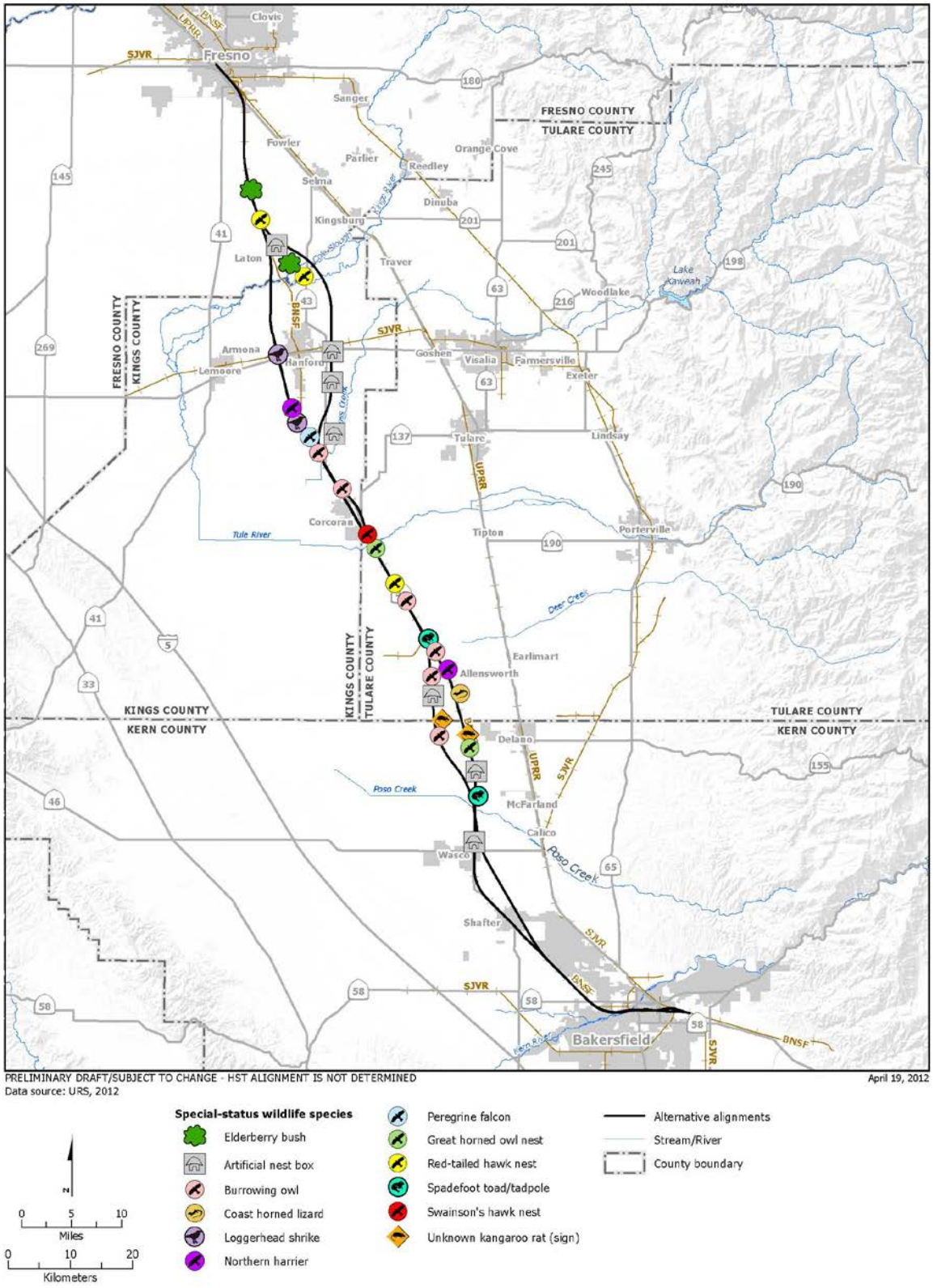

Figure 3.7-4
Special-status species (wildlife) within the Habitat Study Area

Direct (Bio#2) Impacts during Construction Period

Invertebrates: Vernal pool branchiopods (vernal pool tadpole shrimp and vernal pool fairy shrimp) or their cysts could be disturbed, injured, or killed if any construction activity occurs within seasonal wetlands, including vernal pools, when wet or dry. These impacts could also occur as a result of changes in the retention/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. Construction period impacts can alter the watershed of specific vernal pools, which, in turn, could alter seasonal inundation conditions. Valley elderberry longhorn beetles would be directly affected through the damage or removal of elderberry host plants. Removal of young elderberry shrubs would reduce the long-term habitat of the valley elderberry longhorn beetle by inhibiting recruitment of young elderberry shrubs into the canopy.

Amphibians: Direct impacts on amphibian species (including the California tiger salamander and western spadefoot toad) would include construction activities in suitable upland or aquatic habitat that could cause mortality, injury, or harassment of adults, eggs or egg masses, and larvae. Construction may also result in the temporary destruction, degradation, fill, or pollution of aquatic breeding or upland nesting habitats 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 similar to those described for vernal pool branchiopods.

Reptiles: Direct impacts on reptiles (including western pond turtle, silvery legless lizard, San Joaquin whipsnake, and coast horned lizard) include construction activities in suitable habitat that could cause mortality, injury, or harassment of adults, eggs, or juveniles. Construction may also result in the temporary destruction, degradation, or pollution of habitat and the temporary loss of nesting areas, burrows, or other refugia. Mortality, injury, or harassment may also occur if these species become trapped in open, excavated areas. Due to its status as a California Fully Protected species, blunt-nosed leopard lizard may not be subjected to mortality, injury, or entrapment in excavated areas.

Fish: As a direct result of the construction of the HST project, one special-status fish species (i.e., Kern brook lamprey) may be disturbed, injured, or killed, or their waters disturbed, degraded, or polluted by sedimentation, construction equipment spills or leaks, and shading from overhead elevated structures. Direct impacts on the Kern brook lamprey may consist of physical disturbance, interruptions to fish passage, sedimentation, turbidity, altered water temperatures, oxygen depletion, and contaminants. Final bridge design plans are not currently available, but construction may require work below the ordinary high water mark. Dewatering during construction, if needed, may result in the stranding and mortality of special-status fish.

Birds (includes all migratory birds covered under MBTA): Thirty-two special-status bird species have been identified as having a low, moderate, or high potential of occurring in at least one HST alternative (Appendix 3.7-A, Attachment 2). Burrowing owls and other raptors extensively use agricultural lands, annual grasslands, valley foothill riparian (except burrowing owl), alkali desert scrub, irrigated hay field, and pasture land cover types. Construction activities (e.g., grubbing, grading, excavation, and driving off-road) could remove or disturb potential nesting habitat for special-status passerine birds; special-status wading birds; shorebirds; duck species; and migratory birds. Direct impacts may include bird mortality or injury. If construction occurs during the breeding season (February 1 to September 1), active nests could also be disturbed, potentially causing the loss of eggs or developing young (i.e., nest abandonment during the incubation, nestling or fledgling stages of these species).

- Burrowing Owls: Burrowing owls extensively use open landscapes with suitable artificial or natural burrows. Suitable habitat exists along most of the construction footprint. Vibration from construction equipment along with increased vehicular traffic could collapse inhabited burrows. Rodent control programs could directly poison owls as well as reduce the long-term availability of burrows.

- Other Raptors: Raptors may nest in riparian habitat, in roadside trees, in windbreaks, in oak woodlands, and on man-made towers. Several species were identified in the survey area, including Swainson's hawks. Construction disturbance within the February 1 to September 1 breeding season could result in the loss of fertile eggs or nestlings through nest abandonment. Direct impacts on raptors may also include the loss of breeding and foraging habitat, as well as a decline in prey as a result of rodent control programs.

Mammals: Construction activities described above also have the potential to affect special-status mammals, including special-status bats, the San Joaquin kit fox, American badger, and other special-status mammal species.

- Western mastiff bat, western red bat, Townsend's big-eared bat, and pallid bat: Increased lighting after sunset could disrupt foraging activities by special-status bat species, causing them to leave an area that has prolonged disturbance. 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 impacts with construction equipment. Direct impacts on bats could include mortality of individuals during construction and temporary disturbances from noise, dust, and ultrasonic vibrations from construction equipment.

- San Joaquin kit fox: Impacts on San Joaquin kit foxes could occur since this species has the potential to actively use the construction footprint and adjacent areas. Mortality and injury of San Joaquin kit foxes could occur from crushing burrows by construction equipment as well as from vehicle strikes in work areas. Ground disturbance could lead to the temporary loss of foraging habitat. Temporary impacts on unhabituated San Joaquin kit fox could occur from noise, dust, and motion disturbance.

- American badger: Mortality and injury of American badgers could occur from burrows being crushed by construction equipment as well as 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, dust, and motion disturbance.

- Other special-status mammal species: Direct impacts on other special-status mammal species (including Nelson's [San Joaquin] antelope squirrel, Fresno kangaroo rat, Tipton kangaroo rat, Dulzura pocket mouse, and Tulare grasshopper mouse) during construction would be the same as for the San Joaquin kit fox and American badger.

Native fauna: Direct impacts for native fauna (e.g., fish, mollusks, crustaceans, amphibians, birds, mammals, reptiles, and insects) are similar to those impacts described above for special-status wildlife species.

Indirect (Bio#2) Impacts during Construction Period

Invertebrates: Indirect impacts could result from the disturbance and stockpiling of soils contributing to the transportation of sediment loads to adjacent habitats suitable for vernal pool branchiopods. Changes in the contour of the landscape or the disturbance of hardpan soils could cause changes in the hydrological cycles of seasonal wetlands, including vernal pools; could alter the amount and quality of water available above and below ground; and could change the inflow of water to particular pools or decrease or increase inundation. These changes in hydrology could

affect the reproductive success and survival of these species and their food. Chemical spills from construction equipment (e.g., fuel, transmission fluid, lubricating oil, and motor oil) could contaminate the water column, resulting in habitat degradation, reduced reproductive success of vernal pool branchiopods, or branchiopod mortality. Indirect impacts on vernal pool branchiopods may also include the shading of habitats by structures and the inadvertent introduction of nonnative invasive (noxious) weeds such as yellow star thistle (*Centaureum solstitialis*). For valley elderberry longhorn beetle, indirect impacts during construction could include the accumulation of fugitive dust on elderberry host plants, potentially weakening their vigor. In addition, changes to local runoff could have negative effects on the health and vigor of these plants.

Amphibians: Indirect construction period impacts for amphibians are similar to those for vernal pool branchiopods described above. In addition, potential indirect impacts could include abandonment of refugia (e.g., burrows), temporary shifts in foraging patterns or territories, and increased predation as a result of increased noise, light, and ground disturbance where suitable habitat is present.

Reptiles: Indirect impacts on reptiles may include the inadvertent introduction of invasive (noxious) weeds, such as yellow star thistle, which can reduce habitat suitability. Soil compaction and the placement of fill in suitable habitat may indirectly affect special-status reptiles by prohibiting burrowing, or by changing the frequency of vegetative cover. Construction activities may attract opportunistic predators (e.g., ravens, feral cats, raccoons) that may feed on special-status reptiles. Construction activities could result in temporary shifts in foraging patterns or territories, refugia abandonment, and increased predation as a result of increased noise, light, and infrastructure and ground vibrations where suitable habitat is present.

Fish: Indirect impacts on special-status fish may include changes in water quality, which could lead to temporary shifts in foraging patterns or territories. Ground disturbance associated with construction may increase erosion and sedimentation into nearby creeks, rivers, and other waters. Chemical spills from construction equipment (e.g., fuel, transmission fluid, lubricating oil, and motor oil) could contaminate the water column, resulting in habitat degradation or reduced reproductive success of special-status fish in downstream habitats.

Birds (includes all migratory birds covered under MBTA): Indirect impacts during the construction period may include the permanent or temporary displacement of special-status bird species to avoid disturbance (e.g., noise, vibration, visual stimuli); such displacement could also result from the actual fragmentation of the landscape caused by the construction of the HST project components (e.g., security fences, elevated structures, railbeds, and associated facilities). These indirect impacts could interfere with the daily movement, foraging, and dispersal of these bird species. Repeated exposure to disturbance can reduce reproductive success and increase mortality through the exposure of nests to predators and the elements. Indirect impacts could result from repeated disturbance of breeding birds by construction vehicles traveling in work areas.

- Burrowing Owls: Indirect impacts could occur from the loss of habitat due to nonnative plant species, such as yellow star thistle, colonizing the area and from the disruption of breeding activity by repeated disturbance from construction vehicles traveling in work areas.

- Raptors: Indirect impacts during construction on raptors would be the same as the impacts for the avian species described above.

Mammals: Construction activities have the potential to indirectly affect special-status mammals, including special-status bats, San Joaquin kit fox, American badger, and other special-status mammal species.

- Western mastiff bat, western red bat and pallid bat: Ground-disturbing activities, such as excavation, vegetation removal, construction of the rail bed, placement of temporary structures and staging areas, and equipment operation, would result in noise, dust, or vibration disturbance. These disturbances could indirectly disrupt breeding or roosting activity, or result in the temporary loss of foraging habitats.

- San Joaquin kit fox: Temporary habitat conversion could result in shifts in foraging patterns or territories, increased predation, and decreased reproductive success. Indirect impacts could potentially include alteration of soils, such as compaction. Removal of burrowing prey species such as kangaroo rats may impact food availability for this species. The inadvertent introduction of invasive (noxious) weeds, such as yellow star thistle, could reduce habitat suitability for this species.

- American badger: Indirect impacts would be the same as those for the San Joaquin kit fox, as described above.

- Other special-status mammal species: Indirect impacts on other special-status mammal species (including Nelson's [San Joaquin] antelope squirrel, Fresno kangaroo rat, Tipton kangaroo rat, Dulzura pocket mouse, and Tulare grasshopper mouse) during construction would potentially include alteration of soils as a result of compaction. Compaction and the placement of fill would also alter vegetative cover, reducing habitat suitability. The inadvertent introduction of invasive (noxious) weeds, such as yellow star thistle, would reduce habitat value for these species.

Native fauna: Indirect impacts for native fauna (e.g., fish, mollusks, crustaceans, amphibians, birds, mammals, reptiles, and insects) are similar to the impacts described above for special-status wildlife species.

BNSF Alternative

Construction of the BNSF Alternative would result in impacts on a number of special-status wildlife species and on their habitat, as discussed above under direct and indirect impacts on special-status wildlife species. The quantification, based on acreage of potentially suitable habitat affected, of temporary impacts associated with construction period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout and adjacent to the BNSF Alternative varies according to the species' known geographic range and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-6 lists the amount of terrestrial and aquatic habitat (in acres) that could potentially be temporarily affected by the HST alternative alignments.

Invertebrates: Suitable habitat for special-status invertebrate species would be temporarily affected by construction of the BNSF Alternative (Appendix 3.7-B, Attachment 2). Seasonal wetlands and vernal pools may provide suitable habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. An elderberry shrub was identified within the footprint of the BNSF Alternative, and others may occur in unsurveyed areas in Fresno and Kings counties; primarily, along the Kings River, Cole Slough, and Dutch John Slough. Elderberry shrubs may provide suitable habitat for the valley elderberry longhorn beetle, which exclusively uses this shrub as its host plant. Due to the presence of suitable habitat, including sensitive wetland habitat, construction of the BNSF Alternative may result in measurable adverse loss to special-status invertebrate species and their habitat. Therefore, construction of the BNSF Alternative would result in an effect of moderate intensity on special-status invertebrate species and their habitat under NEPA, and a significant impact under CEQA.

Fish: A single special-status fish species (i.e., Kern brook lamprey) may be present in a single location within the BNSF Alternative, the Friant-Kern Canal in Bakersfield. A small amount of marginal habitat (i.e., riverine) for the Kern brook lamprey is present in the Friant-Kern Canal. At this location the BNSF Alternative would be constructed on an elevated structure. Construction of the elevated structure could result in direct and indirect impacts on Kern brook lamprey in a limited area (Appendix 3.7-B, Attachment 2). Kern brook lamprey has a low potential to be temporarily affected, both directly and indirectly, by construction of this alternative. While other streams within the BNSF Alternative may provide suitable habitat for Kern brook lamprey, these streams are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of this species. Due to the limited nature of potential impacts, construction of the BNSF Alternative would result in a slight change from existing biological conditions and little to no regional effects on special-status fish species and their habitat. Therefore, the construction impacts of the BNSF Alternative would result in an effect of negligible intensity on special-status fish species and their habitat under NEPA, and in a less-than-significant impact under CEQA.

Amphibians: Suitable habitat for western spadefoot toad would be temporarily affected by construction of the BNSF Alternative (Appendix 3.7-B, Attachment 2). Potential suitable breeding habitat consists of wetlands and riverine and adjacent upland habitat (e.g., annual grassland and alkali desert scrub). Impacts on this species may occur throughout the BNSF Alternative where suitable aquatic habitat is present. Due to the presence of suitable habitat, including suitable aquatic habitat, construction of the BNSF Alternative may result in measurable adverse loss of habitat that may support special-status amphibian species. Therefore, construction period impacts of the BNSF Alternative would result in an effect of moderate intensity on special-status amphibian species and their habitats under NEPA, and in a significant impact under CEQA.

Reptiles: Suitable habitat for special-status reptiles would be temporarily affected by the construction of the BNSF Alternative (Appendix 3.7-B, Attachment 2). Aquatic habitats—riverine and lacustrine habitats as well as natural upland areas, such as alkali desert scrub and annual grassland—are present. These habitats may support a range of special-status reptiles, including the western pond turtle, blunt-nosed leopard lizard, silvery legless lizard, San Joaquin whipsnake, and coast horned lizard. Due to the presence of large amounts of suitable natural habitats, construction of the BNSF alternative may result in relatively high intensity loss of habitat that may support special-status reptile species. Therefore, the construction impacts of the BNSF Alternative would result in an effect of substantial intensity on special-status reptile species and their habitat under NEPA, and in a significant impact under CEQA.

Birds (including all migratory birds covered under MBTA): A number of habitats known to support special-status birds and raptors would be temporarily affected by construction of the BNSF Alternative (Appendix 3.7-B, Attachment 2). Aquatic habitats (e.g., riverine, lacustrine), annual grassland, valley foothill riparian, and agricultural lands all may provide suitable habitat for a variety of birds and raptors. Due to the presence of large amounts of suitable habitat, construction of the BNSF Alternative may result in relatively high intensity loss of habitat that may support special-status bird species. Therefore, the construction impacts of the BNSF Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status bird and raptor species and their habitat.

Mammals: Suitable habitat for special-status mammals would be temporarily affected by construction of the BNSF Alternative (Appendix 3.7-B, Attachment 2). Natural habitats, such as alkali desert scrub and annual grassland, may support special-status mammals (e.g., American badger, San Joaquin kit fox, and Tipton kangaroo rat). Trees and rocky outcrops in natural habitats as well as trees and buildings in rural and urban areas may support special-status bats. Due to the presence of large amounts of suitable habitat, construction of the BNSF Alternative may result in relatively high intensity loss of habitat that may support special-status mammal

species. Therefore, the construction impacts of the BNSF Alternative would result in an effect of substantial intensity on special-status mammal species and their habitat under NEPA, and in a significant impact under CEQA.

Native fauna: Suitable habitat for native fauna would be temporarily affected by construction of the BNSF Alternative (Table 3.7-6). Suitable habitat for native fauna includes both developed and natural lands. Impacts to these habitats would result in measurable adverse loss to native fauna. Therefore, the construction impacts of the BNSF Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA.

Hanford West Bypass 1 Alternative

Construction of the Hanford West Bypass 1 Alternative at-grade and below-grade options would result in direct and indirect impacts on a number of special-status wildlife species and their habitat. These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The amount of temporary impacts associated with construction period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout the Hanford West Bypass 1 Alternative varies according to the species known geographic range and the presence of suitable habitat capable of supporting the species life history (Appendix 3.7-A, Attachment 2). Table 3.7-6 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be temporarily affected by the HST alignment alternatives.

Both the Hanford West Bypass 1 Alternative and the corresponding segment of the BNSF Alternative are located in a rural setting dominated by agricultural land uses. Construction of the Hanford West Bypass 1 Alternative at-grade and below-grade options would affect slightly more natural habitats (e.g., annual grassland, valley foothill riparian) and much less agricultural and developed habitats than the corresponding segment of the BNSF Alternative. The Hanford West Bypass 1 Alternative at-grade and below-grade options would result in fewer temporary direct impacts on agricultural and developed lands suitable for special-status wildlife species and in slightly more temporary direct impacts on natural habitats suitable for special-status wildlife species (see Table 3.7-6; Appendix 3.7-B, Attachment 2).

Invertebrates: Construction of the Hanford West Bypass 1 Alternative at-grade and below-grade options would not temporarily affect suitable habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Hanford West Bypass 1 Alternative at-grade and below-grade options. This species could be temporarily affected if project activities occur in unsurveyed natural areas that contain elderberry shrubs. However, few natural areas suitable for elderberry shrubs (e.g., valley foothill riparian) are located in the construction footprint of the Hanford West Bypass 1 Alternative at-grade and below-grade options (Table 3.7-6). This species has a low potential to occur in this alternative. Due to the limited amount of suitable habitat present for special-status invertebrates, construction of the Hanford West Bypass 1 Alternative would result in a slight change in biological conditions and little or no regional effects. Therefore, construction period impacts of the Hanford West Bypass 1 Alternative at-grade and below-grade options would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within the Hanford West Bypass 1 Alternative at-grade and below-grade options, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of special-status fish species. Therefore, no direct or indirect impacts on special-status fish would result from construction of this alternative. Construction period impacts of the Hanford West Bypass 1 Alternative at-grade and below-grade

options would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Hanford West Bypass 1 Alternative at-grade and below-grade options contain a small amount of suitable habitat for the western spadefoot toad and California tiger salamander. However, construction period impacts associated with this alternative would result in only small temporary impacts on natural habitats suitable for the western spadefoot toad, and in no temporary impacts on suitable habitat for the California tiger salamander (Appendix 3.7-B, Attachment 2). Portions of the Hanford West Bypass 1 Alternative at-grade and below-grade options in agricultural land uses provide little value or habitat for special-status amphibian species. Due to the limited amount of suitable habitat present for special-status amphibians, construction of the Hanford West Bypass 1 Alternative would result in a slight change in biological conditions and little or no regional effects. Therefore, construction period impacts of the Hanford West Bypass 1 Alternative at-grade and below-grade options would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status amphibian species.

Reptiles: The Hanford West Bypass 1 Alternative at-grade and below-grade options contain suitable habitat (e.g., riverine and annual grassland) for special-status reptile species (e.g., coast horned lizard and western pond turtle) (Appendix 3.7-A, Attachment 2). Portions of the Hanford West Bypass 1 Alternative at-grade and below-grade options in agricultural land uses likely provide little value for special-status reptile species. Special-status reptiles would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts to suitable habitat that may support special-status reptiles due to the construction of the Hanford West Bypass 1 Alternative may result in measureable adverse loss to these species. Therefore, construction period impacts of the Hanford West Bypass 1 Alternative at-grade and below-grade options would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Hanford West Bypass 1 Alternative at-grade and below-grade options contain suitable habitat (including both natural habitats and agricultural land uses) for a variety of special-status birds (Appendix 3.7-A, Attachment 2). Impacts to these habitats due to the construction of the Hanford West Bypass 1 Alternative would result in measureable adverse loss habitat that may support special-status bird species. Therefore, construction period impacts of the Hanford West Bypass 1 Alternative at-grade and below-grade options would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Hanford West Bypass 1 Alternative at-grade and below-grade options contain both natural lands and agricultural lands that provide suitable habitat (e.g., annual grassland) for special-status mammal species (e.g., Tipton kangaroo rat and the San Joaquin kit fox). The agricultural land uses likely provide little value for breeding for special-status mammal species. However, these areas may be suitable for dispersal and foraging activities. Natural lands may provide opportunity for breeding, foraging, dispersal, and migration of the special-status mammal species. Special-status mammals would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts to suitable habitats due to the construction of the Hanford West Bypass 1 Alternative would result in measurable adverse loss to habitat that may support special-status mammal species. Therefore, construction period impacts of the Hanford West Bypass 1 Alternative at-grade and below-grade options would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: Suitable habitat for native fauna would be temporarily affected by construction of the Hanford West Bypass 1 Alternative (Table 3.7-6). Suitable habitat for native fauna includes

both developed and natural lands. Impacts to these habitats would result in measurable adverse loss to native fauna. Therefore, construction period impacts of the Hanford West Bypass 1 Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on native fauna.

Hanford West Bypass 2 Alternative

Construction of the Hanford West Bypass 2 Alternative at-grade and below-grade options would result in direct and indirect impacts on a number of special-status wildlife species and their habitat. These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The amount of temporary impacts associated with construction period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout the Hanford West Bypass 2 Alternative varies according to the species known geographic range and the presence of suitable habitat capable of supporting the species life history (Appendix 3.7-A, Attachment 2). Table 3.7-6 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be temporarily affected by the HST alignment alternatives.

Both the Hanford West Bypass 2 Alternative and the corresponding segment of the BNSF Alternative are located in a rural setting dominated by agricultural land uses. The Hanford West Bypass 2 Alternative at-grade and below-grade options would result in fewer temporary direct impacts on agricultural and developed lands suitable for special-status wildlife species and in slightly more temporary direct impacts on natural habitats suitable for special-status wildlife species (Table 3.7-6; Appendix 3.7-B, Attachment 2).

Invertebrates: Construction of the Hanford West Bypass 2 Alternative at-grade and below-grade options would not temporarily affect suitable habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Hanford West Bypass 2 Alternative at-grade and below-grade options. This species could be temporarily affected if project activities occur in unsurveyed natural areas that contain elderberry shrubs. However, few natural areas suitable for elderberry shrubs (e.g., valley foothill riparian) are located in the construction footprint of the Hanford West Bypass 2 Alternative at-grade and below-grade options (see Table 3.7-6). This species has a low potential to occur in this alternative. Due to the limited amount of suitable habitat present for special-status invertebrates, construction of the Hanford West Bypass 2 Alternative would result in a slight change in biological conditions and little or no regional effects. Therefore, construction period impacts of the Hanford West Bypass 2 Alternative at-grade and below-grade options would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within the Hanford West Bypass 2 Alternative at-grade and below-grade options, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of special-status fish species. Therefore, no direct or indirect impacts on special-status fish would result from construction of this alternative. Construction period impacts of the Hanford West Bypass 2 Alternative at-grade and below-grade options would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Hanford West Bypass 2 Alternative at-grade and below-grade options contain a small amount of suitable habitat for the western spadefoot toad and California tiger salamander. However, construction period impacts associated with this alternative would result in only minor temporary impacts on natural habitats suitable for the western spadefoot toad, and in no temporary impacts on suitable habitat for the California tiger salamander (Appendix 3.7-B,

Attachment 2). Portions of the Hanford West Bypass 2 Alternative at-grade and below-grade options in agricultural land uses provide little value or habitat for special-status amphibian species. Due to the limited amount of suitable habitat present for special-status amphibians, construction of the Hanford West Bypass 2 Alternative would result in a slight change in biological conditions and little or no regional effects. Therefore, construction period impacts of the Hanford West Bypass 2 Alternative at-grade and below-grade options would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status amphibian species.

Reptiles: The Hanford West Bypass 2 Alternative at-grade and below-grade options contain suitable habitat (e.g., riverine and annual grassland) for special-status reptile species (e.g., the coast horned lizard and western pond turtle) (Appendix 3.7-A, Attachment 2). Portions of the Hanford West Bypass 2 Alternative at-grade and below-grade options in agricultural land uses likely provide little value for special-status reptile species. Special-status reptiles would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts to suitable habitat for special-status reptiles due to the construction of the Hanford West Bypass 2 Alternative would result in measureable adverse loss of habitat that may support these species. Therefore, construction period impacts of the Hanford West Bypass 2 Alternative at-grade and below-grade options would result in an effect of moderate intensity under NEPA and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Hanford West Bypass 2 Alternative at-grade and below-grade options contain suitable habitat (including both natural habitats and agricultural land uses) for a variety of special-status birds (Appendix 3.7-A, Attachment 2). Impacts to these habitats due to the construction of the Hanford West Bypass 2 Alternative may result in measureable adverse loss of habitats that may support special-status bird species. Therefore, construction period impacts of the Hanford West Bypass 2 Alternative at-grade and below-grade options would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Hanford West Bypass 2 Alternative at-grade and below-grade options contain both natural lands and agricultures lands that provide suitable habitat (e.g., annual grassland) for special-status mammal species (e.g., the Tipton kangaroo rat and San Joaquin kit fox). The agricultural land uses likely provide little value for breeding for special-status mammal species. However, these areas may be suitable for dispersal and foraging activities. Natural lands may provide opportunities for breeding, foraging, dispersal, and migration of the special-status mammal species. Special-status mammals would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts to suitable habitats due to the construction of the Hanford West Bypass 2 Alternative would result in measurable adverse loss to special-status mammal species or their habitat. Therefore, construction period impacts of the Hanford West Bypass 2 Alternative at-grade and below-grade options would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: Suitable habitat for native fauna would be temporarily affected by construction of the Hanford West Bypass 2 Alternative (Table 3.7-6). Suitable habitat for native fauna includes both developed and natural lands. Impacts to these habitats would result in measurable adverse loss to native fauna. Therefore, construction period impacts of the Hanford West Bypass 2 Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on native fauna.

Corcoran Elevated Alternative

Construction period activities associated with the Corcoran Elevated Alternative would result in direct and indirect project impacts on a number of special-status wildlife species and their habitat. These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The amount of temporary impacts associated with construction period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout the Corcoran Elevated Alternative varies according to the species' known geographic range, and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-6 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be temporarily affected by the HST alternative alignments.

Both the Corcoran Elevated Alternative and the corresponding BNSF Alternative segment are located in the urban areas of Corcoran. Both alternatives would affect small areas of habitat that could support special-status wildlife species; however, these habitats are mainly urban and agricultural lands (Table 3.7-6) which have a low to moderate potential of supporting these species (Appendix 3.7-A, Attachment 2). Construction period activities associated with the Corcoran Elevated Alternative would affect more urban and barren habitats than the corresponding segment of the BNSF Alternative. The magnitude of impacts on natural habitats of the Corcoran Elevated Alternative and the corresponding segment of the BNSF Alternative is similar (Table 3.7-6; Appendix 3.7-B, Attachment 2). However, indirect impacts on these species are substantially less from the Corcoran Elevated Alternative, compared with those of the corresponding BNSF Alternative segment, because the elevated structure will maintain habitat porosity across the alignment.

Invertebrates: Construction of the Corcoran Elevated Alternative would not temporarily affect suitable habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Corcoran Elevated Alternative. This species could be temporarily affected if project activities occur in unsurveyed natural areas that contain elderberry shrubs. However, few natural areas are located in the Corcoran Elevated Alternative (Table 3.7-6). This species has a low potential to occur in this alternative. Construction period impacts of the Corcoran Elevated Alternative would result in no effect under NEPA, and no impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within the Corcoran Elevated Alternative, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement, or because they are outside the range of special-status fish species. Therefore, no direct or indirect impacts on special-status fish would result from construction of this alternative. Construction period impacts of the Corcoran Elevated Alternative would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Corcoran Elevated Alternative occurs mainly in urban and agricultural lands but does include only a small amount of suitable habitat (e.g., riverine) (Table 3.7-6) for western spadefoot toad. Portions of the Corcoran Elevated Alternative in agricultural and urban land uses likely provide little value for western spadefoot toad. Western spadefoot toad has a low potential of being temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). The Corcoran Elevated Alternative contains a small amount of suitable upland habitat for the California tiger salamander. However, construction period impacts associated with this alternative would result in no temporary impacts on suitable habitat for the California tiger salamander (Appendix 3.7-B, Attachment 2). Due to the limited amount of suitable habitat for special-status amphibians, construction of the Corcoran Elevated Alternative would result in a slight change from existing biological conditions and little to no regional effects.

Therefore, construction period impacts of the Corcoran Elevated Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status amphibian species.

Reptiles: The Corcoran Elevated Alternative occurs mainly in urban and agricultural lands and includes only a small amount of natural upland and aquatic habitat (Table 3.7-6) potentially suitable for special-status reptile species (e.g., coast horned lizard and western pond turtle) (Appendix 3.7-A, Attachment 2). Portions of the Corcoran Elevated Alternative in agricultural and urban land uses likely provide little value for special-status reptile species. Special-status reptiles have a low potential of being temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Due to the limited amount of suitable habitat for special-status reptiles, construction of the Corcoran Elevated Alternative would result in a slight change from existing biological conditions and little to no regional effects. Therefore, construction period impacts of the Corcoran Elevated Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Corcoran Elevated Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for a variety of special-status birds (Appendix 3.7-A, Attachment 2). Special-status birds would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts to these habitats due to the construction of the Corcoran Elevated Alternative would result in measureable adverse loss to special-status bird species or their habitat. Therefore, construction period impacts of the Corcoran Elevated Alternative would result in an effect of moderate intensity under NEPA and in significant impact under CEQA on special-status bird species.

Mammals: The Corcoran Elevated Alternative contains both natural lands (e.g., annual grassland) and agricultural lands that provide suitable habitat for special-status mammal species (e.g., Tipton kangaroo rat and the San Joaquin kit fox). The agricultural land uses likely provide little value for breeding for special-status mammal species. However, these areas may be suitable for dispersal and foraging activities. Natural lands may provide opportunity for breeding, foraging, dispersal, and migration of the special-status mammal species. Special-status mammals would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Appendix 2). Impacts to suitable habitats due to the construction of the Corcoran Elevated Alternative would result in measurable adverse loss of habitats that may support special-status mammal species. Therefore, construction period impacts of the Corcoran Elevated Alternative would result in an effect of moderate intensity under NEPA, and in significant impact under CEQA on special-status mammal species.

Native fauna: Suitable habitat for native fauna would be temporarily affected by construction of the Corcoran Elevated Alternative (Table 3.7-6). Suitable habitat for native fauna includes both developed and natural lands. Impacts to these habitats would result in measurable adverse loss to native fauna. Therefore, construction period impacts of the Corcoran Elevated Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on native fauna.

Corcoran Bypass Alternative

Construction of the Corcoran Bypass Alternative would result in minor direct and indirect impacts on a number of special-status wildlife species and their habitat. These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The amount of temporary impacts associated with construction period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout the

Corcoran Bypass Alternative varies according to the species known geographic range and the presence of suitable habitat capable of supporting the species life history (Appendix 3.7-A, Attachment 2). Table 3.7-6 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be temporarily affected by the HST alignment alternatives.

The segment of the BNSF Alternative that corresponds to the Corcoran Bypass Alternative would run through the urban areas of Corcoran and, in some instances, through annual grasslands adjacent to SR 43 and the BNSF Railway right-of-way, while the Corcoran Bypass Alternative would affect annual grasslands that would provide higher habitat value for special-status species (Appendix 3.7-B, Attachment 2; Table 3.7-6). Construction period activities associated with the Corcoran Bypass Alternative would have slightly more impacts on natural, urban, and agricultural lands than the corresponding segment of the BNSF Alternative (see Table 3.7-6). The Corcoran Bypass Alternative would also create a new transportation alignment in these habitats, resulting in greater indirect impacts (i.e., habitat fragmentation) than would the BNSF Alternative, which follows existing transportation alignments. Both the Corcoran Bypass Alternative and the corresponding BNSF Alternative segment would run through areas in the vicinity of Cross Creek and the Tulare Lakebed Mitigation Site.

Invertebrates: Construction of the Corcoran Bypass Alternative would not temporarily affect suitable habitat (e.g., vernal pool or seasonal wetland) for vernal pool fairy shrimp and vernal pool tadpole shrimp. Construction of the Corcoran Bypass Alternative would temporarily affect a small area of suitable habitat (e.g., valley foothill riparian [elderberry shrubs]) for the valley elderberry longhorn beetle. Due to the limited amount of suitable habitat present for special-status invertebrates, construction of the Corcoran Bypass Alternative would result in a slight change from existing biological conditions and little to no regional effects. Therefore, construction period impacts of the Corcoran Bypass Alternative would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within the Corcoran Bypass Alternative, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of special-status fish species. Therefore, no direct or indirect impacts on special-status fish would result from construction of this alternative. Construction period impacts of the Corcoran Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Corcoran Bypass Alternative includes suitable habitat for the western spadefoot toad and California tiger salamander. However, construction period impacts associated with this alternative would result in only minor temporary impacts on natural habitats suitable for the western spadefoot toad, and in no temporary impacts on suitable habitat for the California tiger salamander (Appendix 3.7-A, Attachment 2). Due to the limited amount of suitable habitat present for special-status amphibians, construction of the Corcoran Bypass Alternative would result in a slight change from existing biological conditions and little to no regional effects. Therefore, construction period impacts of the Corcoran Bypass Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant significant impact under CEQA on special-status amphibian species.

Reptiles: The Corcoran Bypass Alternative contains suitable habitat (e.g., riverine and annual grassland) for special-status reptile species (e.g., coast horned lizard and western pond turtle) (Appendix 3.7-A, Attachment 2). However, construction period impacts associated with this alternative would result in only minor temporary impacts on natural habitats and agricultural lands suitable for special-status reptile species. Due to the limited amount of suitable habitat present for special-status reptiles, construction of the Corcoran Bypass Alternative would result in

a slight change from existing biological conditions and little to no regional effects. Therefore, construction period impacts of the Corcoran Bypass Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Corcoran Bypass Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for a variety of special-status birds (Appendix 3.7-A, Attachment 2). Due to the considerable amount of suitable habitat present, construction of the Corcoran Bypass Alternative may result in relatively high intensity loss of special-status bird species and their habitats. Therefore, construction period impacts of the Corcoran Bypass Alternative would result in an effect of substantial intensity under NEPA, and in significant impact under CEQA on special-status bird species.

Mammals: The Corcoran Bypass Alternative contains both natural lands and agricultures lands that provide suitable habitat (e.g., annual grassland) for special-status mammal species (e.g., Tipton kangaroo rat and the San Joaquin kit fox). Due to the considerable amount of suitable habitat present, construction of the Corcoran Bypass Alternative may result in relatively high intensity loss of special-status mammal species and their habitats. Therefore, construction period impacts of the Corcoran Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: Suitable habitat for native fauna would be temporarily affected by construction of the Corcoran Bypass Alternative (Table 3.7-6). Suitable habitat for native fauna includes both developed and natural lands. Impacts to these habitats would result in measurable adverse loss to native fauna. Therefore, construction period impacts of the Corcoran Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on native fauna.

Allensworth Bypass Alternative

Construction of the Allensworth Bypass Alternative would result in direct and indirect impacts on a number of special-status wildlife species and their habitat. These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The amount of temporary impacts associated with construction period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout the Allensworth Bypass Alternative varies according to the species known geographic range and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-6 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be temporarily affected by the HST alternative alignments.

Construction of the Allensworth Bypass Alternative at-grade and below-grade options would affect slightly more agricultural lands suitable for special-status wildlife species than the corresponding segment of the BNSF Alternative. During the construction period, the magnitude of impacts on natural habitats of the Allensworth Bypass Alternative and the corresponding segment of the BNSF Alternative segment is similar (Table 3.7-6).

Invertebrates: Construction of the Allensworth Bypass Alternative would not temporarily affect suitable habitat (e.g., vernal pool or seasonal wetland) for vernal pool fairy shrimp and vernal pool tadpole shrimp. Construction of the Allensworth Bypass Alternative would temporarily affect a small amount of suitable habitat (e.g., valley foothill riparian [elderberry shrubs]) for the valley elderberry longhorn beetle. Due to the limited amount of suitable habitat present for special-status invertebrates, construction of the Allensworth Bypass Alternative would result in a slight change from existing biological conditions and little to no regional effects. Therefore, construction period impacts of the Allensworth Bypass Alternative would result in an effect of negligible

intensity under NEPA, and a less-than-significant impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within Allensworth Bypass Alternative, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement, or because they are outside the range of special-status fish species. Therefore, no temporary direct or indirect impacts on special-status fish would result from construction of this alternative (Appendix 3.7-B, Attachment 2). Construction period impacts of the Allensworth Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Allensworth Bypass Alternative contains a small amount of suitable upland habitat for the western spadefoot toad. Construction period impacts associated with this alternative would result in only minor temporary impacts on natural habitats suitable for this species (Appendix 3.7-B, Attachment 2). Due to the limited amount of suitable habitat present for special-status amphibians, construction of the Allensworth Bypass Alternative would result in a slight change from existing biological conditions and little to no regional effects. Therefore, construction period impacts of the Allensworth Bypass Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on this special-status amphibian species.

Reptiles: The Allensworth Bypass Alternative contains a small amount suitable habitat for special-status reptile species. Construction period impacts associated with this alternative would result in temporary impacts on habitats suitable for these species (Appendix 3.7-B, Attachment 2). Impacts to these habitats due to the construction of the Allensworth Bypass Alternative would result in a measureable adverse loss of habitat that may support special-status reptiles. Therefore, construction period impacts of the Allensworth Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Allensworth Bypass Alternative contains suitable habitat (e.g., agricultural land uses) for migratory birds and special-status birds (Appendix 3.7-A, Attachment 2). Special-status birds would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts to these habitats due to the construction of the Allensworth Bypass Alternative would result in measureable adverse loss of habitat that may support special-status bird species. Therefore, construction period impacts of the Allensworth Bypass Alternative would result in an effect of moderate intensity under NEPA, and in significant impact under CEQA on special-status bird species.

Mammals: The Allensworth Bypass Alternative contains suitable habitat (e.g., agricultural land uses) for special-status mammals, including the San Joaquin kit fox, American badger, and Tipton kangaroo rat. The agricultural land uses likely provide little value for breeding for special-status mammal species. However, these areas may be suitable for dispersal and foraging activities. Special-status mammals would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts to suitable habitats due to the construction of the Allensworth Bypass Alternative would result in measureable adverse loss to special-status mammal species or their habitat. Therefore, construction period impacts of the Allensworth Bypass Alternative would result in an effect of moderate intensity under NEPA, and in significant impact under CEQA on special-status mammal species.

Native fauna: Suitable habitat for native fauna would be temporarily affected by construction of the Allensworth Bypass Alternative (Table 3.7-6). Suitable habitat for native fauna includes both developed and natural lands. Impacts to these habitats would result in measurable adverse loss

to native fauna. Therefore, construction period impacts of the Allensworth Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on native fauna.

Wasco-Shafter Bypass Alternative

Construction of the Wasco-Shafter Bypass Alternative would result in direct and indirect impacts on a number of special-status wildlife species and their habitat. These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The amount of temporary impacts associated with construction period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout the Wasco-Shafter Bypass Alternative varies according to the species' known geographic range, and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-6 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be temporarily affected by the HST alternative alignments.

Construction of the Wasco-Shafter Bypass Alternative would affect fewer agricultural lands and urban areas suitable for special-status wildlife species than the corresponding segment of the BNSF Alternative. Construction activities would affect a similar number of or slightly fewer natural habitats suitable for special-status wildlife species than the corresponding segment of the BNSF Alternative (Table 3.7-6; Appendix 3.7-B, Attachment 2).

Invertebrates: The Wasco-Shafter Bypass Alternative does not contain suitable habitat (e.g., vernal pools) for vernal pool fairy shrimp and vernal pool tadpole shrimp, and therefore there would be no temporary effects on suitable habitat for these species. Construction of the Wasco-Shafter Bypass Alternative would not temporarily affect suitable habitat (e.g., valley foothill riparian [elderberry shrubs]) for the valley elderberry longhorn beetle. Construction period impacts of the Wasco-Shafter Bypass Alternative would result in no effect under NEPA, and in no impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within the Wasco-Shafter Bypass Alternative, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of special-status fish species. Therefore, no direct or indirect impacts on special-status fish would result from construction of this alternative. Construction period impacts of the Wasco-Shafter Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Wasco-Shafter Bypass Alternative contains a small amount of suitable upland habitat for the western spadefoot toad. Construction period impacts associated with this alternative would result in only minor temporary impacts on natural habitats suitable for this species (Appendix 3.7-B, Attachment 2). Due to the limited amount of suitable habitat present for special-status amphibians, construction of the Wasco-Shafter Bypass Alternative would result in a slight change from existing biological conditions and little or no regional effects. Therefore, construction period impacts of the Wasco-Shafter Bypass Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on this special-status amphibian species.

Reptiles: The Wasco-Shafter Bypass Alternative contains a small amount of suitable habitat for special-status reptile species. Construction period impacts associated with this alternative would result in only minor temporary impacts on habitats suitable for these species (Appendix 3.7-B, Attachment 2). Due to the limited amount of suitable habitat present for special-status reptiles, construction of the Wasco-Shafter Bypass Alternative would result in a slight change from existing biological conditions and little or no regional effects. Therefore, construction period

impacts of the Wasco-Shafter Bypass Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Wasco-Shafter Bypass Alternative contains suitable habitat (e.g., agricultural land uses) for special-status birds along much of its length. Special-status birds would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts to suitable habitats due to the construction of the Wasco-Shafter Bypass Alternative would result in measureable adverse loss of habitat that may support special-status bird species. Therefore, construction period impacts of the Wasco-Shafter Bypass Alternative would result in an effect of moderate intensity under NEPA, and in significant impact under CEQA on special-status bird species.

Mammals: The Wasco-Shafter Bypass Alternative contains suitable habitat (e.g., agricultural land uses) for special-status mammals (Appendix 3.7-A, Attachment 2). The agricultural land uses likely provide little value for breeding for special-status mammal species. However, these areas may be suitable for dispersal and foraging activities. Special-status mammals would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts to suitable habitats due to the construction of the Wasco-Shafter Bypass Alternative would result in measureable adverse loss of habitat that has limited potential to support special-status mammal species. Therefore, construction period impacts of the Wasco-Shafter Bypass Alternative would result in an effect of moderate intensity under NEPA, and in significant impact under CEQA on special-status mammal species.

Native fauna: Suitable habitat for native fauna would be temporarily affected by construction of the Wasco-Shafter Bypass Alternative (Table 3.7-6). Suitable habitat for native fauna includes both developed and natural lands. Impacts to these habitats would result in measurable adverse loss to native fauna. Therefore, construction period impacts of the Wasco-Shafter Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on native fauna.

Bakersfield South Alternative

Construction of the Bakersfield South Alternative would result in direct and indirect impacts on a number of special-status wildlife species and their habitat. These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The amount of temporary impacts associated with construction period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout Bakersfield South Alternative varies according to the species' known geographic range, and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-6 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be temporarily affected by the HST alternative alignments.

Both the Bakersfield South Alternative and the corresponding BNSF Alternative segment are located in a highly urbanized portion of metropolitan Bakersfield. Both alternatives would affect small areas of habitat that could support special-status wildlife species. The magnitude of these impacts is similar.

Invertebrates: Construction of the Bakersfield South Alternative would not impact suitable habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Bakersfield South Alternative. However, this species would be affected, if present, in areas where construction activities occur in unsurveyed natural areas along the Kern River where the host plant could be found. However, construction period impacts associated with this alternative would result in only minor temporary impacts on natural habitats. Due to the limited amount of suitable habitat

present for special-status invertebrates, construction of the Bakersfield South Alternative would result in a slight change from existing biological conditions and little or no regional effects. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status invertebrate species.

Fish: Within the footprint of the Bakersfield South Alternative, a small amount of marginal habitat (i.e., riverine) for the Kern brook lamprey is present in the Friant-Kern Canal. However, the construction period would not result in temporary effects on this habitat. Due to the limited amount of suitable habitat present for special-status fish, construction of the Bakersfield South Alternative would result in a slight change from existing biological conditions and little or no regional effects. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA on special-status fish species.

Amphibians: The Bakersfield South Alternative contains limited suitable habitat (e.g., riverine, alkali desert scrub, and annual grassland) that may support western spadefoot toad (Appendix 3.7-A, Attachment 2). Because suitable habitats in the Bakersfield South Alternative are small and fragmented, the potential for special-status amphibians to occur may be limited. Due to the presence of suitable habitat, including aquatic habitat, construction of the Bakersfield South Alternative would result in measureable adverse loss of habitat that has limited potential to support special-status amphibians. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of moderate effect under NEPA, and in a significant impact under CEQA on special-status amphibian species.

Reptiles: The Bakersfield South Alternative contains suitable habitat (e.g., annual grassland and alkali desert scrub) for special-status reptiles, including coast horned lizard. Because suitable habitats in the Bakersfield South Alternative are fragmented, the potential for special-status reptiles to occur may be limited. Special-status reptiles would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-A, Attachment 2). Due to the considerable amount of natural habitat present, construction of the Bakersfield South Alternative would result in a relatively high intensity loss of habitat that has limited potential to support special-status reptiles. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status reptile species, because of the temporary direct and indirect impacts on special-status reptile species and their habitats.

Birds (includes all migratory birds covered under MBTA): The Bakersfield South Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for a variety of special-status birds, including burrowing owl. The natural areas provide suitable habitat for breeding, foraging, and migration stopover habitat. Special-status bird species and their habitat would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Due to the considerable amount of suitable habitat present, construction of the Bakersfield South Alternative would result in relatively high intensity loss of habitat that may support special-status bird species. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status bird species, because of the temporary direct and indirect impacts on special-status bird species and their habitats.

Mammals: The Bakersfield South Alternative contains suitable habitat (i.e., annual grasslands, valley foothill riparian, barren), for special-status mammals, including San Joaquin Kit fox and special-status bats. In addition, urban land uses in Bakersfield are utilized by the San Joaquin kit fox. Special-status mammals would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Due to the considerable amount

of suitable habitat present, construction of the Bakersfield South Alternative would result in relatively high intensity loss of special-status mammal species and their habitats. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status mammal species, because of the temporary direct and indirect impacts on special-status mammal species and their habitats.

Native fauna: Suitable habitat for native fauna would be temporarily affected by construction of the Bakersfield South Alternative (Table 3.7-6). Suitable habitat for native fauna includes both developed and natural lands. Impacts to these habitats would result in measurable adverse loss to native fauna. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on native fauna.

Bakersfield Hybrid Alternative

Construction of the Bakersfield Hybrid Alternative would result in direct and indirect impacts on a number of special-status wildlife species and their habitat. These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The amount of temporary impacts associated with construction period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout Bakersfield Hybrid Alternative varies according to the species' known geographic range and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-6 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be temporarily affected by the HST alternative alignments.

Both the Bakersfield Hybrid Alternative and the corresponding segment of the BNSF Alternative are located in a highly urbanized portion of metropolitan Bakersfield. Both alternatives would affect small areas of habitat that could support special-status wildlife species. The magnitude of these impacts is similar.

Invertebrates: Construction of the Bakersfield Hybrid Alternative would not impact suitable habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Bakersfield Hybrid Alternative. However, this species would be affected, if present, in areas where construction activities occur in unsurveyed natural areas along the Kern River where the host plant could be found. However, construction period impacts associated with this alternative would result in only minor temporary impacts on natural habitats. Due to the limited amount of suitable habitat present for special-status invertebrates, construction of the Bakersfield Hybrid Alternative would result in a slight change from existing environmental conditions and little or no regional effects. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status invertebrate species.

Fish: Within the footprint of the Bakersfield Hybrid Alternative, a small amount of marginal habitat (i.e., riverine) for the Kern brook lamprey is present in the Friant-Kern Canal. The construction period would result in minor temporary effects on this habitat. Due to the limited amount of suitable habitat present for special-status fish, construction of the Bakersfield Hybrid Alternative would result in a slight change from existing environmental conditions and little or no regional effects. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status fish species.

Amphibians: The Bakersfield Hybrid Alternative contains limited suitable habitat (e.g., riverine, alkali desert scrub, and annual grassland) that may support western spadefoot toad (Appendix 3.7-A, Attachment 2). Because suitable habitats in the Bakersfield Hybrid Alternative are small and fragmented, the potential for special-status amphibians to occur may be limited. Due to the presence of suitable habitat, including aquatic habitat, construction of the Bakersfield Hybrid Alternative would result in a measureable adverse loss of habitat that has limited potential to support special-status amphibians. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status amphibian species.

Reptiles: The Bakersfield Hybrid Alternative contains suitable habitat (e.g., annual grassland and alkali desert scrub) for special-status reptiles, including coast horned lizard. Because suitable habitats in the Bakersfield Hybrid Alternative are small and fragmented, the potential for special-status reptiles to occur may be limited. Special-status reptiles would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-A, Attachment 2). Due to the considerable amount of natural habitat present, construction of the Bakersfield Hybrid Alternative would result in a relatively high intensity loss of habitat that has limited potential to support special-status reptiles. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Bakersfield Hybrid Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for a variety of special-status birds, including burrowing owl. The natural areas provide suitable habitat for breeding, foraging, and migration stopover habitat. Special-status bird species and their habitat would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Due to the considerable amount of natural habitat present, construction of the Bakersfield Hybrid Alternative would result in a relatively high intensity loss of habitat that may support special-status birds. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Bakersfield Hybrid Alternative contains suitable habitat (i.e., annual grasslands, valley foothill riparian, barren), for special-status mammals, including San Joaquin Kit fox and special-status bats. In addition, urban land uses in Bakersfield are utilized by the San Joaquin kit fox. Special-status mammals would be temporarily affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Due to the considerable amount of natural habitat present, construction of the Bakersfield Hybrid Alternative would result in a relatively high intensity loss to special-status mammals. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: Suitable habitat for native fauna would be temporarily affected by construction of the Bakersfield Hybrid Alternative (Table 3.7-6). Suitable habitat for native fauna includes both developed and natural lands. Impacts to these habitats would result in measurable adverse loss to native fauna. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on native fauna.

Impact Bio #3 – Construction Effects on Habitats of Concern

As described in Section 3.7.4, habitats of concern occurring within the various study areas include special-status plant communities, jurisdictional waters, conservation areas, and protected trees (Figures 3.7-1a through 3.7-1d). Attachments 3, 4, and 5 of Appendix 3.7-B provide a

comparison of impacts on habitats of concern by alternative. The HST alternatives were selected over time to avoid sensitive biological resources and/or to provide project design features, such as elevated sections, to minimize direct effects while accommodating operation requirements.

Direct (Bio#3) Impacts during Construction Period

Construction activities within and adjacent to temporary impact areas of the construction footprint would have direct impacts on habitats of concern. These impacts would include removal or disruption (i.e., trampling and crushing) of special-status plant communities by construction vehicles and personnel. With respect to vegetation removal, it should be noted that vegetation within the HST right-of-way would be permanently removed. However, adjacent vegetation requiring removal to accommodate construction operations (i.e., access and laydown area) would be restored after construction activities are completed.

Direct construction impacts on jurisdictional waters include the placement of temporary fill during construction in both man-made and natural jurisdictional waters. Construction staging areas are planned adjacent to seasonal riverine features to facilitate construction of elevated structures, and are also planned where bridges are proposed at at-grade crossings. Temporary fill would be placed during the construction of access roads and staging/equipment storage areas. This fill would result in a temporary loss of jurisdictional waters; potential impacts on the physical, chemical and biological characteristics of aquatic substrates and food webs; and a potential increase in erosion and sediment transport into adjacent aquatic areas. The origin of these fill materials has yet to be determined; however, the temporary fill would be supplied by local sources and from existing permitted quarries, to the extent practicable. Fill material would be suitable for construction purposes and free from toxic pollutants in toxic amounts in accordance with Section 307 of the Clean Water Act.

Direct construction impacts on federal recovery plan areas include the creation of temporary partial or total movement barriers to special-status species, the loss or degradation of special-status plant and wildlife species, and the loss or degradation of the lands that could support or provide habitat for these species.

Construction activities could directly affect biological resources associated with the Allensworth ER, as described in Section 3.7.5.3, High-Speed Train Alternatives, Construction Period Impacts, Special-Status Plant Species); in Section 3.7.5.3, High-Speed Train Alternatives, Construction Period Impacts, Special-Status Wildlife Species; and in the discussions of jurisdictional waters in Section 3.7.5.3, High-Speed Train Alternatives, Construction Period Impacts, Habitats of Concern). However, because of the proximity of the alignment alternatives to existing linear features (e.g., BNSF and SR 43) the biological resources are likely to be only indirectly affected.

Construction activities could interfere with, disturbs, or conflict with the objectives, goals, and/or provisions of the MBHCP and could, therefore, result in a direct impact on this plan.

Construction of the HST project would result in the temporary removal or modification of protected trees within the construction footprint, which could conflict with the objectives, goals, and/or provisions identified in approved local, regional, or state conservation plans. Where the alignment is at-grade, removal or trimming of all protected trees is anticipated. Where the alignment is on an elevated structure in urban areas (the location of the majority of the landscaped ornamental trees), trimming and limited removal of protected trees would occur.

Indirect (Bio #3) Impacts during Construction Period

Indirect impacts would include contamination of habitats of concern outside the construction footprint from construction equipment leaks; construction dust reducing photosynthetic capability

(especially during flowering periods); and an increased risk of fire (e.g., construction equipment use and smoking by construction workers) in adjacent open spaces.

Temporary indirect construction impacts on special-status plant communities would include fragmentation and introduction of nonnative, invasive plant species. These changes would result in decreased viability and gradual loss of special-status plant communities. Fragmentation would result from the construction of temporary features, especially linear features, including access roads that bisect special-status plant communities. Construction activities could facilitate the spread of nonnative invasive plant species through introduction of seeds by construction equipment, vehicles, and personnel.

Potential indirect impacts on jurisdictional waters include a number of water-quality-related impacts: erosion, siltation, and runoff into natural and constructed water features and fill downstream of the construction footprint. These discharges would have a temporary indirect adverse impact on adjacent or downstream jurisdictional waters. Indirect impact acreages on jurisdictional waters reported in this document represent the combined sum of indirect impact acreages for both construction period and project impacts. Project indirect impacts on jurisdictional waters are more extensive than and tend to encompass the construction period impacts. Therefore, the construction period indirect impact acreages reported for jurisdictional waters overestimate the actual anticipated indirect impact.

Indirect construction impacts on federal recovery plan areas would include fragmentation of satellite areas and linkages where recovery areas are crossed by temporary construction activities (e.g., staging areas and access roads) and disturbance of natural lands within recovery areas that reduces habitat value for species recovery.

Indirect construction impacts on the Allensworth ER would be similar to those described in Section 3.7.5.3, High-Speed Train Alternatives, Construction Period Impacts, Special-Status Plant Species; in Section 3.7.5.3, High-Speed Train Alternatives, Construction Period Impacts, Special-Status Wildlife Species; and in the discussions of jurisdictional waters in Section 3.7.5.3, High-Speed Train Alternatives, Construction Period Impacts, Habitats of Concern).

BNSF Alternative

Special-Status Plant Communities

Eight special-status plant communities are present within the BNSF Alternative: iodine bush scrub, alkali goldenbush scrub, bush seepweed scrub, saltgrass flats, Fremont cottonwood forest, black willow thickets, red willow thickets, and other natural lands (including valley foothill riparian areas). In addition to the special-status plant communities that have been observed, a number of special-status plant communities could occur in unsurveyed habitats that have the potential to support special-status plant communities where permission to enter was not available. Impacts on special-status plant communities would occur as described above under the direct and indirect impacts on habitats of concern. Minimal temporary impacts would occur within areas known to contain bush seepweed scrub, saltgrass flats, black willow thickets, and valley foothill riparian; substantial impacts would occur in unsurveyed habitats that may support special-status plant communities (Appendix 3.7-B, Attachment 3).

The impacts to known special-status plant communities and unsurveyed habitats that may support special-status plant communities would result in relatively high intensity loss to special-status plant communities. Therefore, construction period impacts of the BNSF Alternative would have an effect of substantial intensity on special-status plant communities and their habitats under NEPA. The impact would be significant under CEQA.

Jurisdictional Waters

Wetlands and other waters, including seasonal wetlands, vernal pools and swales, canals/ditches, lacustrine, and riverine features are present throughout the BNSF Alternative. Direct and indirect impacts would occur during construction of the BNSF Alternative, resulting in the temporary disturbance of jurisdictional waters (Table 3.7-7; Appendix 3.7-B, Attachment 4).

Because of the sensitivity of vernal pools and swales to direct impacts, temporary impacts on these jurisdictional waters are considered permanent and are therefore only discussed under the project impacts.

Temporary construction areas would result in direct and indirect impacts on the adjacent seasonal riverine features. Specifically, temporary construction areas are located immediately adjacent to the Kings River complex (Cole Slough, Dutch John Slough, and Kings River), Tule River, and Kern River. Additional discussions specific to impacts on major surface water features are provided in Section 3.8, Hydrology and Water Resources (see Section 3.8.5.3, High-Speed Train Alternatives, Construction Period Impacts, Common Surface Water Impacts).

Impacts on jurisdictional waters, especially natural features such as riparian and seasonal riverine, would result in influential regional effects and high intensity loss to jurisdictional waters. Therefore, construction period impacts of the BNSF Alternative would have an effect of substantial intensity on jurisdictional waters under NEPA. The impact would be significant under CEQA.

Conservation Areas

Recovery Plans

The BNSF Alternative overlaps the planning area for one recovery plan, *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the BNSF Alternative occurs in satellite and linkage areas identified in the recovery plan. Construction of the BNSF Alternative would result in temporary impacts on the recovery plan areas identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Appendix 3.7-B, Attachment 5).

Due to the large area of impact, construction of the BNSF Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, construction period impacts of the BNSF Alternative would result in an effect of substantial intensity on recovery plans under NEPA, and in a significant impact under CEQA.

Allensworth Ecological Reserve

In southern Tulare County, the BNSF Alternative would overlap the eastern boundary of the Allensworth ER. No temporary direct or indirect impacts on the Allensworth ER are anticipated as a result of construction activities (Appendix 3.7-B, Attachment 5).

Construction period impacts of the BNSF Alternative would have no effect on the Allensworth ER under NEPA, and no impact under CEQA.

Table 3.7-7
Comparison of Construction Period Impacts on Jurisdictional Waters by Alternative

Wetlands and Other Waters (TYPE/HST water type)	Impact Type[A]	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Acreage / Difference Compared to Corresponding BNSF Area[B]										
Emergent wetland	*Construction*	—	—	—	—	—	—	—	—	—	—	—
	Indirect	<0.01	0.59 / +0.59	0.59 / +0.59	0.92 / +0.92	0.92 / +0.92	—	—	—	—	— / -<0.01	<0.01 / 0.00
Seasonal wetland	*Construction*	*0.82*	—	—	—	—	—	—	*— / -0.16*	—	—	—
	Indirect	40.13	0.45 / +0.45	0.45 / +0.45	0.45 / +0.45	0.45 / +0.45	2.14 / -0.05	0.13 / -2.06	10.75 / -22.69	—	0.55 / -0.08	0.55 / -0.08
Vernal pools and swales	*Construction*	—	—	—	—	—	—	—	—	—	—	—
	Indirect Bisect	23.88	—	—	—	—	4.76 / -0.73	— / -5.49	1.73 / -15.52	—	—	—
	Indirect	38.61	—	—	—	—	1.78 / +1.19	1.56 / +0.97	11.58 / -20.75	—	—	—
Canals/Ditches	*Construction*	*3.50*	*0.11 / -0.39*	*0.11 / -0.39*	*0.21 / -0.29*	*0.21 / -0.29*	*0.90 / +0.02*	*1.02 / +0.14*	—	*0.06 / +0.04*	*1.03 / +0.46*	*0.98 / +0.41*
	Indirect	75.18	21.61 / +8.75	20.86 / +8.00	21.53 / +8.68	20.78 / +7.92	19.16 / +8.24	14.13 / +3.20	24.12 / -0.72	5.82 / -1.99	11.89 / +2.26	11.63 / +1.99
Lacustrine	*Construction*	*7.53*	—	—	—	—	—	*3.55 / +3.55*	*2.45 / +1.14*	*1.10 / -1.50*	*1.91 / -0.64*	*1.91 / -0.64*
	Indirect	139.66	6.34 / +1.91	0.79 / -3.64	17.61 / +13.18	12.05 / +7.62	11.37 / +0.11	8.09 / -3.16	104.37 / +14.06	6.52 / -5.23	4.35 / -4.16	4.04 / -4.47
Seasonal riverine	*Construction*	*0.92*	*0.50 / +0.50*	*0.50 / +0.50*	*0.50 / +0.50*	*0.50 / +0.50*	—	*0.14 / +0.14*	*0.10 / +0.08*	—	*0.65 / -0.26*	*0.64 / -0.26*
	Indirect	36.63	5.32 / -8.81	4.74 / -9.40	5.40 / -8.73	4.81 / -9.32	0.80 / -0.17	2.72 / +1.75	1.27 / -0.28	—	12.40 / -7.58	12.40 / -7.58
Riparian	*Construction*	*0.24*	*0.82 / +0.74*	*0.82 / +0.74*	*0.82 / +0.74*	*0.82 / +0.74*	—	*0.47 / +0.47*	*0.17 / +0.14*	—	*0.34 / +0.22*	*0.36 / +0.24*
	Indirect	30.94	9.09 / -8.56	9.04 / -8.61	9.09 / -8.56	9.04 / -8.61	1.02 / -0.11	1.84 / +0.70	2.59 / -1.40	—	3.67 / -4.49	3.66 / -4.50

Notes:
— = No impact or not applicable
[A] Indirect impacts are calculated within a 250-foot buffer of the project footprint, which includes areas of permanent and temporary impacts.
[B] The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.
Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.
All impacts were calculated based on 15% engineering design construction footprint.

Habitat Conservation Plans

The BNSF Alternative overlaps the *Metropolitan Bakersfield Habitat Conservation Plan* area (City of Bakersfield and Kern County 1994). Construction of the BNSF Alternative would result in temporary impacts within the habitat conservation plan area (Appendix 3.7-B, Attachment 5).

Construction period impacts of the BNSF Alternative do not conflict with the provisions of the MBHCP because proposed mitigation ratios are similar to the "adequate mitigation" ratios presented in the plan. Additionally, the BNSF Alternative does not overlap with the Conceptual Focus Areas identified as potential preserve areas. Therefore, construction period impacts of the BNSF Alternative would result in no effect on habitat conservation plans under NEPA, and no impact under CEQA.

Protected Trees

Trees including those regulated by various local government regulations are present along the BNSF Alternative (Appendix 3.7-B, Attachment 6), and project construction activities would both alter and remove some portion of these resources. The majority of trees are in Fresno, and almost all of the native oaks are in the vicinity of the Kings River. Protected riparian trees associated with the Kern River are also located in the city of Bakersfield. Direct and indirect impacts would occur during construction of the BNSF Alternative, resulting in temporary disturbance to these protected trees.

The anticipated removal and trimming of protected trees (both native and landscape ornamentals) as part of the construction activities in all four counties of the Fresno to Bakersfield Section would conflict with the relevant city and county ordinances. Due to the considerable number of trees that would require trimming or removal, construction of the BNSF Alternative would result in relatively high intensity loss to protected trees. Therefore, construction period impacts of the BNSF Alternative would result in an effect of substantial intensity on protected trees under NEPA, and in a significant impact under CEQA.

Hanford West Bypass 1 Alternative

Special-Status Plant Communities

Field surveys identified two special-status plant communities in the Hanford West Bypass 1 Alternative: bush seepweed scrub and valley foothill riparian (Table 3.7-6; Appendix 3.7-B, Attachment 3). Additional unsurveyed habitats that have the potential to support special-status plant communities are present, including annual grassland and agricultural areas. Neither the Hanford West Bypass 1 Alternative nor the corresponding segment of the BNSF would have temporary impacts on observed bush seepweed scrub communities. However, the Hanford West Bypass 1 Alternative, compared to the corresponding segment of the BNSF Alternative, would result in slightly smaller temporary impacts on unsurveyed habitats that have potential to support special-status plant communities and slightly larger temporary impacts to valley foothill riparian (Appendix 3.7-B, Attachment 3, Table 3.7-6). If special-status plant communities are present in these habitats, construction period impacts of the Hanford West Bypass 1 Alternative could directly and indirectly result in temporary impacts on these species.

Because the construction period impacts of the Hanford West Bypass 1 Alternative on special-status plant communities are minimal, only a slight change from existing biological conditions and little to no regional effects are expected. Therefore, construction period impacts of the Hanford West Bypass 1 Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Wetlands and other waters present in the Hanford West Bypass 1 Alternative include emergent and seasonal wetlands, canals/ditches, lacustrine, and seasonal riverine and riparian areas (Table 3.7-7; Appendix 3.7-B, Attachment 4). No natural jurisdictional wetland features (e.g., emergent wetlands or seasonal wetlands) would be temporarily directly affected by the selection of this alternative. However, direct impacts on seasonal riverine and riparian features would occur. Indirect impacts would occur to both natural wetlands and seasonal riverine features. Direct and indirect impacts on a number of man-made features (e.g., canals/ditches, and lacustrine) would occur during construction of the Hanford West Bypass 1 Alternative, resulting in the temporary disturbance of these jurisdictional waters.

Both the Hanford West Bypass 1 Alternative and the corresponding segment of the BNSF Alternative are located in a rural setting dominated by agricultural land uses. The majority of the jurisdictional waters in the Hanford West Bypass 1 Alternative and the corresponding segment of the BNSF Alternative are man-made and in poor ecological condition, with the exception of the Kings River complex and other seasonal riverine features, which are in fair to good ecological condition. The Hanford West Bypass 1 Alternative would have similar temporary direct impacts on man-made jurisdictional waters when compared with the corresponding segment of the BNSF Alternative (Table 3.7-7; Appendix 3.7-B, Attachment 4). Indirect impacts as a result of both construction and project activities on the Hanford West Bypass 1 Alternative would be less than those of the corresponding segment of the BNSF Alternative. Like the corresponding segment of the BNSF Alternative, temporary construction areas would be located adjacent to the Kings River complex (e.g., Murphy Slough and Kings River).

The direct impacts associated with the at-grade and below grade design options are similar. However, the below-grade option would result in a greater decrease in indirect impacts when compared to the corresponding segment of the BNSF Alternative.

Due to the impacts on natural jurisdictional water features (i.e. seasonal riverine and riparian), construction of the Hanford West Bypass 1 Alternative would cause relatively high intensity loss of jurisdictional waters. Therefore, construction period impacts of the Hanford West Bypass 1 Alternative would result in an effect of substantial effect intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

Neither the Hanford West Bypass 1 Alternative nor the corresponding segment of the BNSF Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998) (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts on the plan area would occur as a result of the construction of either of these alternatives. Construction period impacts of the Hanford West Bypass 1 Alternative would result in no effect under NEPA, and no impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Hanford West Bypass 1 Alternative nor the corresponding segment of the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts on the Allensworth ER would occur as a result of construction of either of these alternatives. Construction period impacts of the Hanford West Bypass 1 Alternative would result in no effect under NEPA, and no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans

Neither the Hanford West Bypass 1 Alternative nor the corresponding segment of the BNSF Alternative overlaps the plan area of the MBHCP (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts within the MBHCP plan area would occur as a result of construction period impacts of either of these alternatives. Construction period impacts of the Hanford West Bypass 1 Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Ten protected oak trees were identified in the Hanford West Bypass 1 Alternative, and no protected trees were identified in the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Construction activities would both alter and remove some portion of these resources. These impacts would occur through the same mechanisms as those described above under the direct and indirect impacts for habitats of concern.

Construction of the Hanford West Bypass 1 Alternative would result in an increase in the number of trees disturbed when compared to the construction of the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Construction impacts on protected trees would be the same for the at-grade and the below-grade options.

The removal and trimming of protected trees related to construction period impacts of the Hanford West Bypass 1 Alternative would result in measureable adverse loss of this resource. Therefore, construction period impacts of the Hanford West Bypass 1 Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA.

Hanford West Bypass 2 Alternative

Special-Status Plant Communities

There is one known occurrence of special-status plant communities within the Hanford West Bypass 2 Alternative: valley foothill riparian. However, special-status plant communities have the potential to occur in unsurveyed habitats with the potential to support special-status plant communities within the footprint of this alternative. Temporary impacts would occur in these unsurveyed habitats with the potential to support special-status plant communities (Appendix 3.7-B, Attachment 3). Impacts on special-status plant communities, if present, would occur as described above under direct and indirect impacts for habitats of concern.

The Hanford West Bypass 2 Alternative would result in slightly more temporary impacts on valley foothill riparian habitat and unsurveyed habitats that have the potential to support special-status plant communities than the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 3).

Because the construction period impacts of the Hanford West Bypass 2 Alternative on special-status plant communities are minimal, only a slight change from existing biological conditions and little to no regional effects are expected. Therefore, construction period impacts of the Hanford West Bypass 2 Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Wetlands and other waters present in the Hanford West Bypass 2 Alternative include emergent and seasonal wetlands, canals/ditches, lacustrine features, and seasonal riverine and riparian areas (Table 3.7-7; Appendix 3.7-B, Attachment 4). No jurisdictional wetlands (e.g., emergent wetlands, or seasonal wetlands) would be temporarily directly affected by the selection of this

alternative. However, direct impacts on seasonal riverine and riparian features would occur. Indirect impacts would occur to both natural wetlands and seasonal riverine features. Direct and indirect impacts on a number of man-made features (e.g., canals/ditches, and lacustrine features) would occur during construction of the Hanford West Bypass 2 Alternative, resulting in the temporary disturbance of these jurisdictional waters.

Both the Hanford West Bypass 2 Alternative and the corresponding segment of the BNSF Alternative are located in a rural setting dominated by agricultural land uses. The majority of the jurisdictional waters in the Hanford West Bypass 2 Alternative and the corresponding segment of the BNSF Alternative are man-made and in poor ecological condition, with the exception of the Kings River Complex and other seasonal riverine features, which are in fair to good ecological condition. The Hanford West Bypass 2 Alternative would have similar temporary direct impacts on jurisdictional waters when compared with the corresponding segment of the BNSF Alternative (Table 3.7-7; Appendix 3.7-B, Attachment 4). Like the corresponding segment of the BNSF Alternative, temporary construction areas would be located adjacent to the Kings River complex (e.g., Murphy Slough and Kings River).

The direct impacts associated with the at-grade and below grade design options are similar. However, the at-grade option would increase indirect impacts and the below grade option would decrease indirect impacts when compared to the corresponding segment of the BNSF Alternative.

The construction period impacts of the Hanford West Bypass 2 Alternative on jurisdictional waters, especially impacts on natural features (i.e. seasonal riverine and riparian) would cause relatively high intensity loss of jurisdictional waters. Therefore, construction period impacts of the Hanford West Bypass 2 Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

Neither the Hanford West Bypass 2 Alternative nor its corresponding segment in the BNSF Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998) (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts on the plan area would occur as a result of the construction of either of these alternatives. Construction period impacts of the Hanford West Bypass 2 Alternative would result in no effect under NEPA, and no impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Hanford West Bypass 2 Alternative nor its corresponding segment in the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts on the Allensworth ER would occur as a result of construction of either of these alternatives. Construction period impacts of the Hanford West Bypass 2 Alternative would result in no effect under NEPA, and no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans

Neither the Hanford West Bypass 2 Alternative nor the corresponding segment of the BNSF Alternative overlaps the plan area of the MBHCP (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts within the MBHCP plan area would occur as a result of construction period impacts of either of these alternatives. Construction period impacts of the Hanford West Bypass 2 Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Impacts on protected trees in the footprint of the Hanford West Bypass 2 Alternative would be the same as those discussed for the Hanford West Bypass 1. Eight protected oak trees were identified in the temporary impact area of the Hanford West Bypass 2, and no protected trees were identified in the temporary impact area of the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Construction activities would both alter and remove some portion of these resources.

Construction of the Hanford West Bypass 2 Alternative would result in an increase in the number of trees disturbed compared to the construction of the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Impacts on protected trees would be the same for the at-grade and the below-grade options.

The removal and trimming of protected trees related to construction period impacts of the Hanford West Bypass 2 Alternative would result in measureable adverse loss of this resource. Therefore, construction period impacts of the Hanford West Bypass 2 would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA.

Corcoran Elevated Alternative

Special-Status Plant Communities

Field surveys identified three special-status plant communities in the Corcoran Elevated Alternative: saltgrass flats, black willow thickets, and valley foothill riparian habitat located along the Tule River (Table 3.7-6; Appendix 3.7-B, Attachment 3). However, temporary impacts would only occur in a minimal area of saltgrass flats. Additional unsurveyed habitats that have the potential to support special-status plant communities are present (Appendix 3.7-B, Attachment 3). Habitats in the Corcoran Elevated Alternative, including these unsurveyed areas, are mainly urban and agricultural lands (Table 3.7-6), which have no to low potential of supporting special-status plant communities. The Corcoran Elevated Alternative compared to the corresponding segment of the BNSF Alternative would result in a slightly larger area of temporary impact on unsurveyed habitats that have a low potential to support special-status plant communities (Appendix 3.7-B, Attachment 3). If special-status plant communities are present in these habitats, construction period impacts of the Corcoran Elevated Alternative could directly and indirectly result in temporary impacts on these communities.

Because construction period impacts of the Corcoran Elevated Alternative on special-status plant communities would be minimal, only a slight change to existing biological conditions and little to no regional effects are expected. Therefore, construction period impacts of the Corcoran Elevated Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Wetlands and other waters present in the Corcoran Elevated Alternative include seasonal wetlands, vernal pools and swales, agricultural canals/ditches, lacustrine features, and seasonal riverine and riparian features (e.g., Cross Creek and Tule River) (Table 3.7-7; Appendix 3.7-B, Attachment 4). No jurisdictional wetlands (e.g., seasonal wetlands, vernal pools and swales) seasonal riverine, or riparian features would be temporarily directly affected by the use of this alternative; however, indirect impacts would occur to these features. Direct and indirect impacts on a number of man-made features (e.g., canals/ditches, and lacustrine features) would occur during construction of the Corcoran Elevated Alternative, resulting in the temporary disturbance of these jurisdictional waters. The Corcoran Elevated Alternative and the corresponding segment of the BNSF Alternative are similarly located in an urban and rural setting.

The majority of the jurisdictional waters in the Corcoran Elevated Alternative and corresponding BNSF Alternative segment are man-made and in poor ecological condition, with the exception of Cross Creek, which is in fair ecological condition and Tule River, which is in relatively good ecological condition. The Corcoran Elevated Alternative will result in similar temporary impacts on jurisdictional waters when compared with the corresponding segment of the BNSF Alternative (Table 3.7-7; Appendix 3.7-B, Attachment 4). Like the corresponding segment of the BNSF Alternative, temporary construction areas would be located adjacent to the Tule River.

Because construction period impacts of the Corcoran Elevated Alternative on jurisdictional waters are largely to man-made features, the effects of this alternative would be incremental on a regional scale. Therefore, construction period impacts of the Corcoran Elevated Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Corcoran Elevated Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Corcoran Elevated Alternative occurs in a satellite area identified in the recovery plan area. Temporary direct or indirect impacts would occur on the recovery plan area as a result of construction of this alternative (Appendix 3.7-B, Attachment 5). Selection of the Corcoran Elevated Alternative would slightly increase the amount of temporary disturbance to the recovery plan area compared to the amount of temporary disturbance to the corresponding BNSF Alternative segment.

Due to the large area of impact, construction of the Corcoran Elevated Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, construction period impacts of the Corcoran Elevated Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Corcoran Elevated Alternative nor its corresponding segment in the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts on the Allensworth ER would occur as a result of construction of either of these alternatives. Construction period impacts of the Corcoran Elevated Alternative would result in no effect under NEPA, and no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans

Neither the Corcoran Elevated Alternative nor its corresponding segment in the BNSF Alternative overlaps the plan area of the MBHCP (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts within the MBHCP plan area would occur as a result of construction period impacts of either of these alternatives. Construction period impacts of the Corcoran Elevated Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Trees that are regulated under the Kings County General Plan and/or the Corcoran City Code are present in both the Corcoran Elevated Alternative and the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Construction activities would both alter and remove some portion of these resources.

Construction of the Corcoran Elevated Alternative, compared to the construction of the corresponding segment of the BNSF Alternative, would disturb one fewer protected tree (Appendix 3.7-B, Attachment 6).

Construction period impacts of the Corcoran Elevated Alternative are minimal and are expected to result in only a slight change to existing biological conditions and little to no regional effects. Therefore, construction period impacts of the Corcoran Elevated Alternative would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA.

Corcoran Bypass Alternative

Special-Status Plant Communities

Field surveys identified three special-status plant communities in the Corcoran Bypass Alternative: saltgrass flats, black willow thickets, and valley foothill riparian habitat located along the Tule River (Table 3.7-6; Appendix 3.7-B, Attachment 3). Additional unsurveyed habitats with the potential to support special-status plant communities, including annual grasslands, were identified and could also support special-status plant communities. Although three special-status plant communities are present in the alignment, no temporary impacts would occur in these communities; however, minimal temporary impacts would occur in unsurveyed habitats that have the potential to support special-status plant communities.

The Corcoran Bypass Alternative would result in slightly more temporary impacts on saltgrass flats, black willow thickets, valley foothill riparian, and unsurveyed habitats that have the potential to support special-status plant communities than the corresponding segment of the BNSF Alternative.

Because construction period impacts of the Corcoran Bypass Alternative on special-status plant communities would be minimal, only a slight change to existing biological conditions and little to no regional effects are expected. Therefore, construction period impacts of the Corcoran Bypass would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Wetlands and other waters present in the Corcoran Bypass Alternative include seasonal wetlands, vernal pools and swales, agricultural canals/ditches, lacustrine features, and seasonal riverine and riparian features (e.g., Cross Creek and Tule River) (Table 3.7-7; Appendix 3.7-B, Attachment 4). No natural jurisdictional wetlands (i.e., seasonal wetlands and vernal pools and swales) would be temporarily directly affected by the use of this alternative (Table 3.7-7; Appendix 3.7-B, Attachment 4); however, temporary impacts would occur on seasonal riverine and riparian features. Limited direct and moderate indirect impacts on a number of man-made features (e.g., canals/ditches, and lacustrine features) would occur during construction of the Corcoran Bypass Alternative, resulting in the temporary disturbance of these jurisdictional waters.

The Corcoran Bypass Alternative would be located in agricultural areas east of Corcoran, whereas the corresponding BNSF Alternative segment would be routed through Corcoran, along SR 43 and the BNSF Railway right-of-way. The majority of the jurisdictional waters in the Corcoran Bypass and the corresponding segment of the BNSF Alternative are man-made and in poor ecological condition, with the exception of the Cross Creek, which is in fair ecological condition, and Tule River, which is in relatively good ecological condition.

Both the Corcoran Bypass Alternative and the corresponding segment of the BNSF Alternative would have no temporary impacts on wetlands (e.g., seasonal wetland or vernal pools and swales) (Table 3.7-7; Appendix 3.7-B, Attachment 4). However, overall, the Corcoran Bypass

would have slightly more temporary impacts on man-made jurisdictional waters (canals/ditches, lacustrine features, etc.) and seasonal riverine features compared with the corresponding segment of the BNSF Alternative (Table 3.7-7; Appendix 3.7-B, Attachment 4). Unlike the corresponding segment of the BNSF Alternative, the Corcoran Bypass would not require the temporary construction area adjacent to the Tule River.

Construction of the Corcoran Bypass Alternative would result in impacts on man-made and natural jurisdictional water features and would cause relatively high intensity loss of jurisdictional waters. Therefore, construction period impacts of the Corcoran Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Corcoran Bypass Alternative overlaps one of two recovery plan areas that occur in the region: *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Corcoran Bypass Alternative occurs in a satellite area identified in the recovery plan area. Construction of the Corcoran Bypass Alternative would result in temporary disturbance of this recovery plan area (Appendix 3.7-B, Attachment 5). Selection of the Corcoran Bypass Alternative would result in a larger temporary disturbance to the recovery plan area when compared with the amount in the corresponding BNSF Alternative segment.

Due to the large area of impact, construction of the Corcoran Bypass Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, construction period impacts of the Corcoran Bypass Alternative would result in an effect of substantial intensity under NEPA, and a significant impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Corcoran Bypass Alternative nor its corresponding segment in the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts on the Allensworth ER would occur as a result of construction of either of these alternatives. Construction of the Corcoran Bypass Alternative would result in no effect under NEPA, and in no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans

Neither the Corcoran Bypass Alternative nor its corresponding segment in the BNSF Alternative overlaps the plan area of the MBHCP (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts within the habitat conservation plan area would occur as a result of construction period impacts of either of these alternatives. Construction period impacts of the Corcoran Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Trees that are regulated under the Kings County General Plan and/or the Corcoran City Code are present in the Corcoran Bypass Alternative or the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Construction activities would both alter and remove some portion of these resources.

However, no construction period impacts on protected trees were identified in the Corcoran Bypass Alternative, while five trees were identified in the corresponding segment of the BNSF Alternative. Construction of the Corcoran Bypass Alternative would result in an increase in the number of trees disturbed compared to the corresponding segment of the BNSF Alternative.

Construction period impacts on protected trees of the Corcoran Bypass Alternative would result in no effect under NEPA and no impact under CEQA.

Allensworth Bypass Alternative

Special-Status Plant Communities

During the field surveys, six special-status plant communities were identified in the Allensworth Bypass Alternative: iodine brush scrub, saltgrass flats, bush seepweed scrub, iodine bush scrub, black willow thickets, and valley foothill riparian (Table 3.7-6; Appendix 3.7-B, Attachment 3). Special-status plant communities could also be present in unsurveyed habitats that have the potential to support special-status plant communities (e.g., annual grasslands, riverine, and fragmented natural areas). Of the identified special-status plant communities in the Allensworth Bypass Alternative, temporary impacts would only occur in valley foothill riparian. However, substantial temporary impacts would occur in unsurveyed habitats that have the potential to support special-status plant communities.

The Allensworth Bypass Alternative would result in more temporary impacts to valley foothill riparian than the corresponding segment of the BNSF Alternative (Table 3.7-6). The Allensworth Bypass Alternative would result in substantially more temporary impacts on unsurveyed habitats that have the potential to support special-status plant communities than the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1).

Due to the presence of one known special-status plant community on considerable area of unsurveyed habitats that have the potential to support special-status plant communities, construction of the Allensworth Bypass Alternative may result in a measurable loss to this resource. Therefore, construction period impacts of the Allensworth Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Surveys for vernal pools were used to determine the routing of the Allensworth Bypass to minimize impacts on wetlands and other waters (a reduction of more than 100 acres in the Wetland Study Area). Jurisdictional waters are present in the Allensworth Bypass Alternative, including seasonal wetlands, vernal pools and swales, ditches, lacustrine features (e.g., Alpaugh Irrigation District pond), seasonal riverine (e.g., Poso Creek) and riparian areas. However, no direct temporary impacts would occur under the Allensworth Bypass Alternative on natural wetland features. Indirect impacts would occur during construction of the Allensworth Bypass Alternative, resulting in the temporary disturbance of these jurisdictional waters (Table 3.7-7; Appendix 3.7-B, Attachment 4).

The Allensworth Bypass Alternative travels primarily through agricultural lands, in contrast with the corresponding segment of the BNSF Alternative, which runs adjacent to significant undeveloped natural landscape located parallel to SR 43 and along the BNSF right-of-way. The majority of the wetland features (e.g., vernal pools and swales) as well as Poso Creek are located in a highly fragmented landscape but are in relative fair-to-good ecological condition. The remaining man-made features (e.g., canals/ditches, lacustrine features) are in relatively poor ecological condition.

The Allensworth Bypass Alternative would slightly decrease the temporary impact on seasonal wetland compared to the corresponding segment of the BNSF Alternative; however, it would increase the temporary impacts on seasonal riverine, riparian, and man-made features (Table 3.7-7; Appendix 3.7-B, Attachment 4). Selection of the Allensworth Bypass Alternative would decrease the amount of indirect impacts on wetlands, including those that are sensitive to

indirect impacts (e.g., vernal pool and swales). These indirect impacts would occur as a result of both construction and project activities on the Allensworth Bypass Alternative.

Because of the sensitivity of vernal pools and swales to indirect impacts and the impacts to other jurisdictional waters, construction period impacts of the Allensworth Bypass Alternative would result in influential regional effects and relatively high intensity loss to these resources. Therefore, the construction period impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Allensworth Bypass Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Allensworth Bypass Alternative occurs in satellite and linkage areas identified in the recovery plan area. Construction of the Allensworth Bypass Alternative would result in temporary disturbance of this recovery plan area (Appendix 3.7-B, Attachment 5).

The Allensworth Bypass Alternative and its corresponding segment in the BNSF Alternative both overlap the recovery plan area for the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). Selection of the Allensworth Bypass Alternative would slightly increase the amount of temporary disturbance to the satellite area and greatly increase the amount of temporary disturbance to the linkage area identified in the recovery plan when compared with that of the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 5).

Due to the large area of impact, construction of the Allensworth Bypass Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, construction period impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on recovery plans because of the temporary direct and indirect impacts on the plan area.

Allensworth Ecological Reserve

The Allensworth Bypass Alternative does not overlap the Allensworth ER (Appendix 3.7-B, Attachment 5). This alternative is approximately 0.5 mile west of the Allensworth ER. Therefore, no direct or indirect impacts on the Allensworth ER would occur as a result of construction of this alternative. Neither construction of the Allensworth Bypass Alternative nor of the corresponding segment of the BNSF Alternative would result in temporary impacts on the Allensworth ER (Appendix 3.7-B, Attachment 5).

Construction of the Allensworth Bypass Alternative would result in no effect under NEPA, and no impact under CEQA to the Allensworth ER because the corresponding segment of the BNSF Alternative is the only segment that overlaps the Allensworth ER.

Habitat Conservation Plans

Neither the Allensworth Bypass Alternative nor its corresponding segment of the BNSF Alternative overlaps the plan area of the MBHCP (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts within the habitat conservation plan area would occur as a result of the construction period impacts of either of these alternatives. Construction period impacts of the Allensworth Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

One protected tree was identified in the temporary impact area of the Allensworth Bypass Alternative, and protected trees were identified in the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). This impact would occur as described above in the section on the direct and indirect impacts on habitats of concern. Minimal tree removal and trimming would be required in association with construction period impacts of the Allensworth Bypass and only a slight change from existing biological conditions and little to no regional effects are expected. Therefore, construction period impacts on protected trees of the Allensworth Bypass Alternative would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA.

Wasco-Shafter Bypass Alternative

Special-Status Plant Communities

There are no known occurrences of special-status plant communities within the Wasco-Shafter Bypass Alternative. However, special-status plant communities have the potential to occur in unsurveyed habitats that have the potential to support special-status plant communities within this alternative (Appendix 3.7-B, Attachment 3). Temporary impacts would occur in these unsurveyed habitats that may support special-status plant communities.

The Wasco-Shafter Bypass Alternative would result in slightly more temporary impacts on unsurveyed habitats that have the potential to support special-status plant communities than the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 3).

Because construction of the Wasco-Shafter Bypass Alternative would affect no known special-status plant communities and impacts would be limited to unsurveyed habitats that have the potential to support special-status plant communities, only a slight change to existing biological conditions and little to no regional effects are expected. Therefore, construction period impacts of the Wasco-Shafter Bypass Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Jurisdictional waters in the Wasco-Shafter Bypass Alternative include only man-made structures (e.g., ditches and lacustrine features) (Table 3.7-7; Appendix 3.7-B, Attachment 4). No natural jurisdictional waters (e.g., seasonal wetlands, vernal pools and swales, riparian, and seasonal riverine) would be temporarily affected by the use of this alternative. Direct and indirect impacts would occur during construction of the Wasco-Shafter Bypass Alternative, resulting in the temporary disturbance of these man-made jurisdictional waters. The Wasco-Shafter Bypass Alternative avoids urban centers and travels entirely through agricultural areas east of SR 43, whereas the corresponding BNSF Alternative segment travels through the urban centers of Wasco and Shafter along the existing, disturbed BNSF Railway right-of-way. Regardless of the alternative, the majority of the impacts would be on man-made features in relatively poor ecological condition that provide limited ecological value. When considering the magnitude of the impacts, the selection of the Wasco-Shafter Bypass Alternative would marginally decrease the amount of temporary direct and indirect impacts on jurisdictional waters compared with the amount of the corresponding segment of the BNSF Alternative. These differences would be negligible, considering the man-made nature of the majority of these resources.

Because construction period impacts of the Wasco-Shafter Bypass would be limited to man-made features, the effects of this alternative would be incremental on a regional scale. Therefore, construction period impacts of the Wasco-Shafter Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Wasco-Shafter Bypass Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Wasco-Shafter Bypass occurs in a linkage area identified in this recovery plan. Construction of the Wasco-Shafter Bypass Alternative would result in temporary disturbance of this recovery plan area (Appendix 3.7-B, Attachment 5).

The Wasco-Shafter Bypass Alternative and the corresponding segment in the BNSF Alternative both overlap the recovery plan area for the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). Selection of the Wasco-Shafter Bypass Alternative would increase the amount of temporary disturbance to the linkage recovery plan area compared to the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 5).

The limited area of impact to recovery plan areas resulting from construction period impacts of the Wasco-Shafter Bypass Alternative, would lead to measureable adverse loss of this resource. Therefore, construction period impacts of the Wasco-Shafter Bypass Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Wasco-Shafter Bypass Alternative nor the corresponding segment of the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts on the Allensworth ER would occur as a result of construction of these alternatives. Construction period impacts of the Wasco-Shafter Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on the Allensworth ER, because no temporary direct or indirect impacts on the Allensworth ER are anticipated.

Habitat Conservation Plans

Both the Wasco-Shafter Bypass Alternative and the corresponding segment of the BNSF Alternative overlap the MBHCP area. Construction of either alternative would result in temporary impacts within the habitat conservation plan area (Appendix 3.7-B, Attachment 5).

Construction period impacts of the Wasco-Shafter Bypass Alternative and the corresponding segment of the BNSF Alternative do not conflict with the provisions of the MBHCP because proposed mitigation ratios are similar to the “adequate mitigation” ratios presented in the plan. Additionally, the Wasco-Shafter Bypass Alternative and the corresponding segment of the BNSF Alternative do not overlap with the Conceptual Focus Areas identified as potential preserve areas. Therefore, construction period impacts of the Wasco-Shafter Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

While trees are present in the footprint of the Wasco-Shafter Bypass Alternative, no construction period impacts on protected trees were identified in the Wasco-Shafter Bypass or in the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Construction period impacts on protected trees of the Wasco-Shafter Bypass would result in no effect under NEPA, and no impact under CEQA.

Bakersfield South Alternative

Special-Status Plant Communities

During the field surveys, valley foothill riparian and black willow thickets were identified along the Kern River of the Bakersfield South Alternative (Table 3.7-6; Appendix 3.7-B, Attachment 3).

Additionally, this alternative includes unsurveyed habitats that may support special-status plant communities. However, the Bakersfield South Alternative is in an urban setting, and the remaining natural areas are small and fragmented; therefore, special-status plant communities are not expected to be present (except where identified along the Kern River). Temporary impacts would occur in one identified special-status plant community (i.e., valley foothill riparian) in the Bakersfield South Alternative. Temporary impacts would also occur in unsurveyed habitats that have the potential to support special-status plant communities. Selection of the Bakersfield South Alternative would cause slightly more temporary impacts on one special-status plant community (i.e., valley foothill riparian) and on unsurveyed habitats that have the potential to support special-status plant communities, and would cause fewer temporary impacts on black willow thickets than would the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 3). Riparian habitat along the Kern River Corridor receives additional protection under Chapter 19.73 of the Kern County ordinances.

Due to the large area of impact, including large areas of unsurveyed habitats that have the potential to support special-status plant communities, construction of the Bakersfield South Alternative may result in relatively high intensity loss to special-status plant communities. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status plant communities and their habitats.

Jurisdictional Waters

Wetlands and other waters in the footprint of the Bakersfield South Alternative include seasonal riverine (e.g., Kern River) and the associated riparian buffer, as well as seasonal wetlands, canals/ditches, and lacustrine. However, no natural jurisdictional wetlands (e.g., seasonal wetlands) would be temporarily affected by the use of this alternative (Table 3.7-7; Appendix 3.7-B, Attachment 4). Direct and indirect impacts would occur during construction of the Bakersfield South Alternative, resulting in the temporary disturbance of seasonal riverine and associated riparian features (e.g., the Kern River) and man-made features including canals/ditches and lacustrine features.

Both the Bakersfield South Alternative and the corresponding segment of the BNSF Alternative would be located in areas of urban Bakersfield that contain similar man-made and natural wetlands and other waters. The majority of the jurisdictional waters in the Bakersfield South Alternative and corresponding segment of the BNSF Alternative are man-made and in poor ecological condition, with the exception of the Kern River and the seasonal wetlands, which are in fair to good ecological condition.

In some instances, because the alternatives are located close together, nearly identical impacts on the various jurisdictional waters are anticipated. When compared with the corresponding segment of the BNSF Alternative, the Bakersfield South Alternative would marginally decrease the amount of temporary direct impacts on other waters (Table 3.7-7; Appendix 3.7-B, Attachment 4). When indirect impacts are compared, selection of the Bakersfield South Alternative would decrease the amount of indirect impacts on jurisdictional waters. These indirect impacts would occur as a result of both construction and project activities on the Bakersfield South Alternative.

Neither the Bakersfield South Alternative nor the corresponding segment of the BNSF Alternative would have temporary direct impacts on wetland features (Table 3.7-7; Appendix 3.7-B, Attachment 4). Impacts on the Kern River would be similar regardless of the alternative selected, and as with the corresponding segment of the BNSF Alternative, a temporary construction area would be located adjacent to the Kern River.

Construction of the Bakersfield South Alternative would affect both man-made and natural jurisdiction waters and would result in relatively high intensity loss to these features. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Bakersfield South Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Bakersfield South Alternative occurs in a satellite area identified in this recovery plan. Construction of the Bakersfield South Alternative would result in temporary disturbance of this recovery plan area (Appendix 3.7-B, Attachment 5).

Selection of the Bakersfield South Alternative would slightly increase the amount of temporary disturbance to this recovery plan area when compared with the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 5).

Due to the large area of impact, construction of the Bakersfield South Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, construction period impacts under the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on recovery plans because of the temporary direct and indirect impacts on the plan area.

Allensworth Ecological Reserve

Neither the Bakersfield South Alternative nor its corresponding segment of the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts on the Allensworth ER would occur as a result of construction of either of these alternatives.

Habitat Conservation Plans

The Bakersfield South Alternative overlaps the MBHCP. Construction of the Bakersfield South Alternative would result in temporary disturbance within the plan area of the MBHCP (Appendix 3.7-B, Attachment 5).

The Bakersfield South Alternative and the corresponding segment of the BNSF Alternative both overlap the plan area for the MBHCP. Neither alternative conflicts with the provisions of the MBHCP because proposed mitigation ratios are similar to the “adequate mitigation” ratios presented in the plan. Additionally, the Bakersfield South Alternative and the corresponding segment of the BNSF Alternative do not overlap with the Conceptual Focus Areas identified as potential preserve areas. Therefore, construction period impacts of the Bakersfield South Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Trees that may be regulated are present in the Bakersfield South Alternative (Appendix 3.7-B, Attachment 6). Direct and indirect impacts would occur during construction of the Bakersfield South Alternative and would result in the disturbance of protected trees. Selection of the Bakersfield South Alternative would increase the number of trees removed; however, all of the trees were landscape/ornamental or unidentified and may not qualify as protected trees. Protected tree removal and trimming as a result of construction of the Bakersfield South Alternative would be considerable and would result in relatively high intensity loss of this resource. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and a significant impact under CEQA.

Bakersfield Hybrid Alternative

Special-Status Plant Communities

During the field surveys, valley foothill riparian and black willow thickets were identified along the Kern River of the Bakersfield Hybrid Alternative (Table 3.7-6; Appendix 3.7-B, Attachment 3). Additionally, this alternative includes unsurveyed habitats that may support special-status plant communities. However, the Bakersfield Hybrid Alternative is in an urban setting, and the remaining natural areas are small and fragmented; therefore, special-status plant communities are not expected to be present (except where identified along the Kern River). Impacts on special-status plant communities would occur as described above under the direct and indirect impacts for habitats of concern. Selection of the Bakersfield Hybrid Alternative would cause fewer temporary impacts on black willow thickets and slightly more temporary impacts on one special-status plant community (valley foothill riparian) and unsurveyed habitats that have the potential to support special-status plant communities than would the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 3). Riparian habitat along the Kern River Corridor receives additional protection under Chapter 19.73 of the Kern County ordinances.

Due to the large area of impact, including large areas of unsurveyed habitats that have the potential to support special-status plant communities, construction of the Bakersfield Hybrid Alternative may result in relatively high intensity loss to special-status plant communities. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status plant communities and their habitats.

Jurisdictional Waters

Wetlands and other waters in the footprint of the Bakersfield Hybrid Alternative include seasonal riverine (e.g., Kern River) and the associated riparian buffer, as well as seasonal wetlands, canals/ditches, and lacustrine features. However, no natural jurisdictional wetlands (e.g., seasonal wetlands) would be temporarily affected by the use of this alternative (Table 3.7-7; Appendix 3.7-B, Attachment 4). Direct and indirect impacts would occur during construction of the Bakersfield Hybrid Alternative, resulting in the temporary disturbance of seasonal riverine features (e.g., the Kern River) and man-made features, including canals/ditches and lacustrine features.

Both the Bakersfield Hybrid Alternative and the corresponding segment of the BNSF Alternative would be located in areas of urban Bakersfield that contain similar man-made and natural wetlands and other waters. The majority of the jurisdictional waters in the Bakersfield Hybrid Alternative and the corresponding segment of the BNSF Alternative are man-made and in poor ecological condition with the exception of the Kern River and the seasonal wetlands, which are in fair to good ecological condition.

When compared with the corresponding segment of the BNSF Alternative, the Bakersfield Hybrid Alternative would marginally decrease the amount of temporary direct impacts on other waters and marginally increase the impacts on state waters (Table 3.7-7; Appendix 3.7-B, Attachment 4). When indirect impacts are compared, selection of the Bakersfield Hybrid Alternative would decrease the amount of indirect impacts on jurisdictional waters. These indirect impacts would occur as a result of both construction and project activities of the Bakersfield Hybrid Alternative.

Neither the Bakersfield Hybrid Alternative nor the corresponding segment of the BNSF Alternative would have temporary direct impacts on wetland features (Table 3.7-7; Appendix 3.7-B, Attachment 4); however, the Bakersfield Hybrid Alternative would have a minor indirect impact on emergent wetlands. Impacts on the Kern River would be similar regardless of the alternative

selected, and as with the corresponding segment of the BNSF Alternative, a temporary construction area would be located adjacent to the Kern River.

Construction of the Bakersfield Hybrid Alternative would affect both man-made and natural jurisdiction waters and would result in relatively high intensity loss to these features. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Bakersfield Hybrid Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Bakersfield Hybrid Alternative occurs in a satellite area identified in this recovery plan. Construction of the Bakersfield Hybrid Alternative would result in temporary disturbance of this recovery plan area (Appendix 3.7-B, Attachment 5).

Selection of the Bakersfield Hybrid Alternative would increase the amount of temporary disturbance to this recovery plan area when compared with the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 5).

Due to the large area of impact, construction of the Bakersfield Hybrid Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, construction period impacts under the Bakersfield Hybrid Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Bakersfield Hybrid Alternative nor its corresponding segment of the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no temporary direct or indirect impacts on the Allensworth ER would occur as a result of construction of either of these alternatives. Construction of the Bakersfield Hybrid Alternative would result in no effect under NEPA, and in no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans

The Bakersfield Hybrid Alternative overlaps the MBHCP. Construction of the Bakersfield Hybrid Alternative would result in temporary disturbance within the plan area of the MBHCP (Appendix 3.7-B, Attachment 5).

The Bakersfield Hybrid Alternative and the corresponding segment of the BNSF Alternative both overlap the plan area for the MBHCP. Neither alternative conflicts with the provisions of the MBHCP because proposed mitigation ratios are similar to the “adequate mitigation” ratios presented in the plan. Additionally, the Bakersfield Hybrid Alternative and the corresponding segment of the BNSF Alternative do not overlap with the Conceptual Focus Areas identified as potential preserve areas. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Trees that may be regulated are present in the Bakersfield Hybrid Alternative (Appendix 3.7-B, Attachment 6). Direct and indirect impacts would occur during construction of the Bakersfield Hybrid Alternative and would result in the disturbance of protected trees. Selection of the Bakersfield Hybrid Alternative would increase the number of trees removed due to temporary impacts; however, all of the trees were unidentified and may not qualify as protected trees. Protected tree removal and trimming as a result of construction of the Bakersfield Hybrid

Alternative would be considerable and would result in relatively high intensity loss of this resource. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA.

Impact Bio #4 – Construction Effects on Wildlife Movement Corridors

As described in Section 3.7.4.6 and shown on Figure 3.7-2, several modeled wildlife movement corridors, also known as linkages, exist within the HST alternative construction footprints:

- Kings River linkage.
- St. John's River–Cross Creek linkage.
- Tule River linkage.
- SR 43/SR 155 linkage.
- Deer Creek–Sand Ridge linkage.
- Poso Creek linkage.
- Kern River linkage.

This section evaluates direct and indirect impacts on wildlife movement corridors that would result from construction of each of the HST alternatives. For a more detailed discussion of potential impacts on these linkages, refer to Section 5.6 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Direct (Bio #4) Impacts during Construction Period

Temporary 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 wildlife movement corridors (linkages). However, temporary disturbance areas are generally small and non-linear; therefore, wildlife should be able to move around these barriers.

Construction activities in the SR 43/SR 155, Deer Creek–Sand Ridge, Tule River, Kings River, St. John's River–Cross Creek, Poso Creek, and Kern River linkages are not likely to impair the habitat linkages between existing habitat blocks. Impacts associated with construction activities in minor amounts of natural habitat, primarily concentrated near the Kern River corridor, may temporarily impede wildlife movement within that area.

Indirect (Bio#4) Impacts during Construction Period

Construction of the project would result in concentrated heavy vehicle and equipment use within existing agricultural and urban development areas. Construction activities occurring at or in the vicinity of wildlife movement corridors (linkages) or natural lands may result in indirect disruption of wildlife movement through lighting, noise, motion, and startle effects. However, temporary disturbance areas are generally small and non-linear; therefore, wildlife should be able to move around these barriers.

BNSF Alternative

The BNSF Alternative passes through all of the identified linkages discussed above; thus this alternative may directly and indirectly affect regional wildlife movement within these linkages. However, in general, temporary construction activities are not expected to impede wildlife movement.

Because construction period impacts are not expected to impede movement, construction of the BNSF Alternative would result in only a slight change from existing biological conditions and little to no regional effects. Therefore, construction of the BNSF Alternative would result in an effect if

negligible intensity under NEPA on wildlife movement corridors during construction. The impact would be less-than-significant under CEQA.

Hanford West Bypass 1 Alternative

The Hanford West Bypass 1 Alternative passes through the Kings River, SR 43/SR 155, and St. John's River–Cross Creek linkages; however, construction activities within isolated, non-linear areas of temporary impact are not expected to disrupt wildlife movement within these linkages. Construction period impacts (i.e., temporary activities) associated with the Hanford West Bypass 1 Alternative would be similar to those of the corresponding segment of the BNSF Alternative; therefore, as described above in the section on the direct and indirect impacts for wildlife movement corridors, neither alternative should impede wildlife movement.

Construction period impacts of the Hanford West Bypass 1 Alternative would result in no effect under NEPA, and no impact under CEQA on wildlife movement corridors.

Hanford West Bypass 2 Alternative

The Hanford West Bypass 2 Alternative passes through the Kings River, SR 43/SR 155, and St. John's River–Cross Creek linkages; however, construction activities within isolated, non-linear areas of temporary impact are not expected to disrupt wildlife movement within these linkages. Construction period impacts (i.e., temporary activities) associated with the Hanford West Bypass 2 Alternative would be similar to those of the corresponding segment of the BNSF Alternative; therefore neither alternative should impede wildlife movement.

Construction period impacts of the Hanford West Bypass 2 Alternative would result in no effect under NEPA, and no impact under CEQA on wildlife movement corridors.

Corcoran Elevated Alternative

The Corcoran Elevated Alternative passes through the SR 43/SR 155 and Tule River linkages; however, construction activities within isolated, non-linear areas of temporary impact are not expected to disrupt wildlife movement within these linkages. Construction period impacts (i.e., temporary activities) associated with the Corcoran Elevated Alternative would be similar to those of the corresponding segment of the BNSF Alternative; therefore neither alternative should impede wildlife movement.

Construction period impacts of the Corcoran Elevated Alternative would result in no effect under NEPA, and no impact under CEQA on wildlife movement corridors.

Corcoran Bypass Alternative

The Corcoran Bypass Alternative passes through the SR 43/SR 155 and Tule River linkages; however, construction activities within isolated, non-linear areas of temporary impact are not expected to disrupt wildlife movement within these linkages. Construction period impacts (i.e., temporary activities) associated with the Corcoran Bypass Alternative would be similar to those of the corresponding segment of the BNSF Alternative; therefore, neither alternative should impede wildlife movement.

Construction period impacts of the Corcoran Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on wildlife movement corridors.

Allensworth Bypass Alternative

The Allensworth Bypass Alternative passes through the SR 43/SR 155 linkage; however, construction activities within isolated, non-linear areas of temporary impact are not expected to

disrupt wildlife movement within this linkage. Construction period impacts (i.e., temporary activities) associated with the Allensworth Bypass Alternative would be similar to those of the corresponding segment of the BNSF Alternative; therefore, neither alternative should impede wildlife movement.

Construction period impacts of the Allensworth Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on wildlife movement corridors.

Wasco-Shafter Bypass Alternative

The Wasco-Shafter Bypass Alternative does not overlap an identified wildlife movement corridor. Both the Wasco-Shafter Bypass Alternative and the corresponding BNSF Alternative segment would not affect identified wildlife movement corridors.

Construction period impacts of the Wasco-Shafter Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on wildlife movement corridors.

Bakersfield South Alternative

The Bakersfield South Alternative passes through the Kern River linkage and has the potential to affect wildlife movement within this linkage, because construction activities will affect a minor amount of natural lands. With both alternatives, the Kern River linkage corridor would be temporarily blocked by fencing during construction activities, which may result in adverse effects on local wildlife movement.

The use of the Bakersfield South Alternative rather than the corresponding BNSF Alternative would not change the level or degree of impacts, because impacts on wildlife movement corridors would be similar.

Because construction period impacts are not expected to significantly impede movement, construction of the Bakersfield South Alternative would result in only a slight change from existing biological conditions and little to no regional effects. Therefore, construction period impacts of the Bakersfield South Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on wildlife movement corridors.

Bakersfield Hybrid Alternative

The Bakersfield Hybrid Alternative passes through the Kern River linkage and has the potential to affect wildlife movement within this linkage because construction activities will affect a minor amount of natural lands. With both alternatives, the Kern River linkage corridor would be temporarily blocked by fencing during construction activities, which may result in adverse effects on local wildlife movement.

The use of the Bakersfield Hybrid Alternative rather than the corresponding segment of the BNSF Alternative would not change the level or degree of impacts, because impacts on wildlife movement corridors would be similar.

Because construction period impacts are not expected to significantly impede movement, construction of the Bakersfield Hybrid Alternative would result in only a slight change from existing biological conditions and little to no regional effects. Therefore, construction period impacts of the Bakersfield Hybrid Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on wildlife movement corridors.

Project Impacts – Common Biological Resource Impacts

Sensitive biological resources occurring adjacent to and within the construction footprint are expected to incur direct and indirect impacts from the project. These direct and indirect impacts would be common through all HST alternatives. The following sections discuss how the HST alternatives would affect these biological resources.

Project impacts on natural lands could result in temporary direct and indirect effects on a number of biological resources, including special-status plant and wildlife species, habitats of concern (encompasses jurisdictional waters), and wildlife movement corridors (Table 3.7-8). Urban and agricultural lands affected by project activities are not expected to provide conditions that support special-status plant species or special-status plant communities, to provide preferred habitat for special-status wildlife species, to support high-quality jurisdictional waters, or to facilitate the movement or migration of wildlife species. However, these areas often contain degraded or marginal habitats for a number of special-status wildlife species; and in some instances support jurisdictional waters (specifically lacustrine), and are used for movement and migration by a number of wildlife species. Direct, and in some instances indirect, impacts associated with urban, agricultural, and natural lands are described for the various biological resources. For a more complete description of the impacts on agricultural lands, see Section 3.14, Agricultural Lands.

Table 3.7-8
Communities Potentially Affected by the Alternative Alignments (acres): Project Impacts[a] (Permanent Impacts)

Community Type		High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Acreage / Difference Compared to Corresponding BNSF Area[a]										
Terrestrial Communities	Barren	54.43	1.82 / -0.02	1.82 / -0.02	7.21 / +5.37	7.21 / +5.37	10.82 / +3.65	3.89 / -3.28	—[c]	— / -18.81	6.74 / +1.81	6.53 / +1.60
	Urban	1287.43	184.53 / +19.08	139.10 / -26.35	177.58 / +12.13	132.16 / -33.30	126.54 / -11.21	83.54 / -54.20	26.52 / -41.04	147.78 / -144.02	209.53 / -67.10	206.49 / -70.13
	Agricultural Lands	2221.58	644.76 / -180.55	641.41 / -183.89	619.90 / -205.40	616.56 / -208.74	90.80 / -127.68	140.89 / -77.60	328.79 / +14.41	462.68 / +15.41	—	—
	Annual Grassland	208.35	27.91 / +25.55	33.63 / +31.27	32.60 / +30.24	38.32 / +35.96	24.40 / +2.13	41.36 / +19.0	82.68 / -25.22	18.93 / -1.53	7.76 / +0.96	5.65 / -1.15
	Valley Foothill Riparian	4.05	0.91 / -1.55	0.97 / -1.49	0.91 / -1.55	0.97 / -1.49	0.38 / -0.01	0.24 / -0.15	0.29 / -0.79	—	0.46 / +0.34	0.46 / +0.34
	Alkali Desert Scrub	40.25	—	—	—	—	—	—	6.78 / -26.11	—	8.40 / +1.04	7.10 / -0.26
	Pasture	35.88	10.36 / -1.98	9.75 / -2.59	5.38 / -6.96	4.77 / -7.57	— / -0.18	2.24 / +2.06	— / -5.04	—	0.51 / -0.31	0.51 / -0.31
Aquatic Communities	Fresh Emergent Wetland[d]	—	—	—	—	—	—	—	—	—	—	—
	Riverine[e]	50.68	15.06 / +4.14	13.74 / +2.81	11.66 / +0.73	10.33 / -0.59	9.53 / -4.93	8.51 / -5.95	5.97 / -1.42	1.98 / -1.86	3.10 / -0.08	3.79 / +0.62
	Lacustrine[f]	33.27	0.53 / -0.35	0.35 / -0.54	0.51 / -0.37	0.32 / -0.56	4.00 / -0.78	3.64 / -1.14	16.28 / -3.97	2.80 / -1.41	1.82 / -0.32	1.82 / -0.32

Notes:
[a] All impacts were calculated based on 15% engineering design construction footprint.
[b] See Appendix 3.7-B, Attachments 1, 2, and 3 for more detailed comparisons. The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.
[c] — = No impact or not applicable
[d] Fresh Emergent Wetland is equivalent to the jurisdictional waters feature emergent wetland.
[e] Riverine includes two jurisdictional waters feature types: seasonal riverine and canals/ditches.
[f] Lacustrine is equivalent to the jurisdictional waters lacustrine.

Impact Bio #5 – Project Effects on Special-Status Plant Species

Direct (Bio #5) Project Impacts

Direct impacts on special-status plant species and native plant species would result from the permanent removal of vegetation from within the HST System footprint. Disturbance of individuals, populations, or suitable potential habitat for these special-status plant species could occur during ongoing operation and maintenance activities (e.g., routine inspection and maintenance of the HST right-of-way).

Direct impacts include the permanent removal of special-status plant communities and land cover types that provide habitat for a number of special-status plants. Based on the habitat requirements of special-status plants, an estimated 55 species have a potential to occur within the land to be occupied by the HST track and facilities. Some areas within the study areas and the corresponding limits of disturbance were not made available for pedestrian field surveys. Therefore, inaccessible areas with potentially suitable habitat present are considered occupied by special-status plant species. For these reasons, all the HST alternatives are assumed to have various amounts of suitable habitat for special-status species. Depending on the amount of affected habitat, the projected adverse effect may be considered moderate to substantial with respect to NEPA and significant under CEQA.

Indirect (Bio #5) Project Impacts

Indirect impacts on special-status plant species and native plant species are anticipated to include:

- Increased erosion, sedimentation, siltation from runoff, and hydrology that could affect adjacent aquatic habitats.
- Wind erosion effects (including from unvegetated rights-of-way and passing high-speed trains).
- Increased risk of fire in adjacent open spaces from increased human activity.
- Habitat degradation through changes in habitat heterogeneity, fragmentation, and the introduction of nonnative invasive plant species (could significantly disrupt the habitat and result in the decreased viability of special-status plant populations).
- Fragmentation from the construction of permanent features, especially linear features, including track and access roads that bisected natural habitats.
- Introduction of noxious plant species (nonnative, detrimental species) from construction equipment and vehicles, increasing competition for resources (i.e., sun, water) and decreasing success in blooming, flowering, pollinating, seeding, and setting seed (annuals).
- Indirect project impacts would be less during the operation of the HST as project design features would be in place to direct water flow.

BNSF Alternative

Two special-status plant species, heartscale and little mouse tail, are known to occur in the BNSF Alternative. Additionally, special-status plant species may occur in unsurveyed habitats that have the potential to support special-status plant species within the BNSF Alternative (Appendix 3.7-B, Attachment 1). The above-mentioned direct and indirect impacts would potentially occur, resulting in the permanent loss or damage to known occurrences of heartscale and little mouse tail, and to other areas that have potential to support special-status plant species (Appendix 3.7-

B, Attachment 1). Due to the impacts to known special-status species and unsurveyed habitats that have the potential to support special-status plant species, the BNSF Alternative would result in relatively high intensity loss to these resources. Project impacts of the BNSF Alternative would result in an effect of substantial intensity under NEPA from impacts on special-status plant species. The impact would be significant under CEQA.

Hanford West Bypass 1 Alternative

No special-status plant species were identified in the Hanford West Bypass 1 Alternative, although unsurveyed habitats that have the potential to support special-status plant species do occur (Appendix 3.7-B, Attachment 1). Habitats in the Hanford West Bypass 1 Alternative, including these unsurveyed areas, are mostly urban and agricultural; however, some natural areas are present (Table 3.7-8). If special-status plant species are present in suitable unsurveyed habitats, project impacts of the Hanford West Bypass 1 Alternative could directly and indirectly result in the permanent loss or damage of special-status plant species.

Neither the Hanford West Bypass 1 Alternative nor the corresponding segment of the BNSF Alternative would result in project impacts on observed special-status plant species. However, the Hanford West Bypass 1 Alternative would result in project impacts on a larger area of unsurveyed habitats that have a low potential to support special-status plant species than its corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1). The at-grade option would result in slightly larger impacts on these habitats than the below-grade option.

Although no special-status plant species were observed in the Hanford West Bypass 1 Alternative, measurable adverse loss to special-status plant species may occur due to the loss of habitat that has potential to support special-status plant species. Therefore, project impacts of the Hanford West Bypass 1 Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant species.

Hanford West Bypass 2 Alternative

No special-status plant species were identified in the footprint of the Hanford West Bypass 2 Alternative, although unsurveyed habitats with the potential to support special-status plant species do occur (Appendix 3.7-B, Attachment 1). If special-status plant species are present in suitable unsurveyed habitats, project impacts of the Hanford West Bypass 2 Alternative could directly and indirectly result in the permanent loss or damage of special-status plant species.

Neither the Hanford West Bypass 2 Alternative nor the corresponding segment of the BNSF Alternative would result in project impacts on special-status plant species. However, the Hanford West Bypass 2 Alternative would result in project impacts on a larger area of habitats that have a low potential to support special-status plant species than the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1). The at-grade option would result in impacts on a slightly smaller area of these habitats than the below-grade option.

Although no special-status plant species were observed in the Hanford West Bypass 2 Alternative, measurable adverse loss to special-status plant species may occur due to the loss of habitat that has potential to support special-status plant species. Therefore, project impacts of the Hanford West Bypass 2 Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant species.

Corcoran Elevated Alternative

No special-status plant species were identified in the Corcoran Elevated Alternative, but unsurveyed habitats with the potential to support special-status plant species are present (Appendix 3.7-B, Attachment 1). Habitats in the Corcoran Elevated Alternative, including the

unsurveyed habitats, are mainly in urban and agricultural lands (Table 3.7-8), which have no to low potential for supporting special-status plant species.

Both the Corcoran Elevated Alternative and the corresponding BNSF Alternative would have permanent impacts on unsurveyed habitats that have a low potential to support special-status plant species in the vicinity of Cross Creek. The corresponding segment of the BNSF Alternative would result in impacts on a substantially smaller area of unsurveyed habitats that have the potential to support special-status plant species than the Corcoran Elevated Alternative (Appendix 3.7-B, Attachment 1). However, selection of the Corcoran Elevated Alternative would reduce indirect impacts by maintaining porosity and habitat connectivity underneath the elevated section. If special-status plant species are present in unsurveyed habitats, project impacts of the Corcoran Elevated Alternative could directly and indirectly result in permanent impacts on these species.

Although no special-status plant species were observed in the Corcoran Elevated Alternative, measurable adverse loss to special-status plant species may occur due to the loss of habitat that has limited potential to support special-status plant species. Therefore, project impacts of the Corcoran Elevated Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant species.

Corcoran Bypass Alternative

No special-status plant species were identified in the Corcoran Bypass Alternative, but unsurveyed habitats that have the potential to support special-status plant species are present (Appendix 3.7-B, Attachment 1). If special-status plant species are present in suitable unsurveyed habitats, project impacts of the Corcoran Bypass Alternative could directly and indirectly result in the permanent loss or damage of special-status plant species.

Both the Corcoran Bypass Alternative and the corresponding segment of the BNSF Alternative would occur in the natural lands in the vicinity of the Tulare Lakebed Mitigation Site. However, the corresponding segment of the BNSF Alternative would occur (in some instances) adjacent to SR 43 and the BNSF right-of-way and in the urban areas of Corcoran, while the Corcoran Bypass Alternative would affect more annual grasslands, which are more likely to support special-status plant species.

The Corcoran Bypass Alternative would substantially increase permanent impacts on unsurveyed habitats that have the potential to support special-status plant species compared with the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1). Indirect impacts on species and on unsurveyed natural habitats with potential to support special-status plant species are greater in the Corcoran Bypass Alternative, compared with the corresponding BNSF Alternative segment, because of the potential for greater habitat fragmentation resulting from construction of the Corcoran Bypass Alternative.

Although no special-status plant species were observed in the Corcoran Bypass Alternative, measurable adverse loss to special-status plant species may occur due to the loss of habitat that has potential to support special-status plant species. Therefore, project impacts of the Corcoran Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant species.

Allensworth Bypass Alternative

No special-status plant species were identified in the Allensworth Bypass Alternative, although unsurveyed habitats that have the potential to support special-status plant species do occur (Appendix 3.7-B, Attachment 1). If special-status plant species are present in suitable unsurveyed

habitats, project impacts of the Allensworth Bypass Alternative could directly and indirectly result in the permanent loss or damage of special-status plant species.

Selection of the Allensworth Bypass Alternative would decrease permanent impacts on known occurrences of heartscale and little mouse tail when compared with the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1). Additionally, the Allensworth Bypass Alternative would result in a smaller area of permanent direct impacts on unsurveyed habitats that have the potential to support special-status plant species. Indirect impacts on these species are greater in the Allensworth Bypass Alternative compared with the corresponding segment of the BNSF Alternative, because of habitat fragmentation resulting from construction of a new transportation alignment.

Both alternatives would occur in the natural lands in the vicinity of the Allensworth ER. However, the corresponding BNSF Alternative would occur adjacent to SR 43 and the BNSF Railway right-of-way, while the Allensworth Bypass Alternative would affect agricultural lands and natural areas that could provide greater habitat value for special-status plant species. Additionally, the Allensworth Bypass Alternative would create a new transportation alignment in these habitats, resulting in an increase in indirect impacts (i.e., habitat fragmentation) compared with the BNSF Alternative, which follows existing transportation alignments.

Although no special-status plant species were observed in the Allensworth Bypass Alternative, measurable adverse loss to special-status plant species would occur due to the loss of habitat that has potential to support special-status plant species. Therefore, project impacts of the Allensworth Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant species.

Wasco-Shafter Bypass Alternative

There are no known occurrences of special-status plants in the Wasco-Shafter Bypass Alternative (Appendix 3.7-B, Attachment 1). Unsurveyed habitats that could support special-status plant species are limited in the Wasco-Shafter Bypass Alternative (and the corresponding segment of the BNSF Alternative) by a number of factors, including the conversion of natural lands to agricultural land uses. While suitable habitat is limited, special-status plant species have up to a moderate potential of being present in suitable habitats. Direct and indirect project impacts are anticipated to occur as a result of the Wasco-Shafter Bypass Alternative, resulting in the potential permanent loss or damage of special-status plant species.

The Wasco-Shafter Bypass Alternative would have more permanent impacts on unsurveyed habitats that potentially have special-status plant species than the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 1).

Both the Wasco-Shafter Bypass Alternative and the corresponding segment of the BNSF Alternative pass through predominantly agricultural areas and bisect Poso Creek at nearly identical locations. Because the habitats located in the footprints of both alternatives would be largely disturbed, the potential for special-status plant species to occur is low. Selection of the Wasco-Shafter Bypass Alternative would affect unsurveyed potential habitat for special-status plant species; however, most of this potential habitat is low-quality, fragmented, and small in size.

Although no special-status plant species were observed in the Wasco-Shafter Bypass Alternative, measurable adverse loss to special-status plant species would occur due the loss of habitat that has limited potential to support special-status plant species. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant species.

Bakersfield South Alternative

There are no known occurrences of special-status plants in the Bakersfield South Alternative; however, unsurveyed potential habitat is present (Appendix 3.7-B, Attachment 1). Suitable habitat for most special-status plant species is limited in the Bakersfield South Alternative (as well as in its corresponding segment of the BNSF Alternative) by a number of factors, including fragmentation and disturbance from development (urbanization) that encompasses residential, commercial, and industrial purposes. While suitable habitat is limited, special-status plant species have up to a moderate potential of being present in unsurveyed suitable habitats. Direct and indirect project impacts are anticipated to occur as a result of the Bakersfield South Alternative, resulting in the permanent loss or damage of special-status plant species.

The Bakersfield South Alternative would result in slightly more permanent impacts on unsurveyed habitats that have the potential to support special-status plant species than the corresponding BNSF Alternative (Appendix 3.7-B, Attachment 1).

Because no special-status plant species are present and unsurveyed potential habitat is limited, the Bakersfield South Alternative would result in only a slight change from existing biological conditions and little to no regional effects. Therefore, project impacts of the Bakersfield South Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant species.

Bakersfield Hybrid Alternative

There are no known occurrences of special-status plants in the Bakersfield Hybrid Alternative; however, unsurveyed potential habitat is present (Appendix 3.7-B, Attachment 1). Suitable habitat for most special-status plant species is limited in the Bakersfield Hybrid Alternative (as well as in its corresponding segment of the BNSF Alternative) by a number of factors, including fragmentation and disturbance from development (urbanization) for residential, commercial, and industrial purposes. While suitable habitat is limited, special-status plant species have a moderate potential of being present in unsurveyed suitable habitats. Direct and indirect project impacts are anticipated to occur as a result of the Bakersfield Hybrid Alternative, resulting in the permanent loss or damage of special-status plant species.

The Bakersfield Hybrid Alternative would result in fewer permanent impacts on unsurveyed habitats that have the potential to support special-status plant species than the corresponding BNSF Alternative (Appendix 3.7-B, Attachment 1).

Because no special-status plant species are present and unsurveyed potential habitat is limited, the Bakersfield Hybrid Alternative would result in only a slight change from existing biological conditions and little to no regional effects. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant significant impact under CEQA on special-status plant species.

Heavy Maintenance Facility Alternatives

Fresno Works–Fresno HMF Site: There are no known occurrences of special-status plant species in the Fresno Works-Fresno HMF. The Fresno Works-Fresno HMF would result in permanent impacts on unsurveyed habitats that have the potential to support special-status plant species. Habitats in the footprint of the Fresno Works-Fresno HMF Site are all influenced by human activity (Table 3.7-9); therefore these habitats have a low to moderate potential of supporting these species. Direct and indirect impacts on special-status plants could occur, resulting in the permanent loss or damage to special-status plants species, as discussed above under the direct and indirect impact for species-status plant species. Because no special-status plant species are present and unsurveyed potential habitat is limited, the Fresno Works-Fresno HMF would result in

only a slight change from existing biological conditions. Therefore, project impacts of the Fresno Works-Fresno HMF would result in an effect of negligible intensity under NEPA, on special-status plant species. The impact would be less than significant under CEQA.

Kings County–Hanford HMF Site: There are no known occurrences of special-status plant species in the Kings County-Hanford HMF. This HMF Alternative would result in permanent impacts on unsurveyed habitats that have the potential to support special-status plant species (39.02 acres); however, these habitats are located mostly in urban and agricultural lands (Table 3.7-9) and have a low to moderate potential of supporting these species (Appendix 3.7-A, Attachment 1). Direct and indirect impacts on special-status plants could potentially occur, resulting in the permanent loss or damage to special-status plants species. Because no special-status plant species are present and unsurveyed potential habitat is limited, the Kings County-Hanford HMF would result in only a slight change from existing biological conditions and little to no regional effects. Therefore, project impacts of the Kings County–Hanford HMF would result in an effect of negligible intensity under NEPA, on special-status plant species. The impact would be less than significant under CEQA.

Kern Council of Governments–Wasco HMF Site: There are no known occurrences of special-status plant species in the Kern Council of Governments–Wasco HMF. No habitats capable of supporting special-status plant species are present within or directly adjacent to the Kern Council of Governments –Wasco HMF. Therefore, project impacts of the Kern Council of Governments – Wasco HMF would result in no effect under NEPA, and no impact would occur under CEQA on special-status plant species.

Kern Council of Governments–Shafter East HMF Site: There are no known occurrences of special-status plant species in the Kern Council of Governments–Shafter East HMF Site. The Shafter East HMF site would result in permanent impacts on a small amount of unsurveyed habitats that have the potential to support special-status plant species (0.10 acre). Direct and indirect impacts on special-status plants could potentially occur, resulting in the permanent loss or damage to special-status plants species. However, special-status plant species have a low potential to occur in the Kern Council of Governments–Shafter HMF because the small fragments of habitat within the construction footprint are unlikely to support special-status plant species. Because no special-status plant species are present and unsurveyed potential habitat is limited, the Kern Council of Governments–Shafter East HMF would result in only a slight change from existing biological conditions and little to no regional effects. Therefore, project impacts of the Kern Council of Governments–Shafter HMF would result in an effect of negligible intensity on special-status plant species under NEPA. The impact would be less than significant under CEQA.

Kern Council of Governments–Shafter West HMF Site: There are no known occurrences of special-status plant species in the Kern Council of Governments –Shafter West HMF Site. No unsurveyed habitats capable of supporting special-status plant species are present within or directly adjacent to the Shafter West HMF site. Therefore, project impacts of the Shafter West HMF site would result in no effect under NEPA, and no impact would occur under CEQA on special-status plant species.

Table 3.7-9
Communities Potentially Affected by the Heavy Maintenance Facility Alternatives (acres): Project (Permanent Impacts)

Community Type		Heavy Maintenance Facility Alternatives				
		Fresno Works–Fresno	Kings County–Hanford	Kern Council of Governments–Wasco	Kern Council of Governments–Shafter East	Kern Council of Governments–Shafter West
		Impact Acreage				
Terrestrial Communities	Barren	—	—	—	—	—
	Urban	194.85	28.67	18.03	10.22	27.85
	Agricultural Lands	316.36	454.82	396.81	483.26	448.44
	Annual Grassland	—	—	—	0.04	—
	Valley Foothill Riparian	—	—	—	—	—
	Alkali Desert Scrub	—	—	—	—	—
	Pasture	68.28	26.40	—	—	—
Aquatic Communities	Fresh Emergent Wetland[a]	—	—	—	—	—
	Riverine[b]	—	—	—	—	—
	Lacustrine[c]	—	—	—	—	—

Notes:
— = No impact or not applicable
All impacts were calculated based on 15% engineering design construction footprint.
[a] Fresh Emergent Wetland is equivalent to the jurisdictional waters feature emergent wetland.
[b] Riverine includes two jurisdictional waters feature types: seasonal riverine and canals/ditches.
[c] Lacustrine is equivalent to the jurisdictional waters lacustrine.

Station Alternatives

Kings/Tulare Regional Station–West Alternative: There are no known occurrences of special-status plant species in the footprint of the Kings/Tulare Regional Station–West Alternative. This station alternative would result in permanent impacts on unsurveyed habitats that have the potential to support special-status plant species (18.59 acres). However, habitats within this alternative, including unsurveyed habitats, are mostly urban and agricultural lands (Table 3.7-10), which have a low to moderate potential of supporting these species. Direct and indirect impacts on special-status plants could potentially occur, resulting in the permanent loss or damage to special-status plants species. Because no special-status plant species are present and unsurveyed potential habitat is limited, the Kings/Tulare Regional Station–West Alternative would result in only a slight change from existing biological conditions and little to no regional effects. Therefore, project impacts of the Kings/Tulare Regional Station–West Alternative would result in an effect of negligible intensity under NEPA, on special-status plant species. The impact would be less than significant under CEQA.

Table 3.7-10
Terrestrial Communities Potentially Affected by the Heavy Maintenance Facility Alternatives (acres): Project Operation (Permanent Impacts)

Community Type		Station Alternatives						
		Fresno Station–Mariposa	Fresno Station–Kern	Kings/ Tulare Regional Station–East	Kings/ Tulare Regional Station–West	Bakersfield Station – North	Bakersfield Station–South	Bakersfield Station–Hybrid
		Impact Acreage						
Terrestrial Communities	Barren	0.15	1.95	—	—	—	—	—
	Urban	17.23	16.07	—	4.79	21.14	23.86	29.96
	Agricultural Lands	—	—	21.87	24.84	—	—	—
	Annual Grassland	0.40	—	—	18.59	—	—	—
	Valley Foothill Riparian	—	—	—	<0.01	—	—	—
	Alkali Desert Scrub	—	—	—	—	—	—	—
	Pasture	—	—	—	—	—	—	—
Aquatic Communities	Fresh Emergent Wetland[a]	—	—	—	—	—	—	—
	Riverine[b]	—	—	—	—	—	—	—
	Lacustrine[c]	—	—	—	—	—	—	—

Notes:
— = No impact or not applicable
All impacts were calculated based on 15% engineering design construction footprint.
[a] Fresh Emergent Wetland is equivalent to the jurisdictional waters feature emergent wetland.
[b] Riverine includes two jurisdictional waters feature types: seasonal riverine and canals/ditches.
[c] Lacustrine is equivalent to the jurisdictional waters lacustrine.

Fresno Station–Mariposa, Fresno Station–Kern, Kings/Tulare Regional Station–East, Bakersfield Station–North, Bakersfield Station–South, and Bakersfield Station—Hybrid Alternatives: There are no known occurrences of special-status plants species in these proposed station alternatives, and no habitats capable of supporting special-status plant species are present in the footprint of these station alternatives. Therefore, project impacts of these station alternatives would result in no effect under NEPA, and no impact would occur under CEQA on special-status plant species.

Impact Bio #6 – Project Effects on Special-Status Wildlife Species

The following section discusses impacts, direct and indirect, resulting from permanent project facilities and their operation on special-status wildlife species and native fauna. Based on their specific habitat requirements, several special-status invertebrates and vertebrates are likely to occur in the construction footprint.

The majority of special-status wildlife species observed were in relatively undisturbed portions of the Habitat Study Area in areas that were mapped as alkali desert scrub, annual grassland, and valley foothill riparian communities. Special-status species like the western burrowing owl and Swainson's hawk were also observed in the vicinity of barren, urban, or agricultural areas; species like the western spadefoot toad were found breeding in seasonal, man-made wetlands, or roadside ditches.

Direct (Bio #6) Project Impacts

Direct impacts relative to all special-status wildlife species include the permanent conversion of occupied habitat to project infrastructure and the loss of individual special-status wildlife species within the limits of disturbance.

Invertebrates: Direct impacts would include mortality from incidental trampling or crushing caused by increased human activity in work areas and exposure to accidental spills, including contaminants/pollutants. Direct impacts would also include the permanent conversion of occupied habitat to project infrastructure or changes to micro/local hydrology. Valley elderberry longhorn beetles would be directly affected through the damage or removal of elderberry host plants.

Amphibians and Reptiles: Train operation and maintenance activities would be limited to activities in the fenced right-of-way or to the raised structure. However, since security fencing would not likely prohibit or deter most reptile and amphibian species from accessing the right-of-way, the occasional special-status amphibian and reptile species could enter the right-of-way, which would increase the likelihood of a direct strike resulting from train operation or related maintenance activities. Such direct strikes could lead to injury or mortality of the species. However, short-term disturbances associated with vibration and noise levels from the operation of the train would likely deter wildlife species from entering the right-of-way.

Direct impacts from the project may include some similar impacts on invertebrates, such as incidental trampling or crushing, exposure to accidental spills including contaminants/pollutants, changes in micro/local hydrology, and displacement from the permanent conversion of occupied habitat. In addition, the fragmentation of the habitats and landscapes resulting from the construction of the Fresno to Bakersfield Section may interfere with the daily and seasonal movement and dispersal of the special-status amphibian and reptile species.

Fish: Direct impacts during operation could include exposure to contaminants/pollutants from accidental spills and increased sedimentation from erosion. Direct impacts from the project would also include the permanent conversion of potential habitat if project infrastructure is installed in river channels.

Birds (includes all migratory birds covered under MBTA): Thirty-two special-status bird species have been identified as having a low, moderate, or high potential of occurring in at least one HST alternative (Appendix 3.7-A, Attachment 2). Burrowing owls and other raptors extensively use agricultural lands, annual grasslands, valley foothill riparian (except burrowing owl), alkali desert scrub, irrigated hay field, and pasture land cover types.

Project impacts (e.g., mowing, weed control, and driving off-road) would result in the removal or disturbance of areas that provide potential nesting habitat for a diverse population of birds. Operations and maintenance activities conducted in areas of nesting habitat during the breeding season (generally between February 1 and September 1) could disturb nesting birds. This disturbance could cause nest abandonment and subsequent loss of eggs or developing young at active nests in or near the area of activity.

Project impacts (e.g., operation of the HST project at-grade or on an elevated structure) could result in injury or mortality from bird strikes or bird interactions with the electrical systems, as

well as by permanent disturbance or temporary displacement from noise, vibration, wind, or visual stimuli. Human presence may accelerate local shifts in populations as could additional pressures on the landscape from colonization by nonnative plant species.

Burrowing Owls: Direct impacts on burrowing owls as a result of project infrastructure may include the permanent conversion of occupied habitat and local nest/burrow abandonment. Operations may increase noise levels and human presence may accelerate local shifts in populations and any additional pressures on the landscape from colonization by nonnative plant species.

Raptors: Direct impacts on raptors could include disruption of breeding activity from increased noise, mortality from HST strikes and human presence associated with HST operations, and the loss of habitat as a result of tree-clearing. Direct impacts on potential raptor foraging habitat include the permanent conversion of habitat as a result of site preparation activities.

Mammals: Direct impacts from project facilities would be primarily related to habitat conversion. Burrowing, denning and foraging habitat may be lost through ground disturbance and/or habitat degradation or land conversion from natural and bare-earth habitats to developed, hardscaped land uses. In addition, increased noise levels and human presence may accelerate local shifts in populations. In addition to the loss of habitat, some free-ranging mammals may avoid the area and be funneled along the HST corridor until locating a dispersion corridor. Project components like security fencing and Environmentally Sensitive Area fencing could result in injury or mortality if mammals become trapped by predators (e.g., coyotes, domestic/wild dogs) while traveling parallel to fence lines, which could lead to an increase in mammal predation along the length of the HST corridor.

Native fauna: Direct impacts for native fauna (e.g., fish, mollusks, crustaceans, amphibians, birds, mammals, reptiles, and insects) are similar to those impacts described above for special-status wildlife species.

Indirect (Bio #6) Project Impacts

Invertebrates: Any change in local hydrology and vernal pools could cause a change in habitat conditions for vernal pool branchiopods. Indirect impacts may result from grading and stockpiling soils upslope of the pools, leading to sediment transfer into the water column. Depending on drainage best management practices (BMPs), some changes to local hydrology could cause mobilization of otherwise standing water, scour, and changes to the period of inundation of vernal pools. Chemical spills from fuel, transmission fluid, lubricating oil, and motor oil leaks could contaminate the water column, resulting in habitat degradation or reduced reproductive success of special-status vernal pool branchiopods. Removal of young elderberry shrubs could reduce the long-term habitat of the valley elderberry longhorn beetle by inhibiting recruitment of young elderberry shrubs into the canopy.

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. However, maintenance activities that have potential impacts on special-status wildlife species are limited to the at-grade portion of the project footprint.

Amphibians: Impacts on amphibians would be dependent on the effectiveness of BMPs implemented in potentially affected drainages to mitigate changes to water velocity and periods of inundation in nearby habitats. Chemical spills from fuel, transmission fluid, lubricating oil, and motor oil leaks have the potential to contaminate the water column, resulting in mortality, habitat degradation, or reduced reproductive success. Indirectly, project components such as security fencing, electrical infrastructure, and elevated structures could attract predators like raptors by providing artificial perch sites in the landscape.

Reptiles: Indirect impacts on reptiles include changes in the local landscape from invasive species as well as aquatic and terrestrial spills of fuel, transmission fluid, lubricating oil, and motor oil leaks. Indirectly, project components such as security fencing, electrical infrastructure, and elevated structures could attract predators like raptors by providing artificial perch sites in the landscape.

Fish: Indirect impacts on water quality would be similar to those discussed for the invertebrates. Depending on drainage BMPs, some changes to local hydrology could cause scour and changes to local hydrologic profiles. Chemical spills from fuel, transmission fluid, lubricating oil, and motor oil leaks could also contaminate water, resulting in mortality, habitat degradation, or reduced reproductive success of special-status fish. Project components such as electrical infrastructure, fencing, and elevated structures could attract predators like raptors by providing artificial perch sites in the landscape, all of which could lead to an increase in predation on special-status fish species.

Birds: Indirect impacts could occur from work activities that disrupt nesting birds, potentially leading to nest failure or abandonment. Indirect impacts may include avoidance behavior by some species in response to increased noise, lighting, and startle and motion disturbances during HST operation and maintenance activities. Fragmentation of the landscape resulting from Fresno to Bakersfield Section components could interfere with special-status bird daily or seasonal movement, foraging, and dispersal.

- Burrowing Owls: Indirect impacts would be similar to those identified as common to all bird species.
- Raptors: Indirect impacts would be similar to those identified as common to all bird species.

Mammals: Operation of the Fresno to Bakersfield Section at-grade could result in displacement of these species from noise, vibration, wind, and visual stimuli, and from the actual fragmentation of the landscape as a result of the construction of the project infrastructure. These effects may result in shifts in foraging patterns or territories, or dispersal movements, increased predation, decreased reproductive success, and reduced population viability. Indirect impacts may include any additional pressures on the landscape from the colonization of nonnative plant species. The change in plant species could further reduce adjacent habitat values. Local noise and motion disturbance effects resulting from HST operation may cause some avoidance behavior.

Native fauna: Indirect impacts for native fauna (e.g., fish, mollusks, crustaceans, amphibians, birds, mammals, reptiles, and insects) are similar to those impacts described above for special-status wildlife species.

BNSF Alternative

Project impacts associated with the BNSF Alternative would result in direct and indirect impacts on a number of special-status wildlife species and their habitat (Appendix 3.7-B, Attachment 2). These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The potential for the various special-status wildlife species to occur throughout the BNSF Alternative varies according to the species known geographic range and the presence of suitable habitat capable of supporting the species life history (Appendix 3.7-A, Attachment 2). Table 3.7-8 lists the amount of terrestrial and aquatic habitat (in acres), respectively, that would potentially be permanently affected by the HST alternative alignments.

Invertebrates: Suitable habitat for special-status invertebrate species would be permanently affected by project activities associated with the BNSF Alternative (Appendix 3.7-B, Attachment 2). Seasonal wetlands and vernal pools within the northern portion of the BNSF Alternative may provide habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs

were identified within the BNSF Alternative in Fresno and Kings counties, primarily along the Kings River, Cole Slough, and Dutch John Slough. Elderberry shrubs may provide suitable habitat for the valley elderberry longhorn beetle, which exclusively uses this shrub as its host plant. Due to the presence of suitable habitat, the BNSF Alternative would result in relatively high intensity loss to habitat that likely supports, in at least some areas, special-status invertebrates. Therefore, project impacts of the BNSF Alternative would result in an effect of substantial intensity on special-status invertebrate species and their habitats under NEPA, and in a significant impact under CEQA.

Fish: A single special-status fish species (i.e., Kern brook lamprey) may be present in a single location within the BNSF Alternative, the Friant-Kern Canal in Bakersfield. This canal has the potential to support the Kern brook lamprey; however, this canal is a dead-end habitat that lacks suitable spawning substrate for this species (Moyle 2002). At this location the BNSF Alternative would be constructed on an elevated structure. Project impacts associated with the elevated structure could result in direct and indirect impacts on Kern brook lamprey in a limited area (Appendix 3.7-B, Attachment 2). While other streams within the BNSF Alternative may provide suitable habitat for Kern brook lamprey, these streams are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of this species. Due to the limited amount of suitable habitat present for special-status fish, the BNSF Alternative would result in only a slight change from existing biological conditions and little to no regional effects. Therefore, project impacts of the BNSF Alternative would result in an effect of negligible intensity on Kern brook lamprey and their habitats under NEPA, and a less-than-significant impact under CEQA.

Amphibians: Suitable habitat for western spadefoot toad and California tiger salamander would be permanently affected by project activities associated with the BNSF Alternative (Appendix 3.7-B, Attachment 2). Potential suitable breeding habitat for western spadefoot toad consists of wetlands and riverine and adjacent upland habitat (e.g., annual grassland and alkali desert scrub). Impacts on this species may occur throughout the BNSF Alternative where suitable aquatic habitat is present. No suitable aquatic habitats for California tiger salamander are present in the construction footprint; therefore, no permanent impacts on suitable California tiger salamander aquatic habitat are anticipated to occur as a result of the BNSF Alternative. Suitable aquatic habitat for this California tiger salamander (e.g., seasonal wetlands and vernal pools) does occur outside the construction footprint (i.e., Cross Creek area and Corcoran Irrigation Water District). The BNSF Alternative overlaps suitable California tiger salamander upland habitat (i.e., annual grassland within 1.24 miles of the Corcoran Irrigation Water District). Due to the presence of suitable habitat, the BNSF Alternative would result in relatively high intensity loss of habitat that may support special-status amphibians. Therefore, project impacts of the BNSF Alternative would result in an effect of substantial intensity on special-status amphibian species and their habitats under NEPA, and in a significant impact under CEQA.

Reptiles: Suitable habitat for special-status reptile species would be permanently affected by project activities associated with the BNSF Alternative (Appendix 3.7-B, Attachment 2). Aquatic habitats, such as riverine and lacustrine habitats, as well as natural upland areas, such as alkali desert scrub and annual grassland, are present and may support a range of special-status reptiles, including the western pond turtle, blunt-nosed leopard lizard, silvery legless lizard, San Joaquin whipsnake, and coast horned lizard. Due to the presence of suitable habitat, the BNSF Alternative would result in relatively high intensity loss of habitat that may support special-status reptiles. Therefore, project impacts of the BNSF Alternative would result in an effect of substantial intensity on special-status reptile species and their habitats under NEPA, and in a significant impact under CEQA.

Birds (includes all migratory birds covered under MBTA): A number of habitats known to support special-status birds and raptors would be permanently affected by project activities associated

with the BNSF Alternative (Appendix 3.7-B, Attachment 2). Aquatic and riparian habitats (e.g., riverine, lacustrine, valley foothill riparian) and agricultural lands may provide suitable habitat for a variety of birds and raptors. Impacts to these habitats would result in relatively high intensity loss of habitat that may support special-status bird species. Therefore, project impacts of the BNSF Alternative would result in an effect of substantial intensity on special-status bird species and their habitats under NEPA, and in a significant impact under CEQA.

Mammals: A number of habitats known to support special-status mammals would be permanently affected by project activities associated with the BNSF Alternative (Appendix 3.7-B, Attachment 2). Natural habitats, such as alkali desert scrub and annual grassland, may support special-status mammals (e.g., American badger, San Joaquin kit fox, and Tipton kangaroo rat). Trees and rocky outcrops in natural habitats, such as valley foothill riparian, as well as trees and buildings in rural and urban areas, may support special-status bats. The BNSF Alternative contains suitable habitat (e.g., annual grassland and alkali desert scrub) for special-status mammals, including Tipton kangaroo rat, Dulzura pocket mouse, and the San Joaquin kit fox. Special-status mammals would potentially be permanently affected, both directly and indirectly, by operation activities. Due to the presence of suitable habitat, the BNSF Alternative would result in relatively high intensity loss of habitat that may support special-status mammals. Therefore, project impacts of the BNSF Alternative would result in an effect of substantial intensity on special-status mammal species and their habitats under NEPA, and in a significant impact under CEQA.

Native fauna: Suitable habitat for native fauna would be permanently affected by construction of the BNSF Alternative (Table 3.7-8). Suitable habitat for native fauna includes both developed and natural lands. Due to the large area of habitat that would be affected, the BNSF Alternative would have influential regional effects on native fauna and would result in relatively high intensity loss of this resource. Therefore, project impacts of the BNSF Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on native fauna.

Hanford West Bypass 1 Alternative

Project impacts associated with the Hanford West Bypass 1 Alternative at-grade and below-grade options would result in direct and indirect impacts on a number of special-status wildlife species and their habitat. These impacts would occur through the same mechanisms as described above in the discussion of direct and indirect impacts on special-status wildlife species. The amount of permanent impacts associated with project period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout the Hanford West Bypass 1 Alternative varies according to the species' known geographic range and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-8 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be permanently affected by the HST alignment alternatives.

Both the Hanford West Bypass 1 Alternative and corresponding segment of the BNSF Alternative are in a rural setting dominated by agricultural land uses. The Hanford West Bypass 1 Alternative at-grade and below-grade options would result in fewer permanent direct impacts on agricultural lands suitable for special-status wildlife species and slightly more permanent direct impacts on natural habitats suitable for special-status wildlife species (Table 3.7-8; Appendix 3.7-B, Attachment 2).

Invertebrates: The Hanford West Bypass 1 Alternative at-grade and below-grade options contain a small amount of suitable habitat (i.e., other seasonal wetlands) for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Hanford West Bypass 1 Alternative at-grade and below-grade options. This species could be temporarily affected if project activities occur in unsurveyed natural areas (e.g., valley foothill riparian) that contain elderberry shrubs. Special-

status invertebrates would be permanently affected, both directly and indirectly, by project operation-related activities associated with this alternative (Appendix 3.7-B, Attachment 2).

Because suitable habitat, including a small amount of aquatic habitat, is present the Hanford West Bypass 1 Alternative would result in measureable adverse loss of habitat that may support special-status invertebrates. Therefore, project impacts of the Hanford West Bypass 1 Alternative (at-grade and below-grade options) would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within the Hanford West Bypass 1 Alternative at-grade and below-grade options, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of special-status fish species. Therefore, no direct or indirect impacts on special-status fish would result from project activities associated with this alternative.

Project period impacts of the Hanford West Bypass 1 Alternative at-grade and below-grade options would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Hanford West Bypass 1 Alternative at-grade and below-grade options include suitable habitat, such as annual grassland, for California tiger salamander and western spadefoot toad. Special-status amphibians would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Portions of the Hanford West Bypass 1 Alternative at-grade and below-grade options in agricultural land uses provide little value or habitat for special-status amphibian species.

Because the Hanford West Bypass 1 Alternative affects considerable amounts of natural land that provides suitable habitat for special-status amphibians, this alternative may result in relatively high intensity loss for these species. Therefore, project impacts of the Hanford West Bypass 1 Alternative (at-grade and below-grade options) would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status amphibian species.

Reptiles: The Hanford West Bypass 1 Alternative at-grade and below-grade options contain suitable habitat (e.g., annual grassland, valley foothill riparian, riverine) for special-status reptiles, including coast horned lizard. Portions of the Hanford West Bypass 1 Alternative at-grade and below-grade options in agricultural land uses provide little value or habitat for special-status reptile species. Special-status reptiles would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2).

Because the Hanford West Bypass 1 Alternative would affect considerable amounts of natural land that provides suitable habitat for special-status reptiles, this alternative may result in relatively high intensity loss for these species. Therefore, project impacts of the Hanford West Bypass 1 Alternative at-grade and below-grade options would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA):The Hanford West Bypass 1 Alternative at-grade and below-grade options contain suitable habitat (e.g., annual grassland, valley foothill riparian, and agricultural land uses) for migratory birds and special-status birds, including the western burrowing owl and sandhill crane (Appendix 3.7-A, Attachment 2). Special-status birds would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2).

Hanford West Bypass 1 Alternative would impact natural and agricultural lands that provide habitat for special-status birds potentially resulting in relatively high intensity loss for these

species. Therefore, project impacts of the Hanford West Bypass 1 Alternative at-grade and below-grade options would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Hanford West Bypass 1 Alternative at-grade and below-grade options contains suitable habitat (e.g., annual grassland, pasture, and agricultural lands) for special-status mammals, including San Joaquin kit fox, American badger, and Tipton kangaroo rat. The agricultural land uses likely provide little value for breeding for special-status mammal species. However, these areas may be suitable for dispersal and foraging activities. Natural lands may provide opportunity for breeding, foraging, dispersal, and migration of the special-status mammal species. Special-status mammals would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2).

Hanford West Bypass 1 Alternative would impact natural and agricultural lands that provide habitat for special-status mammals potentially resulting in relatively high intensity loss for these species. Therefore, project impacts of the Hanford West Bypass 1 Alternative (at-grade and below-grade options), would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: The Hanford West Bypass 1 Alternative at-grade and below-grade options contain suitable habitat (e.g., annual grassland, valley foothill riparian, and agricultural land uses) for native fauna (Table 3.7-8). Native fauna would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Due to the large area of habitat that would be affected, the Hanford West Bypass 1 Alternative would have influential regional effects on native fauna and would result in relatively high intensity loss of this resource. Therefore, project impacts of the Hanford West Bypass 1 Alternative (at-grade and below-grade options) would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on native fauna.

Hanford West Bypass 2 Alternative

Project impacts associated with the Hanford West Bypass 2 Alternative at-grade and below-grade options would result in direct and indirect impacts on a number of special-status wildlife species and their habitat. These impacts would occur through the same mechanisms as described above in the discussion of direct and indirect impacts on special-status wildlife species. The amount of permanent impacts associated with project period impacts is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout the Hanford West Bypass 2 Alternative varies according to the species' known geographic range and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-8 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be permanently affected by the HST alignment alternatives.

Both the Hanford West Bypass 2 Alternative and corresponding segment of the BNSF Alternative are in a rural setting dominated by agricultural land uses. The Hanford West Bypass 2 Alternative at-grade and below-grade options would result in fewer permanent direct impacts on agricultural lands suitable for special-status wildlife species, and more permanent direct impacts on natural habitats suitable for special-status wildlife species (Table 3.7-8; Appendix 3.7-B, Attachment 2).

Invertebrates: The Hanford West Bypass 2 Alternative at-grade option contains a small amount of suitable habitat (i.e., other seasonal wetlands) for vernal pool fairy shrimp and vernal pool tadpole shrimp. The Hanford West Bypass 2 Alternative below-grade option does not contain suitable habitat (e.g., vernal pools or other seasonal wetlands) for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Hanford West Bypass 2 Alternative at-grade and

below-grade options. This species could be temporarily affected if project activities occur in unsurveyed natural areas (e.g., valley foothill riparian) that contain elderberry shrubs. Special-status invertebrates would be permanently affected, both directly and indirectly, by project operation-related activities associated with this alternative (Appendix 3.7-B, Attachment 2).

Due to the presence of moderate amounts of suitable habitat, the Hanford West Bypass 2 Alternative at-grade option would result in a measureable adverse loss of habitat that may support special-status invertebrates. Therefore, project impacts of the Hanford West Bypass 2 Alternative at-grade option would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on special-status invertebrate species. The Hanford West Bypass 2 Alternative below-grade option would impact a minimal area of suitable habitat for special-status invertebrates and only a slight change from existing biological conditions and little to no regional effects would be expected from this option. Therefore, project impacts of the Hanford West Bypass 2 Alternative below-grade option would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within the Hanford West Bypass 2 Alternative at-grade and below-grade options, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of special-status fish species. Therefore, no direct or indirect impacts on special-status fish would result from project activities associated with this alternative.

Project period impacts of the Hanford West Bypass 2 Alternative at-grade and below-grade options would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Hanford West Bypass 2 Alternative at-grade and below-grade options include suitable habitat (e.g., annual grassland) for the California tiger salamander and western spadefoot toad. Special-status amphibians would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Because the Hanford West Bypass 2 Alternative affects considerable amounts of natural land that provides suitable habitat for special-status amphibians, this alternative may result in relatively high intensity loss of habitat that has limited potential to support these species. Therefore, project impacts of the Hanford West Bypass 2 Alternative at-grade and below-grade options would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status amphibian species.

Reptiles: The Hanford West Bypass 2 Alternative at-grade and below-grade options contain suitable habitat (e.g., annual grassland, valley foothill riparian, riverine) for special-status reptiles, including coast horned lizard. Portions of the Hanford West Bypass 2 Alternative at-grade and below-grade options in agricultural land uses provide little value or habitat for special-status reptile species. Special-status reptiles would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Because the Hanford West Bypass 2 Alternative affects considerable amounts of natural land that provides suitable habitat for special-status reptiles, this alternative may result in relatively high intensity loss of habitat that has limited potential to support these species. Therefore, project impacts of the Hanford West Bypass 2 Alternative (at-grade and below-grade options) would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA):The Hanford West Bypass 2 Alternative at-grade and below-grade options contain suitable habitat (e.g., annual grassland, valley foothill riparian, and agricultural land uses) for migratory birds and special-status birds, including

western burrowing owl and sandhill crane (Appendix 3.7-A, Attachment 2). Special-status birds would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2).

Hanford West Bypass 2 Alternative would impact natural and agricultural lands that provide habitat for special-status birds potentially resulting in relatively high intensity loss of habitat that has potential to support for these species. Therefore, project impacts of the Hanford West Bypass 2 Alternative (at-grade and below-grade options) would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Hanford West Bypass 2 Alternative at-grade and below-grade options contains suitable habitat (e.g., annual grassland, pasture, agricultural lands) for special-status mammals, including San Joaquin kit fox, American badger, and Tipton kangaroo rat. The agricultural land uses likely provide little value for breeding for special-status mammal species. However, these areas may be suitable for dispersal and foraging activities. Natural lands may provide opportunity for breeding, foraging, dispersal, and migration of the special-status mammal species. Special-status mammals would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2).

Hanford West Bypass 2 Alternative would impact natural and agricultural lands that provide habitat for special-status mammals potentially resulting in relatively high intensity loss of habitat that has limited potential to support these species. Therefore, project impacts of the Hanford West Bypass 2 Alternative (at-grade and below-grade options) would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: The Hanford West Bypass 2 Alternative at-grade and below-grade options contain suitable habitat (e.g., annual grassland, valley foothill riparian, and agricultural land uses) for native fauna (Table 3.7-8). Native fauna would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Due to the large area of habitat that would be affected, the Hanford West Bypass 2 Alternative would have influential regional effects on native fauna and would result in relatively high intensity loss of this resource. Therefore, project impacts of the Hanford West Bypass 2 Alternative (at-grade and below-grade options) would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on native fauna.

Corcoran Elevated Alternative

Project impacts associated with the Corcoran Elevated Alternative would result in direct and indirect impacts on a number of special-status wildlife species and their habitat (Appendix 3.7-B, Attachment 2). These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The potential for the various special-status wildlife species to occur throughout the Corcoran Elevated Alternative varies according to the species' known geographic range, and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-8 lists the amount of terrestrial and aquatic habitat (in acres), respectively, that would potentially be permanently affected by the HST alternative alignments.

Both the Corcoran Elevated Alternative and the corresponding BNSF Alternative segment are located in the urban areas of Corcoran. Both alternatives would affect small areas of habitat that could support special-status wildlife species; however, these habitats are mainly urban and agricultural lands (Table 3.7-8), which have a low to moderate potential of supporting these species (Appendix 3.7-A, Attachment 2). The magnitude of these impacts is similar to those of the corresponding BNSF Alternative segment. However, direct impacts on these species are

substantially less in the Corcoran Elevated Alternative, compared with those of the corresponding BNSF Alternative segment, because the elevated structure would maintain habitat porosity across the alignment.

Invertebrates: The Corcoran Elevated Alternative does not contain suitable habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Corcoran Elevated Alternative. This species could be temporarily affected if project activities occur in unsurveyed natural areas that contain elderberry shrubs. However, few natural areas are located in the Corcoran Elevated Alternative (Table 3.7-8). This species has a low potential to occur in this alternative. Because suitable habitat for special-status invertebrates is limited, the Corcoran Elevated Alternative is expected to result in only a slight change from existing biological conditions and little to no regional effects. Therefore, project impacts of the Corcoran Elevated Alternative would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within the Corcoran Elevated Alternative as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of special-status fish species. Therefore, no direct or indirect impacts on special-status fish would result from project impacts associated with this alternative. Project impacts of the Corcoran Elevated Alternative would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Corcoran Elevated Alternative includes suitable habitat (e.g., annual grassland) for California tiger salamander and western spadefoot toad. Special-status amphibians would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Portions of the Corcoran Elevated Alternative in agricultural and urban land uses likely provide little value for this species. Impacts to suitable habitat for special-status amphibians in the Corcoran Elevated Alternative may result in measureable adverse loss of habitat that has limited potential to support these species. Therefore, project impacts of the Corcoran Elevated Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status amphibian species.

Reptiles: The Corcoran Elevated Alternative occurs mainly in urban and agricultural lands but does contain some habitat that is potentially suitable for special-status reptile species, including considerable amounts of annual grassland (Appendix 3.7-A, Attachment 2). Portions of the Corcoran Elevated Alternative in agricultural and urban land uses likely provide little value for special-status reptile species. Special-status reptiles may be permanently affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Due to the large areas of natural habitat present, the Corcoran Elevated Alternative may result in relatively high intensity loss of habitat that has limited potential to support special-status reptiles. Therefore, project impacts of the Corcoran Elevated Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Corcoran Elevated Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for a variety of special-status birds (Appendix 3.7-A, Attachment 2). Special-status birds would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Due to the large areas of natural habitat and agricultural lands present, the Corcoran Elevated Alternative may result in relatively high intensity loss of habitat that has potential to support special-status birds. Therefore, project impacts of the

Corcoran Elevated Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Corcoran Elevated Alternative contains both natural lands (e.g., annual grassland) and agricultural lands that provide suitable habitat for special-status mammal species (e.g., Tipton kangaroo rat and the San Joaquin kit fox). The agricultural land uses likely provide little value for breeding for special-status mammal species; however, these areas may be suitable for dispersal and foraging activities. Natural lands may provide opportunity for breeding, foraging, dispersal, and migration of the special-status mammal species. Special-status mammals would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Appendix 2). Due to the large areas of natural habitat and agricultural lands present, the Corcoran Elevated Alternative may result in relatively high intensity loss of habitat that has limited potential to support special-status mammals. Therefore, project impacts of the Corcoran Elevated Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: The Corcoran Elevated Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for native fauna (Table 3.7-8). Native fauna would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Due to the large area of habitat that would be affected, the Corcoran Elevated Alternative would have influential regional effects on native fauna and would result in relatively high intensity loss of this resource. Therefore, project impacts of the Corcoran Elevated Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on native fauna.

Corcoran Bypass Alternative

Project activities associated with the Corcoran Bypass Alternative would result in direct and indirect project impacts on a number of special-status wildlife species and their habitat (Appendix 3.7-B, Attachment 2). These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The potential for the various special-status wildlife species to occur throughout the Corcoran Bypass Alternative varies according to the species' known geographic range, and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-8 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be permanently affected by the HST alternative alignments.

The segment of the BNSF Alternative that corresponds to the Corcoran Bypass Alternative would run through the urban areas of Corcoran and, in some instances, annual grasslands adjacent to SR 43 and the BNSF Railway right-of-way, while the Corcoran Bypass Alternative would affect annual grasslands that would provide higher habitat value for special-status species (Appendix 3.7-B, Attachment 2; Table 3.7-8). Project activities associated with the Corcoran Bypass Alternative would have fewer permanent impacts on some aquatic and riparian habitats (e.g., riverine, valley foothill riparian, and lacustrine) and on urban, agricultural lands, and would have more impacts on annual grassland and pasture than the corresponding segment of the BNSF Alternative (see Tables 3.7-8). Additionally, the Corcoran Bypass Alternative would create a new transportation alignment in these habitats, resulting in greater indirect impacts (i.e., habitat fragmentation) than those of the BNSF Alternative, which follows existing transportation alignments. Both the Corcoran Bypass Alternative and the corresponding segment of the BNSF Alternative would run through areas in the vicinity of Cross Creek and the Tulare Lakebed Mitigation Site.

Therefore, the Corcoran Bypass Alternative would result in greater permanent direct impacts on suitable habitat for special-status wildlife species. Indirect impacts on these species are also

greater in the Corcoran Bypass Alternative, compared with those of the corresponding BNSF Alternative segment, because of habitat fragmentation resulting from construction of a new transportation alignment.

Invertebrates: The Corcoran Bypass Alternative contains a small amount of suitable habitat (e.g., seasonal wetland) for vernal pool fairy shrimp and vernal pool tadpole shrimp (Appendix 3.7-B, Attachment 2). Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Corcoran Bypass. However, this species could be affected where project impacts would occur in unsurveyed natural areas. Special-status invertebrates would be permanently affected, both directly and indirectly, by project impacts associated with this alternative.

Impacts of the Corcoran Bypass Alternative on suitable habitat for special-status invertebrates may result in a measureable adverse loss for these species. Therefore, project impacts of the Corcoran Bypass Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within the Corcoran Bypass Alternative, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of special-status fish species. Therefore, no direct or indirect impacts on special-status fish would result from project impacts associated with this alternative. Project impacts of the Corcoran Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Corcoran Bypass Alternative includes suitable habitat, such as annual grassland, for California tiger salamander and western spadefoot toad. Special-status amphibians would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Due to the presence of suitable habitat, the Corcoran Bypass Alternative may result in a measureable adverse loss of habitat that has potential to support special-status amphibians. Therefore, project impacts of the Corcoran Bypass Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on special-status amphibian species.

Reptiles: Project activities associated with the Corcoran Bypass Alternative would impact upland and aquatic habitat (annual grassland, valley foothill riparian, riverine, and lacustrine) potentially suitable for special-status reptile species (Appendix 3.7-A, Attachment 2). Portions of the Corcoran Bypass Alternative in agricultural and urban land uses likely provide little value for special-status reptile species. Special-status reptiles may be permanently affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Due to the large areas of natural habitat present, the Corcoran Bypass Alternative may result in relatively high intensity loss of habitat that has limited potential to support special-status reptiles. Therefore, project impacts of the Corcoran Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Corcoran Bypass Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for a variety of special-status birds (Appendix 3.7-A, Attachment 2). Special-status birds would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Due to the large areas of natural habitat and agricultural lands present, the Corcoran Bypass Alternative may result in relatively high intensity loss for special-status birds. Therefore, project impacts of the Corcoran Bypass Alternative would

result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Corcoran Bypass Alternative contains both natural lands and agricultural lands that provide suitable habitat (e.g., annual grassland and barren) for special-status mammal species (e.g., Tipton kangaroo rat and the San Joaquin kit fox). The agricultural land uses likely provide little value for breeding for special-status mammal species; however, these areas may be suitable for dispersal and foraging activities. Natural lands may provide opportunity for breeding, foraging, dispersal, and migration of the special-status mammal species. Special-status mammals would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Due to the large areas of natural habitat and agricultural lands present, the Corcoran Bypass Alternative may result in relatively high intensity loss of habitat that has limited potential to support special-status mammals. Therefore, project impacts of the Corcoran Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: The Corcoran Bypass Alternative contains suitable habitat for native fauna (Table 3.7-8). Native fauna would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Due to the large area of habitat that would be affected, the Corcoran Bypass Alternative would have influential regional effects on native fauna and would result in relatively high intensity loss of this resource. Therefore, project impacts of the Corcoran Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on native fauna.

Allensworth Bypass Alternative

Project activities associated with the Allensworth Bypass Alternative would result in direct and indirect impacts on a number of special-status wildlife species and their habitat. These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The amount of permanent impacts associated with the project operation is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout the Allensworth Bypass Alternative varies according to the species' known geographic range, and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Tables 3.7-8 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be permanently affected by the HST alternative alignments.

The Allensworth Bypass Alternative would result in fewer permanent direct impacts on natural habitats (e.g., annual grassland, valley foothill riparian, alkali desert scrub, vernal pools, other seasonal wetlands, and riverine) and developed lands suitable for special-status wildlife species than the corresponding segment of the BNSF Alternative (Table 3.7-8; Appendix 3.7-B, Attachment 2).

Invertebrates: The Allensworth Bypass Alternative contains suitable habitat (e.g., vernal pools) for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Allensworth Bypass Alternative. However, this species could be affected where the project occurs in unsurveyed natural areas. Special-status invertebrates would be permanently affected, both directly and indirectly, by project operation-related activities associated with this alternative (Appendix 3.7-B, Attachment 2). The Allensworth Bypass would affect considerable areas of suitable habitat for special-status invertebrates, potentially resulting in relatively high intensity loss for these species. Therefore, project impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within Allensworth Bypass Alternative, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of special-status fish species. Therefore, no direct or indirect project impacts on special-status fish would result from project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Project impacts of the Allensworth Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Allensworth Bypass Alternative contains suitable habitat (e.g., vernal pools, annual grassland, and alkali desert scrub) for western spadefoot toad. Portions of the Allensworth Bypass Alternative in agricultural land uses provide little value or habitat for this special-status amphibian species. This special-status amphibian would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Due to the presence of suitable habitat, including suitable upland habitat, the Allensworth Bypass Alternative may result in relatively high intensity loss of habitat that has potential to support special-status amphibians. Therefore, project impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status amphibian species.

Reptiles: The Allensworth Bypass Alternative contains suitable habitat (e.g., annual grassland and alkali desert scrub) for special-status reptiles, including blunt-nosed leopard lizard and coast horned lizard. Portions of the Allensworth Bypass Alternative in agricultural land uses provide little value or habitat for special-status reptile species. Special-status reptiles would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Due to the large areas of natural habitat present, the Allensworth Bypass Alternative may result in relatively high intensity loss habitat that has potential to support special-status reptiles. Therefore, project impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA):The Allensworth Bypass Alternative contains suitable habitat (e.g., annual grassland, alkali desert scrub, and agricultural land uses) for migratory birds and special-status birds, including western burrowing owl and sandhill crane (Appendix 3.7-A, Attachment 2). Special-status birds would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Due to the large areas of natural habitat and agricultural lands present, the Allensworth Bypass Alternative may result in relatively high intensity loss of habitat that has potential to support special-status birds. Therefore, project impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Allensworth Bypass Alternative contains suitable habitat (e.g., annual grassland and alkali desert scrub) for special-status mammals, including San Joaquin kit fox, American badger, and Tipton kangaroo rat. The agricultural land uses likely provide little value for breeding for special-status mammal species. However, these areas may be suitable for dispersal and foraging activities. Natural lands may provide opportunity for breeding, foraging, dispersal, and migration of the special-status mammal species. Special-status mammals would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Due to the large areas of natural habitat present, the Allensworth Bypass Alternative may result in relatively high intensity loss of habitat that has potential to support special-status mammals. Therefore, project impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: The Allensworth Bypass Alternative contains suitable habitat for native fauna (Table 3.7-9). Native fauna would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Due to the large area of habitat that would be affected, the Allensworth Bypass Alternative would have influential regional effects on native fauna and would result in relatively high intensity loss of this resource. Therefore, project impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on native fauna.

Wasco-Shafter Bypass Alternative

Project activities associated with the Wasco-Shafter Bypass Alternative would result in direct and indirect impacts on a number of special-status species. These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The amount of permanent impacts associated with project operation is provided in Appendix 3.7-B, Attachment 2. The potential for the various special-status wildlife species to occur throughout the Wasco-Shafter Bypass Alternative varies according to the species' known geographic range, and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-8 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be permanently affected by the HST alternative alignments.

In terms of calculated impacts, selection of the Wasco-Shafter Alternative would have slightly fewer impacts on natural habitats when compared to the corresponding segment of the BNSF Alternative (Table 3.7-8; Appendix 3.7-B, Attachment 2). Selection of the Wasco-Shafter Alternative would have slightly greater impacts on agricultural lands and fewer impacts on urban areas when compared to the corresponding segment of the BNSF Alternative. Depending on the species-specific habitat requirements, the selection of the Wasco-Shafter Bypass would either increase or decrease impacts on special-status wildlife species.

Invertebrates: Project activities associated with the Wasco-Shafter Bypass Alternative would not permanently affect suitable habitat (e.g., vernal pool or seasonal wetland) for vernal pool fairy shrimp and vernal pool tadpole shrimp. Project activities associated with the Wasco-Shafter Bypass Alternative would also not temporarily affect suitable habitat (e.g., valley foothill riparian [elderberry shrubs]) for the valley elderberry longhorn beetle. Project period impacts under the Wasco-Shafter Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on special-status invertebrate species.

Fish: Special-status fish species are not expected to occur within the Wasco-Shafter Bypass Alternative, as streams within this alternative are inaccessible either because of extensive water diversions and in-stream obstructions to migratory movement or because they are outside the range of special-status fish species. Therefore, no direct or indirect impacts on special-status fish would result from project impacts associated with this alternative. Project impacts of the Wasco-Shafter Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on special-status fish species.

Amphibians: The Wasco-Shafter Bypass Alternative contains limited suitable habitat (e.g., riverine, annual grassland) for special-status amphibian species (Appendix 3.7-A, Attachment 2). This special-status amphibian species would be permanently affected, both directly and indirectly by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Due to the presence of suitable habitat, the Wasco-Shafter Bypass Alternative may result in a measureable adverse loss of habitat that has limited potential to support special-status amphibians. Therefore, project period impacts under the Wasco-Shafter Bypass Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on this special-status amphibian species.

Reptiles: The Wasco-Shafter Bypass Alternative contains fragmented habitat (e.g., riverine, lacustrine, annual grassland) for special-status reptiles, including blunt-nosed leopard lizard and western pond turtle. Because suitable habitats in the Wasco-Shafter Bypass Alternative are small and fragmented, the potential for special-status reptiles to occur may be limited. Special-status reptiles would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Although natural habitats are fragments, the total area of these suitable habitats is large enough to potentially result in relatively high intensity loss of habitat that has limited potential to support special-status reptiles. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Wasco-Shafter Bypass Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for special-status birds along much of its length. Special-status birds would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Due to the large areas of natural habitat and agricultural lands present, the Wasco-Shafter Bypass Alternative may result in relatively high intensity loss of habitats that have potential to support special-status birds. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Wasco-Shafter Bypass Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for special-status mammals (Appendix 3.7-A, Attachment 2). The agricultural land uses likely provide little value for breeding for special-status mammal species. However, these areas may be suitable for dispersal and foraging activities. Special-status mammals would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Due to the large areas of natural habitat and agricultural lands, the Wasco-Shafter Bypass Alternative may result in relatively high intensity loss of habitats that have limited potential to support special-status mammals. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: The Wasco-Shafter Bypass Alternative contains suitable habitat for native fauna (Table 3.7-8). Native fauna would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Due to the large area of habitat that would be affected, the Wasco-Shafter Bypass Alternative would have influential regional effects on native fauna and would result in relatively high intensity loss of this resource. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on native fauna.

Bakersfield South Alternative

Project activities associated with the Bakersfield South Alternative would result in direct and indirect impacts on a number of special-status wildlife species and their habitat (Appendix 3.7-B, Attachment 2). These impacts would occur as discussed above under direct and indirect impacts on special-status wildlife species. The potential for the various special-status wildlife species to occur throughout the Bakersfield South Alternative varies according to the species known geographic range and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-8 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be permanently affected by the HST alternative alignments.

Both the Bakersfield South Alternative and the corresponding BNSF Alternative segment are located in a highly urbanized portion of metropolitan Bakersfield. Both alternatives would affect small areas of habitat that could support special-status wildlife species; the magnitude of these impacts is similar.

Invertebrates: The Bakersfield South Alternative contains a small amount of suitable habitat (e.g., seasonal wetlands) for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Bakersfield South Alternative. However, this species would be affected where project impacts occur in unsurveyed natural areas and along the Kern River. Special-status invertebrates would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Impacts of the Bakersfield South Alternative on suitable habitat for special-status invertebrates may result in a measureable adverse loss of these species. Therefore, project impacts of the Bakersfield South Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on special-status invertebrate species.

Fish: Within the Bakersfield South Alternative, a small amount of marginal habitat (i.e., riverine) for the Kern brook lamprey is present in the Friant-Kern Canal. The Bakersfield South Alternative is not expected to result in long-term permanent impacts on special-status fish because it would be operated on an elevated structure. Kern brook lamprey has a low potential to be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Because a minimal amount of suitable habitat is present for special-status fish species, only a slight change to existing biological conditions is expected and little to no regional effects. Therefore, project impacts of the Bakersfield South Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status fish species.

Amphibians: The Bakersfield South Alternative contains limited suitable habitat (e.g., riverine, alkali desert scrub, and annual grassland) that may support western spadefoot toads (Appendix 3.7-A, Attachment 2). Western spadefoot toad would be permanently affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts of the Bakersfield South Alternative on suitable habitat for special-status amphibians may result in a measureable adverse loss of these species. Therefore, project impacts of the Bakersfield South Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on this special-status amphibian species.

Reptiles: The Bakersfield South Alternative contains suitable habitat (e.g., annual grassland and alkali desert scrub) for special-status reptiles, including coast horned lizard (Appendix 3.7-B, Attachment 2). Special-status reptiles would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Impacts of the Bakersfield South Alternative on suitable habitat for special-status reptiles may result in a measureable adverse loss of these species. Therefore, project impacts of the Bakersfield South Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Bakersfield South Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for a variety of special-status birds, including burrowing owl. The natural areas provide suitable habitat for breeding, foraging, and migration stopover habitat. Special-status bird species and their habitat would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Impacts of the Bakersfield South Alternative on suitable habitat for special-status birds may result in a measureable adverse loss of these species. Therefore, project impacts of the Bakersfield South Bypass Alternative would result in an

effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Bakersfield South Alternative contains suitable habitat (e.g., annual grasslands, valley foothill riparian, barren), for special-status mammals, including San Joaquin kit fox and special-status bats. In addition, urban land uses in Bakersfield are used by San Joaquin kit fox. Special-status mammals would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Impacts of the Bakersfield South Alternative on suitable habitat for special-status mammals may result in a measureable adverse loss of these species. Therefore, project impacts of the Bakersfield South Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: The Bakersfield South Alternative contains suitable habitat for native fauna (Table 3.7-8). Native fauna would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Due to the large area of habitat that would be affected, the Bakersfield South Alternative would have influential regional effects on native fauna and would result in relatively high intensity loss of this resource. Therefore, project impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on native fauna.

Bakersfield Hybrid Alternative

Project activities associated with the Bakersfield Hybrid Alternative would result in direct and indirect impacts on a number of special-status wildlife species and their habitat (Appendix 3.7-B, Attachment 2). The potential for the various special-status wildlife species to occur throughout the Bakersfield Hybrid Alternative varies according to the species' known geographic range and the presence of suitable habitat capable of supporting the species' life history (Appendix 3.7-A, Attachment 2). Table 3.7-8 lists the amount of terrestrial and aquatic habitat (in acres) that would potentially be permanently affected by the HST alternative alignments.

Both the Bakersfield Hybrid Alternative and the corresponding segment of the BNSF Alternative are located in a highly urbanized portion of metropolitan Bakersfield. Both alternatives would affect small areas of habitat that could support special-status wildlife species; the magnitude of these impacts is similar.

Invertebrates: The Bakersfield Hybrid Alternative contains a small amount of suitable habitat (e.g., other seasonal wetlands) for vernal pool fairy shrimp and vernal pool tadpole shrimp. Elderberry shrubs, the sole host plant of the valley elderberry longhorn beetle, have not been identified in the Bakersfield Hybrid Alternative. However, this species would be affected where project impacts occur in unsurveyed natural areas and along the Kern River. Special-status invertebrates would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Impacts of the Bakersfield Hybrid Alternative on suitable habitat for special-status invertebrates may result in a measureable adverse loss of these species. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on special-status invertebrate species.

Fish: Within the Bakersfield Hybrid Alternative, a small amount of marginal habitat (i.e., riverine) for the Kern brook lamprey is present in the Friant-Kern Canal. The Bakersfield Hybrid Alternative is not expected to result in long-term permanent impacts on special-status fish because it would be operated on an elevated structure. Kern brook lamprey has a low potential to be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Because a minimal amount of suitable habitat is present for

special-status fish species, only a slight change to existing biological conditions and little to no regional effects are expected. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status fish species because of the potential permanent direct and indirect impacts on the Kern brook lamprey and its habitat.

Amphibians: The Bakersfield Hybrid Alternative contains limited suitable habitat (e.g., riverine, alkali desert scrub, and annual grassland) that may support western spadefoot toads (Appendix 3.7-A, Attachment 2). Western spadefoot toad would be permanently affected, both directly and indirectly, by construction of this alternative (Appendix 3.7-B, Attachment 2). Impacts of the Bakersfield Hybrid Alternative on suitable habitat for special-status amphibians may result in a measureable adverse loss of these species. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on this special-status amphibian species.

Reptiles: The Bakersfield Hybrid Alternative contains suitable habitat (e.g., annual grassland and alkali desert scrub) for special-status reptiles, including coast horned lizard (Appendix 3.7-B, Attachment 2). Special-status reptiles would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Impacts of the Bakersfield Hybrid Alternative on suitable habitat for special-status reptiles may result in a measureable adverse loss of these species. Therefore, project impacts of the Bakersfield Hybrid Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status reptile species.

Birds (includes all migratory birds covered under MBTA): The Bakersfield Hybrid Alternative contains suitable habitat (including both natural habitats and agricultural land uses) for a variety of special-status birds, including burrowing owl. The natural areas provide suitable habitat for breeding, foraging, and migration stopover habitat. Special-status bird species and their habitat would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Impacts of the Bakersfield Hybrid Alternative on suitable habitat for special-status birds may result in a measureable adverse loss of these species. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status bird species.

Mammals: The Bakersfield Hybrid Alternative contains suitable habitat (e.g., annual grasslands, valley foothill riparian, barren), for special-status mammals, including San Joaquin kit fox and special-status bats. In addition, urban land uses in Bakersfield are used by San Joaquin kit fox. Special-status mammals would be permanently affected, both directly and indirectly, by project impacts associated with this alternative (Appendix 3.7-B, Attachment 2). Impacts of the Bakersfield Hybrid Alternative on suitable habitat for special-status mammals may result in a measureable adverse loss of these species. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status mammal species.

Native fauna: The Bakersfield Hybrid Alternative contains suitable habitat for native fauna (Table 3.7-8). Native fauna would be permanently affected, both directly and indirectly, by project impacts associated with this alternative. Due to the large area of habitat that would be affected, the Bakersfield Hybrid Alternative would have influential regional effects on native fauna and would result in relatively high intensity loss of this resource. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on native fauna.

Heavy Maintenance Facility Alternatives

Table 3.7-11 lists special-status wildlife species potentially affected by the HMF alternatives and the potential for project impacts on the species. The conclusions presented in Table 3.7-12 are based on the presence or absence of terrestrial and aquatic habitats (Table 3.7-9) suitable for these species that would potentially be permanently affected by the HST heavy maintenance facility alternatives.

Fresno Works—Fresno HMF Site: The Fresno Works—Fresno HMF contains suitable habitat (e.g. seasonal wetlands, riverine, lacustrine, pasture) for special-status wildlife, including vernal pool branchiopods, amphibians, reptiles, birds, mammals, and bats. Project impacts to these species are presented in Table 3.7-11. Due to the presence of moderate amounts suitable habitat, the Fresno Works—Fresno HMF would result in a measureable adverse loss of special-status wildlife species. Therefore, project impacts of the Fresno Works-Fresno HMF may result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on special-status wildlife species.

Kings County–Hanford HMF Site: The Kings County–Hanford HMF contains suitable habitat (e.g. riverine, pasture, agricultural land) for special-status wildlife, including amphibians, reptiles, birds, mammals, and bats. Project impacts to these species are presented in Table 3.7-11. Due to the presence of considerable amounts suitable habitat, the Kings County–Hanford HMF would result in relatively high intensity loss of special-status wildlife species. Therefore, project impacts of the Kings County–Hanford HMF may result in an effect of substantial intensity under NEPA, and a significant impact under CEQA on special-status wildlife species.

Kern Council of Governments–Wasco HMF Site: The Kern Council of Governments–Wasco HMF contains suitable habitat (e.g. riverine, lacustrine, pasture) for special-status wildlife, including amphibians, reptiles, birds, mammals, and bats. Project impacts to these species are presented in Table 3.7-11. Due to the presence of considerable amounts suitable habitat, the Kern Council of Governments–Wasco HMF would result in relatively high intensity loss of special-status wildlife species. Therefore, project impacts of the Kern Council of Governments–Wasco HMF may result in an effect of substantial intensity under NEPA, and a significant impact under CEQA on special-status wildlife species.

Kern Council of Governments–Shafter East HMF Site: The Kern Council of Governments–Shafter East HMF contains suitable habitat (e.g. annual grassland, lacustrine, agricultural land) for special-status wildlife, including amphibians, reptiles, birds, mammals, and bats. Project impacts to these species are presented in Table 3.7-11. Due to the presence of considerable amounts suitable habitat, the Kern Council of Governments–Shafter East HMF would result relatively high intensity loss of special-status wildlife species. Therefore, project impacts of the Kern Council of Governments–Shafter East HMF may result in an effect of substantial intensity under NEPA, and a significant impact under CEQA on special-status wildlife species.

Kern Council of Governments–Shafter West HMF Site: The Kern Council of Governments–Shafter West HMF contains suitable habitat (e.g. agricultural land) for special-status wildlife, including birds, mammals, and bats. Project impacts to these species are presented in Table 3.7-11. Overall, Due to the presence of considerable amounts suitable habitat, the Kern Council of Governments–Shafter West HMF may result in relatively high intensity loss of special-status wildlife species. Therefore, project impacts of the Kern Council of Governments–Shafter West HMF would result in an effect of substantial intensity under NEPA, and a significant impact under CEQA on special-status wildlife species.

Table 3.7-11
Special-Status Wildlife Species Potentially Affected by the HMF Alternatives during Project Operation

HMF Alternatives	Vernal Pool Branchio-pods	Valley Elder-berry Longhorn Beetle	Fish	Amphibians	Reptiles	Birds*	Mammals	Bats
Fresno Works-Fresno	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Moderate Effect/ Significant Impact	Moderate Effect/ Significant Impact	Moderate Effect/ Significant Impact
Kings County – Hanford	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Substantial/ Effect/ Significant Impact	Substantial/ Effect/ Significant Impact	Substantial/ Effect/ Significant Impact
KCOG–Wasco	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Substantial/ Effect/ Significant Impact	Substantial/ Effect/ Significant Impact	Substantial/ Effect/ Significant Impact
KCOG–Shafter East	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Substantial/ Effect/ Significant Impact	Substantial/ Effect/ Significant Impact	Substantial/ Effect/ Significant Impact
KCOG–Shafter West	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Substantial/ Effect/ Significant Impact	Substantial/ Effect/ Significant Impact	Substantial/ Effect/ Significant Impact

NEPA/CEQA Significance Conclusion:
No Effect/No Impact
Negligible Effect/Less than Significant
Moderate Effect/Significant Impact
Substantial Effect/Significant Impact
*includes all migratory birds covered under MBTA

Acronym: KCOG = Kern Council of Governments

Station Alternatives

Table 3.7-12 lists special-status wildlife species potentially affected by the HST station alternatives and the potential for project impacts on the species. The conclusions presented in Table 3.7-12 are based on the presence or absence of terrestrial and aquatic habitat (Table 3.7-10) that would potentially be permanently affected by the HST station alternatives.

Table 3.7-12
Special-Status Wildlife Species Potentially Affected by the Station Alternatives during Project Operation (Permanent Impacts)

Station Alternatives	Vernal Pool Branchio-pods	Valley Elder-berry Longhorn Beetle	Fish	Amphibians	Reptiles	Birds*	Mammals	Bats
Fresno Station–Mariposa Alternative	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant
Fresno Station–Kern Alternative	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant
Kings/Tulare Regional Station – West	No Effect/ No Impact	Negligible Effect/Less than Significant	No Effect/ No Impact	Negligible Effect/Less than Significant	Moderate Effect/ Significant Impact	Moderate Effect/ Significant Impact	Moderate Effect/ Significant Impact	Moderate Effect/ Significant Impact
Kings/Tulare Regional Station – East	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant
Bakersfield Station-North	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant
Bakersfield Station-South	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant
Bakersfield Station-Hybrid	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	No Effect/ No Impact	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant	Negligible Effect/Less than Significant

NEPA/CEQA Significance Conclusion:
No Effect/No Impact
Negligible Effect/Less than Significant
Moderate Effect/Significant Impact
Substantial Effect/Significant Impact
*includes all migratory birds covered under MBTA

Fresno Station–Mariposa Alternative: The Fresno Station–Mariposa Alternative contains a small amount of suitable habitat (e.g., annual grassland, barren) for special-status wildlife species, including amphibians, reptiles, birds, mammals, and bats. Project impacts to these species are presented in Table 3.7-12. Due to the limited amount of suitable habitat present, the Fresno Station–Mariposa Alternative would result in only a slight change from existing biological conditions and little to no regional effects. Therefore, project impacts of the Fresno Station–Mariposa Alternative may result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA on special-status wildlife species.

Kings/Tulare Regional Station–West Alternative: The Kings/Tulare Regional Station–West Alternative contains of suitable habitat (e.g., annual grassland, valley foothill riparian, agricultural land) for special-status wildlife species, including amphibians, reptiles, birds, mammals, and bats.

Project impacts to these species are presented in Table 3.7-12. Impacts to suitable habitat in the Kings/Tulare Regional Station–West Alternative may result in a measureable adverse loss to special-status wildlife species. Therefore, project impacts of the Kings/Tulare Regional Station–West Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on special-status wildlife species.

Fresno Station–Kern, Kings/Tulare Regional Station–East, Bakersfield Station–North, Bakersfield Station–South, and Bakersfield Station—Hybrid Alternatives: These station alternatives contain only urban or agricultural land and therefore provide minimal marginal habitat for reptiles, birds, mammals, and bats. Project impacts to these species are presented in Table 3.7-12. Due to the limited amount of suitable habitat present, these alternatives may result in only a slight change from existing biological conditions and little to no regional effects. Therefore, project impacts of these alternatives would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA on special-status wildlife species.

Impact Bio #7 – Project Effects on Habitats of Concern

This section evaluates direct and indirect project impacts on habitats of concern (i.e., special-status plant communities, jurisdictional waters, conservation areas, and protected trees) that would result from project impacts associated with the HST alternatives. Appendix 3.7-B, Attachments 3 through 6, provide a comparison of impacts on habitats of concern by alternative.

The amount of habitat permanently converted during project–related activities varies among the HST alternatives. Where habitats of concern are present, the HST alternatives will result in either a negligible, moderate, or substantial effect depending on the quantity of the regulated habitat (e.g., jurisdictional waters, conservation areas).

Direct (Bio #7) Project Impacts

Direct impacts include the permanent conversion of special-status plant communities, jurisdictional waters, conservation areas, and conservation trees. Direct project impacts on habitats of concern would result from the operation period including the construction of the various permanent project components (e.g., embankments, rail bed, road overcrossings, and aerial structure footings).

Impacts on special-status plant communities would include the permanent removal of vegetation from within the construction footprint, and the disturbance (i.e., trampling or crushing) of plants due to an increase of pedestrian access/activity in the area. Ongoing operation and maintenance activities would also occur (e.g., routine inspection and maintenance of the HST right-of-way) and would similarly involve disturbance from trampling or crushing of native vegetation by vehicle or foot traffic.

Project impacts would require the use of heavy machinery to recontour the landscape and place permanent fill materials (such as culverts, dirt, and/or engineering structures) in both man-made jurisdictional waters (e.g., basins, canals/ditches) and natural features (e.g., wetlands, river beds, and riparian corridors). The contouring and placement of fill in jurisdictional waters would result in the permanent loss of jurisdictional waters; irreversible impacts on the physical, chemical, and biological characteristics of aquatic substrates and food webs; and a potential increase in erosion and sediment transport into adjacent aquatic areas.

Construction material that may be placed in jurisdictional waters includes imported well-graded soils, sub-ballast (coarse-grained material), ballast (crushed stone), and slab (concrete). Culverts placed in jurisdictional waters would be constructed of pre-cast reinforced concrete pipe, or concrete box culverts. At bridge and elevated structure locations, cast-in-place or precast reinforced concrete girders or piles may be placed in jurisdictional waters. Other materials would

be used during project activities but are not expected to be placed in jurisdictional waters. The origin of these materials has yet to be determined, but would be supplied by local sources and from existing permitted quarries, to the extent practicable. Fill material would be suitable for construction purposes and free from toxic pollutants in toxic amounts in accordance with Section 307 of the Clean Water Act.

Direct impacts on jurisdictional waters (i.e., natural and man-made features) would also include the removal or modification of local hydrology and the redirection of flow within jurisdictional waters. In the case of man-made features, these impacts would remove or disrupt the limited biological functions that these features provide. In natural areas, these activities would remove or disrupt the hydrology, vegetation, wildlife use, water quality conditions, and other biological functions provided by the resources. Additional discussions specific to impacts on major surface water features are also provided in the Section 3.8, Hydrology and Water Resources (see Section 3.8.5.3, Common Surface Water Impacts).

Permanent impacts on jurisdictional waters would occur during construction of bridges and viaducts over biological resources such as rivers or creeks (e.g., Kings River, Dutch John Slough, Cole Slough, Cross Creek, Tule River, Deer Creek, and Kern River) and wetlands, as well as man-made ditches and basins. Permanent impacts would result from the shading of jurisdictional waters by elevated structures (where the aerial structure is near the ground), from the placement of piles to support the aerial structures and bridges, and from the permanent removal of vegetation.

Many of the jurisdictional waters (canal/ditches, and seasonal riverine) are heavily managed by local irrigation districts, which serve public water needs, and agricultural production. As a result, these jurisdictional waters support few natural biological functions and values. The biological functions of these man-made features include limited habitat for wildlife, and capacity for water storage and/or release. A number of these jurisdictional waters have been previously degraded or affected by various existing roads and BNSF infrastructure. The construction of the HST alternatives would eliminate or further degrade these man-made jurisdictional waters.

Project direct impacts on federal recovery plan areas include the creation of permanent partial or total movement barriers to special-status species, the loss or degradation of special-status plant and wildlife species, and the loss or degradation of the lands that could support or provide habitat for these species.

Project activities could directly affect biological resources associated within the Allensworth ER as described in Section 3.7.5(C), High-Speed Train Alternatives, Construction Period Impacts, Special-Status Plant Species), in 3.7.5(C) (Construction Period Impacts, Special-Status Wildlife Species), and in the discussions of jurisdictional waters in Section 3.7.5(C) (Construction Period Impacts, Habitats of Concern). However, because of the proximity to existing linear features (e.g., BNSF and SR 43), biological resources are likely to be only indirectly affected for the most part.

Project activities could interfere with, disturb, or conflict with the objectives, goals, and/or provisions of the MBHCP and could, therefore, result in a direct impact on this plan.

Construction of the HST project would result in the permanent removal or modification of trees within the construction footprint, which could conflict with the objectives, goals, and/or provisions identified in approved local, regional, or state conservation plans. Where the alignment is located at-grade, removal or trimming of all protected trees is anticipated. In urban areas where the majority of the landscaped ornamental trees are located and where the alignment is on an elevated structure, trimming and limited removal of protected trees would occur.

Indirect (Bio#7) Project Impacts

Indirect impacts would include contamination of habitats of concern outside the construction footprint from increased erosion, sedimentation, siltation, and runoff due to alterations in topography and hydrology; wind erosion effects (including from unvegetated rights-of-way and passing high-speed trains); an 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.

Permanent indirect project impacts on sensitive biological communities would include fragmentation and introduction of nonnative, invasive plant species. These changes would result in decreased viability and gradual loss of sensitive biological communities. Fragmentation would result from the construction of permanent features, especially linear features, including track that bisects sensitive biological communities. Project activities could facilitate the spread of nonnative, invasive plant species through introduction of seeds by construction equipment, vehicles, and personnel, and could provide ample habitat for colonization where permanent ground-disturbing activities occurred.

Potential indirect impacts on jurisdictional waters include a number of water-quality-related impacts: erosion, siltation, and runoff into natural and constructed water features and fill downstream of the construction footprint. In addition, permanent changes within the HST alternatives would also result in changes in hydrology. For many of the man-made features these indirect impacts would be minor, and hydrologic changes would be minimal. However, for natural features such as seasonal wetlands, and vernal pools and swales (located outside the project footprint) the changes may result in changes in the natural hydrological regime. In some areas the hydroperiod may be either reduced or extended where sheet flow is limited. Indirect impacts on seasonal riverine and riparian areas include the changes in water temperature through the removal of the riparian trees that provide shade, shading of open water, and reduced contribution to and ability to recycle nutrients. These indirect impacts would adversely affect adjacent or downstream jurisdictional waters up to 250 feet from the project disturbances.

Indirect impacts on vernal pools and swales would occur where these features straddle the footprint, and are categorized and identified as “indirect-bisected” impacts. These features are sensitive to disturbance; therefore, indirect-bisected impacts could result in either significant changes in the hydrological regime, or complete and permanent loss, as a result of drilling, excavation, or other activities that occur within the footprint. These impacts would potentially alter the surface and subsurface water flow within the watershed, affecting the hardpan, volume, and flow direction. Because these impacts would not result from the direct removal or placement of fill material, and are more severe than other indirect impacts described above, these indirect-bisected impacts would adversely affect adjacent or downstream sensitive jurisdictional waters up to 250 feet from project disturbances.

Project indirect impacts on federal recovery plan areas include fragmentation of satellite areas and linkages where recovery areas are crossed by permanent construction activities and disturbance of natural lands within recovery areas, which reduces habitat value for species recovery.

Project indirect impacts on Allensworth ER would be similar to those described in 3.7.5(C), High-Speed Train Alternatives, Construction Period Impacts, Special-Status Plant Species; in Section 3.7.5(C), High-Speed Train Alternatives, Construction Period Impacts, Special-Status Wildlife Species; and in the discussions of jurisdictional waters in Section 3.7.5(C), High-Speed Train Alternatives, Construction Period Impacts, Habitats of Concern.

BNSF Alternative

Special-Status Plant Communities

Eight special-status plant communities would be affected by this alternative: iodine bush scrub, alkali goldenbush scrub, bush seepweed scrub, saltgrass flats, Fremont cottonwood forest, black willow thickets, red willow thickets, and valley foothill riparian (Appendix 3.7-B, Attachment 3). In addition to the special-status plant communities that have been observed, a number of special-status plant communities have the potential to occur in natural areas where permission to enter was not available. Direct and indirect project impacts would occur during project activities associated with the BNSF Alternative and result in the permanent disturbance of these special-status plant communities (Appendix 3.7-B, Attachment 3). Impacts on special-status plant communities would occur as described above under the direct and indirect impacts for habitats of concern.

The magnitude of impacts on special-status plant communities of the BNSF Alternative would result in relatively high intensity loss to these communities. Therefore, project impacts of the BNSF Alternative would result in an effect of substantial intensity under NEPA, on special-status plant communities. The impact would be significant under CEQA.

Jurisdictional Waters

Wetlands and other waters, including seasonal wetlands, vernal pools and swales, canals/ditches, lacustrine features, and seasonal riverine features, are present throughout the BNSF Alternative. Direct and indirect impacts would occur during construction of the BNSF Alternative, resulting in the permanent disturbance of jurisdictional waters (Table 3.7-13; Appendix 3.7-B, Attachment 4).

Because of the sensitivity of vernal pools and swales, all impacts on these features are considered permanent. Furthermore, where these features extend beyond the project footprint, the entire feature is considered to be permanently affected (out to 250 feet).

Elevated sections of the BNSF Alternative will span existing seasonal riverine features including the Cross Creek, Tule River, Deer Creek, and Kern River. Where at-grade profiles are proposed over seasonal riverine features, bridge structures would be constructed across the Kings River Complex, and Poso Creek. Both at-grade (bridges) and elevated structures will result in direct and indirect impacts on seasonal riverine features. Additional discussions specific to impacts on major surface water features are provided in the Section 3.8, Hydrology and Water Resources (see Section 3.8.5.3, Common Surface Water Impacts).

The considerable impacts of the BNSF Alternative on jurisdictional waters, including impacts to natural features, would result in relatively high intensity loss of these resources and influential regional effects. Therefore, project impacts of the BNSF Alternative would result in an effect of substantial intensity under NEPA, due to impacts on jurisdictional waters. The impact would be significant under CEQA.

Table 3.7-13
Comparison of Project Impacts on Jurisdictional Waters by Alternative

Wetlands and Other Waters (TYPE/HST water type)	Impact Type[A]	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1—At-Grade Option	Hanford West Bypass 1—Below-Grade Option	Hanford West Bypass 2—At-Grade Option	Hanford West Bypass 2—Below-Grade Option	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Acreage / Difference Compared to Corresponding BNSF Area[B]										
Emergent wetland	Project	—	—	—	—	—	—	—	—	—	—	—
	Indirect	<0.01	0.59 / +0.59	0.59 / +0.59	0.92 / +0.92	0.92 / +0.92	—	—	—	—	— / -<0.01	<0.01 / 0.00
Seasonal wetland	Project	1.32	0.01 / +0.01	0.01 / +0.01	—	—	0.05 / +0.05	0.43 / +0.43	0.12 / -0.43	—	0.01 / -0.11	0.01 / -0.12
	Indirect	40.13	0.45 / +0.45	0.45 / +0.45	0.45 / +0.45	0.45 / +0.45	2.14 / -0.05	0.13 / -2.06	10.75 / -22.69	—	0.55 / -0.08	0.55 / -0.08
Vernal pools and swales	Project	11.59	—	—	—	—	1.09 / -0.46	1.19 / -0.36	1.05 / -8.37	—	—	—
	Indirect Bisected	23.88	—	—	—	—	4.76 / -0.73	— / -5.49	1.73 / -15.52	—	—	—
	Indirect	38.61	—	—	—	—	1.78 / +1.19	1.56 / +0.97	11.58 / -20.75	—	—	—
Canals/Ditches	Project	44.81	14.35 / +7.45	13.21 / +6.31	10.54 / +3.64	9.40 / +2.50	9.29 / -4.93	8.37 / -5.85	5.84 / -1.28	1.98 / -1.86	2.27 / +0.43	2.96 / +1.12
	Indirect	75.18	21.61 / +8.75	20.86 / +8.00	21.53 / +8.68	20.78 / +7.92	19.16 / +8.24	14.13 / +3.20	24.12 / -0.72	5.82 / -1.99	11.89 / +2.26	11.63 / +1.99
Lacustrine	Project	33.27	0.53 / -0.35	0.35 / -0.54	0.51 / -0.37	0.32 / -0.56	4.00 / -0.78	3.64 / -1.14	16.28 / -3.97	2.80 / -1.41	1.82 / -0.32	1.82 / -0.32
	Indirect	139.66	6.34 / +1.91	0.79 / -3.64	17.61 / +13.18	12.05 / +7.62	11.37 / +0.11	8.09 / -3.16	104.37 / +14.06	6.52 / -5.23	4.35 / -4.16	4.04 / -4.47
Seasonal riverine	Project	5.88	0.71 / -3.31	0.52 / -3.50	1.12 / -2.91	0.93 / -3.09	0.24 / 0.00	0.14 / -0.10	0.14 / -0.14	—	0.83 / -0.50	0.83 / -0.50
	Indirect	36.63	5.32 / -8.81	4.74 / -9.40	5.40 / -8.73	4.81 / -9.32	0.80 / -0.17	2.72 / +1.75	1.27 / -0.28	—	12.40 / -7.58	12.40 / -7.58
Riparian	Project	4.08	0.86 / -1.60	0.92 / -1.54	0.86 / -1.60	0.92 / -1.54	0.38 / -0.01	0.24 / -0.15	0.28 / -0.83	—	0.46 / +0.34	0.46 / +0.34
	Indirect	30.94	9.09 / -8.56	9.04 / -8.61	9.09 / -8.56	9.04 / -8.61	1.02 / -0.11	1.84 / +0.70	2.59 / -1.40	—	3.67 / -4.49	3.66 / -4.50

Notes:
— = No impact or not applicable
[A] Indirect impacts are calculated within a 250-foot buffer of the project footprint, which includes areas of permanent and temporary impacts.
[B] The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.
Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.
All impacts were calculated based on 15% engineering design construction footprint.

Conservation Areas

Recovery Plans

The BNSF Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the BNSF Alternative occurs in satellite and linkage areas identified in the recovery plan. Project activities associated with the BNSF Alternative would result in permanent impacts on the recovery plan areas identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Appendix 3.7-B, Attachment 5).

Due to the large area of impact, the BNSF Alternative would result in relatively high intensity loss of recovery plan areas. Therefore, project impacts of the BNSF Alternative would result in an effect of substantial intensity on recovery plans under NEPA, and in a significant impact under CEQA.

Allensworth Ecological Reserve

The BNSF Alternative in southern Tulare County would overlap the eastern boundary of the Allensworth ER. Project activities associated with the BNSF Alternative would result in permanent disturbance to the Allensworth ER (Appendix 3.7-B, Attachment 5). Due to these impacts, the BNSF Alternative would result in relatively high intensity loss of the Allensworth ER, which would have influential regional effects. Therefore, project impacts on the BNSF Alternative would result in an effect of substantial intensity on the Allensworth ER under NEPA, and in a significant impact under CEQA.

Habitat Conservation Plans

The BNSF Alternative overlaps with the MBHCP. Project activities on the BNSF Alternative would result in permanent impacts within the habitat conservation plan area (Appendix 3.7-B, Attachment 5).

Project impacts under the BNSF Alternative do not conflict with the provisions of the MBHCP because proposed mitigation ratios are similar to the “adequate mitigation” ratios presented in the plan. Additionally, the BNSF Alternative does not overlap with the conceptual focus areas identified as potential preserve areas. Therefore, project impacts under the BNSF Alternative would result in no effect on habitat conservation plans under NEPA, and no impact under CEQA.

Protected Trees

Trees, including those regulated by various local government regulations, are present along the BNSF Alternative (Appendix 3.7-B, Attachment 6), and project impacts would both alter and remove some portion of these resources. The majority of trees are located in Fresno, and almost all of the native oaks are in the vicinity of the Kings River. Protected riparian trees associated with the Kern River are also located in the City of Bakersfield. Direct and indirect project impacts would occur in association with the BNSF Alternative, resulting in the permanent disturbance of these protected trees.

The anticipated removal and trimming of protected trees (both native and landscape ornamentals) as part of construction of permanent project impacts in all four counties of the Fresno to Bakersfield Section would be in conflict with the city and county ordinances. Due to the considerable number of protected trees that would be affected, the BNSF Alternative would result in relatively high intensity loss of that resource. Therefore, project impacts of the BNSF Alternative would result in an effect of substantial intensity on protected trees under NEPA, and in a significant impact under CEQA.

Hanford West Bypass Alternative 1

Special-Status Plant Communities

Field surveys identified two special-status plant communities in the Hanford West Bypass 1 Alternative footprint: bush seepweed scrub and valley foothill riparian habitat (Table 3.7-8; Appendix 3.7-B, Attachment 3). Additional unsurveyed habitats that have the potential to support special-status plant communities, including annual grasslands, could also support special-status plant communities. Permanent impacts would occur in identified special-status plant communities (i.e., valley foothill riparian) in the Hanford West Bypass 1 Alternative footprint. Permanent impacts would also occur in unsurveyed habitats that have the potential to support special-status plant communities. Impacts on special-status plant communities would occur as described above under the direct and indirect impacts for habitats of concern.

The Hanford West Bypass 1 Alternative would result in slightly more permanent impacts on bush seepweed scrub and significantly more permanent impacts on unsurveyed habitats that have the potential to support special-status plant communities than its corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 3). The Hanford West Bypass 1 Alternative below-grade option would have slightly fewer permanent impacts than the corresponding segment of the BNSF Alternative on valley foothill riparian and the at-grade option would have slightly more permanent impacts (Table 3.7-8).

Impacts of the Hanford West Bypass on special-status plant communities and unsurveyed habitats that have the potential to support special-status plant communities would result in measurable loss of these resources. Therefore, project impacts of the Hanford West Bypass 1 Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Wetlands and other waters present in the footprint of the Hanford West Bypass 1 Alternative include emergent and seasonal wetlands, canals/ditches, lacustrine features, seasonal riverine and riparian areas (Table 3.7-13; Appendix 3.7-B, Attachment 4). Direct and indirect impacts on natural jurisdictional waters and man-made features (e.g., canals/ditches, and lacustrine features) would occur during project related activities under the Hanford West Bypass 1 Alternative, resulting in the permanent disturbance of these jurisdictional waters.

Both the Hanford West Bypass 1 Alternative and corresponding segment of the BNSF Alternative are located in rural setting dominated by agricultural land uses. The majority of the jurisdictional waters in the Hanford West Bypass 1 Alternative and corresponding BNSF Alternative segment are man-made and in poor ecological condition, with the exception of the Kings River complex, other seasonal riverine features, and seasonal wetlands, which are in fair to good ecological condition. The Hanford West Bypass 1 Alternative would increase the direct impacts on canals/ditches when compared with the corresponding segment of the BNSF Alternative (Table 3.7-13; Appendix 3.7-B, Attachment 4). However, the Hanford West Bypass 1 Alternative would result in fewer direct and indirect impacts on other man-made features and on seasonal riverine and riparian features (including the Kings River complex) than the corresponding segment of the BNSF Alternative. Additionally, the Hanford West Bypass 1 Alternative would be constructed on an elevated structure above the Kings River complex, while the corresponding segment of the BNSF Alternative would be constructed at-grade and would cross the various seasonal riverine features with bridge structures. Overall, indirect impacts as a result of both construction and project activities on the Hanford West Bypass 1 Alternative would be less than those associated with the corresponding segment of the BNSF Alternative.

The direct impacts associated with the at-grade and below-grade design options are similar. However, the at-grade and below-grade options would increase indirect impacts on wetlands and decrease impacts on seasonal riverine features when compared to the corresponding segment of the BNSF Alternative.

Impacts of the Hanford West Bypass 1 Alternative on jurisdictional waters would result in relatively high intensity loss of these resources due to the magnitude of the impact. Therefore, project impacts under the Hanford West Bypass 1 Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

Neither the Hanford West Bypass 1 Alternative nor its corresponding segment on the BNSF Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998) (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on the plan area would occur as a result of either of these alternatives.

Project impacts of the Hanford West Bypass 1 Alternative would result in no effect under NEPA, and no impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Hanford West Bypass 1 Alternative nor its corresponding segment on the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on the Allensworth ER would occur as a result of project activities associated with either of these alternatives.

Project impacts of the Hanford West Bypass 1 Alternative would result in no effect under NEPA, and no impact under CEQA on Allensworth ER.

Habitat Conservation Plans

Neither the Hanford West Bypass 1 Alternative nor its corresponding segment in the BNSF Alternative overlaps the plan area of the MBHCP (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts within the MBHCP plan area would occur as a result of the project impacts of either of these alternatives.

Project impacts of the Hanford West Bypass 1 Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Trees that may be regulated under Fresno County General Plan and/or the Kings County General Plan are present in both the Hanford West Bypass 1 Alternative and the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Project activities would both alter and remove some portion of these resources. Additionally, these impacts could occur as a result of the at-grade and below-grade options.

Project impacts on protected trees under the Hanford West Bypass 1 at-grade option would result in an increase in the number of trees disturbed compared to the construction of the corresponding segment of the BNSF Alternative.

Project impacts under the Hanford West Bypass 1 below-grade option would result in a negligible decrease in the number of trees disturbed compared to the corresponding segment of the BNSF Alternative.

Due to the number of protected trees that would be affected, the Hanford West Bypass 1 Alternative would result in relatively high intensity loss of this resource. Therefore, project impacts of the Hanford West Bypass 1 Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on protected trees because of the direct and indirect impacts associated with the BNSF Alternative.

Hanford West Bypass Alternative 2

Special-Status Plant Communities

Field surveys identified valley foothill riparian within the Hanford West Bypass 2 Alternative. Special-status plant communities may occur in unsurveyed habitats that have the potential to support special-status plant communities within this alternative (Appendix 3.7-B, Attachment 3). Impacts on special-status plant communities would occur as described above in the discussion of the direct and indirect impacts for habitats of concern.

Selection of the Hanford West Bypass 2 Alternative would result in substantially greater permanent impacts on unsurveyed habitats potentially suitable for special-status plant communities when compared with the corresponding BNSF Alternative segment (Appendix 3.7-B, Attachment 3). The Hanford West Bypass 2 Alternative below-grade option would have slightly fewer permanent impacts than the corresponding segment of the BNSF Alternative on valley foothill riparian, and the at-grade option would have slightly more permanent impacts (Table 3.7-8).

Impacts of the Hanford West Bypass 2 Alternative would result in a measureable adverse loss of special-status plant communities. Therefore, project impacts of the Hanford West Bypass 2 Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Wetlands and other waters present in the footprint of the Hanford West Bypass 2 Alternative include emergent and seasonal wetlands, canals/ditches, lacustrine features, seasonal riverine, and riparian areas (Appendix 3.7-B, Attachment 4). Direct and indirect impacts on natural jurisdictional waters and man-made features (e.g., canals/ditches, and lacustrine features) would occur during project activities under the Hanford West Bypass 2 Alternative, resulting in the permanent disturbance of these jurisdictional waters.

Both the Hanford West Bypass 2 Alternative and corresponding segment of the BNSF Alternative are located in a rural setting dominated by agricultural land uses. The majority of the jurisdictional waters in the Hanford West Bypass 2 Alternative and corresponding BNSF Alternative segment are man-made and in poor ecological condition, with the exception of the Kings River complex, other seasonal riverine features, and seasonal wetlands, which are in fair to good ecological condition. The Hanford West Bypass 2 Alternative at-grade option would slightly increase the direct impacts on man-made jurisdictional waters when compared with the corresponding segment of the BNSF Alternative and the below-grade option would slightly decrease impacts (Table 3.7-13; Appendix 3.7-B, Attachment 4). Direct and indirect impacts on seasonal riverine and riparian features (including the Kings River complex) would decrease under Hanford West Bypass 2 Alternative when compared to the corresponding segment of the BNSF Alternative.

Additionally, the Hanford West Bypass 2 Alternative would be constructed on an elevated structure above the Kings River complex, while the corresponding BNSF Alternative would be constructed at-grade and cross the various seasonal riverine features with bridge structures. Overall, indirect impacts on jurisdictional waters associated with the Hanford West Bypass 2

Alternative would slightly increase for the at-grade option and decrease for the below-grade option compared to the corresponding segment of the BNSF Alternative, as a result of both construction and project activities combined.

The direct impacts associated with the at-grade and below-grade design options are similar. However, the at-grade option would increase indirect impacts on wetlands and decrease impacts on seasonal riverine features compared to the below-grade option.

Impacts of the Hanford West Bypass 2 Alternative on jurisdictional waters would result in relatively high intensity loss of these resources due to the magnitude of the impact. Therefore, project impacts under the Hanford West Bypass 2 Alternative would result in an effect of substantial intensity under NEPA, and a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

Neither the Hanford West Bypass 2 Alternative nor its corresponding segment of the BNSF Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998) (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on the plan area would occur as a result of either of these alternatives.

Project impacts of the Hanford West Bypass 2 Alternative would result in no effect under NEPA, and no impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Hanford West Bypass 2 Alternative nor its corresponding segment in the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on the Allensworth ER would occur as a result of project activities associated with either of these alternatives.

Project impacts of the Hanford West Bypass 2 Alternative would result in no effect under NEPA, and no impact under CEQA on Allensworth ER.

Habitat Conservation Plans

Neither the Hanford West Bypass 2 Alternative nor its corresponding segment on the BNSF Alternative overlaps the plan area of the MBHCP (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts within the MBHCP plan area would occur as a result of the project impacts of either of these alternatives.

Project impacts of the Hanford West Bypass 2 Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Impacts on protected trees in the Hanford West Bypass 2 Alternative would be the same as discussed for the Hanford West Bypass 1 Alternative. Trees that may be regulated under the Fresno County General Plan and/or the Kings County General Plan are present in both the Hanford West Bypass 2 Alternative, and the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Construction activities would both alter and remove some portion of these resources. Additionally, these impacts could occur as a result of at-grade and below-grade options.

Project impacts on protected trees under the Hanford West Bypass 2 Alternative at-grade design option would result in an increase in the number of trees disturbed when compared to the corresponding segment on the BNSF Alternative.

Project impacts under the Hanford West Bypass 2 Alternative below-grade option would result in a negligible decrease in the number of trees disturbed when compared to the corresponding segment on the BNSF Alternative.

Due to the number of protected trees that would be affected, the Hanford West Bypass 2 Alternative would result in relatively high intensity loss of this resource. Therefore, project impacts associated with the Hanford West Bypass 2 Alternative would result in an effect of substantial intensity under NEPA, and a significant impact under CEQA on protected trees because of the direct and indirect impacts associated with the BNSF Alternative.

Corcoran Elevated Alternative

Special-Status Plant Communities

Field surveys identified three special-status plant communities in the Corcoran Elevated Alternative: saltgrass flats, black willow thickets, and valley foothill riparian habitat located along the Tule River (Table 3.7-8; Appendix 3.7-B, Attachment 3). Additional unsurveyed habitats, including annual grasslands, could also support special-status plant communities. Permanent impacts would occur in identified special-status plant communities (i.e., valley foothill riparian) located in the footprint of the Corcoran Elevated Alternative. Permanent impacts would also occur in unsurveyed habitats that have the potential to support special-status plant communities. Impacts on special-status plant communities would occur as described above in the section on the direct and indirect impacts for habitats of concern. The Corcoran Elevated Alternative would result in slightly more permanent impacts on saltgrass flats and significantly more permanent impacts on unsurveyed habitats that could support special-status plant communities than the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 3). The Corcoran Elevated Alternative would result in slightly less permanent impacts on black willow thicket and valley foothill riparian than the corresponding segment of the BNSF Alternative.

Impacts of the Corcoran Elevated Alternative would result in a measureable adverse loss of special-status plant communities. Therefore, project impacts of the Corcoran Elevated Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Wetlands and other waters present in the Corcoran Elevated Alternative contain seasonal wetlands, vernal pools and swales, agricultural canals/ditches, lacustrine, and seasonal riverine and riparian features (e.g., Cross Creek and Tule River) (Table 3.7-13; Appendix 3.7-B, Attachment 4). Direct and indirect project impacts would occur under the Corcoran Elevated Alternative, resulting in the permanent disturbance of natural (e.g., vernal pools and swales and seasonal riverine and riparian areas) and man-made jurisdictional waters.

Both the Corcoran Elevated Alternative and the corresponding segment of the BNSF Alternative are located in an urban and rural setting, and are routed through Corcoran along SR 43 and the BNSF right-of-way. The majority of the jurisdictional waters in the footprints of the Corcoran Elevated Alternative and the corresponding segment of the BNSF Alternative are man-made and in poor ecological condition, with the exception of Cross Creek, which is in fair ecological condition, and Poso Creek and vernal pools and swales, which are in good ecological condition. The Corcoran Elevated Alternative would have fewer permanent impacts on jurisdictional waters (including features in good or fair ecological condition) than the corresponding segment of the BNSF Alternative (Table 3.7-13; Appendix 3.7-B, Attachment 4).

Both the Corcoran Elevated Alternative and the corresponding segment of the BNSF Alternative would be constructed on an elevated structure above Cross Creek and the Tule River. Overall,

the Corcoran Elevated Alternative's indirect impacts, including indirect-bisected impacts on sensitive jurisdictional waters, resulting from both construction and project activities, are similar to those of the corresponding segment of the BNSF Alternative.

Impacts of the Corcoran Elevated Alternative on jurisdictional waters would result in relatively high intensity loss of these resources due to the magnitude of the impact and the sensitivity of the features. Therefore, project related impacts under the Corcoran Elevated Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Corcoran Elevated Alternative overlaps an area covered by the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Corcoran Elevated Alternative occurs in a satellite area identified in this recovery plan area (Appendix 3.7-B, Attachment 5). Construction of this alternative would result in permanent direct or indirect on the recovery plan area. The Corcoran Elevated Alternative and the corresponding segment in the BNSF Alternative both overlap the recovery plan area for the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). Selection of the Corcoran Elevated Alternative would substantially decrease the amount of permanent disturbance to the recovery plan area compared with selection of the corresponding segment of the BNSF Alternative.

Due to the large area of impact, the Corcoran Elevated Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, project impacts of the Corcoran Elevated Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Corcoran Elevated Alternative nor the corresponding segment of the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on the Allensworth ER would occur as a result of project activities associated with either of these alternatives.

Project impacts of the Corcoran Elevated Alternative would result in no effect under NEPA, and no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans

Neither the Corcoran Elevated Alternative nor the corresponding segment in the BNSF Alternative overlaps the plan area of the MBHCP (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on this habitat conservation plan area would occur as a result of the project impacts of either of these alternatives.

Project impacts of the Corcoran Elevated Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Six trees that are regulated under the Kings County General Plan and/or the Corcoran City Code are present in the footprint of the Corcoran Elevated Alternative (Appendix 3.7-B, Attachment 6). Project impacts would both alter and remove some portion of these resources. Project impacts on protected trees under the Corcoran Elevated Alternative would result in a decrease in the number of trees disturbed compared to the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6).

Project impacts on protected trees under the Corcoran Elevated Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA.

Corcoran Bypass Alternative

Special-Status Plant Communities

Field surveys identified three special-status plant communities in the Corcoran Bypass Alternative: saltgrass flats, black willow thickets, and valley foothill riparian habitat located along the Tule River (Table 3.7-8; Appendix 3.7-B, Attachment 3). Additional unsurveyed habitats that have the potential to support special-status plant communities, including annual grasslands, could also support special-status plant communities. Permanent impacts would occur in identified special-status plant communities (i.e., valley foothill riparian) in the Corcoran Bypass Alternative. Permanent impacts would also occur in unsurveyed habitats that have the potential to support special-status plant communities. Impacts on special-status plant communities would occur as described above under the direct and indirect impacts for habitats of concern. The Corcoran Bypass Alternative would result in similar permanent impacts on saltgrass flats and substantially more permanent impact on unsurveyed habitats that have the potential to support special-status plant communities than the corresponding segment of the BNSF Alternative. The Corcoran Bypass Alternative would result in slightly fewer permanent impacts than the corresponding segment of the BNSF Alternative on black willow thicket and valley foothill riparian habitats (Appendix 3.7-B, Attachment 3).

Impacts of the Corcoran Bypass Alternative would result in a measureable adverse loss of special-status plant communities. Therefore, project impacts of the Corcoran Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Wetlands and other waters present in the Corcoran Bypass Alternative include seasonal wetlands, vernal pools and swales, canals/ditches, lacustrine, and seasonal riverine and riparian areas (e.g., Cross Creek and the Tule River) (Table 3.7-13; Appendix 3.7-B, Attachment 4). Direct and indirect impacts would occur due to construction of the Corcoran Bypass Alternative, resulting in the permanent disturbance of natural (e.g., seasonal wetlands, vernal pools and swales, and seasonal riverine and riparian areas) and man-made jurisdictional waters.

The Corcoran Bypass Alternative would be located in agricultural areas east of Corcoran, whereas the corresponding segment of the BNSF Alternative would be routed through Corcoran, along SR 43 and the BNSF right-of-way. The natural jurisdictional water features are in fair (Cross Creek) to good ecological condition (vernal pools and swales, seasonal wetlands, and Tule River), whereas the man-made features are generally in poor ecological condition. The Corcoran Bypass Alternative would have fewer permanent impacts on riparian, and seasonal riverine features and man-made jurisdictional waters and slightly more impacts on wetlands when compared with the corresponding segment of the BNSF Alternative (Table 3.7-13; Appendix 3.7-B, Attachment 4).

Additionally, both the Corcoran Bypass Alternative and the corresponding BNSF Alternative segment would be constructed on an elevated structure above Cross Creek and the Tule River. Overall, indirect and indirect bisected impacts on sensitive jurisdictional waters associated with the Corcoran Bypass Alternative, as a result of both construction and project activities combined, are less than those associated with the corresponding segment of the BNSF Alternative.

Impacts of the Corcoran Bypass Alternative on jurisdictional waters would result in relatively high intensity loss of these resources due to the magnitude of the impact and the sensitivity of vernal pools and swales and seasonal riverine features. Therefore, project impacts under the Corcoran

Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA.

Conservation Areas

Recovery Plans

The Corcoran Bypass Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Corcoran Bypass Alternative occurs in a satellite area identified in this recovery plan area. Project activities on the Corcoran Bypass Alternative would result in permanent disturbance of this recovery plan area (Appendix 3.7-B, Attachment 5).

The Corcoran Bypass Alternative and the corresponding segment in the BNSF Alternative both overlap the recovery plan area for the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). Selection of the Corcoran Bypass Alternative would greatly decrease the amount of permanent disturbance to the recovery plan area when compared with the corresponding BNSF Alternative segment (Appendix 3.7-B, Attachment 5).

Due to the large area of impact, the Corcoran Bypass Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, project impacts of the Corcoran Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Corcoran Bypass Alternative nor the corresponding segment of the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect project impacts on the Allensworth ER would occur as a result of project impacts associated with either of these alternatives.

Project impacts of the Corcoran Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans

Neither the Corcoran Bypass Alternative nor the corresponding segment of the BNSF Alternative overlaps the plan area of the MBHCP (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on this habitat conservation plan area would occur as a result of project impacts of either of these alternatives.

Project impacts of the Corcoran Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Trees that may be regulated under the Kings County General Plan and/or the Corcoran City Code are present in the Corcoran Bypass Alternative and in the corresponding segment of the BNSF Alternatives. Direct and indirect project impacts would occur in association with the Corcoran Bypass Alternative, resulting in the disturbance of protected trees. Project impacts on protected trees under the Corcoran Bypass Alternative would result in a decrease of the number of unknown trees disturbed when compared to the corresponding segment in the BNSF Alternative (Appendix 3.7-B, Attachment 6).

Due to the limited number of protected trees that would be affected, the Corcoran Bypass Alternative would result in only a slight change to existing biological conditions and little to no regional effects. Therefore, project impacts on protected trees under the Corcoran Bypass

Alternative would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA.

Allensworth Bypass Alternative

Special-Status Plant Communities

During the field surveys, five special-status plant communities were identified in the Allensworth Bypass Alternative: saltgrass flats, bush seepweed scrub, iodine bush scrub, black willow thickets, and valley foothill riparian (Table 3.7-8; Appendix 3.7-B, Attachment 3). Special-status plant communities could also be present in unsurveyed habitats that have the potential to support special-status plant communities (e.g., annual grasslands, riverine, and fragmented natural areas). Permanent impacts would occur in identified special-status plant communities (i.e., valley foothill riparian) in the Allensworth Bypass Alternative. Permanent impacts would also occur in unsurveyed habitats that have the potential to support special-status plant communities. Impacts on special-status plant communities would occur as described above under the direct and indirect impacts for habitats of concern.

The Allensworth Bypass Alternative would result in significantly fewer permanent impacts on bush seepweed scrub and slightly fewer permanent impacts on iodine bush scrub, alkali goldenbush scrub, Freemont cottonwood forest, red willow thickets, and valley foothill riparian than the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 3, Table 3.7-8). The Allensworth Bypass Alternative would result in a greater number of permanent impacts on saltgrass flats, black willow thickets, and unsurveyed habitats that have the potential to support special-status plant communities than the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 3).

Due to the magnitude of the impact, the Allensworth Bypass Alternative would result in relatively high intensity loss to special-status plant communities. Therefore, project impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on special-status plant communities because of the potential permanent direct and indirect impacts on these communities.

Jurisdictional Waters

Surveys for vernal pools were used to inform routing of the Allensworth Bypass to minimize impacts on wetlands and other waters (a reduction of more than 100 acres in the Wetland Study Area). Even after minimization of impacts, the Allensworth Bypass Alternative would permanently affect seasonal wetlands, vernal pools and swales, seasonal riverine and riparian areas (e.g., Deer Creek, Poso Creek), and man-made features, including ditches, and lacustrine (e.g., Alpaugh Irrigation District pond)(Table 3.7-13; Appendix 3.7-B, Attachment 4). Direct and indirect project impacts would occur in association with the Allensworth Bypass Alternative, resulting in the permanent disturbance of these jurisdictional waters.

The Allensworth Bypass Alternative travels primarily through agricultural lands, in contrast with the corresponding segment of the BNSF Alternative, which runs adjacent to significant undeveloped natural lands parallel to SR 43 and along the BNSF right-of-way. The majority of the wetland features (e.g., vernal pools and swales) as well as Deer Creek and Poso Creek are located in a highly fragmented landscape but are in relative fair to good ecological condition. The remaining man-made features (e.g., ditches, lacustrine) are in relatively poor ecological condition. Selection of the Allensworth Bypass Alternative would greatly decrease the amount of permanent impacts on vernal pools and swales, seasonal wetlands, and other man-made jurisdictional waters compared with the corresponding segment of the BNSF Alternative (Table 3.7-13; Appendix 3.7-B, Attachment 4).

The Allensworth Bypass Alternative would bisect an existing lacustrine feature, resulting in an increased impact on this water storage feature compared to the corresponding segment of the BNSF Alternative. However, selection of the Allensworth Bypass Alternative would decrease the amount of indirect impacts on wetlands, including those that are sensitive to indirect-bisected impacts (e.g., vernal pool and swales) (Table 3.7-13; Appendix 3.7-B, Attachment 4). These indirect impacts would occur as a result of the combined construction and project activities.

Additionally, both the Allensworth Bypass and the corresponding segment of the BNSF Alternative would be constructed on an elevated structure above Deer Creek, and would be constructed at-grade and use a bridge to cross Poso Creek. If both the Allensworth Bypass and the Wasco Shafter Bypass are selected, the Poso Creek crossing would be constructed on an elevated structure.

Impacts of the Allensworth Bypass Alternative on jurisdictional waters would result in relatively high intensity loss of these resources due to the magnitude of the impact and the sensitivity of features such as vernal pools and swales. Therefore, project impacts of the Allensworth Bypass would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Allensworth Bypass Alternative and the corresponding segment of the BNSF Alternative both overlap the recovery plan area for the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Allensworth Bypass Alternative occurs in satellite and linkage areas identified in this recovery plan area (Appendix 3.7-B, Attachment 5). Selection of the Allensworth Bypass Alternative would greatly decrease the amount of permanent disturbance to the satellite area and greatly increase the amount of permanent disturbance to the linkage area identified in the recovery plan when compared with that of the corresponding BNSF Alternative segment (Appendix 3.7-B, Attachment 5).

Due to the large area of impact, the Allensworth Bypass Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, project impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on recovery plans.

Allensworth Ecological Reserve

The Allensworth Bypass Alternative does not overlap the Allensworth ER (Appendix 3.7-B, Attachment 5). This alternative is approximately 0.5 mile west of Allensworth ER. Therefore, no direct or indirect impacts on the Allensworth ER would occur as a result of project activities on this alternative.

In comparison with the corresponding segment in the BNSF Alternative, the Allensworth Bypass Alternative would have fewer permanent impacts on the Allensworth ER (Appendix 3.7-B, Attachment 5).

Project impacts of the Allensworth Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans

Neither the Allensworth Bypass Alternative nor the corresponding segment of the BNSF Alternative overlaps the plan area of the MBHCP (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on this habitat conservation plan area would occur as a result of the project impacts of either of these alternatives.

Project impacts of the Allensworth Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Three protected trees were mapped in the Allensworth Bypass Alternative and five unknown trees were mapped in the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Direct and indirect project impacts would occur in association with the Allensworth Bypass Alternative, resulting in the disturbance of protected trees. Project impacts on protected trees under the Allensworth Bypass Alternative would result in a negligible decrease in the number of trees disturbed when compared to the corresponding segment in the BNSF Alternative (Appendix 3.7-B, Attachment 6).

Due to the limited number of protected trees that would be affected, the Allensworth Bypass Alternative would result in only a slight change to existing biological conditions and little to no regional effects. Therefore, project impacts under the Allensworth Bypass Alternative on protected trees would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA.

Wasco-Shafter Bypass Alternative

Special-Status Plant Communities

There are no known occurrences of special-status plant communities within the Wasco-Shafter Bypass Alternative. Special-status plant communities could occur in unsurveyed habitats that have the potential to support special-status plant communities within the footprint of this alternative (Appendix 3.7-B, Attachment 3). However, these areas are small (<1 acre) and fragmented and are therefore unlikely to support special-status plant communities. Impacts on special-status plant communities would occur as described above under the direct and indirect impacts for habitats of concern.

Selection of the Wasco-Shafter Bypass Alternative would result in greater permanent impacts on unsurveyed habitats potentially suitable for special-status plant communities when compared with the corresponding BNSF Alternative segment (Appendix 3.7-B, Attachment 3).

Impacts of the Wasco-Shafter Bypass Alternative would result in a measureable adverse loss of surveyed habitats that have limited potential to support special-status plant communities. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in an effect of moderate intensity under NEPA, and in a significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Jurisdictional waters in the Wasco-Shafter Bypass Alternative include man-made structures (e.g., ditches and lacustrine) (Table 3.7-13; Appendix 3.7-B, Attachment 4). No natural jurisdictional waters (e.g., seasonal wetlands, vernal pools and swales, riparian, and seasonal riverine) would be permanently affected by the use of this alternative. Direct and indirect impacts would occur during construction of the Wasco-Shafter Bypass Alternative, resulting in the permanent disturbance of man-made jurisdictional waters.

The Wasco-Shafter Bypass Alternative avoids urban centers and travels entirely through agricultural areas east of SR 43, whereas the corresponding BNSF Alternative segment travels through the urban centers of Wasco and Shafter along the existing, disturbed BNSF Railway right-of-way. Regardless of the alternative, the majority of the impacts would be on man-made features that provide limited ecological value. When considering the magnitude of the impacts,

the selection of the Wasco-Shafter Bypass Alternative would decrease the amount of permanent direct and indirect impacts on wetlands and other waters when compared with the corresponding segment of the BNSF Alternative (Table 3.7-13; Appendix 3.7-B, Attachment 4). These differences would be negligible, considering the man-made nature of the majority of these resources.

Impacts of the Wasco-Shafter Bypass Alternative would result in a measureable adverse loss of jurisdictional waters, although no natural jurisdictional waters would be affected. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Wasco-Shafter Bypass Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Wasco-Shafter Bypass Alternative occurs in a linkage area identified in this recovery plan. Project activities on the Wasco-Shafter Bypass Alternative would result in permanent disturbance of this recovery plan area (Appendix 3.7-B, Attachment 5).

The Wasco-Shafter Bypass Alternative and the corresponding BNSF Alternative segment both occur within the recovery plan area for the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). Selection of the Wasco-Shafter Bypass Alternative would decrease the amount of permanent disturbance within the linkage recovery plan area when compared with the corresponding BNSF Alternative segment (Appendix 3.7-B, Attachment 5).

Due to the large area of impact, the Wasco-Shafter Bypass Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Wasco-Shafter Bypass Alternative nor its corresponding segment in the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on the Allensworth ER would occur as a result of project and operation of either of these alternatives.

Project impacts of the Wasco-Shafter Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans.

Both the Wasco-Shafter Bypass Alternative and the corresponding segment of the BNSF Alternative overlap the MBHCP area. Construction of either alternative would result in permanent impacts within the habitat conservation plan area (Appendix 3.7-B, Attachment 5).

Project impacts of the Wasco-Shafter Bypass Alternative and the corresponding segment of the BNSF Alternative do not conflict with the provisions of the MBHCP because proposed mitigation ratios are similar to the “adequate mitigation” ratios presented in the plan. Additionally, the Wasco-Shafter Bypass Alternative and the corresponding segment of the BNSF Alternative do not overlap with the conceptual focus areas identified as potential preserve areas. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Trees that may be regulated are present in the Wasco-Shafter Bypass Alternative and in the corresponding segment of the BNSF Alternative. The majority of the trees present in both areas are unidentified; however, a few native oak species could be present. Direct and indirect project impacts would occur with selection of the Wasco-Shafter Bypass Alternative, and would result in the disturbance of protected trees.

Project impacts on protected trees under the Wasco-Shafter Bypass Alternative would result in a significant increase in the number of trees disturbed compared to the construction of the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6).

Due to the number of protected trees that would be affected, the Wasco-Shafter Bypass Alternative would result in relatively high intensity loss of this resource. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in an effect of substantial intensity on protected trees under NEPA, and in a significant impact under CEQA.

Bakersfield South Alternative

Special-Status Plant Communities

During the field surveys, black willow thickets and valley foothill riparian habitat were identified along the Kern River of the Bakersfield South Alternative (Table 3.7-8; Appendix 3.7-B, Attachment 3). Additionally, unsurveyed habitats including fragmented habitats within urban areas, riparian forest, alkali desert scrub, and annual grasslands, have low potential to support special-status plant communities. However, the Bakersfield South Alternative is in an urban setting, and the remaining suitable habitat areas are small and fragmented; therefore, special-status plant communities are not expected to be present (except where identified along the Kern River). Permanent impacts would occur in the identified special-status plant communities (e.g., valley foothill riparian) in the Bakersfield South Alternative. Permanent impacts would also occur in unsurveyed habitats that have the potential to support special-status plant communities. Impacts on special-status plant communities would occur as described above under the direct and indirect impacts for habitats of concern.

Selection of the Bakersfield South Alternative would cause slightly more permanent impacts on valley foothill riparian and on unsurveyed habitats that have the potential to support special-status plant communities than would the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 3). The Bakersfield South Alternative would cause fewer impacts on black willow thickets. Riparian habitat along the Kern River Corridor receives additional protection under Chapter 19.73 of the Kern County ordinances.

Because special-status plant communities are limited in the Bakersfield South Alternative, impacts of this alternative are expected to result in only a slight change in existing biological conditions and little to no regional effects. Therefore, project impacts of the Bakersfield South Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Wetlands and other waters in the Bakersfield South Alternative include seasonal riverine (e.g., Kern River) and the associated riparian buffer as well as canals/ditches, and lacustrine features. Direct and indirect impacts would occur during construction of the Bakersfield South Alternative, resulting in the permanent disturbance of man-made features, including canals/ditches, and lacustrine features. Direct and indirect impacts on seasonal riverine features (e.g., Kern River)

and a small seasonal wetland would occur during the project related activities (Table 3.7-13; Appendix 3.7-B, Attachment 4).

Both the Bakersfield South Alternative and the corresponding BNSF Alternative segment would be located in areas of urban Bakersfield that contain similar man-made and natural wetlands and natural waters. The majority of the jurisdictional waters in the Bakersfield South Alternative and corresponding BNSF Alternative segment are man-made and in poor ecological condition, with the exception of the Kern River and the seasonal wetlands, which are in fair to good ecological condition.

In some instances, because the alternatives are located close together, nearly identical impacts on the jurisdictional waters are anticipated. When compared with the corresponding segment of the BNSF Alternative, the Bakersfield South Alternative would marginally decrease the amount of permanent impacts on jurisdictional waters (Table 3.7-13; Appendix 3.7-B, Attachment 4). When indirect impacts are compared, selection of the Bakersfield South Alternative would decrease the amount of indirect impacts on jurisdictional waters. These indirect impacts would occur as a result of both construction and project activities on the Bakersfield South Alternative. Both the Bakersfield South Alternative and the corresponding segment of the BNSF Alternative would be constructed on an elevated structure over the Kern River.

Impacts of the Bakersfield South Alternative on jurisdictional waters would result in relatively high intensity loss of these resources due to the magnitude of the impact. Therefore, project impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Bakersfield South Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Bakersfield South Alternative occurs in a satellite area identified in this recovery plan. Project impacts associated with the Bakersfield South Alternative would result in permanent disturbance of this recovery plan area (Appendix 3.7-B, Attachment 5).

Both the Bakersfield South Alternative and the corresponding BNSF Alternative segment occur within the recovery plan area identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). Selection of the Bakersfield South Alternative would greatly decrease the amount of permanent disturbance to this recovery plan area when compared with the corresponding BNSF Alternative segment (Appendix 3.7-B, Attachment 5).

Due to the large area of impact, the Bakersfield South Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, project impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Bakersfield South Alternative nor its corresponding segment in the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on the Allensworth ER would occur as a result of project impacts associated with either of these alternatives.

Project impacts of the Bakersfield South Alternative would result in no effect under NEPA, and no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans

The Bakersfield South Alternative overlaps the MBHCP. Project activities associated with the Bakersfield South Alternative would result in permanent disturbance within the plan area of the MBHCP (Appendix 3.7-B, Attachment 5).

Both the Bakersfield South Alternative and the corresponding segment of the BNSF Alternative occur within the plan area for the MBHCP. Neither alternative conflicts with the provisions of the MBHCP because proposed mitigation ratios are similar to the "adequate mitigation" ratios presented in the plan. Additionally, the Bakersfield South Alternative and the corresponding BNSF Alternative do not overlap with the conceptual focus areas identified as potential preserve areas. Therefore, project impacts of the Bakersfield South Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Trees that may be regulated under the Kern River Plan Element and/or the City of Bakersfield Municipal Code are present in the Bakersfield South Alternative and in the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Direct and indirect impacts would occur during project activities of the Bakersfield South Alternative, resulting in the permanent loss of protected trees.

Project impacts on protected trees under the Bakersfield South Alternative would result in an increase in the number of trees disturbed when compared to the construction of the corresponding segment in the BNSF Alternative (Appendix 3.7-B, Attachment 6).

Due to the number of protected trees that would be affected, the Bakersfield South Alternative would result in relatively high intensity loss of this resource. Therefore, project impacts of the Bakersfield South Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on protected trees.

Bakersfield Hybrid Alternative

Special-Status Plant Communities

During the field surveys, black willow thickets and valley foothill riparian habitat were identified along the Kern River of the Bakersfield Hybrid Alternative (Table 3.7-8; Appendix 3.7-B, Attachment 3). Additionally, unsurveyed habitats including fragmented habitats within urban areas, riparian forest, alkali desert scrub, and annual grasslands, have low potential to support special-status plant communities. However, the Bakersfield Hybrid Alternative is in an urban setting, and the remaining suitable habitat areas are small and fragmented; therefore, special-status plant communities are not expected to be present (except where identified along the Kern River). Permanent impacts would occur in the identified special-status plant communities (e.g., valley foothill riparian) in the Bakersfield Hybrid Alternative. Permanent impacts would also occur in unsurveyed habitats that have the potential to support special-status plant communities. Impacts on special-status plant communities would occur as described above under the direct and indirect impacts for habitats of concern.

Selection of the Bakersfield Hybrid Alternative would cause slightly more permanent impacts on valley foothill riparian and unsurveyed habitats that have the potential to support special-status plant communities than would the corresponding BNSF Alternative segment (Appendix 3.7-B, Attachment 3). The Bakersfield Hybrid Alternative would cause fewer impacts on black willow thickets than the corresponding segment of the BNSF Alternative. Riparian habitat along the Kern River Corridor receives additional protection under Chapter 19.73 of the Kern County ordinances.

Because special-status plant communities are limited in the Bakersfield Hybrid Alternative, impacts of this alternative are expected to result in only a slight change in existing biological conditions and little to no regional effects. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of negligible intensity under NEPA, and in a less-than-significant impact under CEQA on special-status plant communities.

Jurisdictional Waters

Wetlands and other waters in the Bakersfield Hybrid Alternative include seasonal riverine (e.g., Kern River) and the associated riparian buffer as well as canals/ditches, and lacustrine. Direct and indirect impacts would occur during construction of the Bakersfield Hybrid Alternative, resulting in the permanent disturbance of man-made features, including canals/ditches, and lacustrine. Direct and indirect impacts on seasonal riverine features (e.g., Kern River) and a small seasonal wetland would occur during the project activities (Table 3.7-13; Appendix 3.7-B, Attachment 4).

Both the Bakersfield Hybrid Alternative and the corresponding BNSF Alternative segment would be located in areas of urban Bakersfield that contain similar man-made and natural wetlands and natural waters. The majority of the jurisdictional waters in the Bakersfield Hybrid Alternative and corresponding BNSF Alternative segment are man-made and in poor ecological condition, with the exception of the Kern River and the seasonal wetlands, which are in fair to good ecological condition.

In some instances, because the alternatives are located close together, nearly identical impacts on the jurisdictional waters are anticipated. When compared with the corresponding segment of the BNSF Alternative, the Bakersfield Hybrid Alternative would marginally increase the amount of permanent impacts on jurisdictional waters (Table 3.7-13; Appendix 3.7-B, Attachment 4). When indirect impacts are compared, selection of the Bakersfield Hybrid Alternative would decrease the amount of indirect impacts on jurisdictional waters. These indirect impacts would occur as a result of both construction and project activities on the Bakersfield Hybrid Alternative. Both the Bakersfield Hybrid Alternative and the corresponding segment of the BNSF Alternative would be constructed on an elevated structure over the Kern River.

Impacts of the Bakersfield Hybrid Alternative on jurisdictional waters would result in relatively high intensity loss of these resources due to the magnitude of the impact. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on jurisdictional waters.

Conservation Areas

Recovery Plans

The Bakersfield Hybrid Alternative overlaps the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A portion of the Bakersfield Hybrid Alternative occurs in a satellite area identified in this recovery plan. Project impacts associated with the Bakersfield Hybrid Alternative would result in permanent disturbance of this recovery plan area (Appendix 3.7-B, Attachment 5).

Both the Bakersfield Hybrid Alternative and the corresponding BNSF Alternative segment occur within the recovery plan area identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). Selection of the Bakersfield Hybrid Alternative would greatly decrease the amount of permanent disturbance to this recovery plan area when compared with the corresponding BNSF Alternative segment (Appendix 3.7-B, Attachment 5).

Due to the large area of impact, the Bakersfield South Alternative would result in relatively high intensity loss to recovery plan areas. Therefore, project impacts of the Bakersfield Hybrid

Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on recovery plans.

Allensworth Ecological Reserve

Neither the Bakersfield Hybrid Alternative nor its corresponding segment in the BNSF Alternative overlaps the Allensworth ER (Appendix 3.7-B, Attachment 5). Therefore, no permanent direct or indirect impacts on the Allensworth ER would occur as a result of project impacts associated with either of these alternatives.

Project impacts of the Bakersfield Hybrid Alternative would result in no effect under NEPA, and no impact under CEQA on the Allensworth ER.

Habitat Conservation Plans

The Bakersfield Hybrid Alternative overlaps the MBHCP. Project activities associated with the Bakersfield Hybrid Alternative would result in permanent disturbance within the plan area of the MBHCP (Appendix 3.7-B, Attachment 5).

Both the Bakersfield Hybrid Alternative and the corresponding segment of the BNSF Alternative occur within the plan area for the MBHCP. Neither alternative conflicts with the provisions of the MBHCP because proposed mitigation ratios are similar to the “adequate mitigation” ratios presented in the plan. Additionally, the Bakersfield Hybrid Alternative and the corresponding BNSF Alternative do not overlap with the conceptual focus areas identified as potential preserve areas. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in no effect under NEPA, and no impact under CEQA on habitat conservation plans.

Protected Trees

Trees that may be regulated under the Kern River Plan Element and/or the City of Bakersfield Municipal Code are present in the Bakersfield Hybrid Alternative and in the corresponding segment of the BNSF Alternative (Appendix 3.7-B, Attachment 6). Direct and indirect impacts would occur during project activities of the Bakersfield Hybrid Alternative, resulting in the permanent loss of protected trees.

Project impacts on protected trees under the Bakersfield Hybrid Alternative would result in an increase in the number of trees disturbed when compared to the construction of the corresponding segment in the BNSF Alternative (Appendix 3.7-B, Attachment 6).

Due to the number of protected trees that would be affected, the Bakersfield Hybrid Alternative would result in relatively high intensity loss of this resource. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on protected trees.

Heavy Maintenance Facility Alternatives

Table 3.7-14 lists habitats of concern potentially affected by the HMF alternatives. The conclusions presented in Table 3.7-14 are based on the presence or absence of habitats of concern within the footprint of each HMF and the potential for permanent project impacts to occur.

Table 3.7-14
Habitats of Concern Potentially Affected by the HMF Alternatives during Project Operation

HMF Alternatives	Special-Status Plant Communities[a] (acres)	Jurisdictional Waters (acres)	Conservation Areas			Protected Trees
			Recovery Plans (acres)	Allensworth ER (acres)	HCPs (acres)	
	Total Impact Acreage and NEPA/CEQA Determinations					
Fresno Works-Fresno	9.06 Negligible effect/Less-than-significant impact	6.63 Moderate effect/ Significant impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	33 Substantial effect/ Significant impact
Kings County – Hanford	39.02 Negligible effect/Less-than-significant impact	1.89 Moderate effect/ Significant impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact
KCOG –Wasco	— No effect/ No impact	1.27 Moderate effect/ Significant impact	74.74 Substantial effect/ Significant impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact
KCOG –Shafter East	0.10 Negligible effect/Less-than-significant impact	1.14 Moderate effect/ Significant impact	— No effect/ No impact	— No effect/ No impact	24.00 No effect/ No impact	— No effect/ No impact
KCOG –Shafter West	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	55.02 No effect/ No impact	— No effect/ No impact

Notes:
— = No impact or not applicable
All impacts were calculated based on 15% engineering design construction footprint.
[a] Includes acreage of impacts on potentially suitable habitat that could support special-status plant communities.

Special-Status Plant Communities

The Fresno Works-–Fresno, Kings County–Hanford, and Kern Council of Governments–Shafter East HMFs would result in permanent impacts on unsurveyed habitats that have the potential to support special-status plant communities. Due to the limited nature of these impacts, these HMF sites would result in only a slight change to existing biological conditions and little to no regional effects. Therefore, project impacts of these HMF sites would result in an effect of negligible intensity on special-status plant communities under NEPA, and a less-than-significant impact under CEQA. The remaining HMF would have no effect under NEPA, and no impact under CEQA on special-status plant communities.

Jurisdictional Waters

The Fresno Works–Fresno, Kings County–Hanford, Kern Council of Governments–Wasco, and Kern Council of Governments–Shafter East HMFs would result in permanent impacts to jurisdictional waters, including mostly man-made features (i.e. canal/ditch, retention/detention basin). Impacts of these HMF sites would result in a measureable adverse loss of jurisdictional waters on a regional scale. Therefore, project impacts of these HMF sites would result in an effect of moderate intensity on jurisdictional waters under NEPA, and a significant impact under CEQA. The remaining HMF would have no effect under NEPA, and no impact under CEQA on jurisdictional waters.

Conservation Areas

In general, project impacts of the HMFs would result in no effect under NEPA, when considering both context and intensity, and no impact under CEQA because the sites either do not overlap with the plan or reserve area, or would not conflict with the provisions of the HCP. However, the Kern Council of Governments–Wasco HMF would permanently impact a linkage area identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). Due to the large area of impact, the Kern Council of Governments–Wasco HMF would result in relatively high intensity loss to recovery plan areas. Therefore, project impacts of the Kern Council of Governments–Wasco HMF would result in an effect of substantial intensity under NEPA, and a significant impact under CEQA.

Protected Trees

The Kings County–Hanford, Kern Council of Governments–Wasco, Kern Council of Governments–Shafter East, and Kern Council of Governments–Shafter West HMFs would have no permanent impacts on protected trees. Therefore, project impacts of these HMFs would result in no effect under NEPA, when considering both context and intensity and no impact under CEQA on protected trees. The Fresno Works–Fresno HMF would result in permanent impacts to protected trees, resulting in relatively high intensity loss to this resource. Therefore, the Fresno Works–Fresno HMF would result in an effect of substantial intensity under NEPA, and a significant impact under CEQA on protected trees.

Station Alternatives

Table 3.7-15 lists habitats of concern potentially affected by the station alternatives. The conclusions presented in Table 3.7-15 are based the presence or absence of habitats of concern within each station footprint and the potential for permanent project impacts to occur.

Table 3.7-15
Habitats of Concern Potentially Affected by the Station Alternatives during Project Operation

Station Alternatives	Special-Status Plant Communities[a]	Jurisdictional Waters	Conservation Areas			Protected Trees
			Recovery Plans	Allensworth ER	HCPs	
	Total Impact Acreage and NEPA/CEQA Determinations					
Fresno Station - Mariposa	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	19 Substantial effect/ Significant impact
Fresno Station - Kern	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	8 Moderate effect/ Significant impact
Kings/Tulare Regional Station – West	18.59 Negligible effect/Less-than-significant impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact
Kings/Tulare Regional Station – East	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/ No impact	— No effect/No impact
Bakersfield Station - North	— No effect/ No impact	— No effect/ No impact	21.14 Moderate effect/ Significant impact	— No effect/ No impact	21.14 No effect/ No impact	2 Negligible effect/Less-than-significant impact
Bakersfield Station - South	— No effect/ No impact	— No effect/ No impact	23.86 Moderate effect/ Significant impact	— No effect/ No impact	23.86 No effect/ No impact	3 Negligible effect/Less-than-significant impact
Bakersfield Station – Hybrid	— No effect/ No impact	— No effect/ No impact	29.96 Moderate effect/ Significant impact	— No effect/ No impact	29.96 No effect/ No impact	— No effect/No impact

Notes:

— = No impact or not applicable
All impacts were calculated based on 15% engineering design construction footprint.

[a] Includes acreage of impacts on potentially suitable habitat that could support special-status plant communities.

Special-Status Plant Communities

The Kings/Tulare Regional Station–West Alternative would result in permanent impacts on unsurveyed habitats that have the potential to support special-status plant communities. Due to the limited nature of these impacts, the Kings/Tulare Regional Station–West Alternative would result in only a slight change to existing biological conditions and little to no regional effects. Therefore, project impacts of the Kings/Tulare Regional Station–West Alternative would result in an effect of negligible intensity on special-status plant communities under NEPA, and a less-than-significant impact under CEQA. The remaining station alternatives would have no effect under NEPA, and no impact under CEQA on special-status plant communities.

Jurisdictional Waters

No station alternative would result in permanent impacts on jurisdictional waters. Therefore, the station alternatives would result in no effect under NEPA, and no impact under CEQA on jurisdictional waters.

Conservation Areas

In general, project impacts of the station alternatives would result in no effect under NEPA when considering both context and intensity, and no impact under CEQA because the stations either do not overlap with a plan or reserve area, or would not conflict with the provisions of a HCP. However, the Bakersfield Station alternative would permanently impact a satellite area identified in the Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS 1998). The impact of the Bakersfield Station alternatives would result in measureable adverse loss of the recovery plan area. Therefore, project impacts of the Bakersfield Station alternatives would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on recovery plans.

Protected Trees

The Bakersfield Station—Hybrid Kings/Tulare Regional Station – East, and Kings/Tulare Regional Station – West Alternatives would have no permanent impacts on protected trees. Therefore, project impacts from these station alternatives would result in no effect under NEPA when, and no impact under CEQA on protected trees. The remaining station alternatives would result in permanent impacts to protected trees, and would therefore result in effects ranging from negligible to substantial intensity under NEPA, and either a less-than-significant or significant impact under CEQA on protected trees, depending on the number of trees impacted.

Impact Bio #8 – Project Effects on Wildlife Movement Corridors

The project incorporates a number of engineering designs that would facilitate wildlife movement. At select locations, specific wildlife movement structures would be installed (as described in Chapter 2, Alternatives). However, implementation, including design and locations of these structures, vary across the HST alternatives due to existing adjacent infrastructure. For a more detailed discussion of potential impacts on wildlife movement corridors refer to Section 5.6 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2011a).

Direct (Bio #8) Project Impacts

Design elements of the HST alternatives would facilitate wildlife movement, including elevated tracks, road overcrossings and undercrossings, and specific structures designed for wildlife crossings, which could allow for unimpeded wildlife movement (as described in Chapter 2, Alternatives); however, sections of the HST alternatives would result in direct impacts on wildlife

movement, which could ultimately preclude the use of that corridor by wildlife. Direct impacts include the placement of temporary and permanent linear barriers to wildlife movement with restricted crossing opportunities. This may cause habitat shifts (toward nonnative and/or disturbed type communities) over time (through direct effects), because it could substantially degrade linkages, which may no longer provide food, cover, or ease of travel for many species. These shifts in habitat use can result in increased competition for resources, as well as the potential for genetic isolation of populations.

The severity of this impact to wildlife movement for each HST alternative is dependent on the permeability of the alternative (i.e., the presence of elevated structures, road crossings, or wildlife crossings), the amount of natural land within and adjacent to the alternative, and the presence of identified linkages. HST alternatives on an elevated or viaduct structure are located over a number of riparian and wildlife movement corridor (linkages) areas. These structures would facilitate wildlife movement, but would incrementally affect movement patterns and linkage connectivity in the region. Noise barriers installed for noise mitigation are not expected to affect wildlife movement because they will be located outside of known linkages, and are adjacent to urban areas, which are existing barriers to wildlife movement (see Figure 3.4-15 through 3.4-19 in Section 3.4, Noise and Vibration, for noise barrier locations).

Outside of riparian corridors and known linkages, much of the project footprint has been converted to agricultural or developed urban areas. Much of this area is disturbed on a daily-to-seasonal basis. These areas provide marginal habitat for wildlife at best. On a metapopulation level, developed areas act as barriers to natural wildlife movement and provide little-to-no natural habitat value to most plant and wildlife species. Select species, however, have adapted and acclimated to developed habitats. For example, urban wildlife still persists within the city limits of Bakersfield in vacant lots and open areas, in otherwise marginal habitat. Therefore, although wildlife species that have adapted to urban and agricultural environments may be affected by the placement of barriers in these areas, this impact would be less severe than impacts to species using natural areas.

Indirect (Bio #8) Project Impacts

In addition to HSTs passing over tracks through wildlife movement corridors, implementation of the project would require ongoing operation and maintenance activities (e.g., routine inspection and maintenance of the HST right-of-way). These operational activities occurring at or in the vicinity of wildlife movement corridors or natural lands may result in indirect disruption of wildlife movement through lighting, noise, motion, and startle effects.

Some indirect disturbance, such as noise, of the habitats associated with a wildlife corridor may cause wildlife to avoid use of a linkage. As discussed in Section 3.4, Noise and Vibration, the FRA has established noise exposure limits for wildlife (mammals and birds). Noise exposure limits for each are a sound exposure level (SEL) (i.e., noise exposure from an individual train passage) of 100 dBA from passing trains. It is assumed that noise exposure that exceeds the 100-dBA SEL threshold could elicit a negative response, such as avoidance of a linkage.

In at-grade crossings the screening distance (i.e., distance from the trackway centerline within which an impact could result) for a single-train pass-by SEL of 100 dBA would be approximately 100 feet from the track centerline (for a total width of 200 feet). In all areas that are at-grade where the right-of-way is less than a width of 200 feet and that are adjacent to substantive wildlife habitat (e.g., identified habitat linkages), the HST could expose wildlife to noise levels that exceed the 100-dBA SEL threshold, and which may elicit a startle, avoidance, or negative behavior by these wildlife species. This may cause habitat shifts (toward nonnative and/or disturbed type communities) over time (through indirect effects), because wildlife are no longer able to move freely between areas of natural habitat.

BNSF Alternative

The BNSF Alternative passes through all of the identified linkages discussed above; thus this alternative would directly and indirectly impact regional wildlife movement. In portions of the urban areas of Fresno, Wasco, Shafter, and Bakersfield, and in the vicinity of riparian corridors along portions of the St. John's River–Cross Creek, SR 43/SR 155, Tule River, Deer Creek–Sand Ridge, and Kern River linkages, the BNSF Alternative would be constructed on an elevated structure (Figure 3.7-2), resulting in open areas at ground level for local urban wildlife movement. Although portions of the BNSF Alternative would be elevated, large sections would be at-grade, which would adversely affect local and regional wildlife movement, particularly movement along riparian corridors. The at-grade sections would particularly affect portions of movement corridors within the Kings River, St. John's River-Cross Creek, SR 43/SR 155, Tule River, Deer Creek-San Ridge, and Poso Creek linkages. Impacts of the BNSF Alternative on wildlife movement corridors would have influential regional effects. Therefore, project period impacts under the BNSF Alternative would result in an effect of substantial intensity under NEPA, on wildlife movement corridors during project activities. The impact would be significant under CEQA.

Hanford West Bypass 1 Alternative

The Hanford West Bypass 1 Alternative passes through the Kings River, SR 43/SR 155, and St. John's River–Cross Creek linkages; thus this alternative would directly and indirectly affect wildlife movement corridors. The Hanford West Bypass 1 Alternative would result in impacts on wildlife movement corridors that would be similar to those of the corresponding segment of the BNSF Alternative. In general, the impacts associated with project-period activities of the Hanford West Bypass 1 Alternative would be similar to the impacts associated with the corresponding segment of the BNSF Alternative.

Impacts of the Hanford West Bypass 1 Alternative on wildlife movement corridors would have incremental regional effects. Therefore, project impacts of the Hanford West Bypass 1 Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on wildlife movement corridors.

Hanford West Bypass 2 Alternative

The Hanford West Bypass 2 Alternative passes through the Kings River, SR 43/SR 155, and St. John's River–Cross Creek linkages; thus, this alternative would directly and indirectly affect wildlife movement corridors. The Hanford West Bypass 2 Alternative would result in impacts on wildlife movement corridors that are similar to those of the corresponding segment of the BNSF Alternative. In general, the impacts of the operational activity of the Hanford West Bypass 2 Alternative would be similar to those of the corresponding segment of the BNSF Alternative segment.

Impacts of the Hanford West Bypass 2 Alternative on wildlife movement corridors would have incremental regional effects. Therefore, project impacts of the Hanford West Bypass 2 Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on wildlife movement corridors.

Corcoran Elevated Alternative

The Corcoran Elevated Alternative passes through the SR 43/SR 155 and Tule River linkages; thus this alternative would directly and indirectly affect wildlife movement corridors. The Corcoran Elevated Alternative would result in fewer impacts on wildlife movement corridors than the corresponding segment of the BNSF Alternative, because it would be on an elevated structure, thus allowing wildlife passage.

Impacts of the Corcoran Elevated Alternative on wildlife movement corridors would have incremental regional effects. Therefore, project impacts of the Corcoran Elevated Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on wildlife movement corridors.

Corcoran Bypass Alternative

The Corcoran Bypass Alternative passes through the SR 43/SR 155 and Tule River linkages; thus, this alternative would directly and indirectly affect wildlife movement corridors. The Corcoran Bypass Alternative would result in greater impacts on wildlife movement corridors than would the corresponding segment of the BNSF Alternative. The Corcoran Bypass Alternative would affect a small portion of natural lands on the outskirts of the urban area of Corcoran at-grade, where it is possible that wildlife move unobstructed, although habitat value is extremely low.

Impacts of the Corcoran Bypass Alternative on wildlife movement corridors would have incremental regional effects. Therefore, project impacts of the Corcoran Bypass Alternative would result in an effect of moderate intensity under NEPA, and a significant impact under CEQA on wildlife movement corridors.

Allensworth Bypass Alternative

The Allensworth Bypass Alternative passes through the SR 43/SR 155, Deer Creek–Sand Ridge, and Poso Creek linkages, and has the potential to affect wildlife movement corridors in these linkages. Both the Allensworth Bypass Alternative and the corresponding BNSF Alternative segment would affect natural lands, including annual grasslands, which provide suitable habitat for a number of wildlife species.

The use of the Allensworth Bypass Alternative would create a new wildlife barrier, because it is primarily a new linear corridor constructed predominantly at-grade. However, because the Allensworth Bypass Alternative would not be constructed adjacent to existing infrastructure (e.g., SR 43 and the BNSF railroad), the existing barriers to wildlife movement, and the risk of strikes with vehicles and trains would not be compounded as it would be for the corresponding segment of the BNSF Alternative. In general, the impacts of the Allensworth Bypass Alternative (further fragmentation of the linkage in a new linear corridor) would be less detrimental to wildlife movement corridors than the impacts of the corresponding segment of the BNSF Alternative (further impairment/fragmentation of an existing linear corridor).

Impacts of the Allensworth Bypass Alternative on wildlife movement corridors would have influential regional effects. Therefore, project impacts of the Allensworth Bypass Alternative would result in an effect of substantial intensity under NEPA, and in a significant impact under CEQA on wildlife movement corridors.

Wasco-Shafter Bypass Alternative

The Wasco-Shafter Bypass Alternative does not overlap an identified wildlife movement corridor. Both the Wasco-Shafter Bypass Alternative and the corresponding BNSF Alternative segment would not affect identified wildlife movement corridors. Impacts of the Wasco-Shafter Bypass Alternative on wildlife movement would be minimal and would have little or no regional effects. Therefore, project impacts of the Wasco-Shafter Bypass Alternative would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA on wildlife movement corridors.

Bakersfield South Alternative

The Bakersfield South Alternative passes through the Kern River linkage and has the potential to impact wildlife movement corridors. Project design in this area would use an elevated structure throughout the entire area of Bakersfield for both the Bakersfield South Alternative and the corresponding BNSF Alternative segment (Figure 3.7-2), and would retain opportunities for local urban wildlife movement. The elevated design would minimize the long-term effects to wildlife movement in the Kern River linkage. The use of the Bakersfield South Alternative rather than the corresponding BNSF Alternative would not change the level or degree of impacts because impacts on wildlife movement corridors would be similar.

Impacts of the Bakersfield South Alternative on wildlife movement would be minimal and would have little or no regional effects. Therefore, project impacts of the Bakersfield South Alternative would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA on wildlife movement corridors.

Bakersfield Hybrid Alternative

The Bakersfield Hybrid Alternative passes through the Kern River linkage and has the potential to affect wildlife movement corridors. Project design in this area would use an elevated structure throughout the entire area of Bakersfield for both the Bakersfield Hybrid Alternative and the corresponding segment of the BNSF Alternative (Figure 3.7-2), and would retain opportunities for local urban wildlife movement. The elevated design would minimize the long-term effects on wildlife movement in the Kern River linkage. The use of the Bakersfield Hybrid Alternative rather than the corresponding segment of the BNSF Alternative would not change the level or degree of impacts because impacts on wildlife movement corridors would be similar.

Impacts of the Bakersfield Hybrid Alternative on wildlife movement would be minimal and would have little or no regional effects. Therefore, project impacts of the Bakersfield Hybrid Alternative would result in an effect of negligible intensity under NEPA, and a less-than-significant impact under CEQA on wildlife movement corridors.

Heavy Maintenance Facility Alternatives

Table 3.7-16 lists wildlife movement corridors potentially affected by the HMF alternatives. Since HMFs would not result in the placement of a linear barrier and do not occur in areas of natural land, it is unlikely that they would impede wildlife movement. Therefore, project impacts of the HMFs would result in no effect on wildlife movement corridors under NEPA, and in no impact under CEQA.

Table 3.7-16
Wildlife Movement Corridors Potentially Affected by the HMF Alternatives during Project Operation

HMF Alternatives	Wildlife Movement Corridors
Fresno Works-Fresno	No Effect/No Impact
Kings County–Hanford	No Effect/No Impact
Kern Council of Governments–Wasco	No Effect/No Impact
Kern Council of Governments–Shafter East	No Effect/No Impact
Kern Council of Governments–Shafter West	No Effect/No Impact

Station Alternatives

Fresno Station–Mariposa Alternative: Wildlife movement corridors are not mapped within the urbanized footprint of the Fresno Station–Mariposa Alternative. The station has limited potential to disrupt wildlife movement throughout the region. Project impacts at the Fresno Station–Mariposa Alternative would result in no effect on wildlife movement corridors under NEPA, and in no impact under CEQA.

Fresno Station–Kern Alternative: Wildlife movement corridors are not mapped within the urbanized Fresno Station–Kern Alternative footprint. The station has limited potential to disrupt wildlife movement throughout the region. Project impacts at the Fresno Station–Kern Alternative would result in no effect on wildlife movement corridors under NEPA, and in no impact under CEQA.

Kings/Tulare Regional Station – West Alternative (at-grade option): Identified wildlife movement corridors are absent within the footprint of the potential Kings/Tulare Regional Station–West Alternative at-grade option. The station has limited potential to disrupt wildlife movement throughout the region, and project impacts from this station would result in no effect on wildlife movement corridors under NEPA, and in no impact under CEQA.

Kings/Tulare Regional Station – West Alternative (below-grade option): Identified wildlife movement corridors are absent within the footprint of the potential Kings/Tulare Regional Station–West Alternative below-grade option. The station has limited potential to disrupt wildlife movement throughout the region, and project impacts from this station would result in no effect on wildlife movement corridors under NEPA, and in no impact under CEQA.

Kings/Tulare Regional Station – East Alternative: Identified wildlife movement corridors are absent within the footprint of the potential Kings/Tulare Regional Station–East Alternative. The station has limited potential to disrupt wildlife movement throughout the region. Project activities at this potential station would result in no effect on wildlife movement corridors under NEPA, and in no impact under CEQA.

Bakersfield Station–North Alternative: Wildlife movement corridors are not present within the footprint of the Bakersfield Station–North Alternative. The Bakersfield Station–North Alternative is limited to urban land uses. Therefore, project impacts at this station would result in no effect on wildlife movement corridors under NEPA, and in no impact under CEQA.

Bakersfield Station–South Alternative: Wildlife movement corridors are not present within the footprint of the Bakersfield Station–South Alternative. The Bakersfield Station–South Alternative is limited to urban land uses. Therefore, project impacts at the Bakersfield Station–South Alternative would result in no effect on wildlife movement corridors under NEPA, and no impact under CEQA.

Bakersfield Station–Hybrid Alternative: Wildlife movement corridors are not present within the footprint of the Bakersfield Station–Hybrid Alternative. The Bakersfield Station–Hybrid Alternative is limited to urban land uses. Therefore, project impacts at the Bakersfield Station–Hybrid Alternative would result in no effect on wildlife movement corridors under NEPA, and in no impact under CEQA.

3.7.6 Project Design Features

In addition to the mitigation measures described below in Section 3.7.7, multiple project design features have been developed for the Fresno to Bakersfield Section to avoid and minimize potential impacts and effects on biological resources.

At multiple locations, the route of the alternative alignments was altered to avoid impacts and effects to biological resources. From the results of preliminary surveys, which identified areas of high-quality biological and wetland resources in the vicinity of the Colonel Allensworth State Historic Park and Allensworth Ecological Reserve, the Allensworth Bypass was sited to avoid significant impacts to these resources. Engineering changes were made to the alternative alignments in the vicinity of the Corcoran Bypass to avoid impacts to the Tulare Lakebed Mitigation Site and the seasonal wetlands associated with Cross Creek. Additional engineering changes were made along the Wasco-Shafter Bypass to avoid impacts to local development plans.

As discussed in Chapter 2.0, Alternatives, wildlife crossing opportunities will be available through a variety of engineered structures, including dedicated wildlife crossing structures, elevated structures, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large-diameter [60- to 120-inch] culverts and paired 30-inch culverts). For a more detailed discussion of the crossing structures, including figures depicting the frequency and locations of these structures, refer to Figures 3-3a through 3-3d and Section 5.6 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Additionally, during project design and construction, the Authority and FRA would implement measures to reduce impacts on air quality and hydrology based on applicable design standards. Implementation of these measures would also reduce impacts to biological resources. The design standards applicable to the project are listed in Appendix 2-D and the measures to be applied are summarized in Section 3.3, Air Quality and Global Climate Change and Section 3.8, Hydrology and Water Resources.

3.7.7 Mitigation Measures

The mitigation measures in this section identify avoidance, minimization, and compensation measures to minimize potential impacts and effects on biological resources (e.g., special-status plant and wildlife species, habitats of concern, wildlife movement corridors, and native flora and fauna) by the HST alternative alignments, station alternatives, and HMF alternatives. Many of these mitigation measures have multiple benefits that avoid, protect, or compensate for the impacts and effects on various biological resources.

Section 3.7.2 presents the regulatory programs that apply to the HST alternatives. Table 3.7-1 addresses the federal requirements and Table 3.7-2 addresses the state requirements. The primary agreements and regulatory requirements include the federal ESA (Section 7), CESA (Section 2081), CWA (Section 404), Porter Cologne Act (Section 401), and State Fish and Game Code (Section 1600).

The mitigation measures presented below were refined in some cases as a result of coordination with federal, state, and local agencies. Representative agencies involved in early coordination include USFWS, USACE, EPA, CDFG, and SWRCB. This coordination effort includes consideration for the type, timing, and location of mitigation measures, including consideration for early implementation, as feasible.

The habitat creation, restoration, and/or revegetation ratios presented here are based upon and ultimately depend on the type of impact (i.e., permanent or temporary), scarcity of the resource, and performance anticipated.

In regards to special-status species, the avoidance, minimization, and mitigation measures are specific to special-status species' known geographic ranges and their suitable habitats, and

species-specific measures will not be required when the habitat or range is not located within the construction footprint.

The following roles and definitions represent the lead biology positions responsible for monitoring, reporting, and implementing the mitigation measures and associated terms and conditions. Other support roles may include restoration ecologists, landscape architects, and special-status species experts.

- Project Biologist: The Project Biologist will represent the construction management team, will report directly to the Authority, and will be responsible for reporting and overseeing the biological resources mitigation measures from the Final California HST Fresno to Bakersfield Section EIR/EIS. The Project Biologist will also be responsible for confirming that the terms and conditions in the USFWS, USACE, SWRCB, and CDFG permits are outlined in the Mitigation Monitoring and Reporting Program (MMRP). The Project Biologist will report to the overall construction management team Mitigation Manager (Mitigation Manager), interact with the designated Resident Engineer for the Fresno to Bakersfield Section and work to provide quality assurance on the implementation of the biological resources mitigation program as performed by the Contractor and the designated Contractor's Biologist. It is anticipated that the Project Biologist will have specialized support from other biological monitors and work with the Mitigation Manager during deployment of the monitors and in performance of their respective responsibilities.

- Mitigation Manager: The Mitigation Manager is responsible for overseeing the implementation and compliance of all project mitigation measures and will support the construction management team. The Project Biologist will report to the Mitigation Manager to verify compliance with biological resources mitigation measures.

- Contractor's Biologist: The Contractor's Biologist is responsible for implementing mitigation measures in compliance with the terms and conditions outlined in the MMRP and the USFWS, USACE, SWRCB, and CDFG permits. The Contractor's Biologist will work to implement mitigation reflected within the construction drawings and specifications. The Contractor's Biologist will keep the Project Biologist informed of the progress, planning, implementation, and activities conducted in support of the biological resources mitigation program.

- Project Biological Monitor: The Project Biological Monitor will be approved by and report directly to the Project Biologist. The Project Biological Monitor will be onsite during all ground-disturbing activities that have the potential to affect biological resources and will be the principal agent(s) in the direct implementation of the MMRP and compliance assurance. The Project Biological Monitor is responsible for Worker Environmental Awareness Program (WEAP) training, general surveys, compliance monitoring, and reporting. The Project Biological Monitor will act on behalf of the Project Biologist.

These mitigation measures are based on mitigation strategies from the Statewide Program EIR/EIS, which have been refined and adapted for this proposed project. These mitigation measures will be incorporated into the MMRP and grouped by construction period impacts and project impacts. Construction period mitigation measures include all temporary impacts and effects associated with ground-disturbing activities. Project mitigation measures include all permanent impacts and effects associated with ground-disturbing activities, as well as impacts and effects from HST operation and maintenance activities.

3.7.7.1 Common Mitigation Measures for Biological Resources

The following common mitigation measures shall be implemented, as applicable, during construction period impacts and project impacts to avoid and/or minimize impacts and effects on biological resources. In addition, resource-specific mitigation measures shall be implemented to

directly or indirectly avoid or minimize the impacts and effects to the specific biological resource (e.g., special-status species, habitats of concern, and wildlife movement corridor). Many of the common mitigation measures apply throughout the biological resources program and cover multiple species and habitats.

In addition, mitigation measures will be applied as described in Section 3.4, Noise and Vibration and Section 3.15, Parks, Recreation, and Open Space to avoid and minimize impacts and effects on biological resources. These measures are:

- **N&V-MM#3**. Implement Proposed California High-Speed Train Project Noise Mitigation Guidelines.
- **PC-MM#1.** Compensation for Staging in and Temporary Closures of Park Property During Construction.
- **PP-MM#1.** Acquisition of Park Property.

Bio-MM#1. Designate Project Biologist(s), Contractor's Biologist(s), and Project Biological Monitor(s). During contract procurement, construction management, and Contractor selection, and before the start of ground-disturbing activities, the Authority or its designee will designate a Project Biologist(s), a Contractor's Biologist(s), and a Project Biological Monitor(s) responsible for conducting biological monitoring, overseeing regulatory compliance requirements, and monitoring restoration activities associated with ground-disturbing activities in accordance with the adopted mitigation measures and applicable laws.

The Project Biologist's duties include reviewing design documents and construction schedules and determining which Project Biological Monitor(s), depending on type of biological issues, need(s) to report to the construction site each day. The Project Biologist informs the Biological Monitors as to which mitigation measures should be documented each day and of any special issues that arise during meetings with the construction management team and/or the Contractor's team.

The Contractor's Biologist is responsible for the timely implementation of the biological mitigation measures as outlined in the MMRP and construction documents and pertinent resource agency permits.

The Project Biological Monitor's duties include monitoring construction crew activities, as needed, to document applicable mitigation measures and permit conditions.

Bio-MM#2. Regulatory Agency Access. If requested, before, during, or on completion of ground-disturbing activities, the Contractor will allow access by USFWS, USACE, SWRCB, and CDFG staff to the construction site. Because of safety concerns, all visitors will be required to check in with the Resident Engineer before accessing the construction site. If agency personal access the construction site, the Project Biologist will prepare a memorandum within 1 day of the visit that documents agency access and issues raised during the field meeting. This memorandum will be submitted to the Mitigation Manager. Any non-compliance issues will be reported to the Authority or its designee.

Bio-MM#3. Prepare and Implement a Worker Environmental Awareness Program. Before the start of ground-disturbing activities, the Mitigation Manager or designee will prepare and implement a WEAP for construction crews. WEAP training materials will include the following: discussion of the federal ESA, CESA, Bald and Golden Eagle Protection Act (BGEPA), the MBTA, and the CWA; consequences and penalties for violation or noncompliance with these laws and regulations and project permits; identification and value of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities; hazardous substance spill prevention and containment measures; the contact person in the event of the discovery of a dead or injured wildlife species; and review of mitigation measures. In the WEAP, construction

timing in relation to habitat and species' life stage requirements will be detailed and discussed on project maps, which will show areas of planned minimization and avoidance measures.

A fact sheet conveying this information will be prepared by the Mitigation Manager or designee for distribution to the construction crews and to others who enter the construction footprint. Upon completion of the WEAP training, construction crews will sign a form stating that they attended the training, understood the information presented, and will comply with the WEAP requirements. To the extent possible, nighttime construction will be minimized. Construction crews will be informed during the WEAP training that, to the extent possible, travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved and improved roads.

Bio-MM#4. Prepare and Implement a Weed Control Plan. Before the start of ground-disturbing activities, the Contractor will prepare and implement a Weed Control Plan to minimize or avoid the spread of weeds during ground-disturbing activities. The Weed Control Plan will address the following:

- Schedule for noxious weed surveys to be conducted in coordination with the Biological Resources Management Plan (BRMP)(Bio-MM#5).

- Success criteria for noxious and invasive weed control as established by a qualified biologist. The success criteria will be linked to the Habitat Mitigation and Monitoring Plan [HMMP] (Bio-MM#63) for compensatory mitigation sites, and the standards for onsite work during construction will limit highly invasive species, as defined by the California Invasive Plant Council species, to less than 5%% in areas that were temporarily impacted by construction activities. If these success criteria have not been met by the end of the BRMP monitoring and implementation period, monitoring and control efforts would continue and remedial actions would be identified and implemented until success criteria are met. Based on monitoring results, additional or revised measures may be needed to ensure the introduction and spread of noxious weeds are not promoted by the construction and operation of the HST.

- Provisions to ensure that the development of the Weed Control Plan will be coordinated with development of the Restoration and Revegetation Plan (RRP)(Bio-MM#6) so that the RRP incorporates measures to reduce the spread and establishment of noxious weeds, and incorporates percent cover of noxious weeds into revegetation performance standards.

- Identification of weed control treatments including permitted herbicides, and manual and mechanical methods for application. Restriction of herbicide application from use in Environmentally Sensitive Areas.

- Determination of timing of the weed control treatment for each plant species.

- Identification of fire prevention measures.

The contractor will implement the Weed Control Plan during the construction period and require that HST maintenance crews follow the guidelines in the Weed Control Plan during project operation. The Authority or its designee will appoint the responsible party during the operations period. A monthly memorandum will be prepared by the Project Biologist to document the progress of the plan and its implementation.

Bio-MM#5. Prepare and Implement a Biological Resources Management Plan. During final design, the Project Biologist will prepare the Biological Resources Management Plan (BRMP) and assemble the biological resources mitigation measures. The BRMP will include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility. The BRMP will also include habitat replacement and

revegetation, protection during ground-disturbing activities, performance (growth) standards, maintenance criteria, and monitoring requirements for temporary and permanent native plant community impacts. The parameters for the BRMP will be formed with the mitigation measures from this project-level EIR/EIS, including terms and conditions as applicable from the USFWS, USACE, SWRCB, and CDFG permits.

The goal of the BRMP is to assist the Project Biologist with an organized reporting tool to ensure the mitigation measures and terms and conditions are implemented in a timely manner and are reported on. These include all avoidance, minimization, repair, mitigation, and compensatory actions stated in the mitigation measures or terms and conditions from the permits referenced above. These measures and conditions are tracked through final design, implementation, and post-construction phases. Specific performance standards are habitat-based and are related to success of onsite or offsite repair of temporary impacts, or more permanent impacts that are compensated at an offsite location. Habitat-based mitigation applies to compensatory mitigation or permittee-responsible mitigation for impacts on special-status plants, special-status wildlife, special-status plant communities, or jurisdictional waters. Those impacts are generally addressed in the Bio-MM#63 as part of the HMMP. Performance standards are targets for determining the effectiveness of the mitigation and assessing the need for adaptive management (e.g., mitigation design or maintenance revisions). Success criteria are formal criteria that must be met after a specific timeframe to meet regulatory requirements of the permitting agencies. These are habitat-based performance standards that include consideration for the establishment of a species or habitat. Since species are nested within habitats, the performance standards are primarily based on vegetation, substrate, and hydrology conditions. Performance standards and guidelines specific to each resource category are summarized in Bio-MM#63, as part of the HMMP. The overarching goal is to neutralize the impacts with respect to affected species and habitat.

The BRMP will help the long-term perpetuation of biological resources within the temporarily disturbed areas, as well as protect adjacent targeted habitats. The BRMP will contain, but not be limited to, the following information:

a. Specific measures for the protection of special-status species.

b. Identification (on construction plans) of the locations and quantity of habitats to be avoided or removed, along with the locations where habitats are to be restored.

c. Procedures for vegetation analyses of temporarily affected habitats to approximate their relative composition and procedures for site preparation, irrigation, planting, and maintenance. This information may be used to determine the requirements of the revegetation areas for both onsite temporary impacts and off-site compensatory sites.

d. Sources of plant materials and methods of propagation.

e. Identification of specific parameters consistent with mitigation ratios and permit conditions for determining the amount of replacement habitat for temporary disturbance areas.

f. Specification of parameters for maintenance and monitoring of re-established habitats, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas.

g. Specification of performance standards for the re-established plant communities within the construction limits.

h. Specification of the remedial measures to be taken if performance standards are not met (e.g., a form of adaptive management).

i. Methods and requirements for monitoring restoration/replacement efforts, which will be a combination of qualitative and quantitative data consistent with mitigation measures and permit conditions.

j. Measures to preserve topsoil and control erosion.

k. Design of protective fencing around environmentally sensitive areas (ESAs), environmentally restricted areas (ERAs), and the construction staging areas.

l. Specification of the locations and quantities of gallinaceous guzzlers (catch basin/artificial watering structures) and the monitoring of water levels in them.

m. Locations of trees to be protected as wildlife habitat (roosting sites) and locations for planting replacement trees.

n. Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within sensitive habitat areas.

o. Specific construction monitoring programs for habitats of concern and special-status species, as needed.

p. Specific measures for the protection of vernal pool habitat and riparian areas. These measures may include erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements.

q. Provisions for biological monitoring during ground-disturbing activities to confirm compliance and success of protective measures. The monitoring procedures will (1) identify specific locations of wildlife habitat and sensitive species to be monitored; (2) identify the frequency of monitoring and the monitoring methods (for each habitat and sensitive species to be monitored); (3) list required qualifications of biological monitor(s), and (4) identify the reporting requirements.

Bio-MM#6. Prepare and Implement a Restoration and Revegetation Plan. During final design, the Contractor's Biologist, under the supervision of the Project Biologist, will prepare a restoration and revegetation plan for temporarily disturbed upland communities. (Site restoration will also be conducted to restore temporary impacts on riparian areas [Bio-MM#47] and jurisdictional waters [Bio-MM#48].) In the RRP, impacts on habitat subject to temporary ground disturbances that will require decompaction or re-grading will be addressed, if appropriate. The Project Biologist will approve the seed mix. The standards for onsite work during construction will limit highly invasive species, as defined by the California Invasive Plant Council species, to less than 5%, unless otherwise called out in the final approved seed mix.

During ground-disturbing activities, the Contractor will implement the RRP in temporarily disturbed areas. The Project Biologist will prepare and submit compliance reports to the Mitigation Manager to document implementation and performance of the RRP.

Bio-MM#7. Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). Before the start of ground-disturbing activities, the Project Biologist will verify that environmentally sensitive areas and environmentally restricted areas (ERAs) are delineated as appropriate. Environmentally Sensitive Areas are areas within the construction zones containing suitable habitat for special-status species and habitats of concern that may allow construction activities but have restrictions based on the presence of special-status species or habitats of concern at the time of construction. ERAs are areas outside the construction footprint that must be protected in-place during all construction activities.

Before the start of ground-disturbing activities, the Contractor's Biologist will include all environmentally sensitive areas and ERAs on final construction plans (including grading and landscape plans). The Project Biologist will review and approve the map of all environmentally sensitive areas and ERAs on the design drawings and work with the designer to update the map as necessary.

Before and during the implementation of ground-disturbing activities, the Contractor's Biologist, under the supervision of the Project Biologist, will mark environmentally sensitive areas and ERAs with high-visibility temporary fencing, flagging, or other agency-approved barriers to prevent encroachment of construction personnel and equipment. Two categories, environmentally sensitive areas and ERAs, will be separately designated in the field (e.g., using different colored flagging/fencing). Sub-meter accurate Global Positioning System (GPS) equipment will be used to delineate all environmentally sensitive areas and ERAs. The Contractor will remove environmentally sensitive area and ERA fencing when construction is complete or when the resource has been cleared according to agency permit conditions in the MMRP and construction drawings and specifications. The Project Biologist will submit a memorandum regarding the field delineation and installation of all Environmentally Sensitive Areas/ERAs to the Mitigation Manager.

Bio-MM#8. Wildlife Exclusion Fencing. The Contractor's Biologist, under the supervision of the Project Biologist, will install exclusion barriers (e.g., silt fences) at the edge of the construction footprint. Wildlife exclusion fencing will be installed along the outer perimeter of environmentally sensitive areas and ERAs. The design specifications of the exclusion fencing will be determined through consultation with the USFWS and/or CDFG. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Bio-MM#9. Equipment Staging Areas. Before the start of ground-disturbing activities, the Contractor's Biologist, under the supervision of the Project Biologist, will locate staging areas for construction equipment that are outside of areas of sensitive biological resources, including habitat for special-status species, habitats of concern, and wildlife movement corridors, to the maximum extent possible. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Bio-MM#10. Mono-Filament Netting. Before and during the implementation of ground-disturbing activities, the Project Biologist will verify that that the Contractor is not using plastic mono-filament netting (erosion-control matting) or similar material in erosion control materials; substitutes include coconut coir matting, tackified hydroseeding compounds, rice straw wattles (e.g., Earthsaver wattles: biodegradable, photodegradable, burlap), reusable erosion, sediment, and wildlife control systems that may be approved by the regulatory agencies (e.g., ERTEC Environmental Systems products). The Project Biologist will submit memorandums to the Mitigation Manager to document compliance with this measure; memorandums will be submitted monthly, or as appropriate throughout project construction.

Bio-MM#11. Vehicle Traffic. During ground-disturbing activities, the Contractor's Biologist will restrict project vehicle traffic within the construction area to established roads, construction areas, and other designated areas. The Contractor's Biologist will establish vehicle traffic in locations disturbed by previous activities to prevent further adverse effects, require observance of a 20-mph speed limit for construction areas with potential special-status species habitat, clearly flag and mark access routes, and prohibit off-road traffic. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure; memorandums will be submitted on a weekly basis, or as appropriate, throughout project construction.

Bio-MM#12. Entrapment Prevention. The Contractor will cover all excavated, steep-sided holes or trenches more than 8 inches deep at the close of each working day with plywood or

similar materials, or provide a minimum of one escape ramp per 10 feet of trenching constructed of earth fill. The Contractor's Biologist, under the supervision of the Project Biologist, will thoroughly inspect holes and trenches for trapped animals before leaving the construction site each day.

The Contractor will either screen, cover, or store more than 1 foot off the ground all culverts or similar enclosed structures with a diameter of 4 inches or greater to prevent use by wildlife. The Contractor's Biologist, under the supervision of the Project Biologist, will clear stored material for common and special-status wildlife species before the pipe is subsequently used or moved. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure; memorandums will be submitted on a weekly basis, or as appropriate, throughout project construction.

Bio-MM#13. Work Stoppage. During ground-disturbing activities, the Project Biologist or Biological Monitor will halt work in the event that a special-status wildlife species gains access to the construction footprint. This work stoppage will be coordinated with the resident engineer and/or the Authority or its designee. The Contractor will suspend ground-disturbing activities in the immediate construction area where the potential construction activity could result in "take" of special-status wildlife species; other work may continue in other areas. The Contractor will continue the suspension until the individual leaves voluntarily, is relocated to a release area using USFWS- and/or CDFG-approved handling techniques and relocation methods, or as required by USFWS or CDFG. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance within 1 day of the work stoppage and subsequent action.

Bio-MM#14. "Take" Notification and Reporting. The Contractor's employees will immediately notify the Contractor's Biologist and Biological Monitor in the event of an accidental death or injury to a federal- or state-listed species during project activities. The Project Biologist will then notify USFWS and/or CDFG immediately in the case of an accidental death or injury to a federal- or state-listed species during project activities. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Bio-MM#15. Post-Construction Compliance Reports. After each construction phase is completed, the Project Biologist will submit post-construction compliance reports consistent with the requirements of each appropriate agency (e.g., UFSWS and CDFG) protocols, including compliance with regulatory agency permits. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure. The frequency of the memorandum compilation and submission will be consistent with the requirements in the regulatory agency permits.

3.7.7.2 Construction Period Mitigation Measures

Special-Status Species

In addition to the common mitigation measures (Bio-MM#1 through Bio-MM#15) that apply to all biological resources, specific measures will be implemented to avoid and/or minimize project impacts and effects on special-status species. As applicable, project mitigation measures (Bio-MM#54 through Bio-MM#61; Bio-MM#51 through Bio-MM#53; Bio-MM#66 through Bio-MM#67) may also reduce the impacts to special-status species during the construction period. Furthermore, in some instances mitigation measures associated with habitats of concern and wildlife movement corridors during the construction period and/or project operation may also directly or indirectly avoid and or minimize impacts and effects on special-status species.

The section presents the mitigation measures that will be implemented to avoid and minimize impacts and effects to special-status species during construction period impacts and is organized by species guild.

Special-Status Plant Species and Special-Status Plant Communities

The implementation of the applicable common mitigation measures (Bio-MM#1 through Bio-MM#15) will also directly or indirectly reduce impacts and effects on special-status plant species and special-status plant communities, as applicable. In addition, the following resource-specific mitigation measures are proposed during construction period impacts.

Bio-MM#16. Conduct Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities. A qualified agency-approved biologist (designated by the Project Biologist) will conduct preconstruction surveys for special-status plant species and special-status plant communities in all potentially suitable habitats where permission to enter was not granted during the spring and summer 2010 field surveys. The surveys will 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 will work with the Contractor's Biologist to mark locations of all special-status plant species and special-status plant communities observed, where feasible, for the Contractor to avoid. Before the start of ground-disturbing activities, all populations of special-status plant species and special-status plant communities identified during preconstruction surveys within 100 feet of the construction footprint will be protected and delineated by the Contractor's Biologist, under the supervision of the Project Biologist, as ERAs. As appropriate, the Contractor's Biologist, under the supervision of the Project Biologist, will update the special-status species or habitats of concern mapping within the construction limits, based on resource agency permits.

If special-status plant species cannot be avoided, mitigation for impacts to these species will be incorporated into a relocation/compensation program, as defined in Bio-MM#17 and Bio-MM#54. The Project Biologist will provide verification and report through memorandum to the Mitigation Manager.

Bio-MM#17. Prepare and Implement Plan for Salvage, Relocation and/or Propagation of Special-Status Plant Species. The Contractor's Biologist will prepare a plan before the start of ground-disturbing activities to address monitoring, salvage, relocation, and propagation of special-status plant species. The plan will be submitted to the Project Biologist for concurrence. The relocation or propagation of plants and seed will be performed at a suitable mitigation site approved by the appropriate regulatory agencies, and as appropriate per species. Documentation will include provisions that address the techniques, locations, and procedures required for the successful establishment of the plant populations. The plan will include provisions for performance that address survivability requirements, maintenance, monitoring, implementation, and the annual reporting requirements. Permit conditions issued by the appropriate resource agencies (e.g., USFWS, CDFG) will guide the development of the plan and performance standards. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Special-Status Wildlife Species

Invertebrates

The implementation of the applicable common mitigation measures (Bio-MM#1 through Bio-MM#15), invertebrate mitigation measures (Bio-MM#55 and Bio-MM#56), and other mitigation measures pertaining to the jurisdictional waters (including vernal pools) and special-status plant communities (including riparian areas) will also directly or indirectly reduce project impacts and effects on special-status invertebrate species, as applicable. In addition, the following species-specific mitigation measures are proposed.

Vernal Pool Branchiopods

Bio-MM#18. Conduct Preconstruction Sampling and Assessment for Vernal Pool Fauna. Before the start of ground-disturbing activities, a qualified, agency-approved biologist (designated by the Project Biologist) will conduct preconstruction aquatic assessment and sampling in seasonal wetlands and vernal pools in the construction footprint. The approved biologists will visit the sites after initial storm events to determine when seasonal wetlands and vernal pools have been inundated. A seasonal wetland/vernal pool is considered to be inundated when it holds greater than 3 cm of standing water 24 hours after a rain event. Approximately 2 weeks after the pools are inundated, the approved biologists will conduct general aquatic surveys in appropriate seasonal wetland and vernal pool habitats.

The sampling is an assessment that will be useful in understanding the species present and will help guide the implementation of the performance standards to be consistent with Bio-MM#20: Implement and Monitor Vernal Pool Protection. The Project Biologist will submit a report to the Mitigation Manager and Authority or its designee within 1 month of completing the field work. The report will 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#19. Seasonal Vernal Pool Work Restriction. For seasonal avoidance of special-status vernal pool branchiopods and vernal-pool-dependent species (e.g., vernal pool branchiopods, western spadefoot toads, California tiger salamanders), the Contractor will not work within 250 feet of suitable aquatic habitats (e.g., vernal pools, seasonal wetlands) 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. If any work remains to be completed after October 15, the Contractor's Biologist, under the supervision of the Project Biologist, will install exclusion fencing and erosion control measures in those areas where construction activities need to be completed. The Project Biologist will document compliance through memorandum to the Mitigation Manager during the establishment of the fencing activities.

Bio-MM#20. Implement and Monitor Vernal Pool Protection. If impacts to vernal pool(s) within the temporary construction footprint can be avoided, the vernal pool(s) will be protected by erecting exclusion fencing. The Contractor's biologist, under the supervision of the Project Biologist, will erect and maintain the exclusion fencing.

For impacts on vernal pools within the temporary construction footprint that cannot be avoided, the Contractor's Biologist, under the supervision of the Project Biologist, will place rinsed gravel within the affected vernal pool(s) and will cover the affected vernal pool(s) with geotextile fabric before the start of ground-disturbing activities to minimize damage to the soils and protect the contours. If these temporary impacts take more than one full wet-dry season cycle, soil storage will be implemented. The Contractor's Biologist, in coordination with the Project Biologist, will collect a representative sampling of soils from the vernal pool(s) before initiating ground-disturbing activities within vernal pools. The representative soil sample(s) will contain viable plant seeds and vernal pool branchiopod cysts to be preserved from the vernal pool(s). These samples may be incorporated into other vernal pools, as applicable, with USFWS and/or CDFG consultation. The Contractor will implement these measures within temporary impact areas adjacent to or within the construction footprint. Resource agency consultations with the USFWS and USACE will occur as needed and based on permit conditions.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Additionally, because impacts on vernal pools within the temporary construction footprint are considered to be permanent impacts, these impacts will be mitigated through off-site mitigation, as described in Bio-MM#64.

Valley Elderberry Longhorn Beetle

Bio-MM#21. Implement Conservation Guidelines for the Valley Elderberry Longhorn Beetle. Before and during the implementation of ground-disturbing activities, the Contractor will implement the avoidance and minimization measures detailed in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a). These measures include conducting protocol-level surveys for this species, establishing and maintaining appropriate buffer areas around elderberry plants, restricting the use of chemicals that might harm beetles, and mowing restrictions. After ground-disturbing activities are completed, any damage to temporarily disturbed buffer areas surrounding elderberry shrubs will be restored as detailed in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a). The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Reptiles and Amphibians

The common mitigation measures (Bio-MM#1 through Bio-MM#15), mitigation measures (Bio-MM#56 and Bio-MM#57) and other mitigation measures pertaining to the jurisdictional waters (including vernal pools) will also directly and/or indirectly reduce impacts and effects on reptiles and amphibians and will be implemented during construction period impacts as applicable. In addition, the following species-specific mitigation measures are proposed to be implemented during the construction period.

Special-Status Reptile and Amphibians Species: Western Spadefoot, Western Pond Turtle, Silvery Legless Lizard, San Joaquin Whipsnake, and Coast Horned Lizard

Bio-MM#22. Conduct Preconstruction Surveys for Special-Status Reptile and Amphibian Species. Before the start of ground-disturbing activities, a qualified agency-approved biologist (designated by the Project Biologist) will conduct preconstruction surveys in suitable habitats to determine the presence or absence of special-status reptiles and amphibian species within the construction footprint. Surveys will be conducted no more than 30 days before the start of ground-disturbing activities and will be phased with project build-out.

The results of the preconstruction survey will be used to guide the placement of the environmentally sensitive areas, ERAs, and wildlife exclusion fencing. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#23. Conduct Special-Status Reptile and Amphibian Monitoring, Avoidance, and Relocation. During ground-disturbing activities, the Project Biological Monitor will observe all construction activities in habitat that supports special-status reptiles and amphibians. If suitable habitat is present and environmentally sensitive areas are deemed necessary, the Project Biological Monitor will conduct a clearance survey within the area for special-status reptiles and amphibians after wildlife exclusion fencing is installed. If a special-status reptile or amphibian is present during construction, the Contractor will avoid the special-status reptile or amphibian species, where feasible. Otherwise, the Project Biological Monitor will relocate special-status reptiles or amphibians (other than California tiger salamander) found in the environmentally sensitive area or construction footprint to an area outside the construction area as determined through consultation with USFWS and/or CDFG. If necessary, clearance surveys will be conducted daily. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

California Tiger Salamander

Bio-MM#24. Conduct Preconstruction Surveys for California Tiger Salamander. Before the start of ground-disturbing activities, a qualified, agency-approved biologist (designated by the Project Biologist) will conduct visual preconstruction surveys in suitable habitats in the Cross Creek grassland region to determine the presence or absence of California tiger salamanders within the construction footprint. Surveys will be conducted no more than 30 days before the start of ground-disturbing activities and will be phased with project build-out.

In the unlikely event that California tiger salamander individuals are found within the project footprint, the Authority will contact the USFWS and CDFG to identify appropriate avoidance and minimization measures to be implemented for this species.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#25. Implement Avoidance and Minimization Measures for California Tiger Salamander. The measures listed below will be implemented in the Cross Creek grassland region to avoid and minimize potential adverse effects to this species:

- The Contractor's Biologist, under the supervision of the Project Biologist, will install, maintain, and monitor exclusion fencing along the perimeter of the construction footprint to ensure that no take of California tiger salamander or destruction of their potential habitat outside of the project footprint occurs.

- The Contractor will not conduct construction activities within 250 feet of potential California tiger salamander breeding habitat during the wet season (October 15 through June 1); however, construction activities may begin once the habitat is no longer inundated for the season and it is after April 15.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Blunt-Nosed Leopard Lizard

The blunt-nosed leopard lizard is a California Fully Protected Species. As such, measures must be taken to completely avoid (not just minimize) take of this species.

Bio-MM#26. Conduct Protocol-Level Surveys for Blunt-Nosed Leopard Lizard. A qualified, agency-approved biologist (designated by the Project Biologist) will conduct protocol-level surveys for the blunt-nosed leopard lizard within 1 year of each construction phase. These surveys will be conducted in areas of potential blunt-nosed leopard lizard habitat in accordance with the *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard* (CDFG 2004). The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#27. Conduct Preconstruction Surveys for Blunt-Nosed Leopard Lizard. A qualified, agency-approved biologist (designated by the Project Biologist) will conduct visual preconstruction surveys in areas of potential blunt-nosed leopard lizard habitat in advance of ground disturbing activities associated with each construction phase. The Project Biological Monitor will also conduct daily clearance surveys prior to construction activities. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#28. Blunt-Nosed Leopard Lizard Avoidance. During the active season (April 15 through October 15), in areas where blunt-nosed leopard lizards or blunt-nosed leopard lizard signs are present, the following measures will be implemented:

- Following the preconstruction survey for blunt-nosed leopard lizard within the construction footprint (see Bio-MM#27), if active burrows or egg clutch sites are identified within the construction footprint, the Contractor's Biologist, under the supervision of the Project Biologist, will establish, maintain, and monitor 50-foot buffers around active burrows and egg clutch sites. The 50-foot buffers will be established around the active burrow and clutch sites in a manner that allows for blunt-nosed leopard lizard to leave the construction footprint after the young have hatched. Project activities within the 50-foot buffers, including vegetation clearing and grubbing (as described below), will be prohibited until the eggs have hatched and blunt-nosed leopard lizard have been allowed to leave the construction footprint, as determined by the Project Biologist.

- Following the preconstruction survey for blunt-nosed leopard lizard within the construction footprint (see Bio-MM#27), if no active burrows or egg clutch sites are identified within the construction footprint, the Contractor's Biologist, under the supervision of the Project Biologist, will conduct vegetation clearing and grubbing activities with hand tools. Cleared vegetation will be cut to 4 inches above the ground level, and all trimmings will be removed from the construction footprint. The vegetation-free work area will be allowed to sit undisturbed for a minimum of 72 hours to allow blunt-nosed leopard lizards to passively relocate from the site. A follow-up preconstruction survey will be conducted in the vegetation-free work area to look for blunt-nosed leopard lizards or their sign. Any blunt-nosed leopard lizards observed during the follow-up survey will be allowed to leave the work site on their own accord. Immediately after the follow-up preconstruction survey of the vegetation-free work area, the construction footprint will be delineated with high-visibility construction fence and wildlife exclusion fence. The vegetation-free work area within the wildlife exclusion fence will be maintained and monitored daily by the Contractor's Biologist, under the supervision of the Project Biologist.

- The Contractor will conduct ground-disturbing activities when air temperatures are between 75 and 95 degrees Fahrenheit. The temperature range corresponds to the period when this species is moving around and can avoid danger.

During the non-active season (October 16 through April 14), suitable blunt-nosed leopard lizard burrows identified during protocol-level and preconstruction surveys will be avoided by the Contractor. A 50-foot no-work buffer will be established around burrows to prevent impacts until the active season, when blunt-nosed leopard lizards will be able to leave the vegetation-free work area on their own accord. The no-work buffer will be established by routing the high-visibility construction fence and wildlife exclusion fence around the suitable burrow sites in a manner that allows for blunt-nosed leopard lizard to leave the construction footprint during the active season. If construction activities are required during this period, the appropriate measures will be established through consultation with the USFWS and CDFG.

If blunt-nosed leopard lizards are observed at any time during protocol-level surveys, preconstruction surveys, or the construction period, USFWS and CDFG will be contacted. Appropriate measures to avoid take of the species will be established through consultation with the USFWS and CDFG. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Fish

The common mitigation measures (Bio-MM#1 through Bio-MM#15) will directly and/or indirectly reduce impacts and effects on special-status fish species. The common mitigation measures will be implemented during the construction period, as applicable.

Birds

The common mitigation measures (Bio-MM#1 through Bio-MM#15) and project-period mitigation measures (Bio-MM#58 and Bio-MM#59) will directly and/or indirectly reduce impacts and effects on special-status bird species including those protected under the MBTA and/or listed as species of special concern (SSC) by the CDFG. These mitigation measures will be implemented during project operation as applicable. In addition, the following species-specific mitigation measures are proposed for implementation during the construction period.

Bio-MM#29. Conduct Preconstruction Surveys and Delineate Active Nest Exclusion Areas for Other Breeding Birds. Before the start of ground-disturbing activities, a qualified, agency-approved biologist (designated by the Project Biologist) will conduct visual preconstruction surveys where suitable habitats are present for nesting birds protected by the MBTA if construction and habitat removal activities are scheduled to occur during the bird breeding season (February 1 to August 15). In the event active bird nests are encountered during the preconstruction survey, the Contractor's Biologist, under the supervision of the Project Biologist, will establish nest avoidance buffer zones as appropriate. The buffer distances will be consistent with the intent of the MBTA. The Contractor's Biologist, under the supervision of the Project Biologist, will delineate nest avoidance buffers established for ground-nesting birds in a manner that does not create predatory bird perch points in close proximity (150 feet) to the active nest site. The Project Biological Monitor will periodically monitor active bird nests. The Contractor's Biologist, under the supervision of the Project Biologist, will maintain the nest avoidance buffer zone until nestlings have fledged or the nest is abandoned (as determined by the Project Biologist). The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#30. Conduct Preconstruction Surveys and Monitoring for Raptors. Before the start of ground-disturbing activities, a qualified, agency-approved biologist (designated by the Project Biologist) will conduct visual preconstruction 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 August 15). Surveys will be conducted in areas within the construction footprint and, where permissible, within 300 feet of the construction footprint for raptor species (not Fully Protected species) and 0.5 mile of the construction footprint for Fully Protected raptor species. The required survey dates will be modified based on local conditions. If breeding raptors with active nests are found, the Contractor's Biologist, under the supervision of the Project Biologist, will establish a 300-foot buffer around the nest and phase construction activities within the buffer(s) until the young have fledged from the nest or the nest fails (as determined by the Project Biologist). If fully protected raptors (e.g., white tailed-kite) with active nests are found, the Contractor's Biologist, under the supervision of the Project B Biologist, will establish a 0.5-mile buffer around the nest and phase construction activities within the buffer(s) until the young have fledged from the nest or the nest fails (as determined by the Project Biologist). Adjustments to the buffer(s) will require prior approval by USFWS and/or CDFG. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#31. Raptor Protection on Power Lines. During Final Design, the Project Biologist will verify that the catenary system and masts are designed to be raptor-safe in accordance with

Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC 2006). The Project Biologist will check the final design drawings and submit a memorandum to the Mitigation Manager to document compliance with this measure.

Swainson's Hawks

Bio-MM#32. Conduct Preconstruction Surveys for Swainson's Hawks. A qualified, agency-approved biologist (designated by the Project Biologist) will conduct preconstruction surveys for Swainson's hawks as described in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee [SHTAC] 2000). Surveys will be performed during the nesting season (March 1 through August 1) in the year before ground-disturbing activities within the construction footprint and within a 0.5-mile buffer, where access is permitted. The preconstruction nest surveys following the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000)will be phased with project build-out. The preconstruction surveys will determine the status (i.e., active, inactive) of observed nests. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#33. Swainson's Hawk Nest Avoidance and Monitoring. If active Swainson's hawk nests (defined as a nest used one or more times in the last 5 years) are found within 0.5-mile of the construction footprint during the nesting season (March 1 to August 1), active nests within a 0.25-mile buffer of the construction footprint will be monitored daily by a qualified, agency-approved biologist (designated by the Project Biologist) to assess whether the nest is occupied. If the nest is occupied, the health and status of the nest will be monitored until the young fledge or for the length of construction, whichever occurs first. The Contractor's Biologist, under the supervision of the Project Biologist, will establish buffers restricting construction activities within 500 feet and 0.25 mile of the active nest, depending on the nest activity, as feasible. Adjustments to the buffer(s) will be made in consultation with CDFG. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#34. Monitor Removal of Nest Trees for Swainson's Hawks. Before the start of ground-disturbing activities, the Project Biological Monitor will monitor nest trees for Swainson's hawks in the construction footprint following the guidelines and methods presented in the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (SHTAC 2000). If an occupied Swainson's hawk nest must be removed, the Authority will obtain take authorization through a Section 2081 Incidental Take Permit (including compensatory mitigation to offset the loss of the nest tree) from CDFG. If ground-disturbing activities or other project 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 qualified, agency-approved biologist (designated by the Project Biologist) will be conducted to determine if the nest is 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 will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Burrowing Owls

Bio-MM#35. Conduct Protocol Surveys for Burrowing Owls. Before the start of ground-disturbing activities a qualified, agency-approved biologist, designated by the Project Biologist, will conduct protocol-level surveys in accordance with CDFG's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012c). The Project Biologist or designee will conduct these surveys at

appropriate timeframes within suitable habitat located in the construction footprint. Results of the surveys will be used to inform Bio-MM#36. These surveys will be conducted within suitable habitat of the construction footprint and within a 150-meter (approximately 500-foot) buffer. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#36. Burrowing Owl Avoidance and Minimization. The Contractor will implement burrowing owl avoidance and minimization measures following CDFG's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). During the nesting season (February 1 through August 31) occupied burrowing owl burrows will not be disturbed unless it is verified that either the birds 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 CDFG, the Contractor's Biologist, under the supervision of the Project Biologist, will establish buffers (as an Environmentally Sensitive Area) between the construction work area and occupied burrowing owl nesting sites as described in Table 3.7-17. Adjustments to the buffer(s) will require prior approval by CDFG.

Table 3.7-17
California Department of Fish and Game recommended restricted activity dates and setback distances by level of disturbance for burrowing owls

Location	Time of Year	Level of Disturbance		
		Low	Medium	High
Nesting Sites	April 1–Aug 15	200 m	500 m	500 m
Nesting Sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting Sites	Oct 16-March 31	50 m	100 m	500 m

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

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Mammals

The common mitigation measures (Bio-MM#1 through Bio-MM#15) and project mitigation measures (Bio-MM#60) will directly and/or indirectly reduce impacts and effects on special-status mammals and will be implemented during the construction period as applicable. The following species-specific mitigation measures are proposed during construction period impacts.

Nelson's Antelope Squirrel, Fresno Kangaroo Rat, Tipton Kangaroo Rat, Dulzura Pocket Mouse, Tulare Grasshopper Mouse

Bio-MM#37. Conduct Preconstruction Surveys for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse. Before the start of construction, a qualified, agency-approved biologist, designated by the Project Biologist, will

conduct a habitat assessment in potentially suitable habitat within the project footprint to determine presence of special-status small mammal species burrows or their signs. The habitat assessment surveys will be conducted within 2 years, and no more than 14 days before the start of construction or ground-disturbing activities and may be phased with project build-out. If no burrows or signs of special-status small mammal species are detected, no further measures will be required.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#38. Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse. If during the habitat assessment, burrows or signs of special-status small mammal species are detected, the Contractor's Biologist, under the supervision of the Project Biologist, will establish non-disturbance exclusion zones (i.e., wildlife exclusion fencing [e.g., a silt fence or similar material]) in areas where special-status small mammal species are believed to be present. Non-disturbance exclusion zones will be established at least 14 days before the start of ground-disturbing activities. The non-disturbance exclusion fence with one-way exit/escape points will be placed to exclude the special-status small mammals from the construction area.

Additional measures such as one or both of the following will be implemented after the exclusion fencing is installed.

- The Contractor will trim and clear vegetation to the ground by hand or using hand-operated equipment to discourage the presence of special-status small mammal species in the construction footprint. The cleared vegetation will remain undisturbed by project construction equipment for 14 days to allow species to passively relocate through the one-way exit/escape points along the wildlife exclusion fencing.

- A qualified, agency-approved biologist, designated by the Project Biologist, will conduct small mammal trapping and relocation in general accordance with the *Survey Protocol for the Morro Bay Kangaroo Rat* (USFWS and CDFG 1996) or as determined in consultation with CDFG and USFWS. The small-mammal trapping surveys will occur within the construction footprint in potentially suitable habitat for special-status small-mammal species. The trapping will be conducted before the start of construction and phased with project build-out; trapping will be limited to the dry, summer months on evenings when the nightly low temperature is forecast to exceed 50°F.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#39. Implement Avoidance and Minimization Measures for Fresno Kangaroo Rat. Before the start of ground-disturbing activities, a qualified agency-approved biologist, designated by the Project Biologist, will conduct a habitat assessment on any parcels within the project footprint that may support the Fresno kangaroo rat to determine presence of kangaroo rat burrows or their signs.

If no burrows or signs of kangaroo rats are detected and kangaroo rats are confirmed to be absent from the construction footprint, the following actions will be implemented:

- The Contractor's Biologist, under the supervision of the Project Biologist, will install, maintain, and monitor exclusion fencing along the perimeter of the construction footprint to ensure that no take of Fresno kangaroo rat or destruction of their potential habitat outside of the project footprint occurs.

- The Contractor, under the supervision of the Project Biologist, will trim and clear vegetation to the ground by hand or using hand-operated equipment to discourage small-mammal presence in the construction footprint. The area from which the vegetation was cleared will remain undisturbed by project construction equipment for 14 days to allow other small-mammal species to passively relocate through the one-way exit/escape points along the wildlife exclusion fencing.

In the unlikely event that kangaroo rat individuals, their burrows, or signs of them are found within the project footprint during the habitat assessment, the USFWS and CDFG will be notified immediately and the FRA will reinitiate consultation to identify appropriate avoidance and minimization measures to be implemented for this species, such as:

- With agency permission, small mammal trapping may be conducted by a qualified biologist(s) with the necessary permits. The trapping surveys, will be conducted in general accordance with *Survey Protocol for the Morro Bay Kangaroo Rat* (USFWS and CDFG 1996) or as determined in consultation by either USFWS or CDFG, and will be limited to the dry, summer months on evenings when the nightly low temperature is forecast to exceed 50°F.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Special-Status Bats

Bio-MM#40. Conduct Preconstruction Surveys for Special-Status Bat Species. Before the start of ground-disturbing activities, a qualified, agency-approved biologist, designated by the Project Biologist, will conduct a visual and acoustic preconstruction survey for roosting bats. A minimum of one day and one evening will be included in the visual preconstruction survey. The Project Biologist, in coordination with the Mitigation Manager, will contact CDFG if any hibernation roosts or active nurseries are identified within or immediately adjacent to the construction footprint, as appropriate. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#41 Bat Avoidance and Relocation. During ground-disturbing activities, if active or hibernation roosts are found, the Contractor will avoid them, if feasible, for the period of activity. If avoidance of the hibernation roost is not feasible, the Contractor's Biologist, under the supervision of the Project Biologist, will prepare a relocation plan and coordinate the construction of an alternative bat roost with CDFG. The Contractor will implement the Bat Roost Relocation Plan before the commencement of construction activities.

A qualified, agency-approved biologist, designated by the Project Biologist, will remove roosts with approval from CDFG before hibernation begins (October 31), or after young are flying (July 31), using exclusion and deterrence techniques described in Bio-MM#42, below. The timeline to remove vacated roosts is between August 1 and October 31. All efforts to avoid disturbance to maternity roosts will be made during construction activities. The Project Biologist will submit a memorandum to the Mitigation Manager, on a weekly basis or at other appropriate intervals, to document compliance with this measure.

Bio-MM#42. Bat Exclusion and Deterrence. During ground-disturbing activities, if non-breeding or non-hibernating individuals or groups of bats are found within the construction footprint, a qualified, agency-approved biologist, designated by the Project Biologist, will safely exclude the bats by either opening the roosting area to change the lighting and air-flow conditions or installing one-way doors or other appropriate methods specified by CDFG. The Contractor will leave the roost undisturbed by project activities for a minimum of 1 week after implementing exclusion and/or eviction activities. The Contractor will not implement exclusion

measures to evict bats from established maternity roosts or occupied hibernation roosts. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

American Badger

Bio-MM#43. Conduct Preconstruction Surveys for American Badger and Ringtail. Before the start of ground-disturbing activities, a qualified, agency-approved biologist, designated by the Project Biologist, will conduct preconstruction surveys for den sites within suitable habitats in the construction footprint. These surveys will be conducted no more than 30 days before the start of ground-disturbing activities and phased with project build-out. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#44. American Badger and Ringtail Avoidance. The Contractor's Biologist, under the supervision of the Project Biologist, will establish a 50-foot buffer around occupied dens. The Contractor's Biologist, under the supervision of the Project Biologist, will 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) will require prior approval by CDFG as coordinated by the Project Biologist, under the supervision of the Mitigation Manager. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

San Joaquin Kit Fox

Bio-MM#45. Conduct Preconstruction Surveys for San Joaquin Kit Fox. Before the start of ground-disturbing activities, a qualified, agency-approved biologist, designated by the Project Biologist, will conduct preconstruction surveys in accordance with USFWS' *San Joaquin Kit Fox Survey Protocol for the Northern Range* (USFWS 1999b). The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#46. Minimize Impacts on San Joaquin Kit Fox. The Contractor will implement USFWS' *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS [1999] 2011) to minimize ground disturbance-related impacts to this species. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Habitats of Concern

In addition to the common mitigation measures (Bio-MM#1 through Bio-MM#15) that apply to all biological resources, specific measures will be implemented to avoid and/or minimize impacts on habitat of concern, including special-status plant communities, jurisdictional waters, conservation areas, and protected trees. As applicable, project mitigation measures (Bio-MM#61 through Bio-MM#64) may also reduce the impact on habitats of concern during construction period impacts. Furthermore, in some instances mitigation measures associated with special-status species and wildlife movement corridors during the construction period and/or project operation may also directly or indirectly avoid and/or minimize impacts and effects to habitats of concern.

This section presents the mitigation measures that will be implemented to avoid and minimize impacts and effects to habitats of concern during construction period impacts and is organized into the following subheadings: special-status plant communities, jurisdictional waters, conservation areas, and protected trees.

Special-Status Plant Communities

The implementation of the applicable common mitigation measures (Bio-MM#1 through Bio-MM#15), and other construction period and project operation mitigation measures pertaining to special-status plant species, special-status plant communities, and jurisdictional waters (Bio-MM#16, Bio-MM#53 and Bio-MM#61 through Bio-MM#63) will directly or indirectly reduce impacts and effects on special-status plant communities during the construction period. In addition, the following resource-specific mitigation measure is proposed to be implemented during construction.

Bio-MM#47. Restore Temporary Riparian Impacts. During post-construction, the Contractor will revegetate all disturbed riparian areas using appropriate plants and seed mixes. The Project Biologist will monitor restoration activities consistent with provisions in the HMMP, as described in Bio-MM#62. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager documenting compliance and other reporting requirements required by the regulatory agency permits (e.g., 1600 Streambed Alteration Agreement).

Jurisdictional Waters

The implementation of the applicable common mitigation measures (Bio-MM#1 through Bio-MM#15), and project jurisdictional waters mitigation measures (Bio-MM#62 and Bio-MM#63) will also directly or indirectly reduce impacts and effects on jurisdictional waters during construction period impacts. In addition, the following resource-specific mitigation measures are proposed during construction period impacts.

Bio-MM#48. Restore Temporary Impacts on Jurisdictional Waters. During or after the completion of construction, the Contractor will restore disturbed jurisdictional waters to original topography using stockpiled and segregated soils. In areas where gravel or geotextile fabrics have been placed to protect substrate and minimize impacts to jurisdictional waters, these materials will be removed and affected features will be restored to the extent possible. The Contractor will conduct revegetation using appropriate plants and seed mixes. The Authority will conduct maintenance monitoring consistent with the provisions in the HMMP (Bio-MM#62). The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#49. Monitor Construction Activities within Jurisdictional Waters. During ground-disturbing activities, the Contractor's Biologist and Project Biological Monitor will conduct monitoring within and adjacent to jurisdictional waters, including monitoring of the installation of protective devices (silt fencing, sandbags, fencing, etc.), installation and/or removal of creek crossing fill, construction of access roads, vegetation removal, and other associated construction activities. The Project Biological Monitor will conduct biological monitoring to document adherence to habitat avoidance and minimization measures addressed in the project mitigation measures and as listed in the USFWS, CDFG, SWRCB, and USACE permits conditions. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Conservation Areas

The common mitigation measures (Bio-MM#1 through Bio-MM#15) and other mitigation measures pertaining to the special-status species, habitats of concern, and wildlife movement and migration will also directly or indirectly reduce impacts and effects on conservation areas including Allensworth Ecological Reserve.

Protected Trees

The common mitigation measures (Bio-MM#1 through Bio-MM#15) and the project mitigation measure for protected trees (Bio-MM#64) will also directly and/or indirectly reduce impacts and effects on protected trees during construction period impacts. In addition, the following resource-specific mitigation measure is proposed during construction period impacts.

Bio-MM#50. Mitigation and Monitoring of Protected Trees. Before, during, and after construction, the following methods to preserve and/or mitigate for impacts on protected trees will be implemented:

- A qualified biologist, designated by the Project Biologist, will conduct preconstruction surveys to evaluate the condition of all protected trees found within areas directly and indirectly affected by the Fresno to Bakersfield Section.
- The Authority will compensate for impacts and effects to protected tree resources, including removal or trimming of naturally occurring native protected trees and landscape or ornamental trees (see Bio-MM#64, Compensate for Impacts to Protected Trees).
- The Contractor's Biologist, under the supervision of the Project Biologist, will fence protected trees that may be indirectly affected by construction activities 5 feet from their drip lines to form ERAs.
- The Authority will prepare and implement a monitoring and maintenance program that monitors transplanted trees for re-establishment of root systems.

The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Wildlife Movement Corridors

The common mitigation measures (Bio-MM#1 through Bio-MM#15) that apply to all biological resources and specific measures will be implemented to avoid and/or minimize impacts and effects on wildlife movement corridors. Furthermore, in some instances mitigation measures associated with special-status species and habitats of concern during construction period impacts and project impacts may also directly or indirectly avoid and/or minimize impacts and effects to wildlife movement corridors.

As discussed in Chapter 2, Alternatives, wildlife crossing opportunities will be available through a variety of engineered structures, including dedicated wildlife crossing structures, elevated structures, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large-diameter [60- to 120-inch] culverts and paired 30-inch culverts). For a more detailed discussion of the crossing structures, including figures depicting the frequency and locations of these structures, refer to Figures 5-7a through 5-7c and Section 5.6 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

This section presents the mitigation measures that will be implemented to avoid and minimize impacts and effects to wildlife movement corridors during the construction period.

Bio-MM#51. Install Wildlife Fencing. Before the start of operation of the HST, the Contractor will install permanent special-status mammal-proof fencing consistent with the final design along portions of the project that are adjacent to wildlife movement corridors. The Contractor's Biologist and Project Biologist will verify that the installation is consistent with the designated terms and conditions in the applicable permits. The design of the mammal-proof fencing and the exact locations where mammal-proof fencing will be installed will be determined in consultation with USFWS and CDFG. The Project Biologist will submit a memorandum, on a

weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Bio-MM#52. Construction in Wildlife Movement Corridors. Before the start of ground-disturbing activities, the Contractor's Biologist will submit a construction avoidance and minimization plan for wildlife movement linkages (e.g., SR 43–Garces Highway and Deer Creek–Sand Ridge linkages) to the Project Biologist for concurrence. During ground-disturbing activities, the Contractor will keep the wildlife movement linkages (e.g., SR 43–Garces Highway and Deer Creek–Sand Ridge linkages) free of all equipment, storage materials, construction materials, and any significant potential impediments. The Contractor will minimize ground-disturbing activities within the wildlife linkages (e.g., SR 43–Garces Highway and Deer Creek–Sand Ridge linkages) during nighttime hours to the extent practicable. In addition, the Contractor will 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 will verify compliance with this measure and the Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

3.7.7.3 Project Mitigation Measures

Special-Status Species

In addition to the common mitigation measures (Bio-MM#1 through Bio-MM#15) that apply to all biological resources, specific measures will be implemented to avoid and/or minimize project impacts and effects on special-status species. As applicable, construction period mitigation measures (Bio-MM#16 through Bio-MM#52) may also reduce the impact on special-status species during project operation. Furthermore, in some instances mitigation measures associated with habitats of concern and wildlife movement corridors during the construction period or project operation may also directly or indirectly avoid or minimize impacts and effects on special-status species.

The section presents project impact mitigation measures that will be implemented to avoid and minimize impacts and effects to special-status species and is organized by species guild. The mitigation ratios presented in this section are proposed as a minimum to compensate for project impacts; final ratios will be determined in consultation with appropriate agencies.

Special-Status Plant Species

The implementation of the applicable common mitigation measures (Bio-MM#1 through Bio-MM#15), and special-status plant construction mitigation measures (Bio-MM#16 and Bio-MM#17), will also directly or indirectly reduce impacts and effects on special-status plant species, as applicable. In addition, the following species-specific mitigation measure for project impacts is proposed.

Bio-MM#53. Compensate for Impacts on Special-Status Plant Species. Prior to final design and during the permitting process, the Authority will comply with CESA and the federal ESA by implementing the following measures:

- Purchase credits from an existing mitigation bank or conduct a special-status plant re-establishment program within the same watershed or in proximity to the impact area at a 1:1 ratio.
- Mitigate the impacts on special-status plants in accordance with the USFWS Biological Opinion and/or CFGC Section 2081(b).

The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Special-Status Wildlife Species

Invertebrates

The implementation of the applicable common mitigation measures (Bio-MM#1 through Bio-MM#15), invertebrate construction mitigation measures (Bio-MM#18 through Bio-MM#21), and other mitigation measures pertaining to the jurisdictional waters (including vernal pools) and special-status plant communities (including riparian areas) will also directly or indirectly reduce project impacts and effects on special-status invertebrate species, as applicable. In addition, the following species-specific mitigation measures are proposed to avoid and minimize impacts and effects during project operation.

Vernal Pool Branchiopods

Bio-MM#54. Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp. The Authority will mitigate direct and indirect impacts, including temporary and permanent, on vernal pool branchiopod habitat through compensation determined in consultation with the USFWS and USACE. Compensation for vernal pool branchiopod habitat (e.g., vernal pools, seasonal wetlands) is addressed under compensation for impacts on jurisdictional waters (Bio-MM#63). The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Valley Elderberry Longhorn Beetle

Bio-MM#55. Implement Conservation Guidelines During Project Operation for Valley Elderberry Longhorn Beetle. The Authority will conduct compensatory mitigation for the valley elderberry longhorn beetle, including transplantation and replacement of elderberry shrubs, and maintenance for replacement shrubs following the USFWS' *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a). The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Reptiles and Amphibians

The common mitigation measures (Bio-MM#1 through Bio-MM#15) and mitigation measures developed for implementation (Bio-MM#22 through Bio-MM#28) during project construction will directly and/or indirectly reduce impacts and effects on reptiles and amphibians and will be implemented during project operation as applicable. In addition, the following species-specific mitigation measures are proposed to avoid and minimize impacts and effects during project operation.

California Tiger Salamander

Bio-MM#56. Compensate for Impacts on California Tiger Salamander. If compensatory mitigation is required to offset the loss of habitat for California tiger salamander, the Authority will determine the compensation through consultation with the USFWS. 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 Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel

Bio-MM#57. Compensate for Impacts on Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel. The Authority will determine compensatory mitigation to offset the permanent and temporary loss of suitable habitat for the blunt-nosed leopard lizard, Tipton kangaroo rat, and Nelson's antelope squirrel through consultation with the USFWS and/or CDFG. 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 Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Fish

The common mitigation measures (Bio-MM#1 through Bio-MM#15) will directly and/or indirectly reduce impacts and effects on special-status fish species. The common mitigation measures will be implemented to avoid and minimize impacts and effects during project operation, as applicable.

Birds

The common mitigation measures (Bio-MM#1 through Bio-MM#15) and construction period mitigation measures (Bio-MM#29 through Bio-MM#36) will directly and/or indirectly reduce impacts and effects on special-status bird species including those protected under the MBTA and/or listed as SSC by the CDFG. These mitigation measures will be implemented during the construction period as applicable. In addition, the following species-specific mitigation measures are proposed to avoid and minimize impacts and effects to birds during project operation.

Swainson's Hawks

Bio-MM#58. Compensate for Loss of Swainson's Hawk Nesting Trees. To compensate for the loss of occupied Swainson's hawk nesting trees or mortality to offspring, the Authority will provide project specific compensatory mitigation that replaces nesting trees and provides natural lands for foraging. Compensatory mitigation for Swainson's hawk will be based on the number of trees with "active" nests that are removed by construction activities, or where construction activities create a significant habitat modification that leads to a reduction in reproductive success, or nest abandonment. If project construction occurs within 0.5 mile of a documented or observed active nest, the Authority will acquire and preserve 150 acres of natural habitat, per active nest tree removed by construction activities, or where construction activities create a significant habitat modification that leads to reduce reproductive success or nest abandonment. At a minimum, the habitat preserved will contain trees suitable to support nesting and natural foraging habitat for Swainson's hawk. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Burrowing Owls

Bio-MM#59. Compensate for Loss of Burrowing Owl Active Burrows and Habitat. To compensate for permanent impacts to nesting, occupied, and satellite burrows and/or burrowing owl habitat, the Authority will provide compensatory mitigation based on CDFG's (2012) *Staff Report on Burrowing Owl Mitigation*. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Mammals

The common mitigation measures (Bio-MM#1 through Bio-MM#15) and construction mitigation measures (Bio-MM#37 through Bio-MM#46) will directly and/or indirectly reduce impacts and effects on mammals, and will be implemented during project operation as applicable. In addition, the following species-specific mitigation measures are proposed to avoid and minimize impacts and effects to mammals during project operation.

San Joaquin Kit Fox

Bio-MM#60. Compensate for Destruction of Natal Dens. The Authority will mitigate the destruction of San Joaquin kit fox natal dens by the purchase of suitable, approved habitat (USFWS and CDFG). Habitat will be replaced at a minimum of a 1:1 ratio to provide additional protection and habitat in a location that is consistent with the recovery of the species. The Authority will mitigate the impacts on San Joaquin kit fox in accordance with the USFWS Biological Opinion and/or CDFG 2081(b). The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Habitats of Concern

In addition to the common mitigation measures (Bio-MM#1 through Bio-MM#15) that apply to all biological resources, specific measures will be implemented to avoid and/or minimize impacts and effects on habitat of concern, including special-status plant communities, jurisdictional waters, conservation areas, and protected trees during project operation. As applicable, construction mitigation measures (Bio-MM#47 through Bio-MM#50) may also reduce the impact on habitats of concern during construction. Furthermore, in some instances mitigation measures associated with special-status species and wildlife movement corridors during the construction period and/or project operation may also directly or indirectly avoid and/or minimize impacts and effects on habitats of concern.

The section presents the mitigation measures that will be implemented to avoid, minimize, and compensate for impacts and effects to habitats of concern during project operation; this section addresses the following topics: special-status plant communities, jurisdictional waters, conservation areas, and protected trees.

Special-Status Plant Communities

The implementation of the applicable common mitigation measures (Bio-MM#1 through Bio-MM#15), and special-status plant species and special-status plant communities construction mitigation measures (Bio-MM#16, Bio-MM#17, and Bio-MM#47), and other mitigation measures pertaining to the jurisdictional waters (including vernal pools) will also directly or indirectly reduce impacts and effects on special-status plant communities during project operation, as applicable. In addition, the following species-specific mitigation measures are proposed to avoid and minimize impacts and effects to special-status plant communities during project operation.

Bio-MM#61. Compensate for Permanent Riparian Impacts. The Authority will compensate for permanent impacts on riparian habitats (i.e., valley foothill riparian), as

determined in consultation with the appropriate agencies (e.g., CDFG), by restoring nearby areas to suitable habitat and/or by purchasing credits in a mitigation bank. The HMMP will provide the planning details. Compensation will be based on the following ratio (acres of mitigation to acres of impact), pending agency confirmation:

- Valley Foothill Riparian: 2:1.

The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Jurisdictional Waters

The implementation of the applicable common mitigation measures (Bio-MM#1 through Bio-MM#15), and jurisdictional waters mitigation measures (Bio-MM#48 and Bio-MM#49) will also directly or indirectly reduce impacts and effects on jurisdictional waters during project operation. In addition, the following species-specific mitigation measure is proposed to avoid and minimize impacts and effects to jurisdictional waters during project operation.

Bio-MM#62. Prepare and Implement a Habitat Mitigation and Monitoring Plan. As part of the USFWS, USACE, SWRCB, and CDFG permit applications and before the start of ground-disturbing activities, the Authority will prepare an HMMP to mitigate for temporary and permanent impacts on jurisdictional waters and state streambeds. In the HMMP, performance standards, including percent cover of native species, survivability, tree height requirements, wildlife utilization, the acreage basis, restoration ratios, and the combination of onsite and/or offsite mitigation will be detailed; preference will be given to conducting the mitigation within the same watershed where the impact occurs. The Project Biologist will work with the USACE, SWRCB, and CDFG to develop appropriate avoidance, minimization, mitigation, and monitoring measures to be incorporated into the HMMP. The HMMP will outline the intent to mitigate for the lost conditions, functions, and values of impacts on jurisdictional waters and state streambeds consistent with resource agency requirements and conditions presented in Sections 404 and 401 of the CWA and Section 1600 of the CFGC. The HMMP will incorporate the following standard requirements consistent with USACE, SWRCB, and CDFG guidelines:

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

Additionally, the following will 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 preservation, enhancement, and/or establishment or restoration activities will be conducted on some of the compensatory (i.e., selected permittee-responsible) mitigation sites to

achieve the mitigation goals. A detailed design of the mitigation habitats will be created in coordination with the permitting agencies and be described in the HMMP. It is recognized that several HMMPs will be developed consistent with the selected mitigation sites and the resources mitigated at each. The primary engineering and construction contractors will ensure, through coordination with the Project Biologist, that construction is implemented in a manner that minimizes disturbance of such areas to the extent feasible. Temporary fencing will be used during construction to avoid sensitive biological resources that are located adjacent to construction areas and can be avoided.

Performance standards are targets for determining the effectiveness of the mitigation and assessing the need for adaptive management (e.g., mitigation design or maintenance revisions). The performance standards are developed so that progress towards meeting final success criteria can be assessed on an annual basis; the standard for each year is progressively closer to the final criteria (e.g. vegetation cover standards may increase annually until reaching the success criteria objective in the final year of monitoring). Success criteria are formal criteria that must be met after a specific timeframe to meet regulatory requirements of the permitting agencies. Where applicable, replacement planting/seeding will be implemented if monitoring demonstrates that performance standards or success criteria are not met during a particular monitoring interval.

The performance standards will be used to determine whether the habitat improvement is trending toward sustainability (i.e., reduced human intervention) and to assess the need for adaptive management. These standards must be met for the habitat improvement to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance standards will be developed in consultation with the permitting agencies and described in the HMMP.

The final success criteria will be developed in coordination with the regulatory agencies and presented in the HMMP. Examples of success criteria, which could be included in the HMPP, and would be assessed at the end of the monitoring period (assumed to be 5 years or as directed by agencies), include:

- Percent survival of planted trees (65–85%, depending on species and habitat).
- Percent absolute cover of highly invasive species, as defined by the California Invasive Plant Council (<5%).
- Percent total absolute cover of plant species (50-80%, depending on habitat type)
- Designed wetlands will meet U.S. Army Corps of Engineers criteria for hydrophytic vegetation, hydric soils, and hydrology as defined in the “Corps of Engineers wetland delineation manual” (Environmental Laboratory 1987)
- Designed vernal pools and seasonal wetlands will meet inundation and seasonal drying requirements as specified in the design and indicated by agencies
- Species composition and community diversity, relative to reference sites, and/or as described in the guidelines issued by permitting agencies (e.g., USFWS conservation guidelines for valley elderberry longhorn beetle).

Performance standards and success criteria will be provided for each of the years of monitoring and will be specific to habitat types at each permittee-responsible mitigation site. The monitoring schedule will be detailed in the site-specific HMMPs. To be deemed successful, the site may be required to meet the performance standards only in selected years. However, if performance standards are not met in specific years, remedial measures, such as regrading, adjustment to modify the hydrological regime, and/or replacement planting or seeding, must be implemented

and that year's monitoring must be repeated the following year until the performance standards are met. The success criteria specified must be reached without human intervention (e.g., irrigation, replacement plantings) aside from maintenance practices described in the site-specific HMMPs for maintenance during the establishment period.

The Project Biologist will oversee the implementation of all HMMP elements and monitor consistent with the prescribed maintenance and performance monitoring requirements.

The Project Biologist will prepare annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Bio-MM#63. Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. The Authority will mitigate permanent and temporary wetland impacts through compensation determined in consultation with the USACE, SWRCB, USFWS, and CDFG, in order to be consistent with the HMMP (BIO-MM#62). Regulatory compliance for jurisdictional waters includes relevant terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and CDFG 1600 Streambed Alteration Agreement.

Compensation shall 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 purchase or establishment of a conservation easement or other permanent site protection method 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 will 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 will mitigate impacts on jurisdictional waters by replacing, creating, restoring, enhancing or preserving aquatic resource at the ratios presented above or other ratios, as determined in consultation with the appropriate agencies, which compensates for functions and values lost. The Authority will consider modifying the vernal pool mitigation ratios in the final permits based on site-specific conditions and the specific life history requirements of vernal pool branchiopods, California tiger salamander, and western spadefoot toad.

Where an HST alternative affects an existing conservation area (e.g., Allensworth ER), the Authority will modify the mitigation ratio to meet the vernal pool mitigation requirement. Either the affected portion of the conservation area will be relocated or compensation will be provided to the holder of Allensworth ER in accordance with the Uniform Relocation and Real Property Policy Act of 1970, as amended.

Through the HMMP reporting program and the applicable terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and the CDFG 1600 Streambed Alteration Agreement, the Project Biologist will document compliance and submit it to the Mitigation Manager.

Conservation Areas

The common mitigation measures (Bio-MM#1 through Bio-MM#15) and other mitigation measures pertaining to the special-status species, habitats of concern, and wildlife movement corridors will also directly or indirectly reduce impacts and effects on conservation areas (e.g., Allensworth ER).

Protected Trees

The common mitigation measures (Bio-MM#1 through Bio-MM#15) and construction mitigation measure for protected trees (Bio-MM#50) will also directly and/or indirectly reduce impacts and effects on protected trees during project operation. In addition, the following species-specific mitigation measure is proposed to avoid and minimize impacts and effects to protected trees during project operation.

Bio-MM#64. Compensate for Impacts to Protected Trees. The Authority will compensate for impacts, including removal or trimming of naturally occurring native protected trees and landscape or ornamental trees, through one of the following:

- Transplant all directly affected protected trees that are judged by an arborist to be in good condition to a suitable site outside the zone of impact.
- Replace directly affected protected trees at an onsite or offsite location, based on the number of protected trees removed, at a ratio not to exceed 3:1 for native trees or 1:1 for landscape or ornamental trees.
- Contribute to a tree-planting fund.

The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Wildlife Movement Corridors

As applicable, construction period mitigation measures (Bio-MM#51 and Bio-MM#52) and common mitigation measures (Bio-MM#1 through Bio-MM#15) that apply to all biological resources may also reduce the impact on wildlife movement corridors during project operation. Furthermore, in some instances mitigation measures associated with special-status species and habitats of concern during the construction period and/or project operation may also directly or indirectly avoid and/or minimize impacts and effects to wildlife movement corridors.

As discussed in Chapter 2, wildlife crossing opportunities would be available through a variety of engineered structures, including dedicated wildlife crossing structures, viaducts, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large-diameter [60–120 inches] culverts and paired 30-inch culverts). For a more detailed discussion of the crossing structures, including figures depicting the frequency and locations of these structures, see Figures 5-7a through 5-7c and Section 5.6 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Offsite Habitat Restoration, Enhancement, and Preservation

Bio-MM#65: Offsite Habitat Restoration, Enhancement, and Preservation. Before site preparation at a mitigation site, the Authority will consider the offsite habitat restoration,

enhancement, and preservation program and identify short-term temporary and/or long-term permanent effects on the natural landscape. A determination will be made on any effects from the physical alteration of the site to onsite biological resources, including plant communities, land cover types, and the distribution of special-status plant and wildlife.

Appropriate seasonal restrictions (e.g., breeding season) on activities that result in physical alteration of the site may be applicable if suitable habitats for special-status species and sensitive habitats exist onsite. Activities resulting in the physical alteration of the site include grading/modifications to onsite topography, stockpiling, storage of equipment, installation of temporary irrigation, removal of invasive species, and alterations to drainage features. In general, the long-term improvements to habitat functions and values will offset temporary effects during restoration, enhancement, and preservation activities.

The offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored in ways that are consistent with the terms and conditions of the USACE Section 404 Permit, CDFG 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite. Potential effects on site-specific hydrology and the downstream resources will be evaluated as a result of implementation of the restoration-related activity. Site-specific BMPs and a Storm Water Pollution Prevention Plan (SWPPP) will be implemented as appropriate.

The Authority will report on compliance with the permitting requirements. The Project Biologist will be responsible for the monitoring and tracking of the program, will prepare a memorandum of compliance, and will submit it to the Mitigation Manager.

3.7.8 NEPA Impacts Summary

Under the No Project Alternative, existing development trends affecting biological resources are expected to continue and potentially further degrade some natural systems. Expanded development in the region would continue to result in direct effects including habitat loss, mortality from vehicle strikes, and indirect effects associated with habitat degradation from pollution, noise, and dust effects on special-status species and habitats, creation of barriers to wildlife movement, habitat fragmentation, and other effects. However, ongoing and future conservation planning and regulatory controls are a mechanism for maintaining a degree of natural heritage with the ongoing development trend.

The intensity of effects to various biological resources varies by alternative alignment. Table 3.7-18 and Table 3.7-19 compare the intensity of effects to biological resources for each alternative alignment and the corresponding section of the BNSF alternative for construction period and project impacts, respectively. Table 3.7-20 summarizes the intensity of effects to biological resources for the station and HMF alternatives.

Table 3.7-18
Comparison of Intensity of Effects under NEPA During the Construction Period between HST Alignment Alternatives and the Corresponding Segments of the BNSF Alternative[a]

HST Alternatives	Special-Status Plant Species	Special-Status Wildlife Species	Special-Status Plant Communities	Jurisdictional Waters	Conservation Areas			Protected Trees	Wildlife Movement Corridors
					Recovery Plans	Allensworth ER	HCPs		
Hanford West Bypass 1	Negligible	Moderate	Negligible	Substantial	No Effect	No Effect	No Effect	Moderate	No Effect
Corresponding Segment of BNSF Alt.	Negligible	Substantial	Negligible	Substantial	No Effect	No Effect	No Effect	No Effect	No Effect
Hanford West Bypass 2	Negligible	Moderate	Negligible	Substantial	No Effect	No Effect	No Effect	Moderate	No Effect
Corresponding Segment of BNSF Alt.	Negligible	Substantial	Negligible	Substantial	No Effect	No Effect	No Effect	No Effect	No Effect
Corcoran Elevated	Negligible	Moderate	Negligible	Moderate	Moderate	No Effect	No Effect	No Effect	No Effect
Corresponding Segment of BNSF Alt.	Negligible	Moderate	Negligible	Moderate	Moderate	No Effect	No Effect	Negligible	No Effect
Corcoran Bypass	Negligible	Substantial	Negligible	Substantial	Moderate	No Effect	No Effect	Moderate	No Effect
Corresponding Segment of BNSF Alt.	Negligible	Moderate	Negligible	Moderate	Moderate	No Effect	No Effect	Negligible	No Effect
Allensworth Bypass	Moderate	Moderate	Moderate	Substantial	Substantial	No Effect	No Effect	Negligible	No Effect
Corresponding Segment of BNSF Alt.	Negligible	Moderate	Negligible	Substantial	Substantial	No Effect	No Effect	Negligible	No Effect
Wasco-Shafter Bypass	Negligible	Moderate	Negligible	Moderate	Moderate	No Effect	No Effect	No Effect	No Effect
Corresponding Segment of BNSF Alt.	Negligible	Substantial	Negligible	Moderate	Moderate	No Effect	No Effect	No Effect	No Effect
Bakersfield South	Substantial	Substantial	Substantial	Substantial	Moderate	No Effect	No Effect	Substantial	Negligible
Corresponding Segment of BNSF Alt.	Substantial	Substantial	Substantial	Substantial	Substantial	No Effect	No Effect	Substantial	Negligible
Bakersfield Hybrid	Substantial	Substantial	Substantial	Substantial	Moderate	No Effect	No Effect	Substantial	Negligible
Corresponding Segment of BNSF Alt.	Substantial	Substantial	Substantial	Substantial	Substantial	No Effect	No Effect	Substantial	Negligible

[a] Comparison does not include when the alternatives are considered in combination with the remaining segments of the BNSF Alternative.

Table 3.7-19
Comparison of Intensity of Permanent Effects under NEPA from the Project between HST Alignment Alternatives and the Corresponding Segments of the BNSF Alternative[a]

HST Alternatives	Special-Status Plant Species	Special-Status Wildlife Species	Special-Status Plant Comm-unities	Jurisdict-ional Waters	Conservation Areas			Protected Trees	Wildlife Movement Corridors
					Recovery Plans	Allens-worth ER	HCPs		
Hanford West Bypass 1	Moderate	Substantial	Moderate	Substantial	No Effect	No Effect	No Effect	Substantial	Moderate
Corresponding Segment of BNSF Alt.	Negligible	Substantial	Negligible	Substantial	No Effect	No Effect	No Effect	Substantial	Moderate
Hanford West Bypass 2	Moderate	Substantial	Moderate	Substantial	No Effect	No Effect	No Effect	Substantial	Moderate
Corresponding Segment of BNSF Alt.	Negligible	Substantial	Negligible	Substantial	No Effect	No Effect	No Effect	Substantial	Moderate
Corcoran Elevated	Moderate	Substantial	Moderate	Substantial	Substantial	No Effect	No Effect	Moderate	Moderate
Corresponding Segment of BNSF Alt.	Moderate	Substantial	Moderate	Substantial	Substantial	No Effect	No Effect	Substantial	Moderate
Corcoran Bypass	Moderate	Substantial	Moderate	Substantial	Substantial	No Effect	No Effect	Negligible	Moderate
Corresponding Segment of BNSF Alt.	Moderate	Substantial	Moderate	Substantial	Substantial	No Effect	No Effect	Substantial	Moderate
Allensworth Bypass	Moderate	Substantial	Substantial	Substantial	Substantial	No Effect	No Effect	Negligible	Substantial
Corresponding Segment of BNSF Alt.	Moderate	Substantial	Substantial	Substantial	Substantial	Substantial	No Effect	Negligible	Substantial
Wasco-Shafter Bypass	Moderate	Substantial	Moderate	Moderate	Substantial	No Effect	No Effect	Substantial	Negligible
Corresponding Segment of BNSF Alt.	Negligible	Substantial	Negligible	Moderate	Substantial	No Effect	No Effect	Moderate	Negligible
Bakersfield South	Negligible	Moderate	Negligible	Substantial	Substantial	No Effect	No Effect	Substantial	Negligible
Corresponding Segment of BNSF Alt.	Negligible	Moderate	Moderate	Substantial	Substantial	No Effect	No Effect	Substantial	Negligible
Bakersfield Hybrid	Negligible	Moderate	Negligible	Substantial	Substantial	No Effect	No Effect	Substantial	Negligible
Corresponding Segment of BNSF Alt.	Negligible	Moderate	Moderate	Substantial	Substantial	No Effect	No Effect	Substantial	Negligible

[a]Comparison does not include when the alternatives are considered in combination with the remaining segments of the BNSF Alternative.

Table 3.7-20
Summary of Intensity of Effects under NEPA for HMF and Station Alternatives

HMF/Station Alternatives	Special-Status Plant Species	Special-Status Wildlife Species	Special-Status Plant Communities	Jurisdictional Waters	Conservation Areas			Protected Trees	Wildlife Movement Corridors
					Recovery Plans	Allensworth ER	HCPs		
Fresno Works–Fresno	Negligible	Substantial	Negligible	Moderate	No effect	No effect	No effect	Substantial	No effect
Kings County–Hanford	Negligible	Substantial	Negligible	Moderate	No effect	No effect	No effect	No effect	No effect
KCOG–Wasco	No effect	Substantial	No effect	Moderate	Substantial	No effect	No effect	No effect	No effect
KCOG–Shafter East	Negligible	Substantial	No effect	Moderate	No effect	No effect	No effect	No effect	No effect
KCOG–Shafter West	No effect	Substantial	Negligible	No effect	No effect	No effect	No effect	No effect	No effect
Fresno Station–Mariposa	No effect	Negligible	No effect	No effect	No effect	No effect	No effect	Substantial	No effect
Fresno Station–Kern	No effect	Negligible	No effect	No effect	No effect	No effect	No effect	Moderate	No effect
Kings/Tulare Regional Station–West	Negligible	Moderate	Negligible	No effect	No effect	No effect	No effect	No effect	No effect
Kings/Tulare Regional Station–East	No effect	Negligible	No effect	No effect	No effect	No effect	No effect	No effect	No effect
Bakersfield Station–North	No effect	Negligible	No effect	No effect	Moderate	No effect	No effect	Moderate	No effect
Bakersfield Station–South	No effect	Negligible	No effect	No effect	Moderate	No effect	No effect	Substantial	No effect
Bakersfield Station–Hybrid	No effect	Negligible	No effect	No effect	Moderate	No effect	No effect	No effect	No effect

ER = Allensworth Ecological Reserve
HCP = Habitat Conservation Plan
HMF = Heavy Maintenance Facility
KCOG = Kern Council of Governments

The overall effect of the HST project on biological resources would be dependent on the intensity of the project's effects, the context in which these effects occur, and the measures implemented to mitigate the impacts of the project. The overall effect of the project under NEPA is summarized for each biological resource below.

- **Special-status plant species:** Suitable habitats and known occurrences of special-status plant species are rare in the Special-Status Plant Study Area and throughout the Central Valley. The majority of the land in the Central Valley has been converted to agricultural uses (NRCS 2006), and the natural areas that remain are largely disturbed and fragmented. Therefore, existing populations and suitable habitats for special-status plant species are rare on a regional scale. Special-status plant species and potentially suitable habitats occur within the project footprint, and would be affected by construction period activities and the project. However, though implementation of mitigation measures as described in Section 3.7.7, effects to special-status plant species would be avoided, where possible, or would be slight and would result in minimal regional effects. Therefore, effects of the HST project on special-status plant species would not be significant under NEPA.

- **Special-status wildlife species:** Suitable habitats for special-status wildlife have been significantly reduced in the Habitat Study Area and throughout the Central Valley, where 80% of the land has been converted to agricultural uses (NRCS 2006). The natural areas that remain are largely disturbed and fragmented. These changes to the landscape have significantly reduced suitable habitat for wildlife species, with an especially detrimental effect on species that rely on specific or sensitive habitats, such as vernal pool branchiopods that depend on vernal pool habitats. Some special-status species have adapted to human-altered environments, because their natural habitats have been reduced; for example, San Joaquin kit fox, which utilize urban Bakersfield (USFWS 2010), and Swainson's hawk, which forage in agricultural fields (CDFG 2008). However, these species still rely on natural habitats, which are rare on a regional scale. The HST project would affect special-status wildlife species and their habitat. However, though implementation of mitigation measures as described in Section 3.7.7, effects to special-status wildlife species would be avoided, where possible, or would be slight and would result in minimal regional effects. Therefore, effects of the HST project on special-status wildlife species would not be significant under NEPA.

- **Special-status plant communities:** The special-status plant communities observed in the Special-Status Plant Study Area are ranked as rare in California, or were determined to be rare during botanical surveys in the Special-Status Plant Study Area. Suitable habitats for these communities have been significantly diminished due to land use conversion in the Central Valley. Most of the communities observed in in the Special-Status Plant Study Area do not represent high-quality occurrences of these communities because they have been disturbed through nonnative species invasion and fragmentation. Therefore, although these communities are rare on a regional scale, they do not represent the highest conservation priority because they are generally small and disturbed (CDFG 2012b). Additionally, potential effects of the HST project on these communities would be minimized through the implementation of mitigation measures as described in Section 3.7.7, resulting in minimal regional effects. Therefore, effects of the HST project on special-status plant communities would not be significant under NEPA.

- **Jurisdictional waters:** The southern Central Valley once sustained four large, shallow, terminal lakes and rich riparian wetland habitats fed by waters of the Kings River, the Kaweah River (the source of Poso Creek), the Tule River, and the Kern River flowing from the Sierra Nevada (USDA 1982, 1986). However, more than 88% of wetlands in the southern Central Valley have been converted to agriculture or urban use (Kelly et al. 2005). Streams and rivers in the Wetland Study Area have been dredged, culverted, diverted, dewatered, channelized, or have had their active floodplains severely reduced by levee construction.

Additionally, vernal pool habitats have been greatly reduced due to agricultural and urban land conversion; and at the current rate of loss, these features are anticipated to be eliminated from the Central Valley by 2087 (Holland 2009b). Due to the significant land use conversion and development in the Central Valley, natural jurisdictional water features, including riparian, seasonal riverine, seasonal wetlands, and vernal pools, are extremely rare on a regional scale. Jurisdictional waters occur within and adjacent to the project footprint, and would be affected directly and indirectly by construction period activities and the project. However, though implementation of mitigation measures as described in Section 3.7.7, effects to jurisdictional waters would be avoided, where possible, or would be slight and would result in minimal regional effects. Therefore, effects of the HST project on jurisdictional waters would not be significant under NEPA.

- **Conservation areas:** Because the majority of the land in the Central Valley has been converted to agricultural uses (NRCS 2006) and the natural areas that remain are largely disturbed and fragmented, preservation of remaining natural lands is extremely important for the preservation of biological resources. Existing conservation lands, such as recovery plan areas, ecological reserves, and habitat conservation plan areas, support the preservation of remaining natural lands, and are therefore an important resource in the Central Valley. Potential effects of the HST project on these areas would be minimized through the implementation of mitigation measures as described in Section 3.7.7, resulting in minimal regional effects. Therefore, effects of the HST project on conservation areas would not be significant under NEPA.

- **Protected trees:** The regional and contextual importance of protected trees in the Special-Status Plant Study Area varies based on the species of tree and its location. Native tree species and trees found in riparian areas are ecologically valuable because natural habitats and riparian areas have been greatly reduced in the Central Valley, and these trees, therefore, represent a rare resource. However, the majority of protected trees present, besides those of unknown type, are landscape, ornamental, or nonnative trees, which are less ecologically significant because they do not provide natural habitat, or are less likely to provide native species preservation value. Through the implementation of mitigation measures, as described in Section 3.7.7, effects of construction period and project activities would be slight and would result in minimal regional effect. Therefore, effects of the HST project on protected trees would not be significant under NEPA.

- Wildlife movement corridors: In many places in California, fragmentation of the landscape has reduced much of the remaining habitat available to native wildlife species (Haas 2000). Studies have shown that habitat connectivity is important in biodiversity conservation, particularly because of the role it plays in maintaining gene flow (Beier and Noss 1998), maintaining ecological processes (Bennett 1999), and reducing species extinction risk (Crooks et al. 2011). Current impediments to habitat connectivity and wildlife movement in the region of the HST project include, but are not limited to, agricultural lands, urban development, SR 43, and the BNSF Railway right-of-way. Because of the importance of movement corridors for special-status species, their preservation in the Habitat Study Area is extremely important. Project design elements would reduce effects of the project on wildlife movement corridors, and the implementation of mitigation measures as described in Section 3.7.7 would further lessen project and construction effects. However, despite these steps taken to reduce the project effects, the HST Project would have substantial effects on a regional scale on wildlife movement, and would therefore have a significant effect under NEPA.

3.7.9 CEQA Significance Conclusions

Table 3.7-21 provides a summary of the CEQA impacts, the associated mitigation measures, and the level of significance after mitigation. The table presents only the impacts that are significant

under CEQA prior to mitigation. The determinations presented for each impact represent the impact of the entire Fresno to Bakersfield HST Section and not individual alignment alternatives. The following impacts are not included in Table 3.7-21 because these impacts would be less-than-significant under CEQA:

- Bio #2- Construction period impacts on special-status fish species (less-than-significant).
- Bio #3- Construction period impacts on Allensworth ER (no impact).
- Bio #3- Construction period impacts on habitat conservation plans (no impact).
- Bio #4- Construction period impacts on wildlife movement corridors (less-than-significant).
- Bio #6- Project impacts on special-status fish species (less-than-significant).
- Bio #3- Project impacts on habitat conservation plans (no impact).

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Common Mitigation Measures			
The following mitigation measures effectively mitigate impacts to multiple biological resources (e.g., special-status species and wildlife movement corridors). Common mitigation measures apply to many of the construction period and project impact categories listed below **Bio-MM#1.** Designate Project Biologist(s), Contractor's Biologist(s), and Project Biological Monitor(s). **Bio-MM#2.** Regulatory Agency Access. **Bio-MM#3.** Prepare and Implement a Worker Environmental Awareness Program. **Bio-MM#4.** Prepare and Implement a Weed Control Plan. **Bio-MM#5.** Prepare and Implement a Biological Resources Management Plan. **Bio-MM#6.** Prepare and Implement a Restoration and Revegetation Plan. **Bio-MM#7.** Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). **Bio-MM#8.** Wildlife-Exclusion Fencing. **Bio-MM#9.** Equipment Staging Areas. **Bio-MM#10.** Mono-Filament Netting. **Bio-MM#11.** Vehicle Traffic. **Bio-MM#12.** Entrapment Prevention. **Bio-MM#13.** Work Stoppage. **Bio-MM#14.** "Take" Notification and Reporting. **Bio-MM#15.** Post-Construction Compliance Reports.			
Construction			
Special-Status Plants			
Bio#1: Construction of the HST alternatives would directly or indirectly impact suitable habitat that has potential to support special-status plant species. *Refer to Appendix 3.7-B, Attachment 1.*	Significant	**Bio-MM#16.** Conduct Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities. **Bio-MM#17.** Prepare and Implement Plan for Salvage, Relocation, and/or Propagation of Special-Status Plant Species. **Bio-MM#53.** Compensate for Impacts on Special-Status Plant Species.	Less than Significant

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Special-Status Wildlife Species			
Bio#2: Construction of the HST alternatives would disturb suitable habitat that has potential to support special-status invertebrate species. *Refer to Appendix 3.7-B, Attachment 2.*	Significant	**Bio-MM#18.** Conduct Preconstruction Sampling and Assessment for Vernal Pool Fauna. **Bio-MM#19.** Seasonal Vernal Pool Work Restriction. **Bio-MM#20.** Implement and Monitor Vernal Pool Protection. **Bio-MM#21.** Implement Conservation Guidelines for the Valley Elderberry Longhorn Beetle. **Bio-MM#47.** Restore Temporary Riparian Impacts. **Bio-MM#48.** Restore Temporary Impacts on Jurisdictional Waters. **Bio-MM#49.** Monitor Construction Activities within Jurisdictional Waters. **Bio-MM#54.** Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp. **Bio-MM#55.** Implement Conservation Guidelines during project operation for Valley Elderberry Longhorn Beetle. **Bio-MM#61**. Compensate for Permanent Riparian Impacts. **Bio-MM#62.** Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Bio#2: Construction of the HST alternatives would disturb the suitable habitat that has potential to support special-status reptiles and amphibian species. *Refer to Appendix 3.7-B, Attachment 2.*	Significant	**Bio-MM#22.** Conduct Preconstruction Surveys for Special-Status Reptile and Amphibian Species. **Bio-MM#23.** Conduct Special-Status Reptile and Amphibian Monitoring, Avoidance, and Relocation. **Bio-MM#24**. Conduct Preconstruction Surveys for California Tiger Salamander. **Bio-MM#25**. Implement Avoidance and Minimization Measures for California Tiger Salamander. **Bio-MM#26.** Conduct Protocol-Level Surveys for Blunt-Nosed Leopard Lizard. **Bio-MM#27.** Conduct Preconstruction Surveys for Blunt-Nosed Leopard Lizard. **Bio-MM#28.** Blunt-Nosed Leopard Lizard Avoidance. **Bio-MM#48.** Restore Temporary Impacts on Jurisdictional Waters. **Bio-MM#49.** Monitor Construction Activities within Jurisdictional Waters. **Bio-MM#56.** Compensate for Impacts on California Tiger Salamander. **Bio-MM#57.** Compensate for Impacts on Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel. **Bio-MM#63.** Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant
Bio#2: Construction of the HST alternatives would disturb suitable habitat that has potential to support nesting special-status bird species (including raptors). *Refer to Appendix 3.7-B, Attachment 2.*	Significant	**Bio-MM#29.** Conduct Preconstruction Surveys and Delineate Active Nest Exclusion Areas for Other Breeding Birds. **Bio-MM#30.** Conduct Preconstruction Surveys and Monitoring for Raptors. **Bio-MM#31.** Raptor Protection on Power Lines. **Bio-MM#32.** Conduct Preconstruction Surveys for Swainson's Hawks. **Bio-MM#33.** Swainson's Hawk Nest Avoidance and Monitoring. **Bio-MM#34.** Monitor Removal of Nest Trees for Swainson's Hawks. **Bio-MM#35.** Conduct Protocol Surveys for Burrowing Owls. **Bio-MM#36.** Burrowing Owl Avoidance and Minimization. **Bio-MM#58.** Compensate for Loss of Swainson's Hawk Nesting Trees. **Bio-MM#59.** Compensate for Loss of Burrowing Owl Active Burrows and Habitat. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Bio#2: Construction of the HST alternatives would disturb suitable habitat that has the potential to support special-status mammal species. *Refer to Appendix 3.7-B, Attachment 2.*	Significant	**Bio-MM#37.** Conduct Preconstruction Surveys for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse. **Bio-MM#38.** Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse. **Bio-MM#39.** Implement Avoidance and Minimization Measures for Fresno Kangaroo Rat. **Bio-MM#40.** Conduct Preconstruction Surveys for Special-Status Bat Species. **Bio-MM#41.** Bat Avoidance and Relocation. **Bio-MM#42.** Bat Exclusion and Deterrence. **Bio-MM#43.** Conduct Preconstruction Surveys for American Badger and Ringtail. **Bio-MM#44.** American Badger and Ringtail Avoidance. **Bio-MM#45.** Conduct Preconstruction Surveys for San Joaquin Kit Fox. **Bio-MM#46.** Minimize Impacts on San Joaquin Kit Fox. **Bio-MM#51.** Install Wildlife Fencing. **Bio-MM#52.** Construction in Wildlife Movement Corridors. **Bio-MM#60.** Compensate for Destruction of Natal Dens. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
HABITATS OF CONCERN			
Special-Status Plant Communities			
Bio#3: Construction of the HST alternatives would disturb special-status plant communities, and riparian areas.	Significant	**Bio-MM#16.** Conduct Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities. **Bio-MM#47.** Restore Temporary Riparian Impacts. **Bio-MM#48.** Restore Temporary Impacts on Jurisdictional Waters. **Bio-MM#49.** Monitor Construction Activities within Jurisdictional Waters. **Bio-MM#53.** Compensate for Impacts on Special-Status Plant Species. **Bio-MM#61.** Compensate for Permanent Riparian Impacts. **Bio-MM#62.** Prepare and Implement a Habitat Mitigation and Monitoring Plan. **Bio-MM#63.** Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant
Jurisdictional Waters			
Bio#3: Construction of the HST alternatives would have direct and indirect impacts on jurisdictional waters.	Significant	**Bio-MM#47.** Restore Temporary Riparian Impacts. **Bio-MM#48.** Restore Temporary Impacts on Jurisdictional Waters. **Bio-MM#49.** Monitor Construction Activities within Jurisdictional Waters. **Bio-MM#61.** Compensate for Permanent Riparian Impacts. **Bio-MM#62.** Prepare and Implement a Habitat Mitigation and Monitoring Plan. **Bio-MM#63.** Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant
Conservation Areas			
Bio#3: Construction of the HST alternatives would disturb areas located in USFWS recovery plans.	Significant	**Construction and Project Mitigation Measures Bio-MM#16 through Bio-MM#64.**	Less than Significant
Protected Trees			
Bio#3: Construction of the HST alternatives would disturb protected trees.	Significant	**Bio-MM#50.** Mitigation and Monitoring of Protected Trees. **Bio-MM#64.** Compensate for Impacts to Protected Trees. **Bio-MM#65** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Project			
Special-Status Plant Species			
Bio#5: Project impacts from the HST alternatives would permanently impact special-status plant species or suitable habitat that has potential to support these species. *Refer to Appendix 3.7-B, Attachment 1.*	Significant	**Bio-MM#16.** Conduct Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities. **Bio-MM#17.** Prepare and Implement Plan for Salvage, Relocation, and/or Propagation of Special-Status Plant Species. **Bio-MM#53.** Compensate for Impacts on Special-Status Plant Species.	Less than Significant
Special-Status Wildlife Species			
Bio#6: Project impacts from the HST alternatives would permanently impact suitable habitat that has the potential to support special-status invertebrate species. *Refer to Appendix 3.7-B, Attachment 2.*	Significant	**Bio-MM#18.** Conduct Preconstruction Sampling and Assessment for Vernal Pool Fauna. **Bio-MM#19.** Seasonal Vernal Pool Work Restriction. **Bio-MM#20.** Implement and Monitor Vernal Pool Protection. **Bio-MM#21.** Implement Conservation Guidelines for the Valley Elderberry Longhorn Beetle. **Bio-MM#47.** Restore Temporary Riparian Impacts. **Bio-MM#48.** Restore Temporary Impacts on Jurisdictional Waters. **Bio-MM#49.** Monitor Construction Activities within Jurisdictional Waters. **Bio-MM#54.** Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp. **Bio-MM#55.** Implement Conservation Guidelines during project operation for Valley Elderberry Longhorn Beetle. **Bio-MM#61**. Compensate for Permanent Riparian Impacts. **Bio-MM#63.** Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Bio#6: Project impacts from the HST alternatives would permanently impact suitable habitat that has the potential to support special-status reptiles and amphibian species. *Refer to Appendix 3.7-B, Attachment 2.*	Significant	**Bio-MM#22.** Conduct Preconstruction Surveys for Special-Status Reptile and Amphibian Species. **Bio-MM#23.** Conduct Special-Status Reptile and Amphibian Monitoring, Avoidance, and Relocation. **Bio-MM#24**. Conduct Preconstruction Surveys for California Tiger Salamander. **Bio-MM#25**. Implement Avoidance and Minimization Measures for California Tiger Salamander. **Bio-MM#26.** Conduct Protocol-Level Surveys for Blunt-Nosed Leopard Lizard. **Bio-MM#27.** Conduct Preconstruction Surveys for Blunt-Nosed Leopard Lizard. **Bio-MM#28.** Blunt-Nosed Leopard Lizard Avoidance. **Bio-MM#48.** Restore Temporary Impacts on Jurisdictional Waters. **Bio-MM#49.** Monitor Construction Activities within Jurisdictional Waters. **Bio-MM#56.** Compensate for Impacts on California Tiger Salamander. **Bio-MM#57.** Compensate for Impacts on Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel. **Bio-MM#63.** Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant
Bio#6: Project impacts from the HST alternatives would permanently impact suitable habitat that has the potential to support special-status bird species (including raptors). *Refer to Appendix 3.7-B, Attachment 2.*	Significant	**Bio-MM#29.** Conduct Preconstruction Surveys and Delineate Active Nest Exclusion Areas for Other Breeding Birds. **Bio-MM#30.** Conduct Preconstruction Surveys and Monitoring for Raptors. **Bio-MM#31.** Raptor Protection on Power Lines. **Bio-MM#32.** Conduct Preconstruction Surveys for Swainson's Hawks. **Bio-MM#33.** Swainson's Hawk Nest Avoidance and Monitoring. **Bio-MM#34.** Monitor Removal of Nest Trees for Swainson's Hawks. **Bio-MM#35.** Conduct Protocol Surveys for Burrowing Owls. **Bio-MM#36.** Burrowing Owl Avoidance and Minimization. **Bio-MM#58.** Compensate for Loss of Swainson's Hawk Nesting Trees. **Bio-MM#59.** Compensate for Loss of Burrowing Owl Active Burrows and Habitat. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Bio#6: Project impacts from the HST alternatives would permanently impact suitable habitat that has the potential to support special-status mammal species. *Refer to Appendix 3.7-B, Attachment 2.*	Significant	**Bio-MM#37.** Conduct Preconstruction Surveys for Nelson's Antelope Squirrel Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse. **Bio-MM#38.** Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse. **Bio-MM#39.** Implement Avoidance and Minimization Measures for Fresno Kangaroo Rat. **Bio-MM#40.** Conduct Preconstruction Surveys for Special-Status Bat Species. **Bio-MM#41.** Bat Avoidance and Relocation. **Bio-MM#42.** Bat Exclusion and Deterrence. **Bio-MM#43.** Conduct Preconstruction Surveys for American Badger and Ringtail. **Bio-MM#44.** American Badger and Ringtail Avoidance. **Bio-MM#45.** Conduct Preconstruction Surveys for San Joaquin Kit Fox. **Bio-MM#46.** Minimize Impacts on San Joaquin Kit Fox. **Bio-MM#51.** Install Wildlife Fencing. **Bio-MM#52.** Construction in Wildlife Movement Corridors. **Bio-MM#60.** Compensate for Destruction of Natal Dens. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant
Habitats of Concern			
Special-Status Plant Communities			
Bio#7: Project impacts from the HST alternatives would permanently impact special-status plant communities, and riparian areas. *Refer to Appendix 3.7-B, Attachment 3.*	Significant	**Bio-MM#16.** Conduct Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities. **Bio-MM#47.** Restore Temporary Riparian Impacts. **Bio-MM#48.** Restore Temporary Impacts on Jurisdictional Waters. **Bio-MM#49.** Monitor Construction Activities within Jurisdictional Waters. **Bio-MM#51.** Compensate for Impacts on Special-Status Plant Species. **Bio-MM#61.** Compensate for Permanent Riparian Impacts. **Bio-MM#62.** Prepare and Implement a Habitat Mitigation and Monitoring Plan. **Bio-MM#63.** Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Jurisdictional Waters			
Bio#7: Project impacts from the HST alternatives would permanently affect jurisdictional waters. *Refer to Appendix 3.7-B, Attachment 4.*	Significant	**Bio-MM#47.** Restore Temporary Riparian Impacts. **Bio-MM#48.** Restore Temporary Impacts on Jurisdictional Waters. **Bio-MM#49.** Monitor Construction Activities within Jurisdictional Waters. **Bio-MM#61.** Compensate for Permanent Riparian Impacts. **Bio-MM#62.** Prepare and Implement a Habitat Mitigation and Monitoring Plan. **Bio-MM#63.** Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant
Conservation Areas			
Bio#7: Project impacts from the BNSF Alternative would disturb portions of recovery plans. *Refer to Appendix 3.7-B, Attachment 5.*	Significant	**Construction and Project Mitigation Measures Bio-MM#16 through Bio-MM#65.**	Less than Significant
Bio#7: Project impacts from the HST alternatives would disturb portions of the Allensworth Ecological Reserve. *Refer to Appendix 3.7-B, Attachment 5*.	Significant (When Allensworth Bypass Alternative is used there is no impact under CEQA)	**PC-MM#1.** Compensation for Staging in Park Property for Construction. **PP-MM#1.** Acquisition of Park Property.	Less than Significant
Protected Trees			
Bio#7: Project impacts from the HST alternatives would permanently affect protected trees. *Refer to Appendix 3.7-B, Attachment 6.*	Significant	**Bio-MM#50.** Mitigation and Monitoring of Protected Trees. **Bio-MM#64.** Compensate for Impacts to Protected Trees. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Wildlife Movement Corridors			
Bio#8: Project impacts from the HST alternatives would permanently reduce the functionality of wildlife movement corridors and habitat linkages. *Refer to Appendix 3.7-B, Attachment 5.*	Significant	**Bio-MM#51.** Install Wildlife Fencing. **Bio-MM#52.** Construction in Wildlife Movement Corridors.	Significant
HMF Alternatives			
The HMF alternatives would result in project impacts on:			
Bio #2 and #6: special-status wildlife species	Significant (all HMF alternatives)	**Construction and Project Mitigation Measures Bio-MM#18 through Bio-MM#49, and Bio-MM#51 through Bio-MM#61, and Bio-MM#63.** **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant
Bio #3 and #7: jurisdictional waters	Significant (Fresno Works-Fresno, Kings County-Hanford, KCOG-Wasco, KCOG-Shafter East)	**Bio-MM#47.** Restore Temporary Riparian Impacts. **Bio-MM#48.** Restore Temporary Impacts on Jurisdictional Waters. **Bio-MM#49.** Monitor Construction Activities within Jurisdictional Waters. **Bio-MM#61.** Compensate for Permanent Riparian Impacts. **Bio-MM#62.** Prepare and Implement a Habitat Mitigation and Monitoring Plan. **Bio-MM#63.** Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant (Fresno Works-Fresno, Kings County-Hanford, KCOG-Wasco, KCOG-Shafter East)
Bio #3 and #7: recovery plans	Significant (KCOG-Wasco HMF)	**Construction and Project Mitigation Measures Bio-MM#16 through Bio-MM#65.**	Less than Significant (KCOG–Wasco)

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Bio #3 and #7: protected trees	Significant (Fresno Works-Fresno)	**Bio-MM#50.** Mitigation and Monitoring of Protected Trees. **Bio-MM#64.** Compensate for Impacts to Protected Trees. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant (Fresno Works-Fresno)
Station Alternatives			
The station alternatives would result in project impacts on:			
Bio # 2 and #6: special-status wildlife species	Significant (Kings/Tulare- West)	**Construction and Project Mitigation Measures Bio-MM#18 through Bio-MM#49, and Bio-MM#54 through Bio-MM#63.** **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant (Kings/Tulare-West)
Bio #3 and #7: recovery plans	Significant (Bakersfield stations [North, South and Hybrid])	**Construction and Project Mitigation Measures Bio-MM#16 through Bio-MM#65.**	Less than Significant (Bakersfield stations [North, South and **Hybrid])**

Table 3.7-21
Summary of CEQA Impacts, Mitigation Measures, and Level of Significance after Mitigation

Impact	Level of Significance before Mitigation[a]	Mitigation Measure	Level of Significance after Mitigation
Bio #3 and #7: protected trees	Significant (Fresno stations [Mariposa and Kern] and Bakersfield stations [North, South and Hybrid)	**Bio-MM#50.** Mitigation and Monitoring of Protected Trees. **Bio-MM#64.** Compensate for Impacts to Protected Trees. **Bio-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.	Less than Significant (Fresno stations [Mariposa and Kern] and Bakersfield stations [North, South and Hybrid)

Notes:
[a] Determinations presented for each impact represent the impact of the entire Fresno to Bakersfield Section and not individual alignment alternatives
HMF=Heavy Maintenance Facilities
Fresno= Fresno Works-Fresno HMF
Kings=Kings County-Hanford HMF
KCOG-Wasco= Kern Council of Governments-Wasco HMF
KCOG-Shafter-West= Kern Council of Governments-Shafter-West HMF
KCOG-Shafter-East=Kern Council of Governments-Shafter-East HMF

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