3.4 Biological Resources

3.4.1 Introduction

This section describes the regulatory and environmental setting for biological resources, including wetlands, in the vicinity of the Proposed Project and the Atwater Station Alternative. It also describes the impacts on biological resources, including wetlands, that would result from implementation of the Proposed Project and the Atwater Station Alternative, and the mitigation measures that would reduce significant impacts, where feasible and appropriate. Appendix K *Supporting Biological Resources Information*, contains additional technical information for this section.

Cumulative impacts on biological resources, including wetlands, in combination with planned, approved, and reasonably foreseeable projects, are discussed in Chapter 4, *Other CEQA-Required Analysis*.

3.4.2 Regulatory Setting

This section summarizes federal, state, regional, and local regulations related to biological resources, including wetlands, that are applicable to the Proposed Project and the Atwater Station Alternative.

3.4.2.1 Federal

Federal Endangered Species Act

The federal Endangered Species Act (ESA) of 1973 requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) when a federal action may result in take of a species listed as threatened or endangered under the ESA. *Take*, as defined by ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." *Harm* is defined as "any act that kills or injures the species, including significant habitat modification." Under federal regulations, take is further defined to include habitat modification or degradation that results, or is reasonably expected to result, in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Pursuant to the requirements of ESA, when reviewing a proposed action within its jurisdiction, an agency must determine whether any federally listed species may be present on a project site and determine if the proposed action will result in a take of such species. Under ESA, habitat loss is considered an impact on a species. In addition, the agency is required to determine whether the proposed action is likely to jeopardize the continued existence of any species that is proposed for listing under ESA or result in the destruction or negative modification of critical habitat that has been proposed or designated for such species (16 United States Code [U.S.C.] 1536(3), (4)).

Endangered Species Act Section 7 (Consultation Process)

USFWS and NMFS maintain areas of critical habitat for federally regulated species to safeguard the continued existence of such species by restricting the type and extent of activities proposed under Section 7 of ESA. Section 7 of ESA requires federal agencies to consult with USFWS and/or NMFS for actions that may take a listed species or its habitat. Federal agency actions include activities that are on federal land, conducted by a federal agency, funded by a federal agency, or authorized by a federal agency (including issuance of federal permits and licenses).

Under Section 7, the federal agency conducting, funding, or permitting an action (the federal lead agency) must consult with USFWS and/or NMFS, as appropriate, to ensure that the proposed action will not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. If a proposed action "may affect" a listed species or designated critical habitat, the lead agency is required to prepare a biological assessment (BA), evaluating the nature and severity of the expected effect. In response, USFWS and/or NMFS issues a biological opinion (BO), with a determination that the proposed action would have one of the following results.

- Jeopardize the continued existence of one or more listed species (jeopardy finding) or result in the destruction or adverse modification of critical habitat (adverse modification finding).
- Not jeopardize the continued existence of any listed species (no jeopardy finding) or result in adverse modification of critical habitat (no adverse modification finding).

The BO issued by USFWS and/or NMFS may stipulate discretionary "reasonable and prudent" conservation measures. If the proposed action would not jeopardize a listed species, USFWS and/or NMFS will issue an incidental take statement to authorize the proposed activity.

For the Proposed Project and the Atwater Station Alternative, Section 7 consultation may be initiated by the Federal Railroad Administration (FRA) depending on the level of FRA involvement in the Proposed Project and the Atwater Station Alternative, relative to project approval or funding. If the FRA is not involved in the project overall or in certain project actions or funding, then the U.S. Army Corps of Engineers (USACE) would be the lead federal agency and would complete the consultation under Section 7 related to permits for project activities that affect wetland or waters within its jurisdiction. To the extent that Section 7 consultation does not address certain project activities, San Joaquin Regional Rail Commission (SJRRC) may need to obtain take coverage under Section 10 of ESA instead.

Endangered Species Act Section 9 (Prohibitions)

Section 9 of the ESA prohibits the take of any fish or wildlife species listed under ESA as endangered. Take of threatened species is also prohibited under Section 9, unless otherwise authorized by federal regulations. In addition to the take definition described above, Section 9 prohibits removing, digging up, cutting, or maliciously damaging or destroying federally listed plants on sites under federal jurisdiction. Section 9 does not prohibit take of federally listed plants on sites that are not under federal jurisdiction.

Endangered Species Act Section 10 (Habitat Conservation Plans)

In cases where a nonfederal entity is undertaking an action that does not require federal authorization, the take of listed species must be permitted by USFWS and/or NMFS through the Section 10 process. If a proposed project would result in the incidental take of a listed species, the project proponent must first obtain a Section 10(a)(1)(B) incidental take permit (ITP). *Incidental*

take is defined under Section 10 as the take of federally listed fish and wildlife species that are "incidental to, but not the purposes of, otherwise lawful activities."

To receive an ITP, the nonfederal entity is required to prepare a habitat conservation plan (HCP). The HCP must include conservation measures to avoid, minimize, and mitigate the project's impact on listed species and their habitat. If FRA or USACE is not the lead federal agency, SJRRC would utilize the Section 10 consultation process for this the Proposed Project and the Atwater Station Alternative. SJRRC would work with USFWS or NMFS, as necessary, to meet the Section 10 process requirements.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) establishes a management system for national marine and estuarine fishery resources. This legislation requires that all federal agencies consult with NMFS regarding all actions or proposed actions whether permitted, funded, or undertaken, that may adversely affect *essential fish habitat* (EFH), defined as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The phrase *adversely affect* refers to any impact that reduces the quality or quantity of EFH.

The Magnuson-Stevens Act states that migratory routes to and from anadromous fish spawning grounds are considered EFH. Federal activities that occur outside of EFH but that may have an impact on EFH must also be considered in the consultation process.

Clean Water Act: Sections 404 and 401

Waters of the United States are protected under Section 404 of the Clean Water Act (CWA). Waters of the United States may include both wetlands and non-wetland waters. Any activity that involves a discharge of dredged or fill material into waters of the United States, including wetlands, is subject to regulation by USACE. *Waters of the United States* are defined to include navigable waters of the United States; interstate waters; all other waters that, through their use, degradation, or destruction, could affect interstate or foreign commerce; direct tributaries of any of these waters; and wetlands that meet any of these criteria or are adjacent to any of these waters. Wetlands are defined under Section 404 as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and, under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Jurisdictional wetlands must meet three wetland delineation criteria.

- They support hydrophytic vegetation (i.e., plants that grow in saturated soil).
- They have hydric soil types (i.e., soils that are wet or moist enough to develop anaerobic conditions).
- They have wetland hydrology (i.e., flooding, inundation, or saturation conditions that support wetland communities).

The extent of USACE jurisdiction in inland situations extends to the ordinary high water mark (OHWM)—the line on the shore established by fluctuations of water and indicated by a clear, natural line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, and/or the presence of litter and debris.

Activities requiring a Section 404 permit must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate, pursuant to CWA Section 401. Either the State Water Resources Control Board (State Water Board) or the Central Valley Regional Water Quality Control Board would have to issue such certification prior to the alteration of or discharge to waters of the United States and the state (i.e., work involving bridge crossings of jurisdictional waters). Waters of the state are defined in Section 3.4.2.2, *State*.

Clean Water Act Section 402

CWA Section 402 regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System program, administered by the United States Environmental Protection Agency. CWA Section 402 is discussed in detail in Section 3.10, *Hydrology and Water Quality*, of this environmental impact report (EIR).

Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act (33 U.S.C. 401 et seq.) is administered by USACE. This section requires permits for all structures in navigable waters of the United States, such as riprap, and for activities such as dredging. Navigable waters are defined as those subject to the ebb and flow of the tide and susceptible to use in their natural condition or by reasonable improvements as means to transport interstate or foreign commerce. USACE grants or denies permits based on the effects on navigation. Most activities covered under this act are also covered under CWA Section 404.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 U.S.C. 661–667(e)) applies to any project with a federal component 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.

General Bridge Act of 1946

Any individual, partnership, corporation, or local, state, or federal legislative body, agency, or authority planning to construct or modify a bridge or causeway across a navigable waterway of the United States must apply for a U.S. Coast Guard bridge permit. This includes all temporary bridges used for construction access or traffic detour.

Executive Order 11990: Protection of Wetlands

Executive Order 11990 (May 24, 1997) directs federal agencies to refrain from assisting in or giving financial support to projects that encroach on publicly or privately owned wetlands. It further requires that federal agencies support a policy to minimize the destruction, loss, or degradation of wetlands. A project that encroaches on wetlands may not be undertaken unless the agency has determined that (1) there are no practicable alternatives to construction, (2) the project includes all practicable measures to minimize harm to wetlands affected, and (3) the impact will be minor.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703) enacts the provisions of treaties between the United States, Great Britain, Mexico, Japan, and the Soviet Union (now Russia) and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes seasons and bag limits for hunted species and protects migratory birds, their occupied nests, and their eggs (16 U.S.C. 703, 50 Code of Federal Regulations [C.F.R.] 21, 50 C.F.R. 10). Most actions that result in taking or in permanent or temporary possession of a protected species constitute violations of the MBTA. Examples of permitted actions that do not violate the MBTA are the possession of a hunting license to pursue specific gamebirds, legitimate research activities, display in zoological gardens, banding, and other similar activities. USFWS is responsible for overseeing compliance with the MBTA, and the U.S. Department of Agriculture's Animal Damage Control Officer makes recommendations on related animal protection issues.

On December 22, 2017, the Department of Interior's (DOI) Solicitor issued Opinion M-37050, which formally revises the DOI's interpretation of the MBTA's prohibition on the take of migratory bird species. Opinion M-37050 concludes that "consistent with the text, history, and purpose of the MBTA, the statute's prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their killing of migratory birds, their nests, or their eggs."

On April 11, 2018, USFWS issued guidance on Opinion M-37050, which states that the MBTA's prohibitions on take apply when the purpose of an action is to take migratory birds, their eggs, or their nests. This guidance also states that ESA and some state laws and regulations are not affected by Opinion M-37050.

According to the USFWS guidance, take of a migratory bird, its nest, or eggs that is incidental to another lawful activity does not violate the MBTA, and the MBTA's criminal provisions do not apply to those activities.

Although the proposed action has the potential to affect migratory birds protected by the MBTA, the incidental take of migratory birds during the construction of the Proposed Project and the Atwater Station Alternative would not be enforced by USFWS per this guidance; however, the Proposed Project and the Atwater Station Alternative would still need to comply with state regulations on migratory birds.

Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds

Executive Order 13186 (January 10, 2001) directs each federal agency, when conducting actions that will have or be likely to have a negative impact on migratory bird populations, to work with USFWS to develop a memorandum of understanding (MOU) and promote the conservation of migratory bird populations. Protocols developed under the MOU must include the following agency responsibilities.

- Avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.
- Restore and enhance habitat of migratory birds, as practicable.
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The Executive Order is designed to assist federal agencies in their efforts to comply with MBTA. The order does not constitute any legal authorization to take migratory birds.

Executive Order 13112: Invasive Species Prevention

Executive Order 11312 (February 3, 1999) directs all federal agencies to prevent and control the introduction and spread of invasive nonnative species in a cost-effective and environmentally sound manner to minimize their effects on economic, ecological, and human health.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 50 C.F.R. 22) prohibits anyone from taking, possessing, or transporting bald eagle or golden eagle, or the parts, nests, or eggs of such birds without prior authorization. *Take* is defined to include pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, and disturb. *Disturb* is further defined in 50 C.F.R. Section 22.3 as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." The BGEPA regulations authorize issuance of incidental take permits of bald and golden eagles under the following conditions: (1) the take is compatible with the preservation of the bald eagle and golden eagle, (2) it is necessary to protect an interest in a particular locality, (3) it is associated with but not the purpose of an otherwise lawful activity, and (4) it cannot be practicably avoided (50 C.F.R. 22.26).

3.4.2.2 State

California Environmental Quality Act

The California Environmental Quality Act (CEQA) of 1970 requires state and local agencies to identify significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as "a project." A project is any activity undertaken by a public agency or a private activity which must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval) from a government agency which may cause either a direct physical change in the environmental or a reasonably foreseeable indirect change in the environment.

California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (Fish & G. Code 1900–1913) prohibits take, possession, transportation, exportation, importation, or sale of rare and threatened plants, except as a result of agricultural practices, fire control measures, timber operations, mining, or actions of public agencies or private utilities. Private landowners are also exempt from the prohibition against removing rare and endangered plants, although they must provide 10-day notice to the California Department of Fish and Wildlife (CDFW) before removing the plants. This act has mostly been superseded by the California Endangered Species Act (CESA).

California Fish and Game Code

California Endangered Species Act

CESA (California Fish and Game Code [Fish & G. Code] 2050–2116) states that all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, plants, and their habitats that are threatened with extinction, as well as those experiencing a significant decline that, if not halted, would lead to a threatened or endangered designation, will be protected or preserved.

Lake and Streambed Alteration

Section 1600 et seq. requires notifying CDFW prior to any project activity undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel.

Incidental Take Permit

Under Section 2081, an ITP from CDFW is required for projects that could result in take of a species that is state listed as threatened or endangered or identified as candidates for threatened or endangered under CESA. *Take* is defined as an activity that would directly or indirectly kill an individual of a species. The definition does not include harm or harass, as does the definition of take under the ESA. In addition, habitat destruction is not included in the definition of take. Consequently, the threshold for take under CESA is higher than that under ESA. For example, habitat modification is not necessarily considered take under CESA. CDFW administers CESA and authorizes take through Section 2081 agreements (ITPs), except for species designated as fully protected. Section 2081 also requires measures to avoid and minimize take of CESA-regulated species, and to fully mitigate the impact of take.

Bird Nesting Protections

Sections 3503 and 3503.3 state that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code or any regulation made pursuant thereto.

Fully Protected Species

Sections 3511, 4700, 5050, 5515 list 37 fully protected species and prohibit take or possession at any time of the species listed, except for collecting these species for scientific research and relocation of bird species for the protection of livestock.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1969 (California Water Code [Wat. Code] 13000 et seq.) governs water quality in California. This act delegates responsibility to the State Water Board for water rights and water quality protection and directs the nine statewide Regional Water Quality Control Boards (Regional Water Boards) to develop and enforce water quality standards within their jurisdictions. The Porter-Cologne Act requires any entity discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state to file a report of waste discharge with the appropriate Regional Water Board. *Waters of the state* are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Wat. Code 13050[e]) including both natural and certain artificial or constructed facilities. Waters of the state includes both waters of the United Sates and non-federal waters of the state (State Water Resources Control Boards 2019). The appropriate Regional Water Board then must

issue a permit, referred to as a waste discharge requirement (WDR). WDRs implement water quality control plans and take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, and the need to prevent nuisances (Wat. Code 13263).

3.4.2.3 Regional and Local Plans

SJRRC, a state joint powers agency, proposes improvements inside and outside of the Union Pacific Railroad (UPRR) right-of-way (ROW). The Interstate Commerce Commission Termination Act (ICCTA) affords railroads engaged in interstate commerce considerable flexibility in making necessary improvements and modifications to rail infrastructure, subject to the requirements of the Surface Transportation Board.[1] ICCTA broadly preempts state and local regulation of railroads and this preemption extends to the construction and operation of rail lines. As such, activities within the UPRR ROW are clearly exempt from local building and zoning codes and other land use ordinances. However, facilities located outside of the UPRR ROW, including proposed stations, the proposed Merced Layover & Maintenance Facility, and the Atwater Station Alternative would be subject to regional and local plans and regulations. Though ICCTA does broadly preempt state and local regulation of railroads, SJRRC intends to obtain local agency permits for construction of facilities that fall outside of the UPRR ROW even though SJRRC has not determined that such permits are legally necessary and such permits may not be required.

Appendix G of this EIR, *Regional Plans and Local General Plans*, provides a list of applicable goals, policies, and objectives from regional and local plans of the jurisdictions in which the Proposed Project and the Atwater Station Alternative would be located. Section 15125(d) of the CEQA Guidelines requires an EIR to discuss "any inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans." These plans were considered during the preparation of this analysis and were reviewed to assess whether the Proposed Project and the Atwater Station Alternative would be consistent with the plans of relevant jurisdictions;[2] this investigation found that the Proposed Project and the Atwater Station Alternative would generally be consistent with the applicable goals, policies, and objectives related to biological resources, including wetlands, identified in Appendix G.

3.4.3 Environmental Setting

This section discusses the environmental setting related to biological resources, including wetlands, for improvements associated with the Proposed Project and the Atwater Station Alternative. For the purposes of this analysis, the study area for biological resources is specific to the resource analyzed (i.e., special-status species, wetlands, and other waters of the United States). The area for direct impacts is the environmental footprint of the Proposed Project and the Atwater Station Alternative. The area for indirect impacts is the environmental footprint of Proposed Project and the Atwater Station Alternative plus a resource-specific buffer.

[1] ACE operates within a ROW and on tracks owned by the UPRR, which operates interstate freight rail service in the same ROW and on the same tracks.

[2] An inconsistency with regional or local plans is not necessarily considered a significant impact under CEQA, unless it is related to a physical impact on the environment that is significant in its own right.

The study area for each biological resource consists of the direct impact and indirect impact areas are defined as follows.

- The study area for special-status plant species is a 100-foot lateral buffer[3] from the environmental footprint of the Proposed Project and the Atwater Station Alternative.
- The study area for wetlands resources is a 250-foot lateral buffer[4] from the environmental footprint of the Proposed Project and the Atwater Station Alternative. The study area may extend beyond the identified buffer to include the entire vernal pool (seasonal wetland) if a portion is directly affected.
- The study area for special-status wildlife species is a 1,000-foot lateral buffer[5] from the environmental footprint of the Proposed Project and the Atwater Station Alternative. Land cover was analyzed within a 250-foot buffer from the environmental footprint of the Proposed Project and the Atwater Station Alternative. Wildlife species' occurrences and ranges were examined within a 750-foot buffer laterally extending from the environmental footprint of the Proposed Project and the Atwater Station Alternative.

Figures 3.4-1 through 3.4-12 depict the study area for biological resources in the vicinity of the Proposed Project and the Atwater Station Alternative.

Information presented in this section regarding existing biological resources was obtained from the following sources and activities.

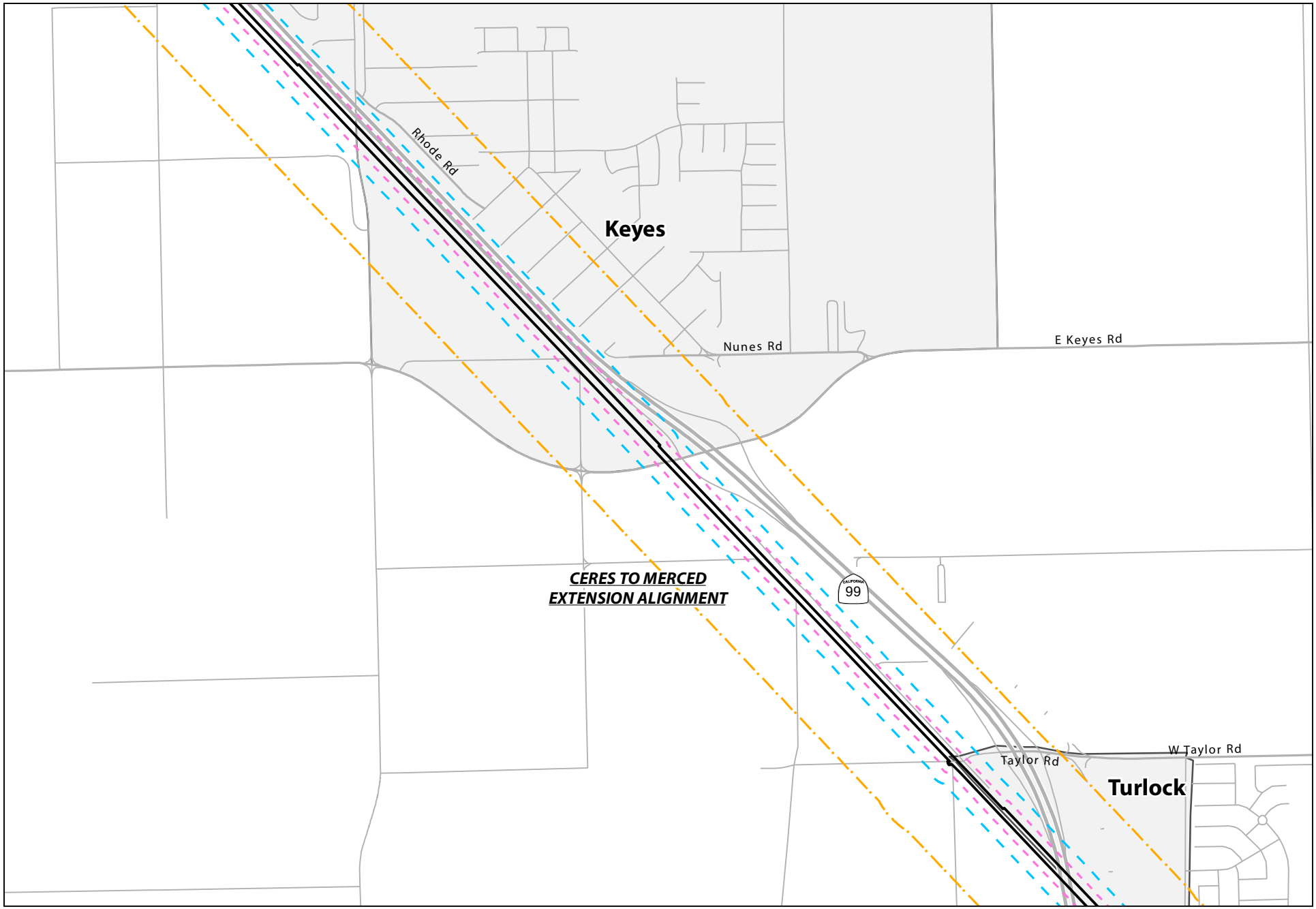
- Plants, wildlife, and fish:
  - Background research from the California Natural Diversity Database (CNDDB) and Information for Planning and Consultation (IPaC).
  - Biological reconnaissance-level surveys of land cover types and general habitat characteristics.
  - Reconnaissance-level floristic surveys for special-status plant species.
  - Biological reconnaissance-level surveys for special-status wildlife species and their habitats, sensitive habitats of concern, and wildlife corridors.
- Waters and wetlands:
  - Determination based on standards and procedures presented in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and as clarified in the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region* (U.S. Army Corps of Engineers 2008).
  - Field analysis of accessible potential waters and wetlands within the Proposed Project and Atwater Station Alternative footprints.
  - Draft map showing all potential jurisdictional areas (e.g., streams, creeks, ditches, wetlands) including all state and federal jurisdictional waters and wetlands.

[3] The 100-foot lateral buffer for plants follows resource agency survey protocol.

[4] The 250-foot lateral buffer for wetlands and vernal pools is standard for assessing impacts to hydrology.

[5] The 1,000-foot lateral buffer for wildlife generally allows for assessing impacts to habitat needs, including foraging, breeding, and nesting.

Figure 3.4-1
Biological Resource Study Area
ACE Ceres-Merced Extension



ACE
ALTAMONT CORRIDOR EXPRESS

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- Direct Impacts Study Area
- Special-Status Plant Study Area (100-ft Buffer)
- Wetland Resource Study Area (250-ft Buffer)
- Special-Status Wildlife Study Area (1000-ft Buffer)

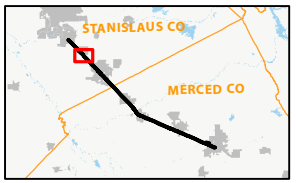
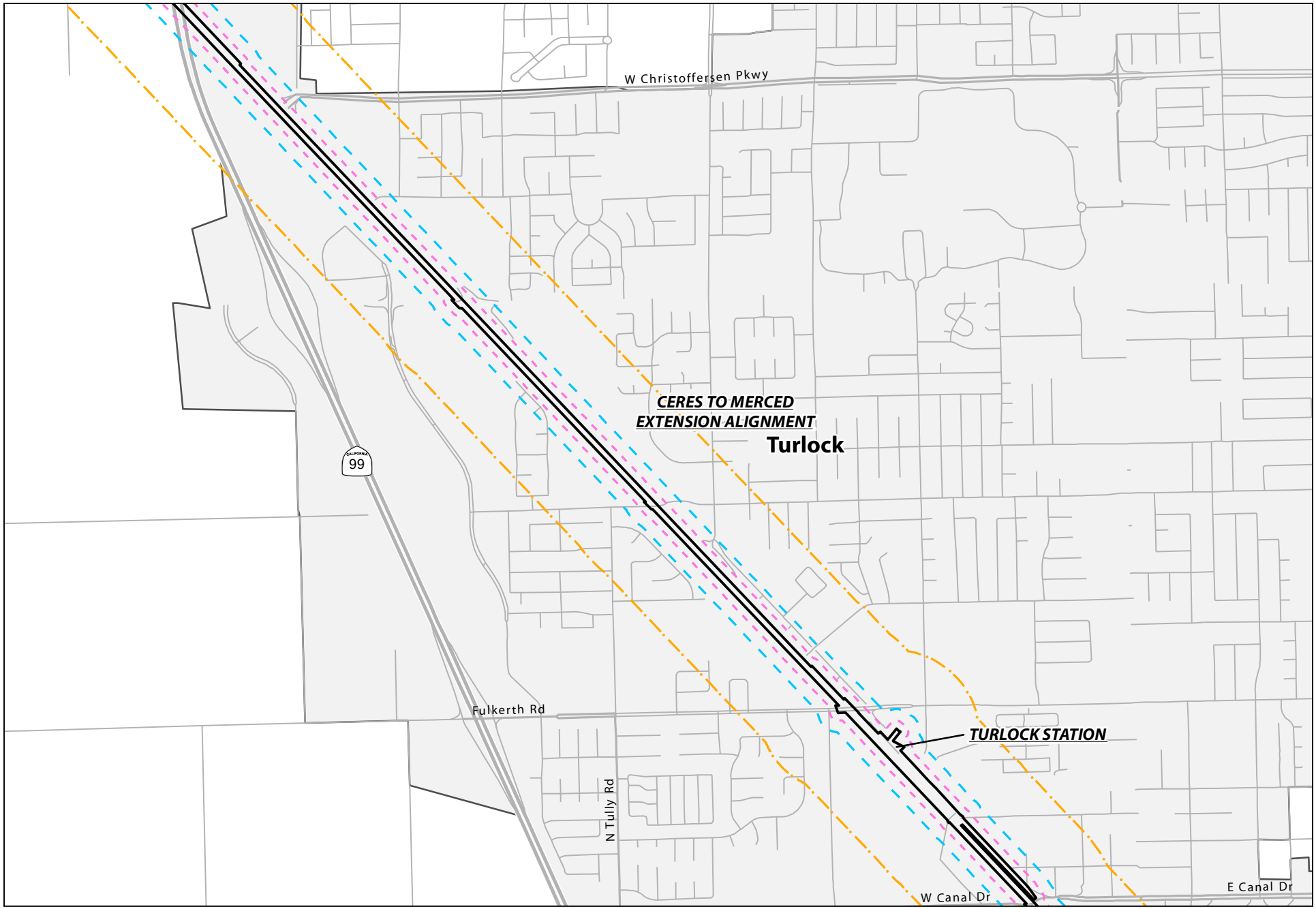


Figure 3.4-2
Biological Resource Study Area
ACE Ceres-Merced Extension



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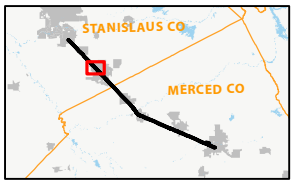

Figure 3.4-3
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ACE Ceres-Merced Extension

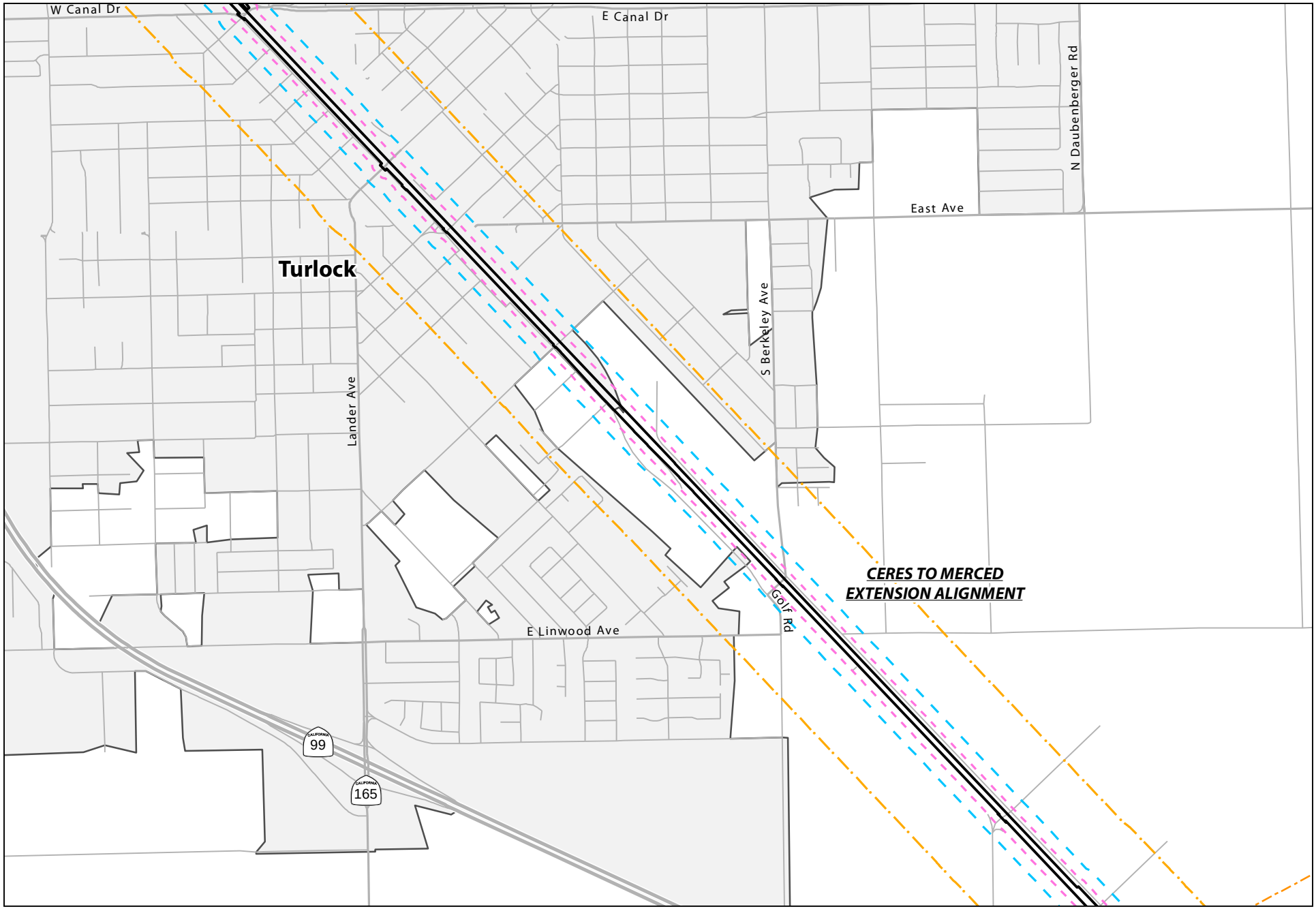
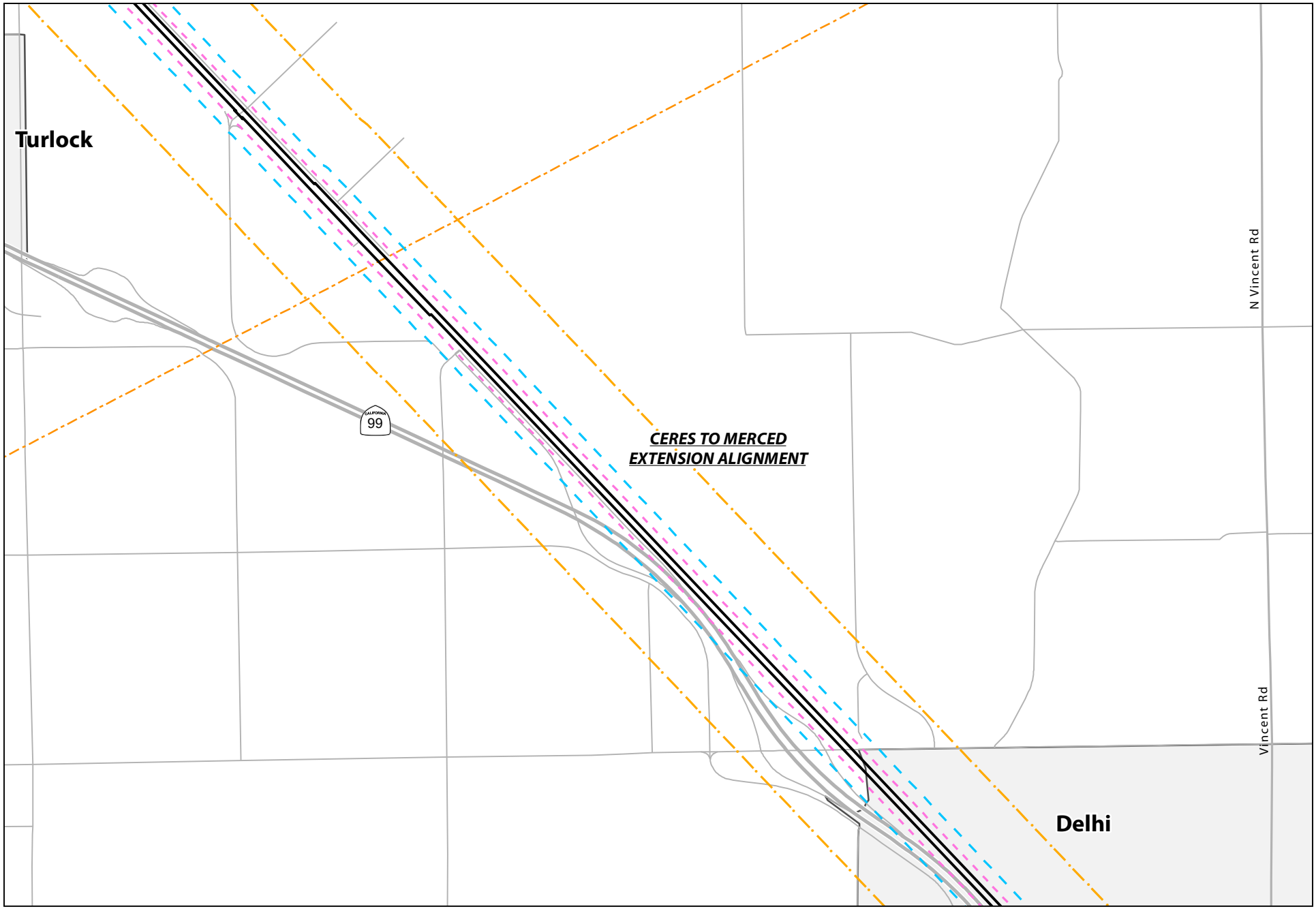


Figure 3.4-4
Biological Resource Study Area
ACE Ceres-Merced Extension



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- Direct Impacts Study Area
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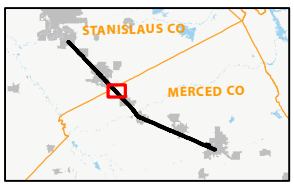
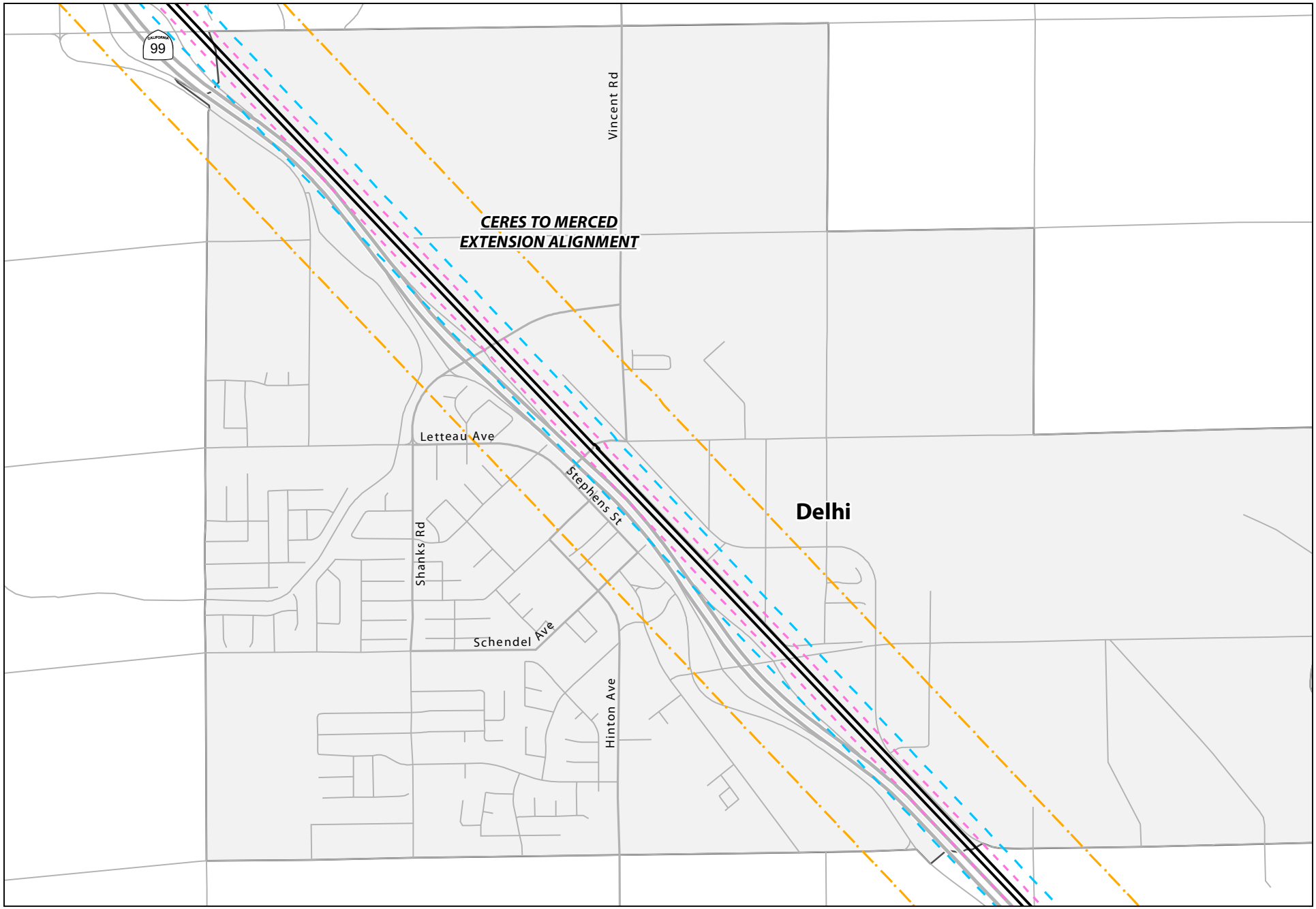


Figure 3.4-5
Biological Resource Study Area
ACE Ceres-Merced Extension



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- Direct Impacts Study Area
- Special-Status Plant Study Area (100-ft Buffer)
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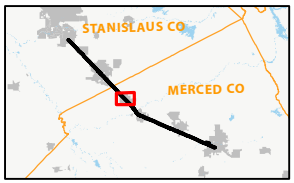
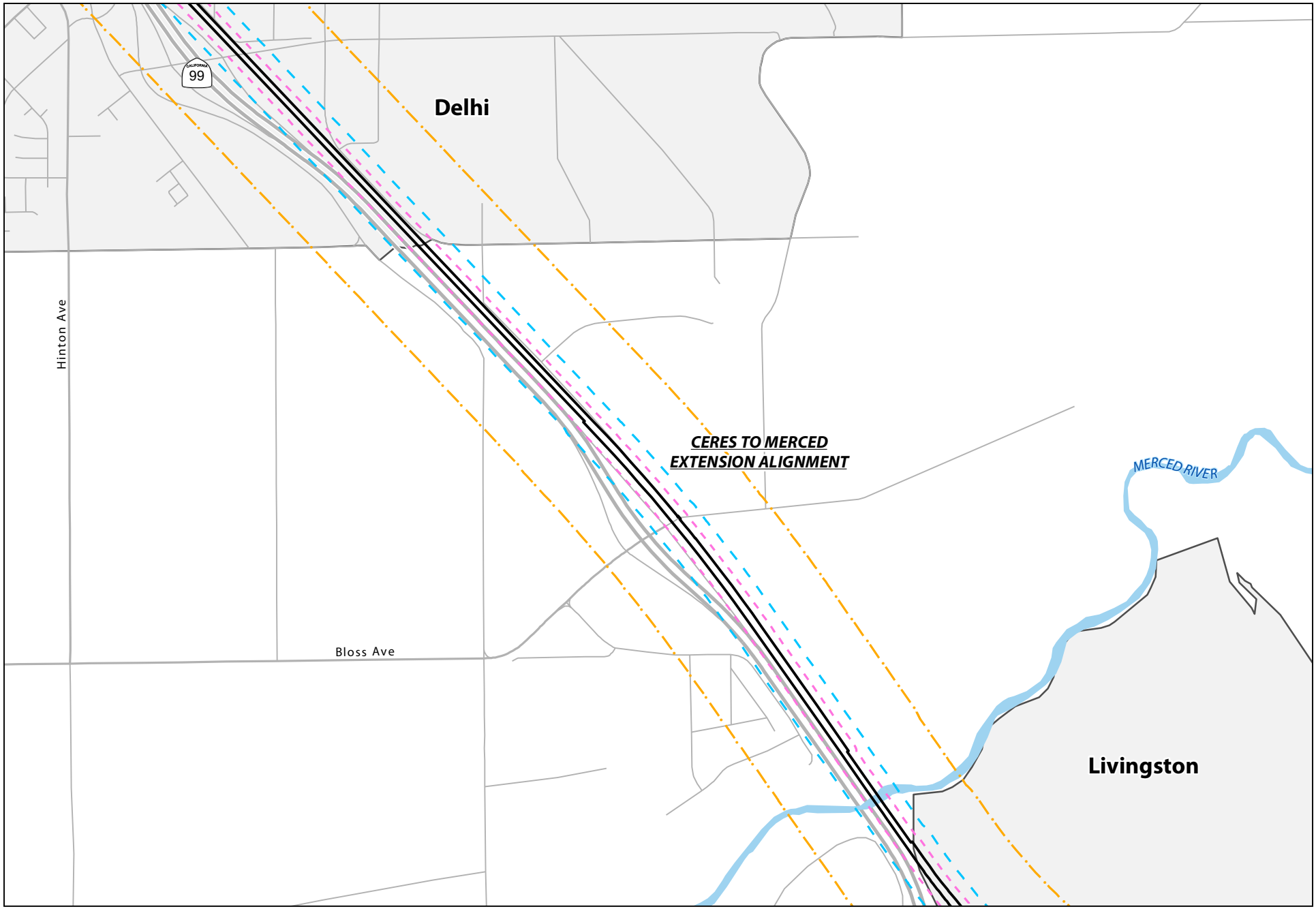


Figure 3.4-6
Biological Resource Study Area
ACE Ceres-Merced Extension



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Direct Impacts Study Area
Special-Status Plant Study Area (100-ft Buffer)
Wetland Resource Study Area (250-ft Buffer)
Special-Status Wildlife Study Area (1000-ft Buffer)

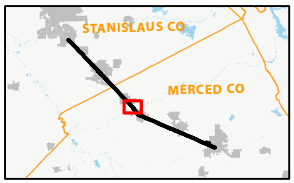
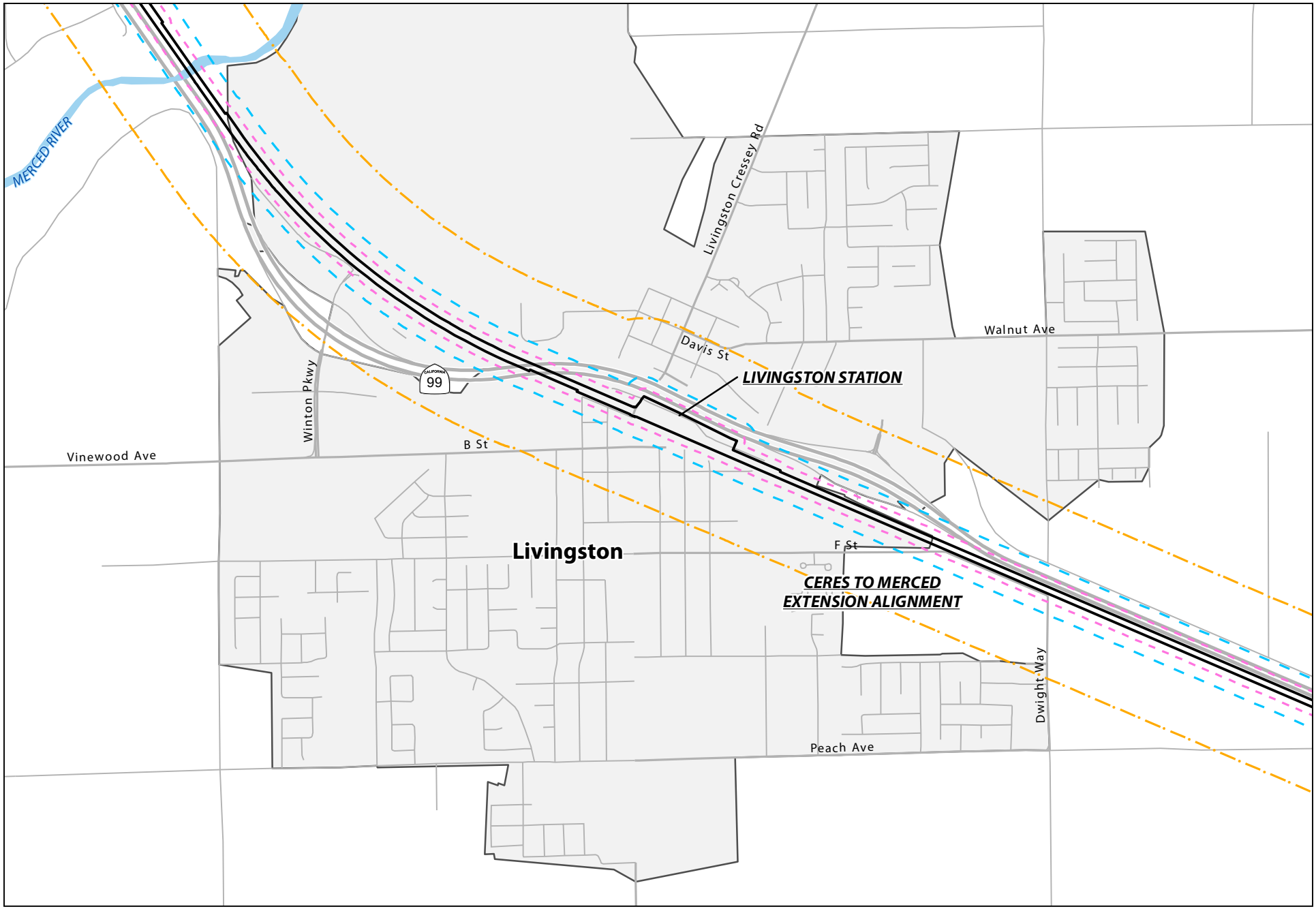


Figure 3.4-7
Biological Resource Study Area
ACE Ceres-Merced Extension



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- Wetland Resource Study Area (250-ft Buffer)
- Special-Status Wildlife Study Area (1000-ft Buffer)

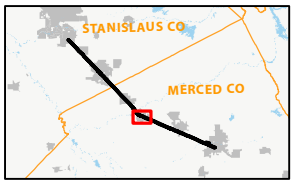
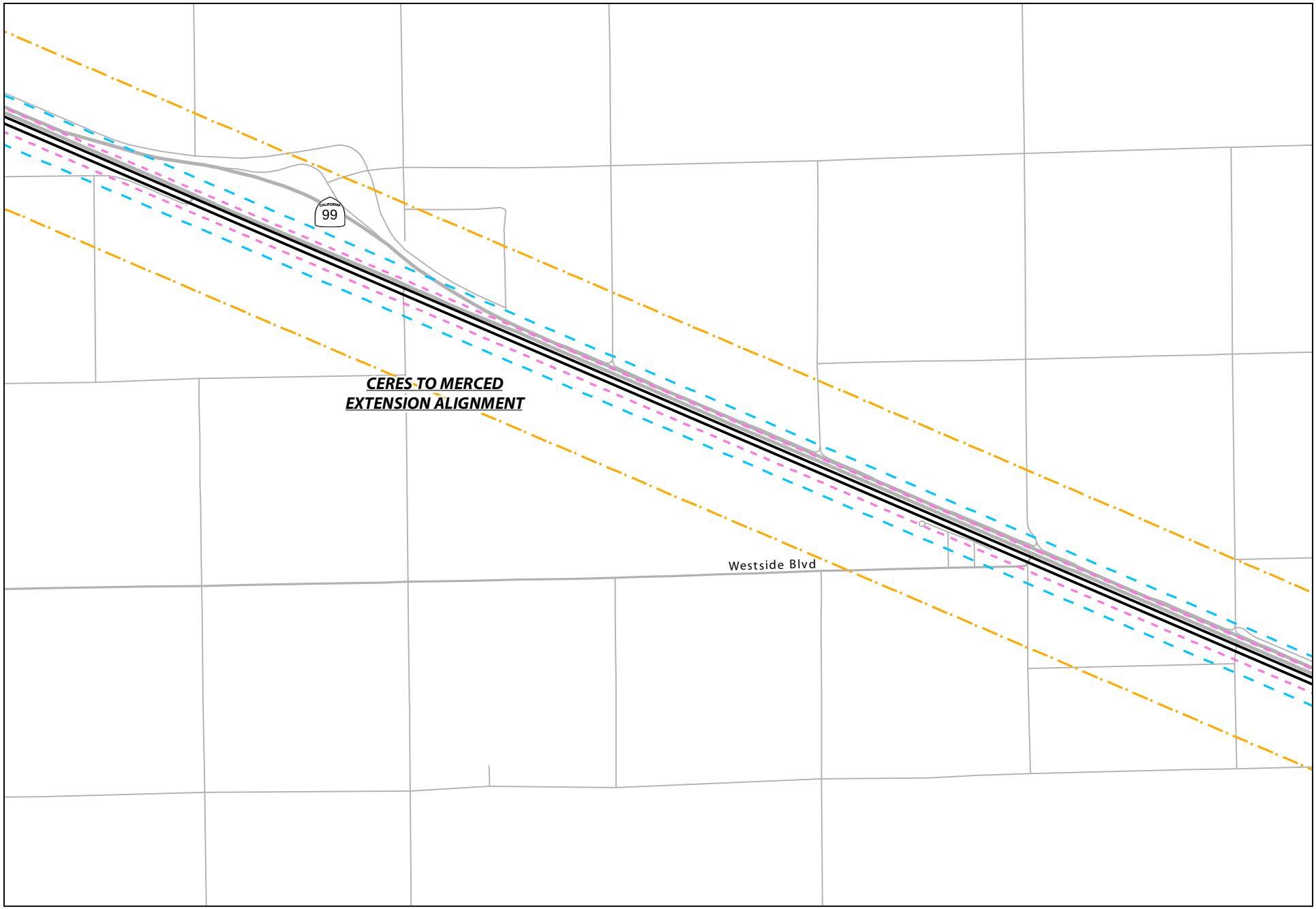


Figure 3.4-8
Biological Resource Study Area
ACE Ceres-Merced Extension



ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

- Direct Impacts Study Area
- Special-Status Plant Study Area (100-ft Buffer)
- Wetland Resource Study Area (250-ft Buffer)
- Special-Status Wildlife Study Area (1000-ft Buffer)

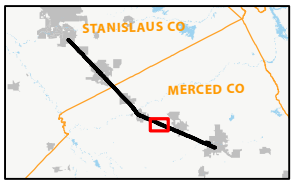
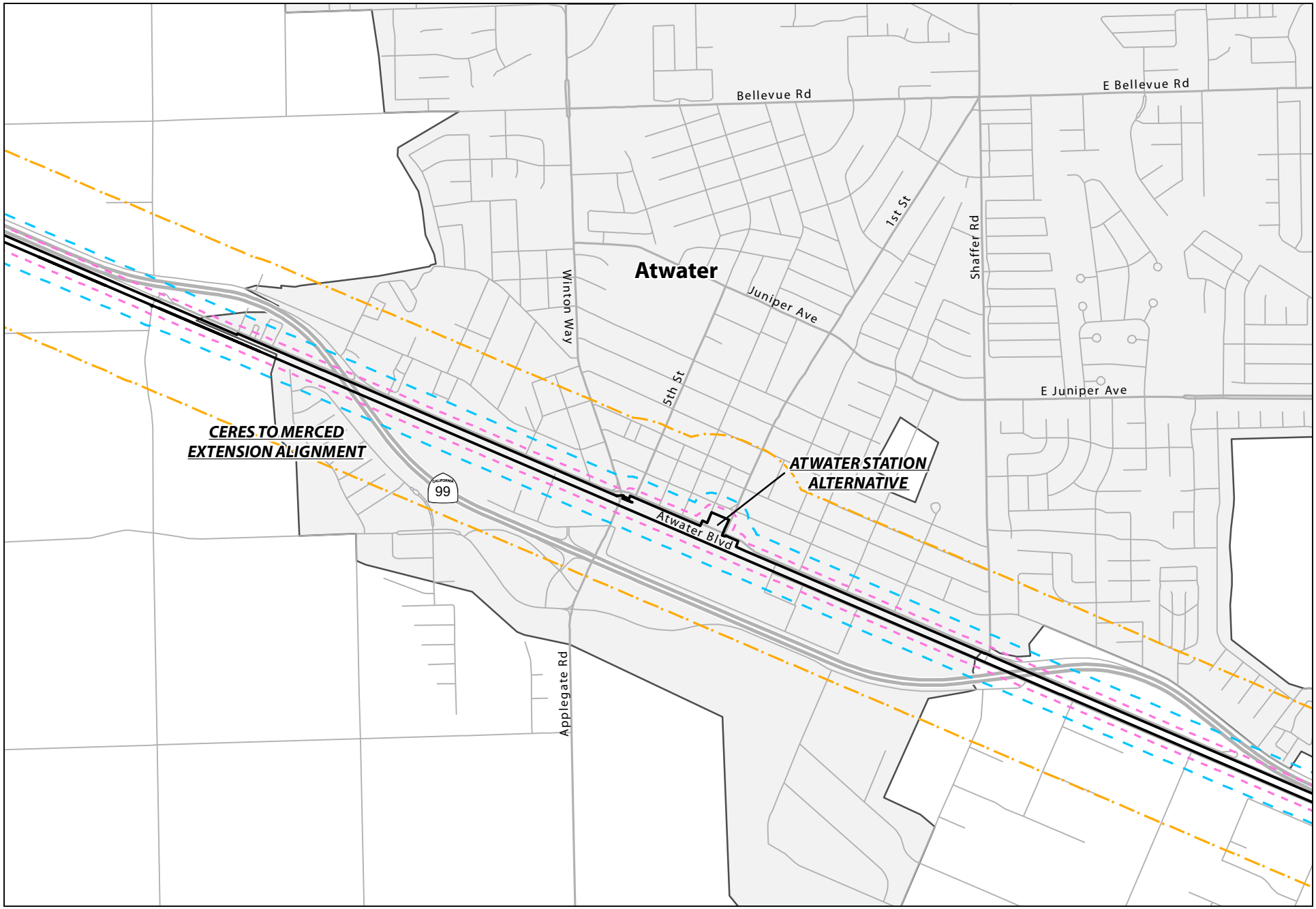


Figure 3.4-9
Biological Resource Study Area
ACE Ceres-Merced Extension



ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

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- Special-Status Plant Study Area (100-ft Buffer)
- Wetland Resource Study Area (250-ft Buffer)
- Special-Status Wildlife Study Area (1000-ft Buffer)

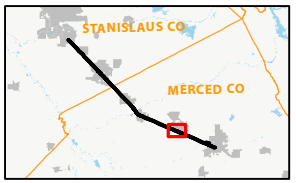
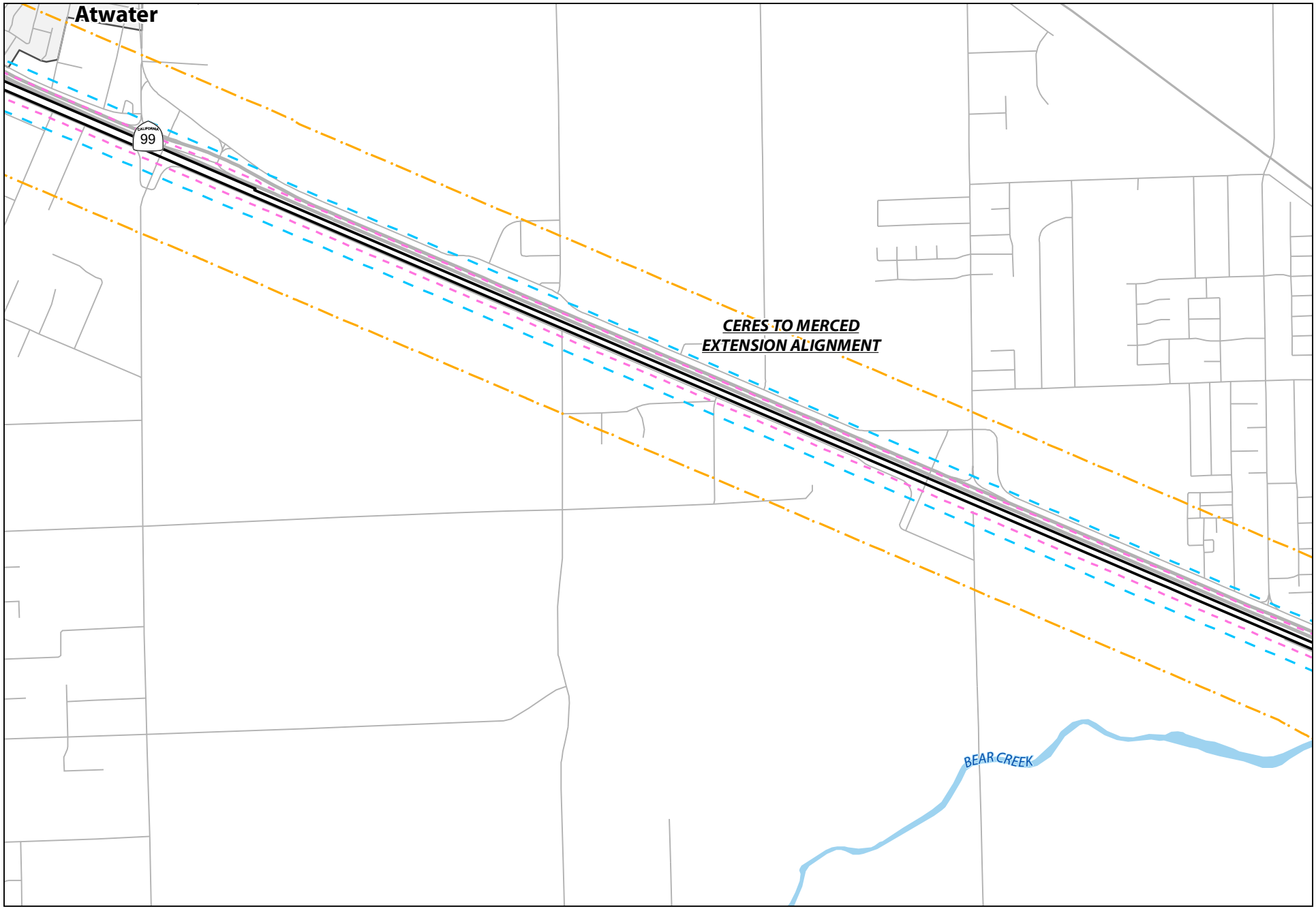


Figure 3.4-10
Biological Resource Study Area
ACE Ceres-Merced Extension



ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

- Direct Impacts Study Area
- Special-Status Plant Study Area (100-ft Buffer)
- Wetland Resource Study Area (250-ft Buffer)
- Special-Status Wildlife Study Area (1000-ft Buffer)

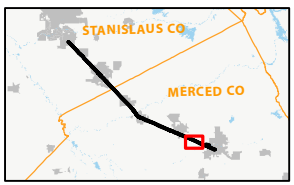
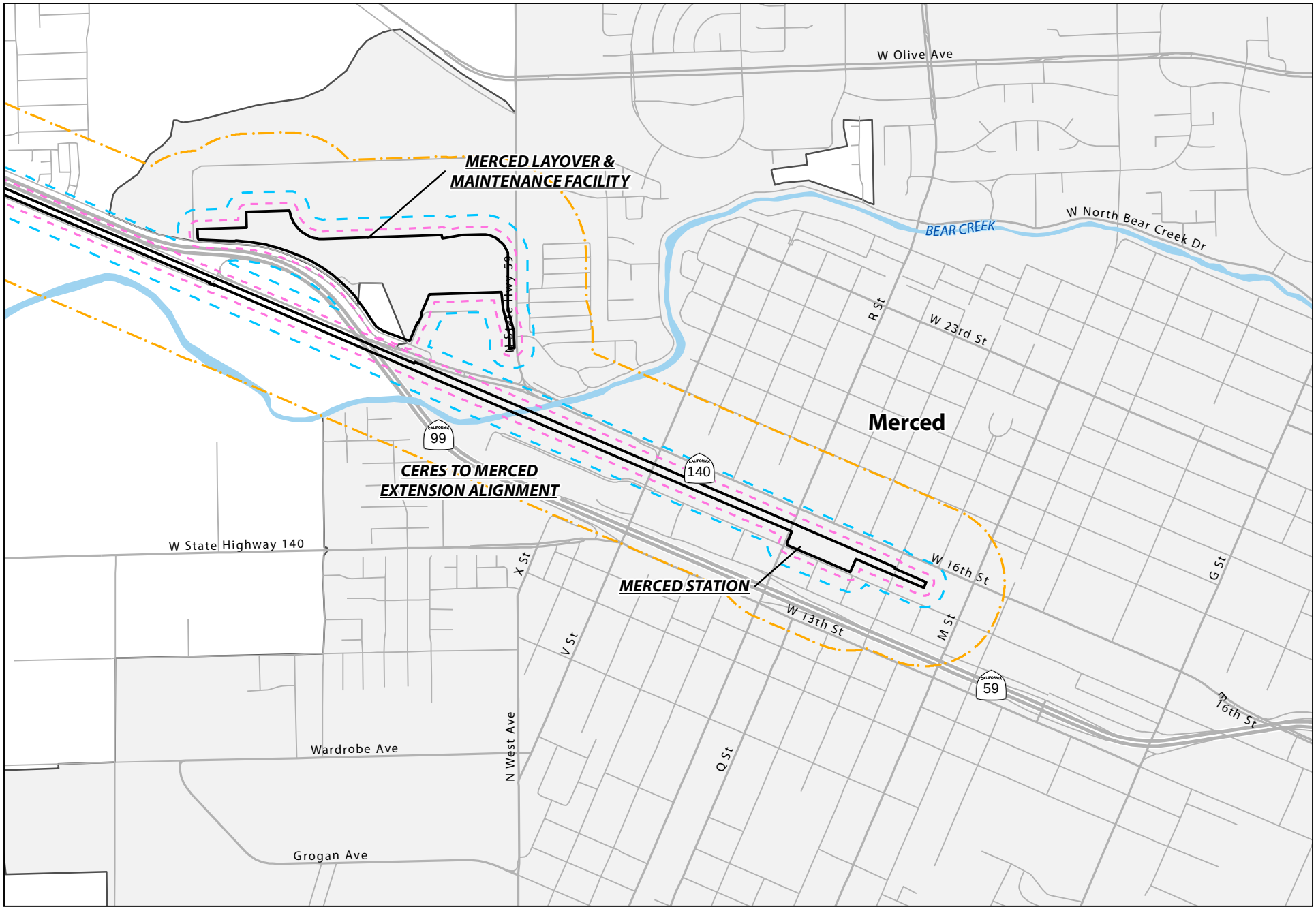


Figure 3.4-11
Biological Resource Study Area
ACE Ceres-Merced Extension



Direct Impacts Study Area
Special-Status Plant Study Area (100-ft Buffer)
Wetland Resource Study Area (250-ft Buffer)
Special-Status Wildlife Study Area (1000-ft Buffer)

N

0 0.125 0.25
Miles

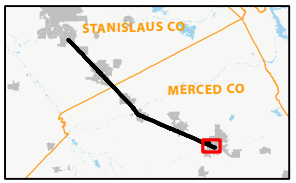


Figure 3.4-12
Biological Resource Study Area
ACE Ceres-Merced Extension

- Stand-alone determination report, including potential waters and wetlands mapping, suitable for submittal to USACE.
- Identification of waters and wetlands using aerial photography and existing water/wetland inventory data (such as the National Wetland Inventory).

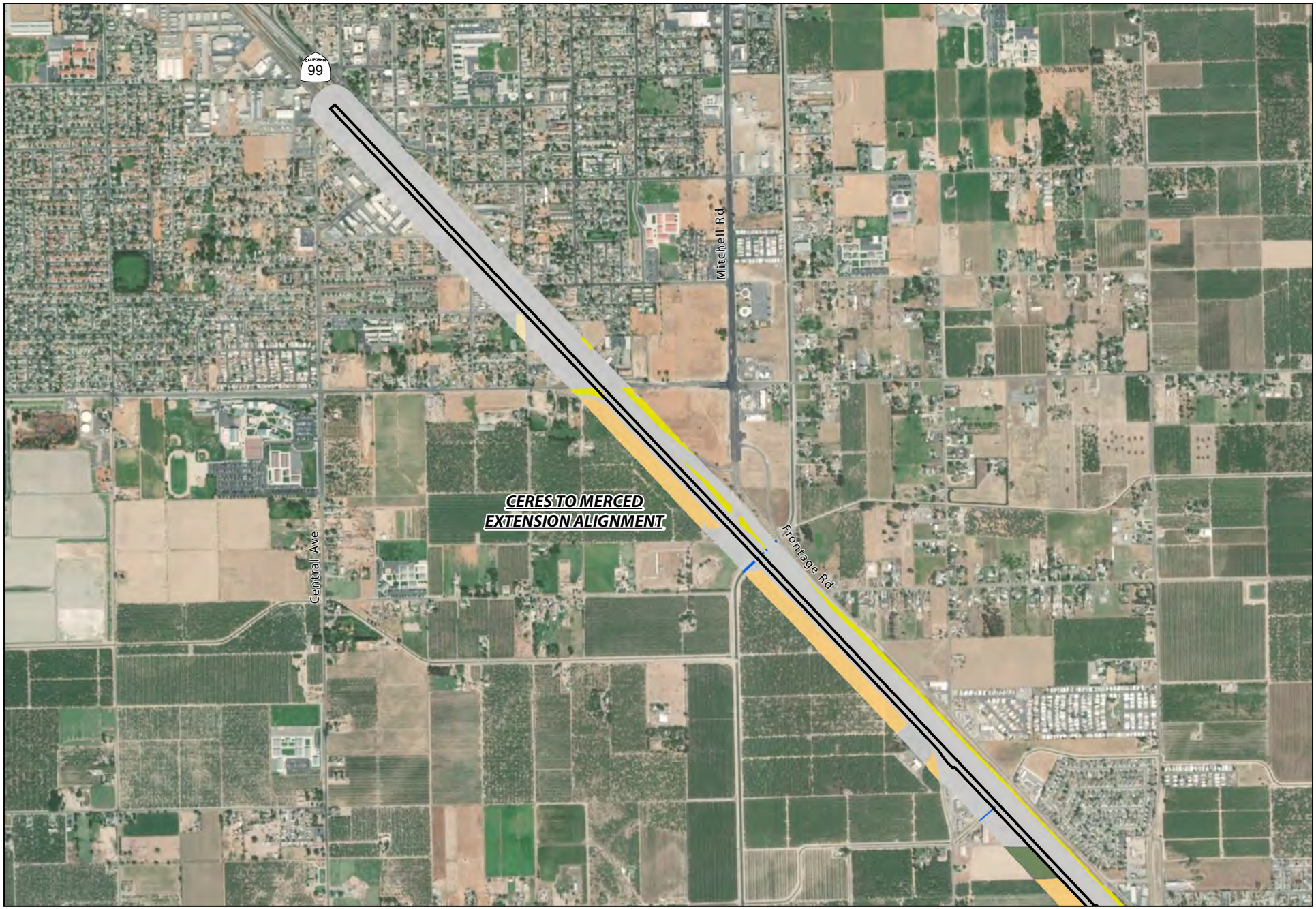
3.4.3.1 Land Cover Types and Associated Wildlife

For the purposes of this analysis, *land cover types* are defined as the dominant character of the land surface, as determined by vegetation, water, or human uses. General land cover types in the study area are as follows.

- Aquatic
- Cropland
- Developed/Landscaped
- Grassland
- Riparian
- Ruderal
- Wetland

Figures 3.4-13 through 3.4-24 depict the land cover types in the study area. Table 3.4-1 presents the acres of land cover types in the environmental footprint for the Proposed Project and the Atwater Station Alternative. The environmental footprint was developed to be a conservative estimation of where facilities could be placed and where construction could occur. The environmental footprint might include certain areas with habitat that might not actually be affected by the Proposed Project. As such, the numbers presented in Table 3.4-1 provide an estimate of the potential impacts to habitat and in some instance, might over-estimate the potential impact. Section 3.4.4.3 provides greater detail of the potential impacts. Where mitigation may be identified for certain impacts requiring compensatory mitigation, the calculation will be based on subsequent estimates of actual impacts based on subsequent final design and may be less than estimated herein.

Vegetation (including plant community and/or vegetation association information from Sawyer et al. 2009, if available) and wildlife associations (including special-status species), for each land cover type are described in the following subsections.



ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

Direct Impacts Study Area

Land Cover

- Aquatic, Riverine
- Cropland
- Cropland, Orchard
- Cropland, Row Crops
- Developed/Landscaped
- Ruderal

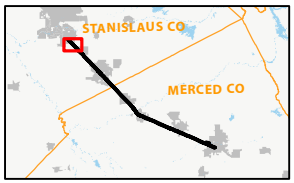
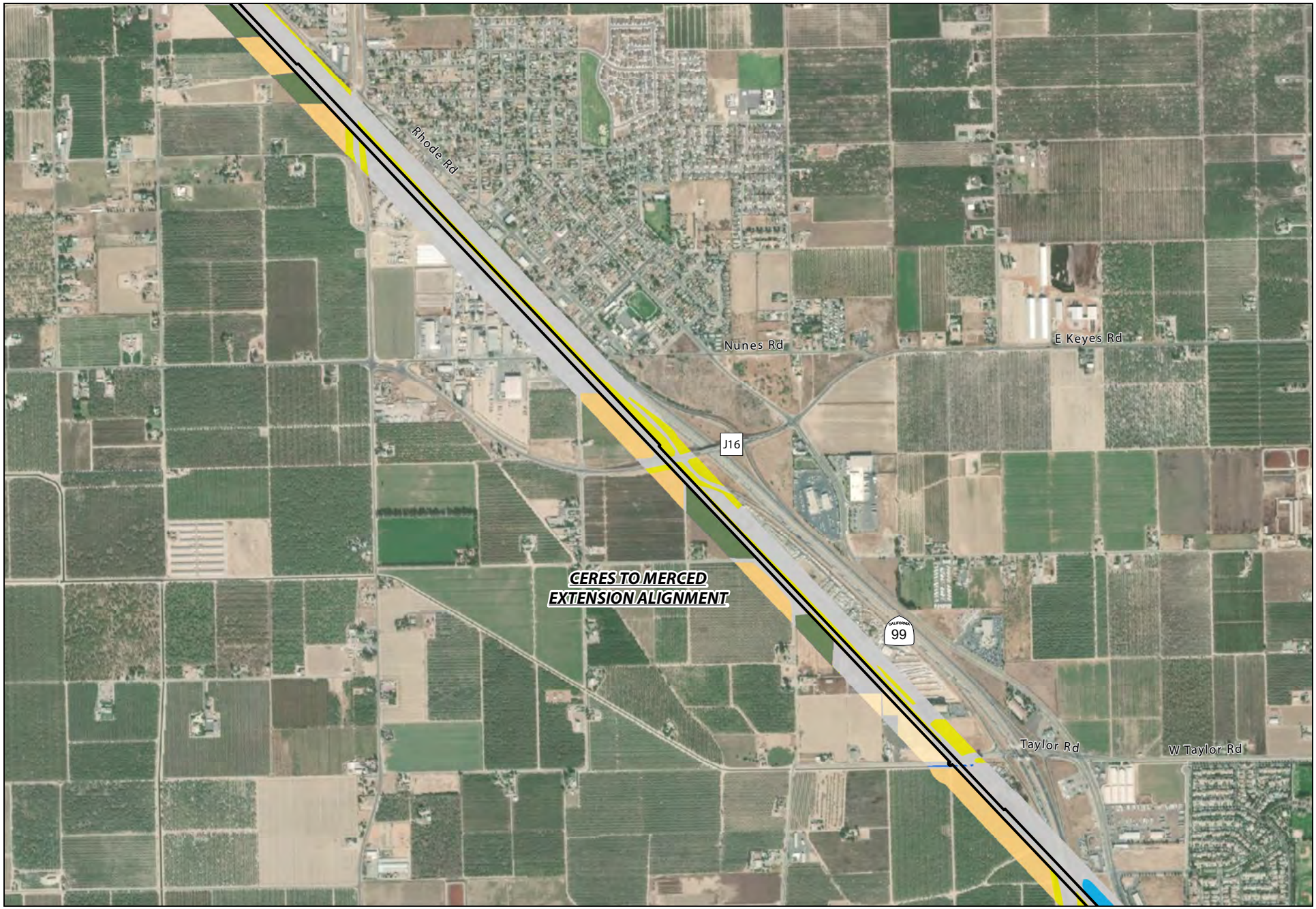


Figure 3.4-13
Land Cover
ACE Ceres-Merced Extension



ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

Direct Impacts Study Area

Land Cover

- Aquatic, Pond
- Aquatic, Riverine
- Cropland
- Cropland, Orchard
- Cropland, Row Crops
- Developed/Landscaped
- Ruderal

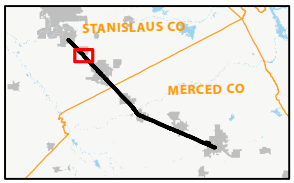
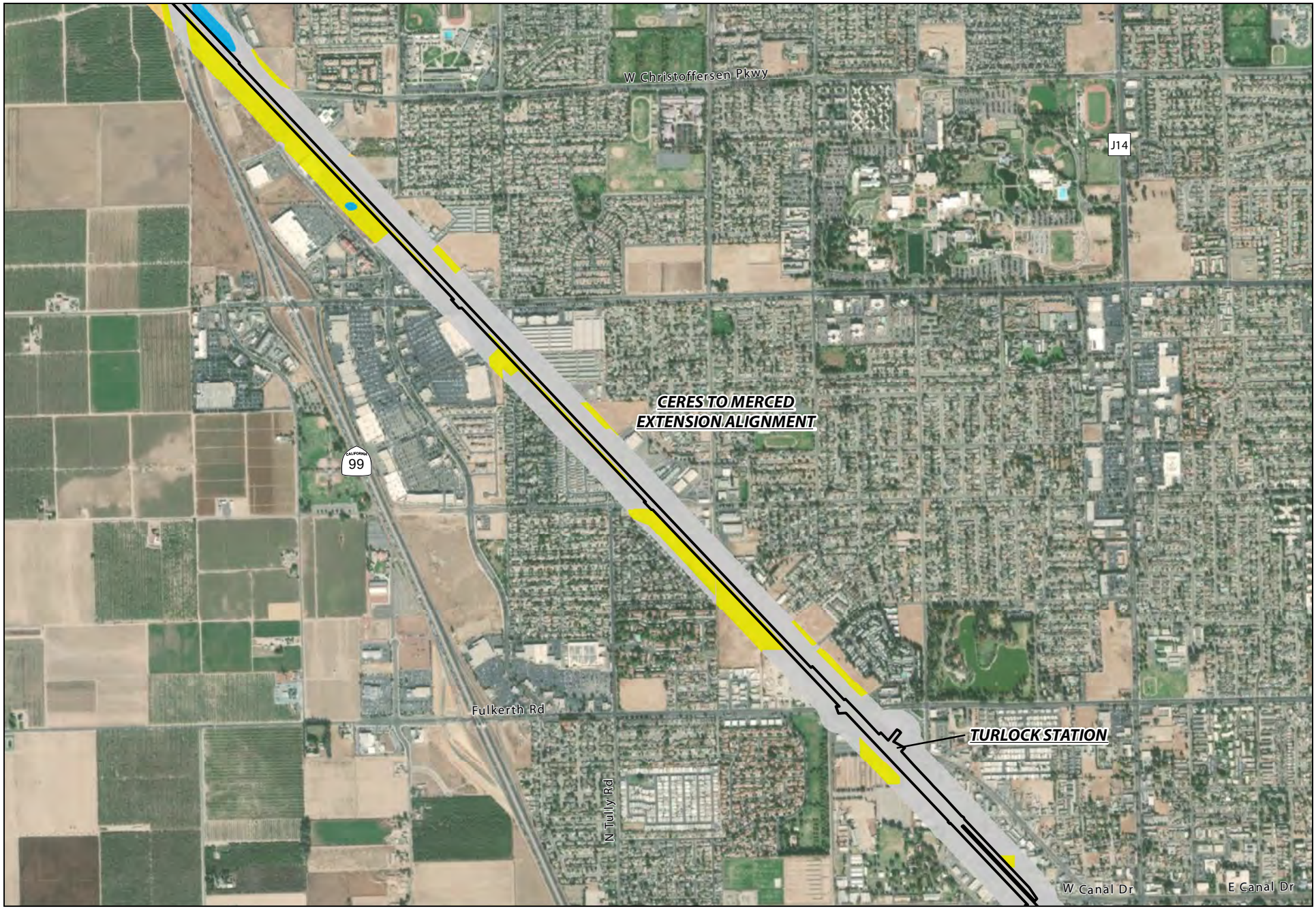


Figure 3.4-14
Land Cover
ACE Ceres-Merced Extension



ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

Direct Impacts Study Area
Ruderal

Land Cover

Aquatic, Pond
Cropland, Orchard
Developed/Landscaped

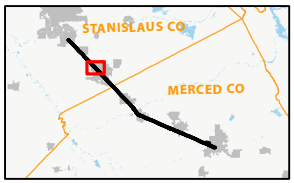


Figure 3.4-15
Land Cover
ACE Ceres-Merced Extension

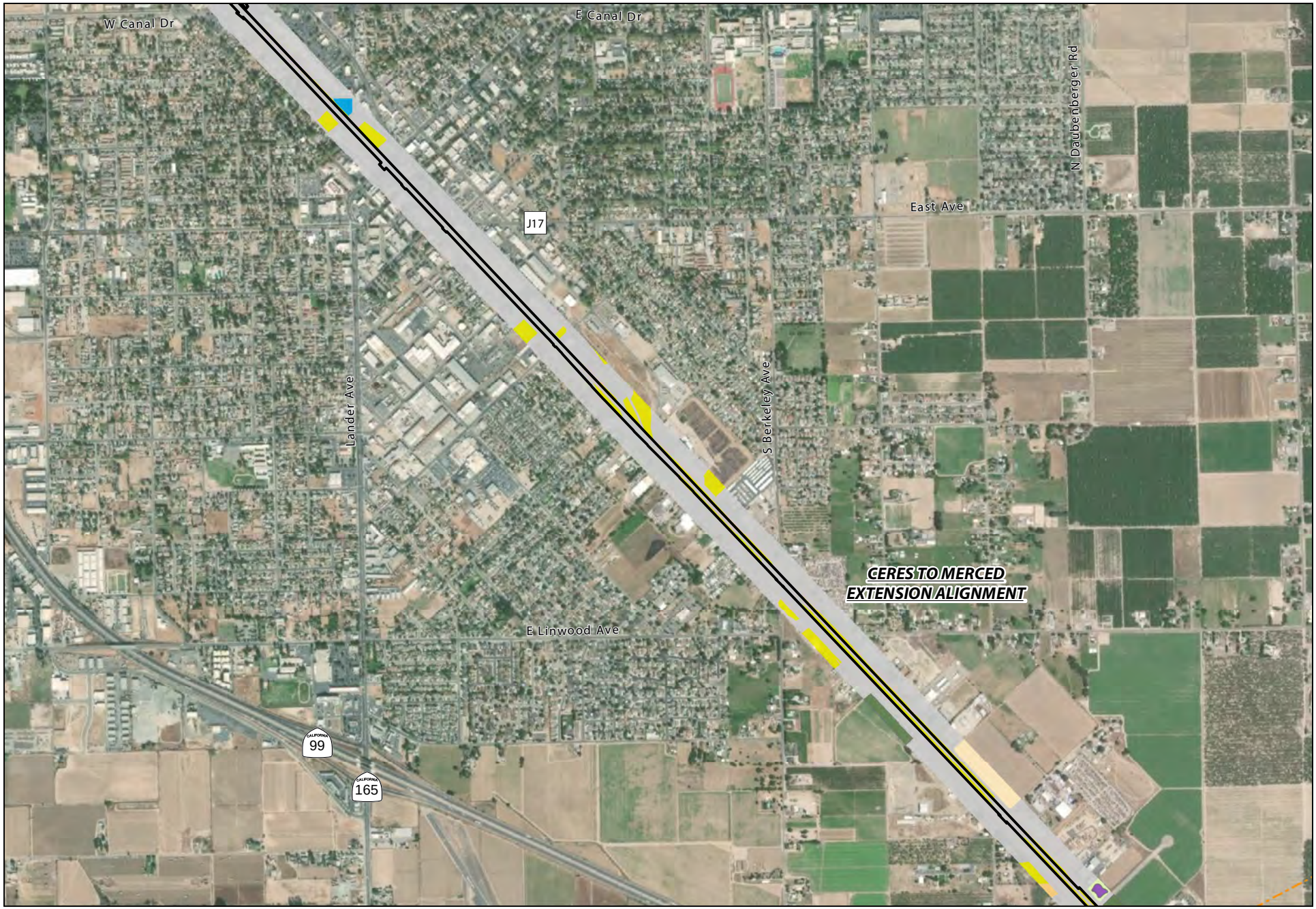
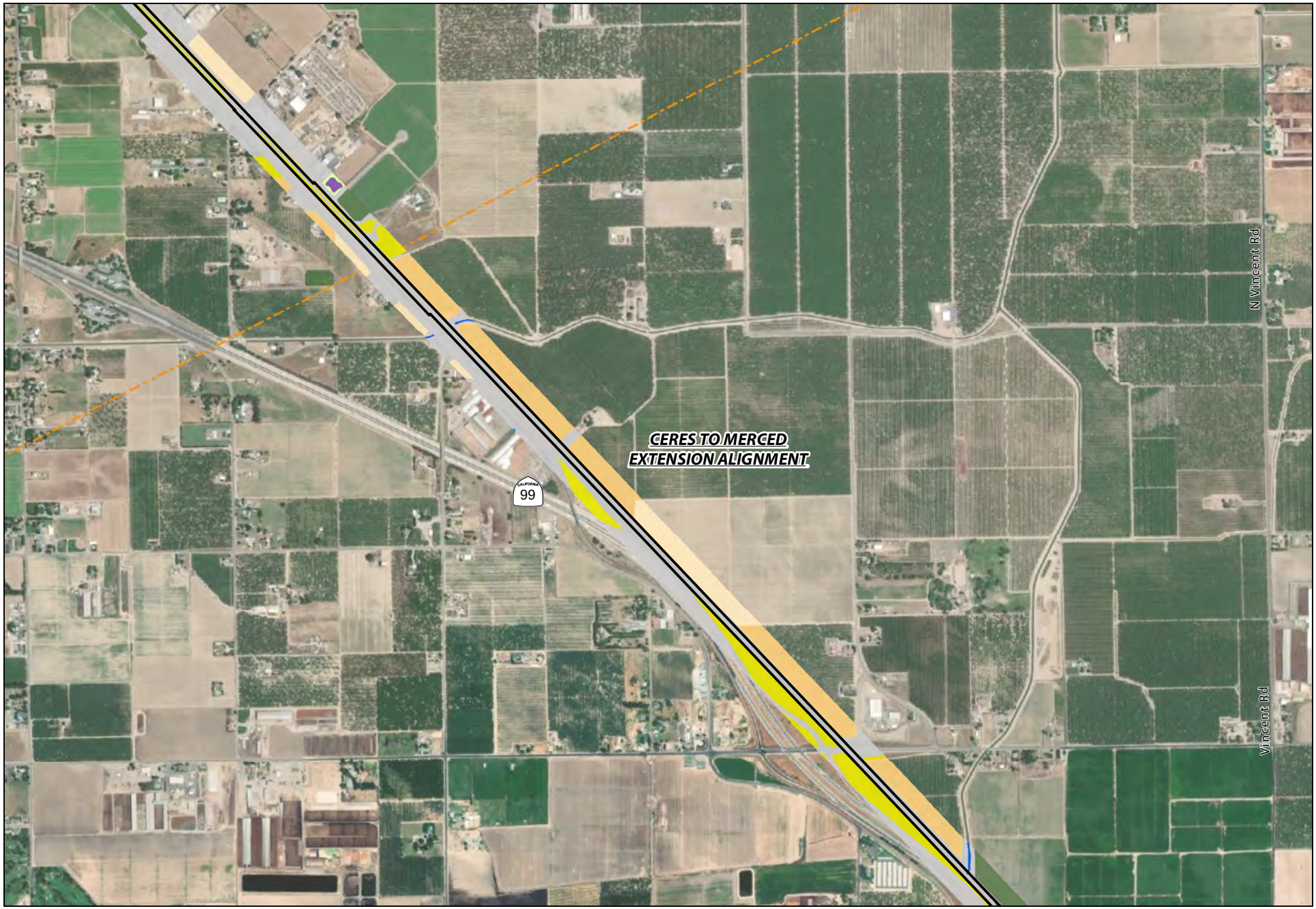


Figure 3.4-16
Land Cover
ACE Ceres-Merced Extension



ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

Direct Impacts Study Area

Land Cover

- Aquatic, Pond
- Aquatic, Riverine
- Cropland
- Cropland, Orchard
- Cropland, Row Crops
- Developed/Landscaped
- Grassland, California Annual Grassland
- Riparian, Mixed Riparian
- Ruderal
- Wetland, Vernal Pool

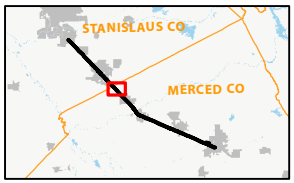
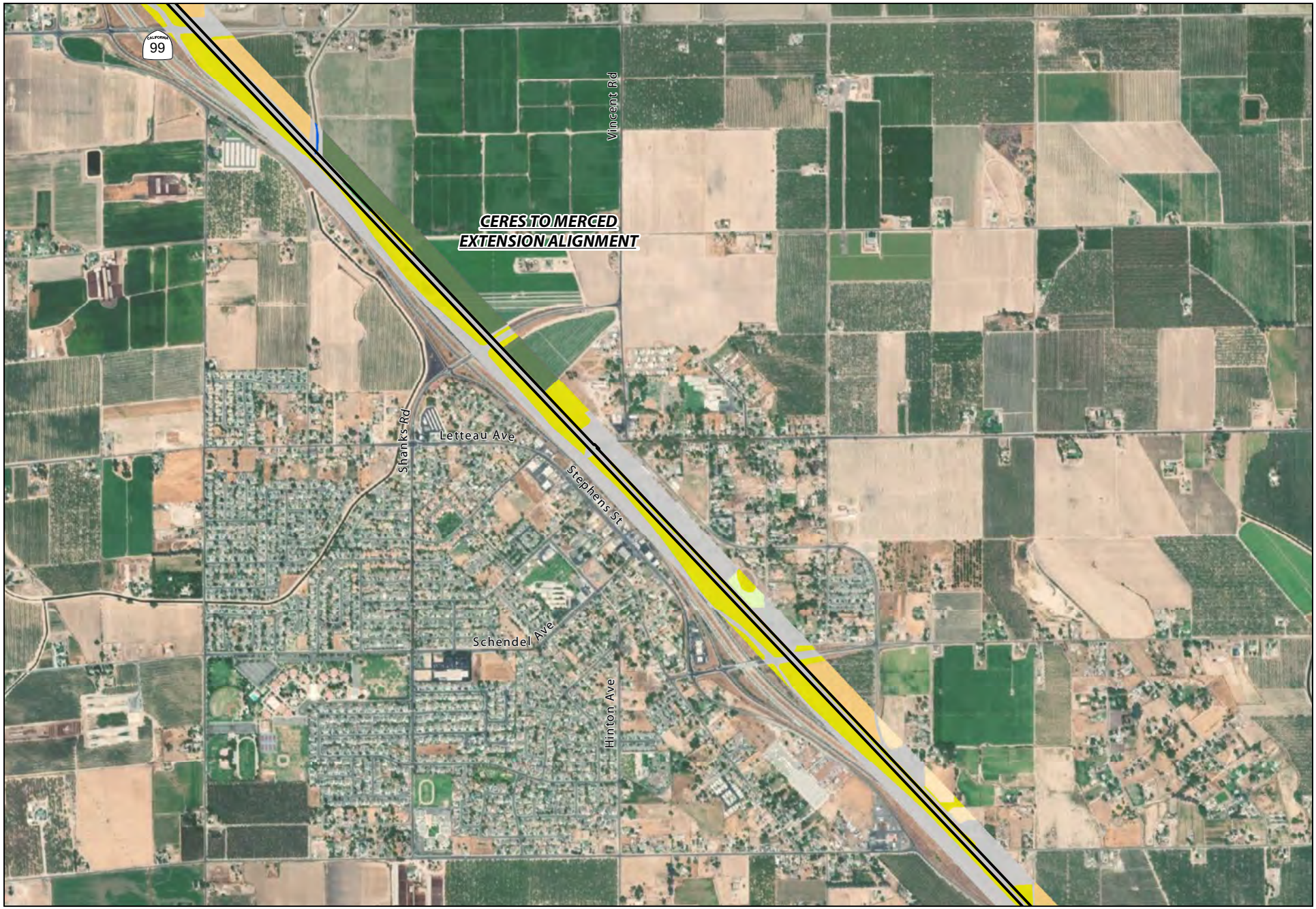


Figure 3.4-17
Land Cover
ACE Ceres-Merced Extension



ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

Direct Impacts Study Area

Land Cover

- Aquatic, Riverine
- Cropland
- Cropland, Orchard
- Cropland, Row Crops
- Developed/Landscaped
- Grassland, California Annual Grassland
- Riparian, Mixed Riparian
- Ruderal

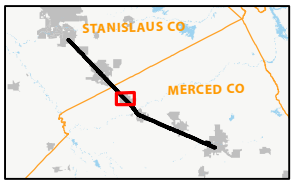


Figure 3.4-18
Land Cover
ACE Ceres-Merced Extension

ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

Direct Impacts Study Area

Land Cover

- Aquatic, Riverine
- Cropland
- Cropland, Orchard
- Developed/Landscaped
- Riparian, Mixed Riparian
- Riparian, Valley Foothill Riparian
- Ruderal

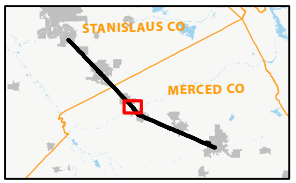
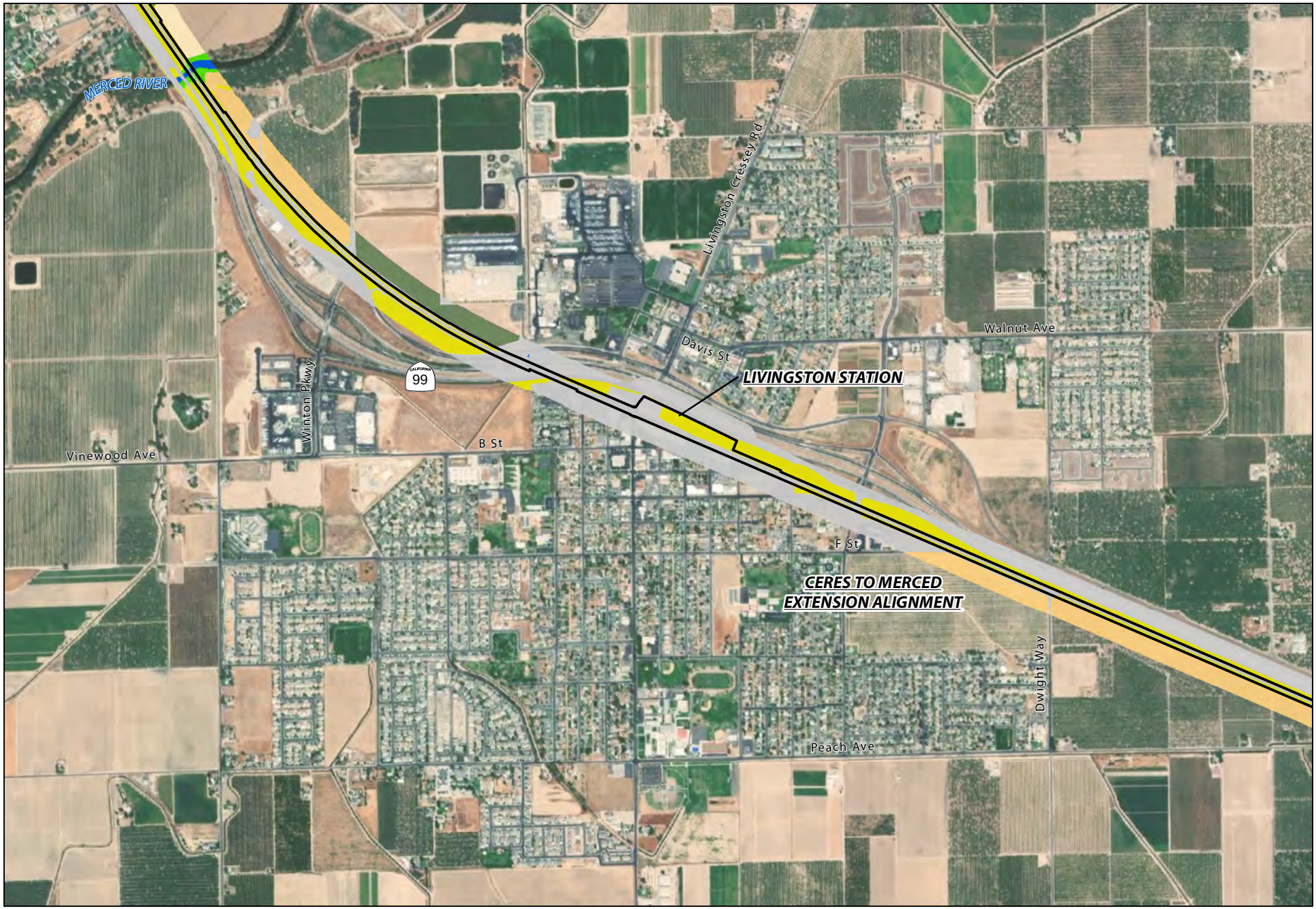


Figure 3.4-19
Land Cover
ACE Ceres-Merced Extension



ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

Direct Impacts Study Area

Land Cover

- Aquatic, Riverine
- Cropland
- Cropland, Orchard
- Cropland, Row Crops
- Developed/Landscaped
- Riparian, Mixed Riparian
- Riparian, Valley Foothill Riparian
- Ruderal

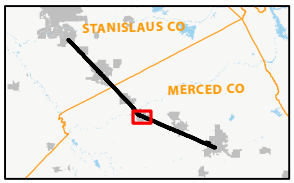


Figure 3.4-20
Land Cover
ACE Ceres-Merced Extension

ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

Direct Impacts Study Area

Land Cover

- Aquatic, Pond
- Aquatic, Riverine
- Cropland
- Cropland, Orchard
- Cropland, Row Crops
- Developed/Landscaped
- Ruderal

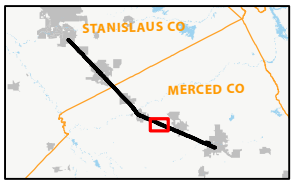


Figure 3.4-21
Land Cover
ACE Ceres-Merced Extension

ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

Direct Impacts Study Area

Land Cover

- Aquatic, Pond
- Aquatic, Riverine
- Cropland, Orchard
- Cropland, Row Crops
- Developed/Landscaped
- Ruderal

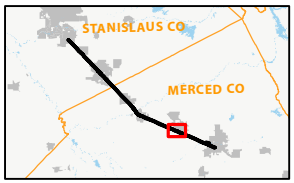
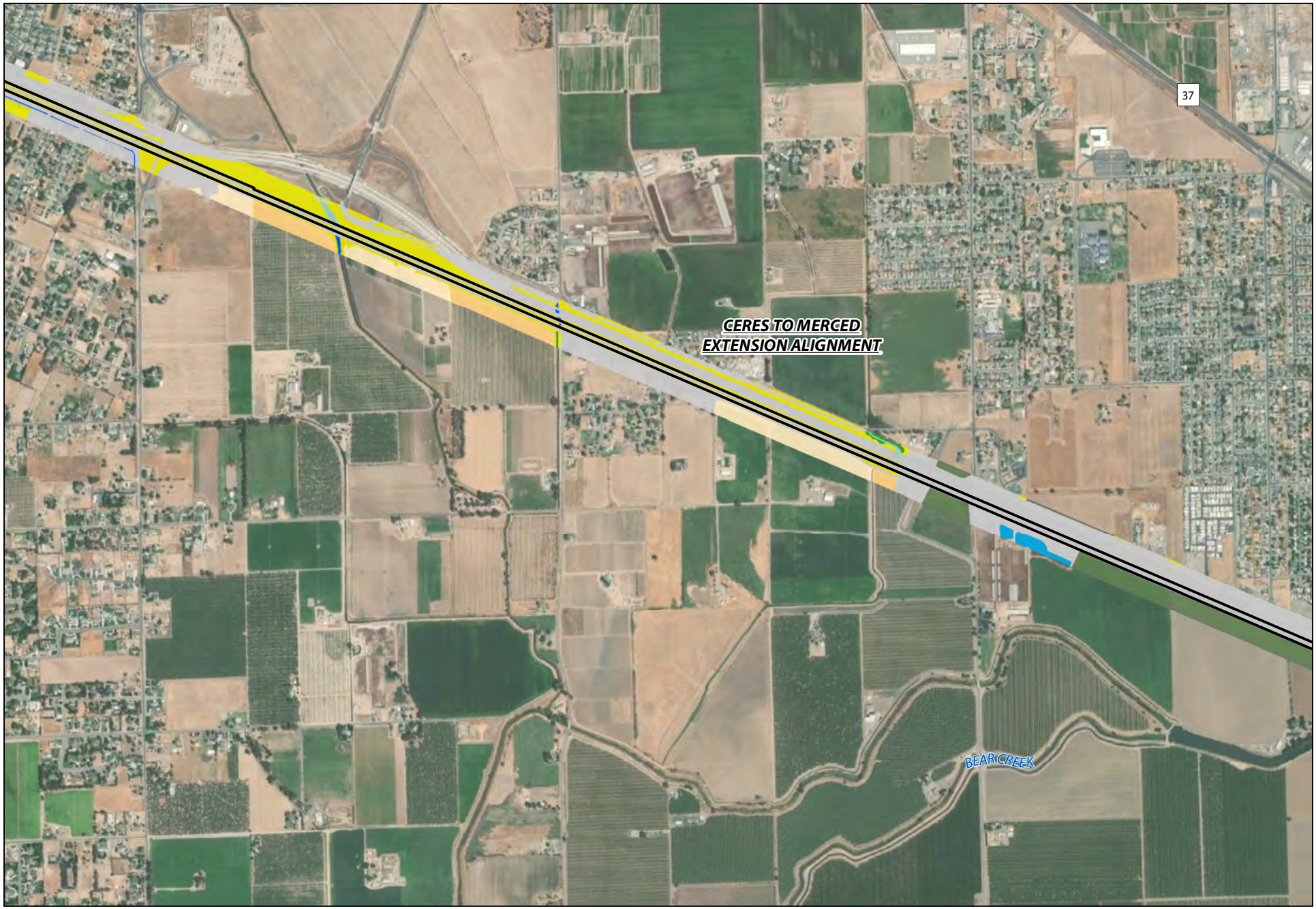


Figure 3.4-22
Land Cover
ACE Ceres-Merced Extension



ACE
ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25
Miles

Direct Impacts Study Area

Land Cover

- Aquatic, Pond
- Aquatic, Riverine
- Cropland
- Cropland, Orchard
- Cropland, Row Crops
- Developed/Landscaped
- Riparian, Mixed Riparian
- Ruderal
- Wetland, Freshwater Marsh

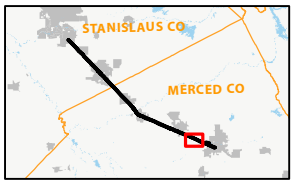
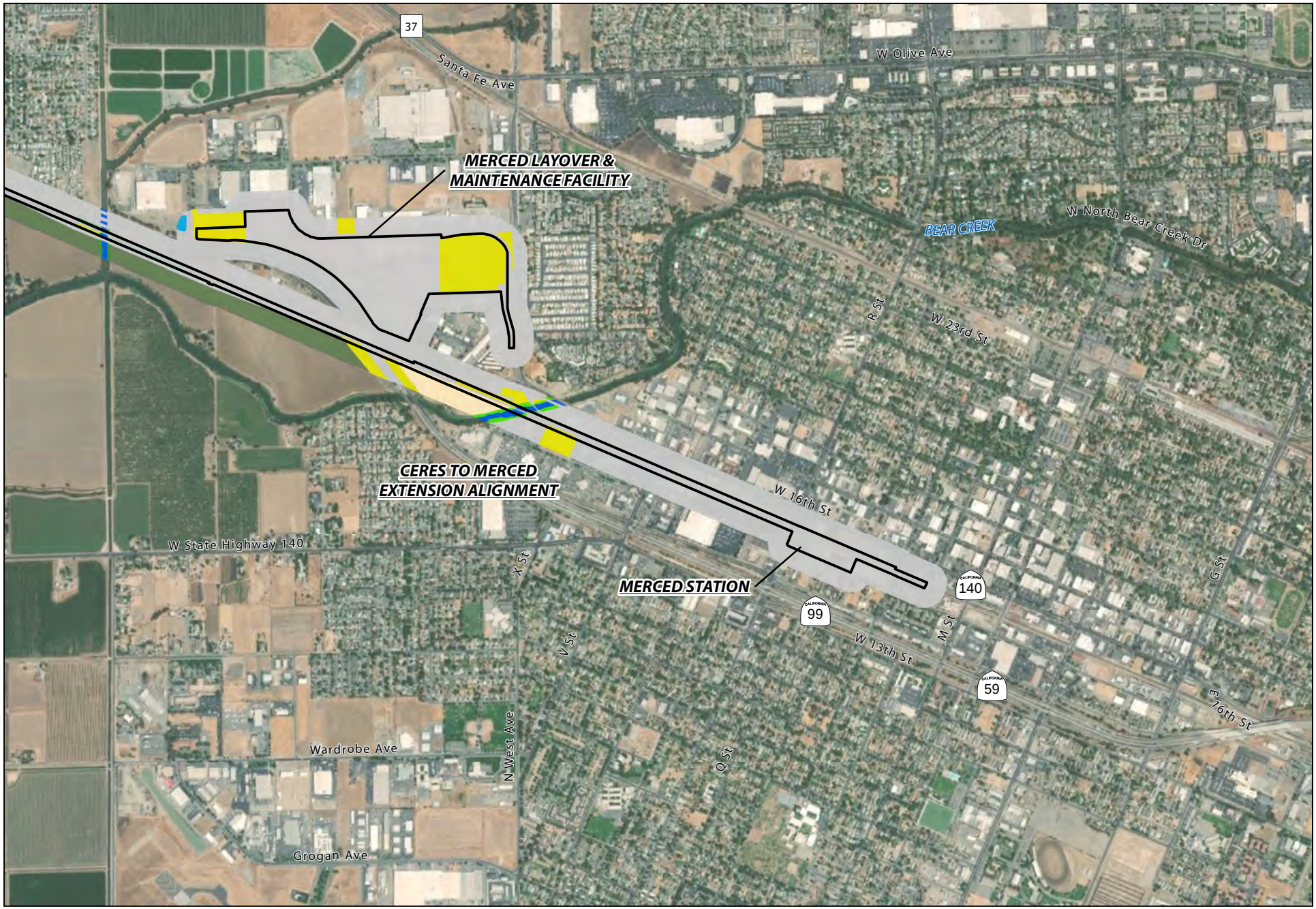


Figure 3.4-23
Land Cover
ACE Ceres-Merced Extension



ACE ALTAMONT CORRIDOR EXPRESS

N

0 0.125 0.25 Miles

Direct Impacts Study Area

Land Cover

- Aquatic, Pond
- Aquatic, Riverine
- Cropland
- Cropland, Row Crops
- Developed/Landscaped
- Riparian, Mixed Riparian
- Riparian, Valley Foothill Riparian
- Ruderal
- Wetland, Freshwater Marsh

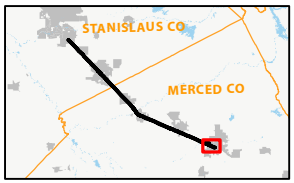


Figure 3.4-24
Land Cover
ACE Ceres-Merced Extension

Table 3.4-1. Land Cover Types in the Environmental Footprint (acres)

Proposed and Alternative Facilities	Aquatic	Cropland		Developed/Landscaped	Riparian		Ruderal	Wetland	Total
	Riverine	Orchard	Row Crops		Mixed Riparian Forest and Woodland	Valley Foothill Riparian		Freshwater Marsh	
Proposed Project									
Ceres to Merced Extension Alignment	0.68	1.02	3.25	261.57	0.52	0.49	80.11	0.70	348.35
Turlock Station	--	--	--	4.88	--	--	0.06	--	4.94
Livingston Station	--	--	--	1.10	--	--	3.65	--	4.75
Merced Layover & Maintenance Facility	--	--	--	42.81	--	--	15.29	--	58.10
Merced Station	--	--	--	3.80	--	--	--	--	3.80
Alternative Analyzed at an Equal Level of Detail									
Atwater Station Alternative	--	--	--	3.60	--	--	0.08	--	3.68

Aquatic

Riverine

The riverine land cover type includes perennial, intermittent, and ephemeral watercourses characterized by a defined bed and bank. Perennial streams support flowing water year-round in normal rainfall years. Intermittent streams carry water through most of the wet season (November to April) and are dry through most or all of the dry season (May to October) in a normal rainfall year. Ephemeral streams carry water only during or immediately following a rainfall event. The riverine land cover type, when assigned to a natural waterway, is most closely associated with riparian plant communities (see *Riparian* section). The riparian plant composition and width of the riparian corridor vary depending on channel slope, magnitude, and frequency of channel and overbank flows, and the frequency and duration of flooding flows that inundate the broader floodplain.

Agricultural canals and ditches are included in the riverine land cover type because they serve a similar function as degraded streams. Due to the nature of these built structures, canals and ditches often are managed for minimal vegetation to enhance the flow of water through the channels.

Perennial watercourses in the study area include the Merced River and Bear Creek.

Pond

Ponds are typically small (smaller than 0.4 acre in surface area), perennial, or seasonal waterbodies that support little or no vegetation. If vegetation is present, it is typically submerged or floating; little to no emergent vegetation is present around pond edges. Ponds in the study area are limited to stock ponds, settlement ponds, and constructed ponds (including water treatment ponds).

Wildlife and Fish Associations

Streams provide habitat for many fish and wildlife species. Fish species present in the study area are both native and nonnative. Species composition in aquatic habitat varies depending on physical characteristics, including salinity, temperature, flow velocity, dissolved oxygen, organic matter, and plant species composition. Some of the watercourses and waterbodies contain special-status anadromous fish species, such as steelhead (*Oncorhynchus mykiss*) and Chinook salmon (*Oncorhynchus tshawytscha*), and California Species of Special Concern, such as hardhead (*Mylopharadon conocephaslus*), Kern Brook lamprey (*Lampetra hubbsi*), Pacific lamprey (*Entosphenus tridentatus*), and Sacramento splittail (*Pogonichthys macrolepidotus)* (Stillwater Sciences 2008). Special-status wildlife species known to use riverine or pond habitat include California tiger salamander (*Ambystoma californiense*), western pond turtle (*Actinemys marmorata*), and giant garter snake (*Thamnophis gigas*). Several waterbird species known to use aquatic communities include American wigeon (*Anas americana*), pied-billed grebe (*Podilymbus podiceps*), mallard (*Anas platyrhynchos*), American coot (*Fulica americana*), and great egret (*Ardea alba*). Common nonnative fish species occurring in the Merced River include mosquito fish (*Gambusia affinis*), bass species such as largemouth, spotted and striped, and sunfish species such as pumpkinseed, redear, and green (Stillwater Sciences 2008). Native fish species include prickly sculpin (*Cottus asper*), Sacramento sucker (*Catostomus occidantalis*), Sacramento pikeminnow (*Ptychocheilus grandis*), and California roach (*Lavinia symmetricus*) (Stillwater Sciences 2008). Common amphibian species that inhabit freshwater aquatic habitat for a portion of their life cycle include Sierran treefrog (*Pseudacris sierra*), California toad (*Anaxyrus boreas halophilus*), and California newt (*Taricha torosa*).

Cropland

Cropland includes both currently cultivated lands (e.g., hay, row crops, orchards, etc.) and fallow fields.

Orchards

Orchards consists of monocultures of evenly spaced, generally low bushy trees that are similar in canopy size and tree height. Canopy cover ranges from open to dense depending on the age of the trees, with saplings and young trees having relatively open canopies and older trees providing more closed canopy cover. Depending on management practices, the understory is either devoid of vegetation or composed of various weedy annual grasses and forbs. Where herbaceous vegetation is present, it is often mowed, sprayed, or tilled to facilitate harvest and conserve water. Orchards in the study area include (*Prunus dulcis*), figs (*Ficus* sp.), cherries (*Prunus* sp.), apricot (*Prunus* sp.), and pistachio (*Pistacia vera*).

Row Crops

Row crops in the study area include (*Medicago sativa*), strawberries (*Fragaria* sp.), watermelon (*Citrullus lanatus*), cantaloupe (*Cucumis melo*), tomato (*Lycopersicon* sp.), and pumpkin (*Curcurbita pepo*).

Wildlife Associations

Field and row crops, such as alfalfa, provide foraging habitat for raptors, particularly Swainson's hawk (*Buteo swansoni*). Row crops can also provide foraging opportunities for tricolored blackbird

(*Agelaius tricolor*). Fallow fields and inactive farmland may provide nesting habitat for several wildlife species, including northern harrier (*Circus cyaneus*) and burrowing owl (*Athene cunicularia*). These and other agricultural lands may provide foraging or dispersal habitat for loggerhead shrike (*Lanius ludovicianus*), white-tailed kite (*Elanus leucurus*), and western red bat (*Lasiurus blossevillii*), which is known to roost in orchards. Although uncommon western yellow-billed cuckoo (*Coccyzus americanus*) and Swainson's hawk have been documented nesting in orchards.

Developed/Landscaped

Developed/landscaped areas include all types of development for residential, commercial, industrial, transportation, landscaping, and recreational uses (e.g., sites with structures, paved surfaces, horticultural and ornamental plantings, golf courses, and irrigated lawns). Vegetation in developed/landscaped areas is highly variable, ranging from nonexistent in paved areas to maintained lawns and ornamental shade trees. Common ornamental species include California fan palm (*Washingtonia filifera*), Canary Island palm (*Phoenix canariensis*), eucalyptus (*Eucalyptus* sp.), olive (*Olea europaea*), oleander (*Nerium oleander*), and pepper tree (*Schinus molle*), among others. Ground cover generally consists of ornamental or ruderal vegetation. The developed/landscaped land cover type is one of the most common land cover types in the study area. This landcover type is predominately associated with the towns of Ceres, Keyes, Turlock, Delhi, Livingston, Atwater, and Merced.

Wildlife Associations

Wildlife species occurring in developed/landscaped areas are typically generalists that have adapted to human-modified landscapes. Ornamental trees and lawns provide nesting and foraging habitat for urban-adapted birds such as American crow (*Corvus brachyrhynchos*), western scrub-jay (*Aphelocoma californica*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), and house finch (*Haemorhous mexicanus*). Other common wildlife found in developed/landscaped areas include Virginia opossum (*Didelphis virginiana*), northern raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and a variety of rodents. Some barren areas along existing railroad grades also support California ground squirrel (*Otospermophilus beecheyi*), which create burrows that also provide habitat for burrowing owl. Western pond turtle can occupy developed/landscaped areas where suitable aquatic habitat is present (e.g., golf course ponds). Although not common, Swainson's hawk have also been observed nesting in urban areas where tall ornamental trees are present; urban nesting sites are near or adjacent to foraging habitat. Urban pollinator gardens associated with developed/landscaped areas can also provide nectar and breeding resources (e.g., milkweed [*Asclepias* spp.]) for Western monarch butterfly (*Danaus plexippus plexippus*).

Grassland

California Annual Grassland

California annual grassland is an herbaceous plant community dominated by nonnative annual grasses (Holland 1986; Sawyer et al. 2009). In the study area, California annual grassland was mapped in only two locations just south of Turlock and Dehli adjacent to the environmental footprint where grasses dominate the land cover, and trees and shrubs provide minimal cover. Dominant species are wild oats (*Avena barbata*, *A. fatua*), ripgut grass (*Bromus diandrus*), soft chess

(*Bromus hordeaceus*), rye grass (*Festuca perennis*), and wall barley (*Hordeum murinum*). Herbaceous cover includes native and nonnative forbs such as bristly ox-tongue (*Helminthotheca echioides*), bull thistle (*Cirsium vulgare*), Italian thistle (*Carduus pycnocephalus* subsp. *pycnocephalus*), lupine (*Lupinus* sp.), prickly lettuce (*Lactuca serriola*), shortpod mustard (*Hirschfeldia incana*), stinkwort (*Dittrichia graveolens*), and yellow star-thistle (*Centaurea solstitialis*).

The California annual grassland cover type is located in the study area, immediately east of the Ceres to Merced Extension Alignment footprint. The California annual grassland cover type is not within the environmental footprint of the Proposed Project or the footprint of the Atwater Station Alternative. The land cover type is intermixed with vernal pool land cover.

Wildlife Associations

Grasslands support insects, amphibians, reptiles, small birds, and mammals that are prey for wildlife such as red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), northern harrier, American kestrel (*Falco sparverius*), burrowing owl, turkey vulture (*Cathartes aura*), coyote (*Canis latrans*), and American badger (*Taxidea taxus*). Grasslands near open water (including vernal pools or seasonal wetlands) and woodland are used by more species than those that lack such features because they provide places for resting, breeding, and escape cover for species that breed in these adjacent habitats. Common wildlife species occurring in grasslands in the study area include black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), California ground squirrel, striped skunk, western fence lizard (*Sceloporus occidentalis*), western kingbird (*Tyrannus verticalis*), loggerhead shrike, horned lark (*Eremophila alpestris*), song sparrow (*Melospiza melodia*), and western meadowlark (*Sturnella neglecta*). Native grasslands can also support insects such as Western monarch butterfly if blooming nectar resources and milkweed plants are present.

Riparian

Mixed Riparian Forest and Woodland

Mixed riparian forest and woodland is a natural community of special concern in undisturbed situations (California Department of Fish and Wildlife 2018a). This land cover type occurs along the margins of natural riverine channels in the study area. Generally, no single species dominates the canopy, and composition varies with elevation, aspect, and hydrology. In the study area along the outer edges of the Merced River floodplain, valley oak (*Quercus lobata*) is most common in the canopy. Other associate canopy species are California sycamore (*Platanus racemosa*), interior live oak (*Quercus wislizeni*), willow (*Salix* spp.), and Fremont cottonwood (*Populus fremontii*).

Valley Foothill Riparian

Valley foothill riparian is a natural community of special concern in undisturbed situations (California Department of Fish and Wildlife 2018a). Dominant canopy species include California sycamore, Fremont cottonwood, and valley oak. Subcanopy trees include box elder (*Acer negundo*), Oregon ash (*Fraxinus latifolia*), and white alder (*Alnus rhombifolia*). The understory shrub layer consists of blackberry (*Rubus* spp.), blue elderberry (*Sambucus nigra* ssp. *caerulea*), California rose (*Rosa californica*), western poison oak (*Toxicodendron diversilobum*), California wild grape (*Vitis californica*), and willow (California Department of Fish and Wildlife 2018a).

Valley foothill riparian cover type is present in the study area and is associated with the Merced River and Bear Creek.

Wildlife Associations

Riparian vegetation is diverse and comprises multiple vegetative strata, which provide high-value habitat for many wildlife species. Dense, multilayered riparian communities provide escape cover, forage, and nesting opportunities for wildlife. Riparian woodlands support many of the same species occurring in other woodland communities discussed in this section, as well as several riparian-specific species, such as Pacific-slope flycatcher (*Empidonax difficilis*), warbling vireo (*Vireo gilvus*), Wilson's warbler (*Cardellina pusilla*), and black-headed grosbeak (*Pheucticus melanocephalus*). The presence of elderberry shrubs (*Sambucus* sp.) in riparian cover type can also provide suitable habitat for valley elderberry longhorn beetle. The presence of milkweed in riparian corridor can also provide suitable habitat for Western monarch butterfly. Riparian woodlands can also be utilized by bat species such as western mastiff bat (*Eumops perotis californicus*) and western red bat. Riparian corridors also function as wildlife corridors as they provide cover and foraging habitat in otherwise suboptimal wildlife habitat (e.g., tree-lined streams in Central Valley cropland). Riparian canopy cover along streams and creeks provides shaded riverine aquatic cover (SRA) that benefits fish by reducing water temperature, providing in-water cover, and increasing aquatic productivity by vegetation input (e.g., leaves, branches) into the channel.

Ruderal

Ruderal cover types occur in areas where natural vegetation has been removed or significantly degraded by past or current human activity. Ruderal vegetation often is associated with the sides of railroad tracks, vacant lots, roadsides, and other highly disturbed areas. Ruderal vegetation is typified by the dominance of nonnative forbs that thrive in disturbed conditions including bristly ox-tongue, bull thistle, Italian thistle, prickly lettuce, shortpod mustard, stinkwort, yellow star-thistle, English plantain (*Plantago lanceolata*), jimson weed (*Datura* sp.), and Russian thistle (*Salsola* sp.). Because of the highly variable nature of ruderal habitats, this type was not classified according to Sawyer et al. (2009) or Holland (1986). Ruderal areas may be similar to California annual grassland but are characterized by a greater level of disturbance. The ruderal land cover type can be found throughout the study area.

Wildlife Associations

Wildlife species occurring in ruderal land cover are primarily determined by the characteristics of nearby natural, less disturbed habitat, although the dense cover provided by weeds can attract large foraging songbirds that are otherwise absent from adjacent developed, grassland, woodland, or wetland areas. Species within this category include white-crowned sparrow (*Zonotrichia leucophrys*), American goldfinch (*Spinus tristis*), dark-eyed junco (*Junco hyemalis*), and song sparrow. Such cover type also provides habitat for common reptiles such as western fence lizard, gopher snake, and common garter snake. Ruderal habitat type can also provide low quality habitat for burrowing owl and loggerhead shrike.

Wetland

Freshwater Marsh

Freshwater marshes in the study area are dominated by emergent herbaceous wetland plants in areas that are either intermittently flooded or contain perennially saturated soils. Cattails (*Typha* spp.) and bulrushes (*Schoenoplectus* spp.) typically are the dominant plant species in freshwater marsh. Freshwater marsh cover type is present in the study area and is associated with Bear Creek riverine and riparian land cover types and with unlined irrigation canals between Merced and Atwater.

Vernal Pool

Vernal pools are seasonal wetlands in which water ponds on the surface for extended durations in winter and spring and dries completely in later spring and summer. They support flora largely comprised of native wetland plant species, such as Fremont's goldfields (*Lasthenia fremontii*), yellow rayed goldfields (*Lasthenia glabrata*), common spikerush (*Eleocharis macrostachya*), vernal pool buttercup (*Ranunculus bonariensis*), coyotethistle (*Eryngium vaseyi*), doublehorn calicoflower (*Downingia bicornuta*), toothed calicoflower (*Downingia cuspidata*), flatface downingia (*Downingia pulchella*), and blow wives (*Achyrachaena mollis*). In the study area, only one vernal pool was observed. The vernal pool land cover type is located within the study area but outside of the environmental footprint, approximately 100 feet away from the environmental footprint south of Turlock and Delhi.

Wildlife Associations

Physical characteristics of wetland communities, including salinity, vegetation species composition, degree of non-vegetated ground, vegetative stratification, and hydraulic regime, strongly determine wildlife species' use. Therefore, common wildlife associations are discussed by wetland community type.

Wildlife species frequently observed within freshwater marsh in the study area include mallard, black phoebe (*Saynoris nigricans*), mosquito fish, great egret, black-necked stilt (*Himantopus mexicanus*), song sparrow, red-winged blackbird (*Agelaius phoeniceus*), and American coot. Freshwater marshes provide drinking water for numerous species of wildlife and attract prey for larger predators when water sources are limited. Freshwater marsh can support suitable habitat for giant garter snake and western pond turtle. As such, freshwater wetlands typically support many wildlife species in addition to those that use such areas exclusively.

Seasonal wetlands and vernal pools can support a variety of invertebrates and amphibians that, in turn, provide food for many other wildlife species, such as great egret, mallard, song sparrow, great blue heron (*Ardea herodias*), American avocet (*Recurvirostra americana*), killdeer (*Charadrius vociferus*), and greater yellowlegs (*Tringa melanoleuca*). Vernal pools generally have a longer period of inundation than seasonal wetlands and can provide suitable habitat for special-status branchiopods (fairy shrimp), including vernal pool tadpole shrimp (*Lepidurus packardi*), and vernal pool fairy shrimp (*Branchinecta lynchi*). Seasonal wetlands and vernal pools also provide aquatic breeding habitat for Sierran treefrog, western spadefoot toad (*Spea hammondi*), and California tiger salamander.

3.4.3.2 Special-Status Species

Special-Status Plants

Appendix K, *Supporting Biological Resources Information*, provides a list of special-status plant species identified during the review of existing information as having the potential to occur in the study area. A brief discussion of the special-status plant species with potential to occur in the study area is also provided in Appendix K. Special-status plant species were determined to be either present or absent in the study area based on suitable habitat, range of the species, and occurrences of the species within 2 miles of the study area.

Special-Status Wildlife

Appendix K provides a list of special-status wildlife species identified during the review of existing information as having the potential to occur in the study area. A brief discussion of the special-status wildlife species with potential to occur in the study area is also provided in Appendix K. Special-status wildlife species were determined to be either present or absent in the study area based on suitable habitat, range of the species, and occurrences of the species within 2 miles of the study area.

Special-Status Fish

Appendix K provides a list of special-status fish species identified during the review of existing information as having the potential to occur in the study area. A brief discussion of the special-status fish species with potential to occur in the study area is also provided in Appendix K. Special-status fish species were determined to be either present or absent in the study area based on suitable habitat, range of the species, and occurrences of the species within 2 miles of the study area.

3.4.3.3 Sensitive Natural Communities

Special-status or *sensitive natural communities* are communities (vegetation types) that are of limited distribution statewide or within a county or region. CDFW's Vegetation Classification and Mapping Program (VegCAMP) works to classify and map the vegetation of California and determine the rarity of vegetation types. Vegetation types with a state rarity ranking of S1 through S3 in CDFW's *List of Vegetation Alliances and Associations* (Natural Communities List) (California Department of Fish and Game 2010) are considered to be highly imperiled, and project impacts on high-quality occurrences of these vegetation types are typically considered significant under CEQA.

Sensitive natural communities in the study area include riparian, wetland, and woodland plant communities. At the state level, riparian plant communities are considered sensitive because of habitat loss and their value to a diverse community of plant and wildlife species (California Department of Fish and Game 2010). In general, wetlands represent a sensitive biotic community due to their limited distribution and importance to special-status plant and wildlife species. Mixed oak forest and valley oak woodland, both dominated by valley oaks, are defined as sensitive in the Natural Communities List.

3.4.3.4 Potential Jurisdictional Waters, Wetlands, and Other Habitats

Waters of the United States Subject to U.S. Army Corps of Engineers Jurisdiction

The term *waters of the United States* is an encompassing term used by USACE for areas that are subject to federal regulation under CWA Section 404 referring to wetlands and non-wetland (other waters) features. Wetlands that exhibit the prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology were identified in the environmental footprint of the Proposed Project and include freshwater marsh, seasonal wetland, and vernal pools. The jurisdictional determination of waters of the United States is in preparation and will be verified by USACE once it is completed (see Appendix K). The information presented for the Proposed Project reflects preliminary research and field delineation efforts conducted for the jurisdictional determination to date (See *Wetland* in Section 3.4.3.1, *Land Cover Types and Associated Wildlife*).

Inland *non-wetland waters of the United States* are seasonal or perennial waterbodies, including lakes, stream channels, and drainages that exhibit an OHWM but lack positive indicators for one or two of the three wetland parameters (33 C.F.R. 328.4). Non-wetland waters of the United States that occur in the study area include Merced River, Bear Creek, canals, and other minor drainages (see Figures 3.4-13 through 3.4-24).

California Fish and Game Code Section 1602 Jurisdiction

Fish & G. Code Section 89.1, through referral to Wat. Code Section 13050, defines *waters of the state* as "any surface water or groundwater, including saline waters, within the boundaries of the state." Activities that result in diversion or obstruction of the natural flow of any river, stream or lake; substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or deposit debris, waste, or other materials that could pass into any river, stream, or lake require that the project applicant enter into a Lake or Streambed Alteration Agreement with CDFW under Section 1602 of the Fish & G. Code (See *Riverine* in Section 3.4.3.1). Major waterways that would be under CDFW 1602 jurisdiction include Merced River and Bear Creek.

Regional Water Quality Control Board Jurisdictional Areas

Waters subject to CWA Section 404 also require a Water Quality Certification from the Regional Water Board under CWA Section 401. The extent of Regional Water Board jurisdiction over wetlands and other waters of the United States is the same as that of USACE. In addition, the Regional Water Board regulates under California's Porter-Cologne Act. Waters regulated under the Porter-Cologne Act are called *waters of the state*. Waters of the state include any surface or groundwater, including saline waters, within state boundaries. Riparian plant communities associated with stream channels in the study area could also be considered jurisdictional by the Regional Water Board. If a project requires a Water Quality Certification, the Regional Water Board will incorporate requirements to also comply with the Porter-Cologne Act. Features that do not fall under USACE jurisdiction (e.g., isolated wetland features, vernal pools, ditches, features excavated in uplands) would be considered *waters of the state*.

Critical Habitat

There are no USFWS-designated critical habitats within the study area. NMFS designates critical habitat for anadromous fish. The following designated critical habitat falls within the study area.

- Central Valley steelhead critical habitat is present in the Merced River (Ceres to Merced Extension Alignment).

Essential Fish Habitat

EFH in the study area was identified according to National Oceanic and Atmospheric Administration's EFH mapper (National Oceanic and Atmospheric Administration 2018). The study area crosses the Merced River (Ceres to Merced Extension Alignment), which is considered EFH for Pacific coast salmon, including the Central Valley fall-run Chinook salmon.

3.4.3.5 Wildlife Corridors

The term *corridor* as used by ecologists and conservation biologists is used in a variety of ways. For the purposes of this EIR, a *wildlife corridor* is defined as "any space, usually linear in shape that improves the ability of organisms to move among patches of their habitat" (Hilty et al. 2006). Corridors can be viewed over broad spatial scales, from those connecting continents (e.g., Isthmus of Panama) to structures crossing agricultural canals or roads. Most wildlife corridors analyzed within the context of land use planning, including those analyzed in this EIR, are moderate in scale and facilitate regional wildlife movement among habitat patches and through human-dominated landscapes.

The Proposed Project crosses natural waterways including the Merced River, Bear Creek, agricultural canals, and other minor drainages that may be used by migratory fish and semi-aquatic species (see Figures 3.10-3 and 3.10-4 in Section 3.10, *Hydrology and Water Quality).* Special-status species that may use these corridors include anadromous fish (e.g., Central Valley steelhead, Chinook salmon, river lamprey), Swainson's hawk, western pond turtle, giant garter snake, and San Joaquin kit fox (*Vulpes macrotis*).

Central Valley steelhead and Central Valley Chinook salmon migrate up the San Joaquin River and many of its tributaries, including the Merced River, to reach spawning habitat. Western pond turtle occurs throughout the San Joaquin River and its tributaries and moves throughout the system where perennial water occurs. Giant garter snake uses sloughs, agricultural canals, ditches with perennial water, and other suitable aquatic habitat to forage and migrate near the Merced River southward. San Joaquin kit fox individuals migrate between core populations, located in the southwestern San Joaquin Valley and the area west of Mendota, and satellite populations, generally in eastern Contra Costa and Alameda Counties (Altamont Hills), central and eastern Merced County, eastern Fresno and Madera Counties, eastern Kings County, eastern and south central Tulare County, north central and central portions of Kern County, and in southwestern San Luis Obispo County. Western yellow-billed cuckoo have historically been documented in Merced County on the Merced River, west of the study area (Gaines and Laymon 1984); individual cuckoos may utilize the river as a wildlife corridor to more suitable habitat north of the study area (i.e., Sacramento and Feather Rivers). Common species of terrestrial wildlife (e.g., California mule deer [*Odocoileus hemionus californicus*], bobcat [*Lynx rufus*]) also migrate through the lowlands along the historic San Joaquin River floodplain.

3.4.4 Impact Analysis

This section describes the environmental impacts of the Proposed Project and the Atwater Station Alternative on biological resources. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. Measures to mitigate significant impacts are provided, where appropriate.

3.4.4.1 Methods for Analysis

The method for analyzing impacts on biological resources is the same for both the Proposed Project and the Atwater Station Alternative. ICF biologists evaluated potential negative effects on special-status species in the study area by reviewing the available literature regarding the status and known distribution of special-status species in the study area and field survey data.

Desktop Review

Prior to and concurrent with conducting fieldwork, ICF biologists consulted the following data sources to identify biological resources occurring or potentially occurring in the study area.

- CDFW's CNDDB records search of Arena, Atwater, Ceres, Cressey, La Grange, Merced, Riverbank, Salida, Turlock, and Winton U.S. Geological Survey (USGS) 7.5-minute quadrangles (California Department of Fish and Wildlife 2020a).
- California Native Plant Society's (CNPS) online *Inventory of Rare and Endangered Plants of California* (California Native Plant Society 2020a).
- California invasive plant inventory (California Invasive Plant Council 2020).
- USFWS species list of endangered and threatened species that may occur in the study area, and/or may be affected by the proposed or alternative facilities (U.S. Fish and Wildlife Service 2020a).
- Environmental setting chapter from the *ACE Extension Lathrop to Ceres/Merced Draft EIR* (San Joaquin Regional Rail Commission 2018).
- National Wetland Inventory data for waters of the United States, including wetlands.

In addition, ICF biologists made a determination based on standards and procedures presented in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and as clarified in the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region* (U.S. Army Corps of Engineers 2008) based on the following.

- Field analysis of potential waters and wetlands within the Proposed Project footprint.
- Draft wetland map showing all potential jurisdictional areas (e.g., streams, creeks, ditches, wetlands) including all state and federal jurisdictional waters and wetlands.
- Stand-alone delineation report, including delineation map, suitable for submittal to USACE (see Appendix K).

Field Surveys

ICF's biological resources team consisted of a wildlife biologist, botanist, and wetland ecologist for the survey efforts for the Proposed Project and the Atwater Station Alternative. Biological resource

surveys included driving, walking, and scanning areas that were accessible at the time of the field surveys. Field surveys were conducted on the following dates.

- May 29, 2020
- June 5, 2020
- June 26, 2020
- July 3, 2020
- July 13, 2020
- July 14, 2020

Biological resource surveys were conducted for resources in the study area that have the potential to be affected by Proposed Project activities. These surveys included defining plant community land cover for project elements; floristic surveys for special-status plant species; biological reconnaissance survey for special-status wildlife species, their habitats; and surveys for waters of the United States, including wetlands. The results of these surveys are included in Appendix K *Supporting Biological Resources Information*. Fisheries resources and their potential to be affected by the Proposed Project and the Atwater Station Alternative were analyzed by ICF fisheries biologist Donna Maniscalco using photos and notes taken during the biological resource surveys. Because private property access was limited along some portions of the study area, most areas were viewed from agricultural and public roads during the 2020 field surveys. This level of survey was determined to be adequate given the extent of agricultural lands and relative lack of native habitats.

Vegetation

Geographic information systems (GIS)–based maps are the primary data source used to map land cover types, including vegetation communities, within the study area. A land cover type is defined as the dominant character of the land, as determined by vegetation, water, or human uses. Land cover types are the most widely used units in analyzing ecosystem function, habitat diversity, natural communities, wetlands and streams, and special-status species habitat.

The following are the primary existing data sources of information for the land cover mapping in the study area.

- *ACE Extension Lathrop to Ceres/Merced Draft EIR* (San Joaquin Regional Rail Commission 2018).
- U.S. Fish & Wildlife Service National Wetlands Inventory (2020b).

In addition to using existing data sets, ICF biologists conducted field visits to accessible portions of the study area to develop and verify land cover mapping. Mapping was verified by visual inspection from locations accessible by public or agricultural roads and the railroad ROW. Classification of land cover types was developed for the study area based primarily on the *Manual of California Vegetation* (Sawyer et al. 2009;) and *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986).

ArcGIS version 10.3.1 software was used to create a GIS dataset of land cover types. The mapping process involved digitizing polygons on screen from the data sources listed above, followed by field verification and a formal accuracy assessment. Digitizing was conducted while viewing the aerial imagery at mapping scales of 1:4,800 to 1:6,000. Once digitized, polygons were assigned to land cover types on the basis of the criteria in the land cover type definitions.

Land cover type data were used to identify all natural communities in the study area. These natural communities were referenced to the current standard list of natural communities to determine if any are considered of special concern (S1–S3 rank) (California Department of Fish and Game 2010). Stands of natural communities in the study area considered of special concern were assessed for whether they can be considered high-quality occurrences of the given community. High-quality occurrences lack invasive exotic species, have little evidence of human-caused disturbance, show continued reproduction, and do not have significant insect infestation or disease damage (California Department of Fish and Wildlife 2018a). Natural communities of special concern that met this criteria were determined to have the potential to occur in the study area.

A search of the USFWS species database, CNDDB records, CNPS online *Inventory of Rare and Endangered Plants of California* (California Native Plant Society 2020a) (Appendix K, *Supporting Biological Resources Information*), and literature review identified special-status plant species with known occurrences in the four USGS 7.5-minute quadrangles of the study area. Appendix K provides a list of special-status plant species with the potential to occur in the study area based on the presence of suitable habitat, range of the species, and occurrences of the species within 2 miles of the study area.

Wildlife and Fish

Wildlife and fish are invariably associated with and their potential for occurrence determined by land cover types present. Consequently, wildlife and fish analysis methods are based on and include those used to determine land cover types described in Section 3.4.3.1, *Land Cover Types and Associated Wildlife.*

In addition to using existing datasets, an ICF biologist conducted field visits to accessible portions of the study area to develop and verify land cover mapping, as well as note wildlife species observed and determine suitability and quality of land cover types to support special-status wildlife and fish species known to occur in the study area. Visual inspections were conducted from locations accessible by public or agricultural roads and the UPRR ROW.

A query of the USFWS Environmental Conservation Online System (ECOS) Information for Planning and Conservation (IPaC) database, CNDDB records, and a literature review identified special-status wildlife and fish species with known occurrences within the study area (Appendix K). Appendix K also provides a list of special-status wildlife and fish species with the potential to occur in the study area based on the presence of suitable habitat, range of the species, and occurrences of the species within 2 miles of the study area. Known native and resident fish and wildlife movement and migration corridors are described and potential impacts are qualitatively analyzed.

Wetlands

Wetlands and non-wetland waters, where accessible, were identified in the study area using the routine onsite determination method described in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the supplemental procedures and wetland indicators provided in the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region* (U.S. Army Corps of Engineers 2008) for guidance.

Wetland boundaries were determined by establishing representative data points to evaluate the presence or absence of indicators of hydrophytic vegetation, hydric soil, and wetland hydrology, the three federal wetland parameters. The boundaries of inland non-wetland waters were identified by

locating the OHWM, which represents the lateral extent of USACE jurisdiction over non-tidal, non-wetland waters in the absence of adjacent wetlands (33 C.F.R. 328.4(c)). For non-wetland waters, the OHWM was identified using the field indicators provided in C.F.R., Title 33, Sections 328.3(e) and 329.11(a)(1) and *A Guide to Ordinary High Water Mark (OWHM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States* (U.S. Army Corps of Engineers 2014).

Base maps were used during fieldwork to record observations and for mapping purposes. The base maps consisted of 2012 aerial imagery obtained from Microsoft Bing Maps at a scale of 1 inch = 50 feet. The delineators used a resource-grade global positioning system (GPS) unit with sub-meter accuracy, supplemented with aerial photograph interpretation, to map the boundaries of wetlands and non-wetland waters, sample point locations, and the locations of representative photographs taken during the site visits. All GPS data collected in the field were downloaded and differentially corrected using the nearest available base-station data.

In some instances, private land could not be accessed to obtain soil data points and determine wetland boundaries. In these instances, field notes were taken on observable indicators of hydrophytic vegetation and wetland hydrology, and aerial photographs and USFWS National Wetland Inventory maps (U.S. Fish and Wildlife Service 2018) were reviewed to make a determination.

Species Evaluation

Based on the results of the desktop review and field surveys, ICF developed lists of special-status species and other sensitive biological resources (e.g., waters of the United States) potentially occurring in the study area. Appendix K, *Supporting Biological Resources Information*, contains a list of candidate, sensitive, and special-status wildlife species that could potentially occur in the study area. For informational purposes, these tables also include species that have been determined to have no potential to occur in the study area.

For the purposes of this EIR, *special-status species* are defined as follows.

- Species listed or proposed for listing as threatened or endangered under the ESA (50 C.F.R. 17.12 for listed plants, 50 C.F.R. 17.11 for listed animals, and various notices in the *Federal Register* [FR] for species proposed for listing).
- Species that are candidates for possible future listing as threatened or endangered under ESA.
- Species that are listed or proposed for listing by the state as threatened or endangered under CESA (14 California Code of Regulations [Cal. Code Regs.] 670.5).
- Species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines 15380).
- Plants listed as rare under the California Native Plant Protection Act (Fish & G. Code 1900 et seq.)
- Plants with a California Rare Plant Rank of 1A, 1B, 2A, or 2B (California Native Plant Society 2020b).
- Animals designated as California Species of Special Concern by CDFW (California Department of Fish and Wildlife 2020b).

- Animals that are fully protected in California (Fish & G. Code 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).
- Bats identified as medium or high priority on the Western Bat Working Group regional priority species matrix (Western Bat Working Group 2020).

To refine the list of species potentially affected by construction and operation of the Proposed Project or the Atwater Station Alternative, ICF biologists evaluated the species for their potential to occur in the study area (Appendix K).

- Species rated as being "absent" have either no suitable habitat within their range in the study area, or a range that excludes the study area.
- Species rated as being "present" are those species for which low- to high-quality habitat occurs within their range or suitable habitat occurs in the study area.

Species rated as having suitable habitat in the study area were considered in the impact analysis.

With this approach, ICF biologists identified the following special-status species as potentially occurring in the study area as shown in Table 3.4-2.

Table 3.4-2. Special-Status Species Potentially Occurring in the Study Area

Species	
Plants	
Alkali milk vetch	Heartscale
California alkali grass	Lesser saltscale
Colusa grass	Prostrate vernal pool navarretia
Coulter's goldfields	Sanford's arrowhead
Delta button-celery	San Joaquin spearscale
Dwarf downingia	San Joaquin Valley Orcutt grass
Hairy Orcutt grass	Spiny-sepaled button-celery
Succulent owl's clover	Watershield
Vernal pool smallscale	
Total Number of Special-Status Plant Species: 17	
Wildlife	
Conservancy fairy shrimp	Grasshopper sparrow
Vernal pool fairy shrimp	White-tailed kite
Vernal pool tadpole shrimp	Mountain plover
Valley elderberry longhorn beetle	Burrowing owl
Western monarch butterfly	Loggerhead shrike
Crotch bumble bee	Song sparrow (Modesto population)
California tiger salamander	Tricolored blackbird
Western spadefoot toad	Yellow-headed blackbird
Western pond turtle	Pallid bat
Coast horned lizard	Townsend's big-eared bat
Northern California legless lizard	Hoary bat
Giant garter snake	Western mastiff bat

Species	
Golden eagle	Western red bat
Short-eared owl	San Joaquin kit fox
Swainson's hawk	American badger
Northern harrier	
Total Number of Special-Status Wildlife Species: 31	
Fish	
Kern Brook lamprey	Central Valley Chinook salmon
Pacific lamprey	Sacramento splittail
Central Valley steelhead	Hardhead
Total Number of Special-Status Fish Species: 6	

3.4.4.2 Thresholds of Significance

The CEQA Guidelines Appendix G (14 Cal. Code Regs. 15000 et seq.) has identified significance criteria to be considered for determining whether a project could have significant impacts on biological resources.

An impact would be considered significant if construction or operation of the project would have any of the following consequences.

- 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 CDFW or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS.
- Have a substantial adverse effect on state or federally protected (including, but not limited to, marshes, vernal pools, and coastal wetlands) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted HCP, natural community conservation plan (NCCP), or other approved local, regional, or state HCP.

Direct impacts on biological resources are those that take place within the environmental footprint of the Proposed Project or the Atwater Station Alternative. *Indirect impacts* on biological resources differ based on resource type and include impacts that are temporally or spatially separated from direct impacts. *Indirect impacts* are expected to occur within the environmental footprint of Proposed Project or the Atwater Station Alternative, as well as within the resource-specific buffers as defined in Section 3.4.3, *Environmental Setting*.

3.4.4.3 Impacts and Mitigation Measures

For the purposes of organization and due to the large number of mitigation measures, please note that the text of the mitigation measures is presented at the end of this document in Section 3.4.4.5, *Mitigation Measures for Biological Resources*. Please refer to that section to review the contents of the mitigation measures referenced under each impact.

Impact BIO-1	Construction of the Proposed Project could remove or degrade special-status plants and their habitat.
Level of Impact Prior to Mitigation	**Potentially significant impact** Proposed Project Ceres to Merced Extension Alignment **No impact** Proposed Project Turlock Station Livingston Station Merced Station Merced Layover & Maintenance Facility Alternative Analyzed at an Equal Level of Detail Atwater Station Alternative
Mitigation Measures	BIO-1.1: Conduct preconstruction surveys for special-status plant species BIO-1.2: Prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species BIO-1.3: Document affected special-status plant species BIO-1.4: Prevent introduction or spread of invasive plant species HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters
Level of Impact after Mitigation	**Less than significant impact**

Impact Characterization

Construction for the majority of Proposed Project would occur within the existing UPRR ROW and would disturb ruderal areas with limited potential to support special-status plant species. Although unlikely, special-status plant species could be present within the existing UPRR ROW during construction. Outside of the existing UPRR ROW, special-status plant species have the potential to occur in natural land cover with suitable habitat characteristics (e.g., clay soils, riparian vegetation, and sandy soils).

If and where special-status plant species are present, ground disturbance activities could result in the direct mortality of individuals through the removal of vegetation, crushing, trampling, introduction of nonnative or invasive plants, and degradation or loss of habitat. Other temporary construction impacts on special-status plant species would include air pollution from dust and construction and removal of vegetation that would likely regenerate within 1 year. Additionally, there is potential for runoff of sediment and contaminants (e.g., oil, grease, concrete) into upland areas and waterbodies adjacent to construction activities, which would decrease habitat quality and potentially affect special-status plant species.

Impact Details and Conclusions

Proposed Project

The Turlock Station, Livingston Station, Merced Station, and Merced Layover & Maintenance Facility are located within developed and ruderal land covers that have no potential to affect special-status plants given the lack of suitable habitat. In addition, protocol-level plant surveys conducted in 2020 in these areas resulted in no special-status plant species findings and concluded these developed and ruderal areas do not support suitable habitat. The results of these surveys are included in Appendix K, *Supporting Biological Resources Information.* As such, these proposed stations and the layover and maintenance facility are not located in areas that would support suitable habitat for special-status plant species and, thus, would have no impact on special-status plant species.

The Ceres to Merced Extension Alignment is located within developed and agricultural land cover, with small pockets of areas that support natural land cover such as aquatic riverine, riparian habitat, and wetland habitat (Table 3.4-1). In addition, grasslands and vernal pools are located near but not within the footprint of the Ceres to Merced Extension Alignment. In these natural land cover areas, construction of the Ceres to Merced Extension Alignment would remove vegetation, which could potentially affect special-status plants. Protocol-level plant surveys conducted in 2020 in the upland accessible areas containing grasslands and vernal pools resulted in no special-status plant species findings (see Appendix K). These surveys also concluded that the developed, ruderal, grassland, and vernal pool land cover types in and near the Ceres to Merced Extension Alignment do not support suitable habitat for special-status plant species.

Table 3.4-3 identifies only three special-status plant species that could be affected by habitat removal or degradation during construction of the Ceres to Merced Extension Alignment. These three species occur in riparian or wetland habitat that was inaccessible during the protocol-level plant surveys conducted in 2020. The acreages shown in Table 3.4-3 are not actual acreages of special-status plant species; these acreages are for land cover impacts proposed within riparian and wetland habitats in which these three special-status plant species may be found. The actual areas of special-status plant species would be much less than the overall land cover impacts and will be determined based on preconstruction special-status plant species surveys (per Mitigation Measure BIO-1.1).

Overall, the construction of the Proposed Project has a low likelihood to impact special-status plant species given that most of the work proposed is within the UPRR ROW dominated by developed and ruderal land cover types. However, approximately 1.90 acres (0.52 acre of riparian landcover, 0.68 acre of riverine land cover, and 0.70 acre of freshwater marsh landcover) within the footprint of the Ceres to Merced Extension Alignment would affect suitable habitat for special-status plant species, and this is a potentially significant impact.

Table 3.4-3. Impacts on Land Covers That May Contain Suitable Habitat for Special-Status Plant Species (acres)

Species of Plants	Area of Riparian and Wetland Land Cover within the Ceres to Merced Extension Alignment Footprint (acres)
Delta button-celery	1.22
Sanford's arrowhead	1.38
Watershield	0.70

Atwater Station Alternative

The Atwater Station Alternative has no potential to affect special-status plants because there is no suitable habitat for special-species plants within the developed and ruderal land covers located on the site. As such, no impact would occur from construction of the Atwater Station Alternative. Neither the proposed Livingston Station nor the Atwater Station Alternative would affect special-status plant species and there would be no difference between the Atwater Station Alternative and the proposed Livingston Station with respect to impacts on special-status plant species (both would result in no impact on special-status plant species).

Mitigation Measures

Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.3, BIO-1.4, and HYD-1.2 would apply to the Ceres to Merced Extension Alignment for construction impacts on special-status plant species. Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.3, and BIO-1.4 are described in Section 3.4.4.5, *Mitigation Measures for Biological Resources*. Mitigation Measure HYD-1.2 is described in Section 3.10, *Hydrology and Water Quality*.

Significance with Application of Mitigation

Implementation of Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.3, and BIO-1.4 would avoid or minimize impacts on special-status plants by avoidance of plants, salvage and relocation, impact documentation, and prevention of the spread of invasive plants. In addition, implementation of Mitigation Measure HYD-1.2 would require specific procedures for work adjacent to, within, or crossing surface waters. With implementation of Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.3, BIO-1.4, and HYD-1.2, impacts on special-status plant species during construction of the Proposed Project (due to the Ceres to Merced Extension Alignment) would be less than significant.

Impact BIO-2	Construction of the Proposed Project could injure or kill special-status wildlife species and remove or degrade their habitat.
Level of Impact	**Potentially significant impact**
Mitigation Measures	BIO-2.1: Conduct a worker environmental training program for construction personnel BIO-2.2: Avoid vernal pool–endemic species BIO-2.3: Avoid valley elderberry longhorn beetle BIO-2.4: Avoid California tiger salamander and western spadefoot toad BIO-2.5: Avoid western pond turtle and giant garter snake BIO-2.6: Avoid coast horned lizard and Northern California legless lizard BIO-2.7: Avoid nesting birds BIO-2.8: Avoid Swainson's hawk BIO-2.9: Compensate for Swainson's hawk foraging habitat loss BIO-2.10: Avoid burrowing owl BIO-2.11: Compensate for burrowing owl habitat loss BIO-2.12: Avoid song sparrow (Modesto population), tricolored blackbird, and yellow-headed blackbird BIO-2.13: Avoid roosting bats BIO-2.14: Avoid San Joaquin kit fox and American badger BIO-2.15: Compensate for San Joaquin kit fox and American badger habitat loss BIO-2.16: Avoid direct impacts on Western Monarch Butterfly Host Plants & Provide Compensatory Mitigation for Impacts on Monarch Butterfly Habitat
Level of Impact after Mitigation	**Less than significant impact**

Impact Characterization

Construction for the majority of the Proposed Project would occur in the existing UPRR ROW and would disturb developed/landscaped and ruderal areas with limited potential to support special-status wildlife species. Although unlikely, special-status wildlife species could be present within the existing UPRR ROW and previously disturbed areas during construction. Outside of the existing UPRR ROW, special-status wildlife species have the potential to occur in natural land cover with suitable habitat characteristics (e.g., riparian, annual grasslands, woodlands).

Construction of the Proposed Project and the Atwater Station Alternative could have direct and/or indirect effects on special-status wildlife species. Direct effects can be temporary (return to baseline within 1 year of disturbance) or permanent in duration and could be caused by the following actions.

- Injury or mortality of wildlife from construction equipment vehicle strike, crushing, and/or entombment.
- Loss or disturbance of habitat from vegetation clearing (including removal of trees, shrubs and ground cover vegetation), grading, excavating/trenching, tie and ballast installation, bridge work, and concrete work activities during construction.
- Temporary stockpiling, soil movement, construction materials, or other construction waste.
- Excavation and placement of fill.
- Soil compaction, dust, air pollution, and water runoff from the construction site.
- Increased vehicle traffic and human presence.
- Short-term construction-related noise (from equipment and human presence) and visual disturbance.
- Degradation of water quality in aquatic habitat features from construction runoff containing petroleum or concrete products.

Indirect effects on wildlife could be caused by the following actions.

- Increased light and noise levels.
- Alteration of hydrology or aquatic thermal regime.
- Damage through toxicity associated with exposure to herbicides and other chemicals.
- Introduction of invasive (nonnative) species.
- Decreased reproductive success as a result of loss of foraging and nesting habitat.
- Reduced habitat suitability and prey abundance as a result of habitat alteration or degradation.

The types of direct and indirect effects on special-status wildlife resulting from these actions would be similar wherever habitat for a given species or species group is present. For the purposes of this discussion, effects on special-status wildlife are described based on land cover types or habitat features that support special-status species (including some that support multiple species) that could be affected by the Proposed Project and the Atwater Station Alternative. A summary of the land covers that could be affected by the Proposed Project and the Atwater Station Alternative and the associated species that could be affected is included below.

- Pond and Wetland Habitat for Special-Status Invertebrates, Amphibians, Reptiles, and Birds
    - Construction activities affecting ponds and vernal pools could, in turn, affect the following special-status species: Conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, western spadefoot toad, western pond turtle, tricolored blackbird, and yellow-headed blackbird. Potential direct effects include mortality and harm of adults, young, larvae, eggs or egg masses, and cysts occurring in aquatic and wetland habitat features within the Proposed Project and the Atwater Station Alternative footprint; permanent habitat loss; and permanent habitat degradation. Potential indirect effects include habitat degradation from invasive plants, increased light and noise levels, alteration of hydrology or aquatic thermal regime, lower reproductive success, altered normal behavior due to increased noise and light, and herbicide exposure.
- Riverine Habitat for Special-Status Amphibians and Reptiles
    - Construction activities affecting aquatic riverine habitat could, in turn, affect the following special-status species: western pond turtle and giant garter snake. Construction activities affecting vegetated irrigation canals could also impact song sparrow (Modesto population). Potential direct effects include injury or mortality of adults, young, larvae occurring in aquatic habitat features within the component footprint; permanent habitat loss; and permanent habitat degradation. Removal of vegetation along riverine habitat could harm and injury individuals. Potential indirect effects include habitat degradation from invasive plants, loss of or reduced prey based due to habitat degradation or modification, increased light and noise levels, visual and vibrational disturbance, alteration of hydrology or aquatic thermal regime, and herbicide exposure.
- Riparian Habitat for Valley Elderberry Longhorn Beetle, Western monarch butterfly, and Special-Status Reptiles, Birds, and Mammals
    - Construction activities affecting riparian habitat could, in turn, affect the following special-status species: valley elderberry longhorn beetle, Western monarch butterfly, western pond turtle, Swainson's hawk, white-tailed kite, western yellow-billed cuckoo (foraging habitat), tricolored blackbird, song sparrow (Modesto population), yellow-headed blackbird, pallid bat, hoary bat, western mastiff bat, and western red bat. Potential direct effects include injury and mortality of adults, young, larvae, and eggs occurring in riparian habitat within the improvements footprint; nest loss; roost loss and disturbance, host plant loss (e.g. *Sambucus* sp.); permanent habitat loss; and permanent habitat degradation through impacts that result in reduced host plant health. Potential indirect effects include habitat degradation from invasive plants; reduced habitat suitability from removal of vegetation cover; increased light and noise levels, alteration of vegetation composition or structure through changes to associated hydrology, alteration of sub-canopy thermal regime, fugitive dust affecting insect host plants, and herbicide/insecticide exposure.
- Grassland Habitat for Special-Status Invertebrates, Amphibians, Reptiles, Birds, and Mammals
    - Construction activities affecting grassland habitat could, in turn, affect the following special-status species: Western monarch butterfly, Crotch bumble bee (*Bombus crotchii*), California tiger salamander, western spadefoot toad, western pond turtle, coast horned lizard (*Phrynosoma blainvillii*), Northern California legless lizard (*Anniella pulchra*), short-eared owl (*Asio flammeus*), grasshopper sparrow (*Ammodramus savannarum*), northern harrier, Swainson's hawk, white-tailed kite, loggerhead shrike, mountain plover (*Charadrius*

montanus), burrowing owl, San Joaquin kit fox, and American badger. Potential indirect effects include habitat degradation from invasive plants, increased light and noise levels, decreased reproductive success, reduced prey abundance, fugitive dust affecting host or nectar plants by covering leaves and reducing plant vigor, and herbicide/insecticide exposure.

- Nesting Habitat for Special-Status Birds
  - Construction activities affecting nesting habitat (i.e., trees, shrubs, bridges, built structures, grasslands, wetlands, gravel, open areas, and river banks) could, in turn, affect the following special-status species: short-eared owl, grasshopper sparrow, Swainson's hawk, northern harrier, white-tailed kite, loggerhead shrike, tricolored blackbird, song sparrow (Modesto population), and other migratory bird species. Potential direct effects include injury and mortality of adults, young, hatchlings, and eggs occurring in nesting habitat within the construction footprint; nest abandonment or loss; permanent habitat loss; and permanent habitat degradation. Potential indirect effects include habitat degradation from invasive plants, increased light and noise levels, reduced reproductive success from loss of foraging habitat and decreased habitat suitability, and herbicide exposure.
- Roosting Habitat for Special-Status Bats
  - Construction activities affecting roosting habitat (i.e., trees, bridges, and anthropogenic structures with little human disturbance) could, in turn, affect the following special-status species: pallid bat, Townsend's big-eared bat, western red bat, hoary bat, and western mastiff bat. Potential direct effects include injury and mortality of adults and young roosting within the construction footprint; permanent loss of roost sites; permanent roosting and foraging habitat loss; and permanent habitat degradation. Potential indirect effects include habitat degradation from invasive plants and domestic wildlife; habitat fragmentation; decreased prey availability as a result of habitat loss, increased light, wind, and noise levels; alteration to roost thermal regime, and herbicide exposure.

Table 3.4-4 identifies the land cover types in the study area where special-status wildlife species have potential to occur. Table 3.4-5 identifies the special-status wildlife species that could be affected due to construction of the Proposed Project and the Atwater Station Alternative**.**

Table 3.4-4. Special-Status Wildlife Species by Land Cover Types in the Study Area

	Land Cover Types										
	Aquatic		Cropland		Developed / Landscaped	Grassland	Riparian		Ruderal	Wetland	
Special – Status Wildlife Species	Riverine	Pond	Orchard	Row Crops	Developed/ Landscaped	California Annual Grassland	Mixed Riparian Forest & Woodland	Valley Foothill Riparian	Ruderal	Freshwater Marsh	Vernal Pool
Conservancy Fairy Shrimp	--	--	--	--	--	--	--	--	--	--	X
Vernal Pool Fairy Shrimp	--	--	--	--	--	--	--	--	--	--	X
Vernal Pool Tadpole Shrimp	--	--	--	--	--	--	--	--	--	--	X
Valley Elderberry Longhorn Beetle	--	--	--	--	--	--	X	X	--	--	--
Crotch Bumble Bee	--	--	--	--	--	X	--	--	--	--	--
Western Monarch Butterfly	--	--	--	--	X	X	X	X	--	--	--
California Tiger Salamander	--	X	--	--	--	X	--	--	--	--	X
Western Spadefoot Toad	--	X	--	--	--	X	--	--	--	--	X
Western Pond Turtle	X	X	--	--	--	X	X	X	--	X	--
Coast Horned Lizard	--	--	--	--	--	X	--	--	X	--	--
Northern California Legless Lizard	--	--	--	--	--	X	--	--	X	--	--
Giant Garter Snake	X	--	--	--	--		--	--	--	X	--
Golden Eagle	--	--	--	X	--	X	X	X	X	--	--
Short-Eared Owl	--	--	--	--	--	X	--	--	--	--	--
Grasshopper Sparrow	--	--	--	--	--	X	--	--	X	X	--
Swainson's Hawk	--	--	X	X	--	X	X	X	X		--
Northern Harrier	--	--	X	X	--	X	X	X	X	X	--

	Land Cover Types										
	Aquatic		Cropland		Developed / Landscaped	Grassland	Riparian		Ruderal	Wetland	
Special – Status Wildlife Species	Riverine	Pond	Orchard	Row Crops	Developed/ Landscaped	California Annual Grassland	Mixed Riparian Forest & Woodland	Valley Foothill Riparian	Ruderal	Freshwater Marsh	Vernal Pool
White-tailed Kite	--	--	X	X	--	X	X	X	X	X	--
Mountain Plover	--	--	--	X	--	X	--	--	X	--	--
Burrowing Owl	--	--	--	X	X	X	--	--	X	--	--
Loggerhead Shrike	--	--	X	X	--	X	X	X	X	X	--
Song Sparrow (Modesto population)	X	--	--	--	--		X	X	X	X	--
Tricolored Blackbird	--	--	X	X	--	X	X	X	X	X	--
Yellow-Headed Blackbird	--	--	--	--	--	--	--	X	X	X	--
Migratory Nesting Birds	--	--	X	X	X	X	X	X	X	X	--
Pallid Bat	--	--	--	--	X	X	X	X	--	--	--
Townsend's Big-eared Bat	--	--	--	--	X	--	X	X	--	--	--
Hoary Bat	--	--	--	--	--	--	X	X	--	--	--
Western Mastiff Bat	--	--	--	--	X	--	X	X	--	--	--
Western Red Bat	--	--	X	--	--	--	X	X	--	--	--
San Joaquin Kit Fox	--	--	--	X	--	X	--	--	X	--	--
American Badger	--	--	--	X	--	X	--	--	X	--	--

Note:
"X" represents suitable habitat for species to occur at improvement locations. Habitat acreage was not estimated due to (1) the species' broad habitat requirements, or (2) the presence of atypical habitat capable of supporting the species.

Table 3.4-5. Special-Status Wildlife Species by Proposed and Alternative Facilities in the Study Area

Special – Status Wildlife Species	Proposed and Alternative Facilities					
	Ceres to Merced Extension Alignment	Turlock Station	Merced Layover & Maintenance Facility	Livingston Station	Merced Station	Atwater Station Alternative
Conservancy Fairy Shrimp	X	--	--	--	--	--
Vernal Pool Fairy Shrimp	X	--	--	--	--	--
Vernal Pool Tadpole Shrimp	X	--	--	--	--	--
Valley Elderberry Longhorn Beetle	X	--	--	--	--	--
Crotch Bumble Bee	X	--	--	--	--	--
Western Monarch Butterfly	X	--	--	--	--	--
California Tiger Salamander	X	--	X	--	--	--
Western Spadefoot Toad	X	--	X	--	--	--
Western Pond Turtle	X	--	X	--	--	--
Coast Horned Lizard	X	--	--	--	--	--
Northern California Legless Lizard	X	--	--	--	--	--
Giant Garter Snake	X	--	--	--	--	--
Golden Eagle	X	--	--	--	--	--
Short-Eared Owl	X	--	--	--	--	--
Grasshopper Sparrow	X	--	--	--	--	--
Swainson's Hawk	X	X	--	X	--	X
Northern Harrier	X	--	--	--	--	--
White-Tailed Kite	X	X	X	X	--	--
Mountain Plover	X	--	--	--	--	--
Burrowing Owl	X	X	X	X	X	X
Loggerhead Shrike	X	X	X	X	X	X
Song Sparrow (Modesto population)	X	--	--	--	--	--
Tricolored Blackbird	X	--	--	--	--	--
Yellow-Headed Blackbird	X	--	--	--	--	--
Migratory Nesting Birds	X	X	X	X	X	X
Roosting Bats	X	X	X	X	X	X
Pallid Bat	X	--	--	--	--	--
Townsend's Big-Eared Bat	X	--	--	--	--	--
Hoary Bat	X	--	--	--	--	--
Western Mastiff Bat	X	--	--	--	--	--
Western Red Bat	X	--	--	--	--	--
San Joaquin Kit Fox	X	--	--	X	--	--
American Badger	X	--	--	X	--	--

Note:
"X" represents suitable habitat for species to occur at the location of proposed and/or alternative facilities. Habitat acreage was not estimated due to (1) the species' broad habitat requirements, or (2) the presence of atypical habitat capable of supporting the species.

Impact Details and Conclusions

Proposed Project

Golden eagle, short-eared owl, bank swallow, least Bell's vireo, western yellow-billed cuckoo, and mountain plover are species that could forage within suitable habitat along the entire Proposed Project; however, these species are not known to nest in the area. Construction of the Proposed Project would not affect individuals and nests of golden eagle, short-eared owl, bank swallow, least Bell's vireo, western yellow-billed cuckoo, and mountain plover. Thus, impacts to these species would be less than significant.

Ceres to Merced Extension Alignment

The majority of the Ceres to Merced Extension Alignment would be constructed in developed land cover, with small pockets of areas that support natural land cover primarily associated with aquatic riverine and cropland (e.g., orchards, row crops) cover. The Ceres to Merced Extension Alignment would span riparian, woodland, and wetland land covers and be constructed adjacent to grassland and vernal pool cover types. In these natural land cover areas, the Ceres to Merced Extension Alignment has the potential to affect special-status wildlife.

Crotch bumble bee, Western monarch butterfly, California tiger salamander, western spadefoot toad, and western pond turtle could be affected through ground-disturbing activities in and near aquatic riverine and ponds and in adjacent upland California annual grassland land covers. Construction activities in and near aquatic riverine and freshwater marsh habitat could also affect giant garter snake, Swainson's hawk, northern harrier, white-tailed kite, mountain plover, burrowing owl, loggerhead shrike, song sparrow (Modesto population), tricolored blackbird, as well as other migratory birds. Wildlife that utilize croplands could also be affected by construction through vegetation removal and ground disturbance.

Disturbance within riparian land cover types and the removal of riparian vegetation could affect western red bat, hoary bat, pallid bat, yellow-headed blackbird, tricolored blackbird, song sparrow (Modesto population), white-tailed kite, Swainson's hawk, coast horned lizard, and western pond turtle. Construction may result in the removal of elderberry shrubs with stems 1 inch in diameter or more and could affect valley elderberry longhorn beetle. Construction activities in riparian corridor and other land covers types (e.g., grassland, developed/landscape) that remove nectar-resources and milkweed could affect Western monarch butterfly through mortality and injury of individual adults, eggs, and larvae, as well as loss of breeding and nectar resources. Disturbance within woodland cover type could also affect nesting migratory birds and roosting bats. Similarly, coast horned lizard and silvery legless lizard could be affected in areas of woodland land cover with sandy soil or thick leaf litter. Disturbance in or near freshwater marsh land cover could affect tricolored blackbird and yellow-headed blackbird. Construction near existing structures, trees, and orchards could also affect migratory and special-status nesting bird and roosting bat species.

The Ceres to Merced Extension Alignment would not be constructed in vernal pool and California annual grassland land cover; therefore, no direct impacts are anticipated to wildlife that could occupy those habitats. However, these landcovers are located immediately adjacent to and/or within 250 feet of the construction area and could be indirectly impacted. Construction of the Ceres to Merced Extension Alignment could indirectly impact vernal pool branchiopod, crotch bumble bee, Western monarch butterfly, California tiger salamander, western spadefoot toad, and coast horned lizard through alteration of hydrology, exposure to toxic chemicals and petroleum, habitat

degradation, and habitat fragmentation. Ground disturbance adjacent to California annual grassland could affect burrowing owl and grasshopper sparrow through visual disturbance and construction noise and vibration. Construction of the Ceres to Merced Extension Alignment would indirectly disturb California annual grassland, which could also affect San Joaquin kit fox and American badger foraging opportunities and movement. Construction of the Ceres to Merced Extension Alignment would affect special-status wildlife species and their habitat and would result in a potentially significant impact.

Turlock Station and Livingston Station

The Turlock Station and Livingston Station would be constructed within developed/landscaped and ruderal land covers. These land covers are characterized by areas where natural vegetation has been removed or significantly degraded by past or current human activity and have a low likelihood to affect special-status wildlife given the lack of suitable habitat and routine human disturbance.

Although developed/landscape and ruderal land cover provides low quality habitat for most special-status wildlife species, some species, such as burrowing owl, can and are known to occupy these land cover types. Ruderal land cover can also provide foraging habitat for migratory nesting birds. Roosting bats may also use built structure for day and night roost and forage over ruderal land cover. Construction of a new surface parking lot would remove and/or disturb ruderal habitat that provides low quality habitat for special-status wildlife species. Construction of the Turlock Station and the Livingston Station could affect nesting migratory bird species and roosting bat species, including loggerhead shrike, burrowing owl, white-tailed kite, hoary bat, and western mastiff bat through noise and vibration generated during construction or vegetation removal. Ground disturbance and removal of natural land cover (e.g., ruderal vegetation) could directly affect burrowing owl if present within burrows or indirectly through foraging habitat loss.

Removal or disturbance of trees that boarder the footprint of the Turlock Station could directly affect roosting bats and nesting migratory bird species. Disturbance of trees that boarder the northeastern footprint of the Livingston Station could directly affect roosting bats and nesting migratory bird species. Due to the proximity of agricultural lands, the Livingston Station could provide potential nesting habitat for Swainson's hawk. Construction noise, visual disturbance, and increased human presence could affect nesting activity of Swainson's hawk, if present. Additionally, construction of the Livingston Station could affect San Joaquin kit fox and American badger directly if individuals are present or indirectly through habitat loss for movement or foraging. Construction of the Turlock Station and the Livingston Station would affect special-status wildlife species and their habitat and would result in a potentially significant impact.

Merced Layover & Maintenance Facility

The Merced Layover & Maintenance Facility would be constructed within an industrial area that is predominately comprised of developed/landscape land cover and two parcels of ruderal land covers. These land covers are characterized by areas where natural vegetation has been removed or significantly degraded by past or current human activity and have a low likelihood to affect special-status wildlife given the general lack of suitable habitat and routine human disturbance.

Although developed/landscape and ruderal land cover provides low quality habitat for most special-status wildlife species, some species such as burrowing owl, can and are known to occupy these land cover types. Ruderal land cover can also provide foraging habitat for migratory nesting birds. Roosting bats may also use built structure for day and night roost and forage over ruderal land

cover. Construction of the Merced Layover & Maintenance Facility could affect nesting migratory bird species and roosting bat species, including loggerhead shrike, burrowing owl, white-tailed kite, Swainson's hawk, and hoary bat through construction activities that generate noise and vibration and removal of vegetation (including trees and ground cover). Ground disturbance and removal of natural, low vegetation could directly affect burrowing owl if present within burrows or indirectly through loss of foraging habitat. Removal or disturbance of trees that boarder the western footprint of the Merced Layover & Maintenance Facility could directly affect nesting birds and tree roosting bat species, such as hoary bat (if present).

Construction noise, visual disturbance, and increased human presence could affect nesting activity of Swainson's hawk. Aquatic pond habitat is located outside of the construction footprint, but within 100 feet of the proposed Merced Layover & Maintenance Facility. Construction activities have the potential to indirectly affect pond habitat and the associated wildlife species, including California tiger salamander, western spadefoot toad, western pond turtle, tricolored blackbird, and yellow-headed blackbird. Airborne fugitive dust and debris generated from construction activity could alter the habitat suitability of pond habitat; increased noise, light, and vibration could alter normal behaviors of wildlife that utilize pond habitat; and wildlife may avoid using the area due to increased human presence. Construction of the Merced Layover & Maintenance Facility would affect special-status wildlife species and their habitat and would result in a potentially significant impact.

Merced Station

The Merced Station would be constructed in developed/landscape land cover. Developed/landscape land cover type is characterized by areas where natural vegetation has been removed or significantly degraded by past or current human activity and has a low likelihood to affect special-status wildlife given the lack of suitable habitat and routine human disturbance.

Although developed/landscape provides low quality habitat for most special-status wildlife species, some species such as burrowing owl, can and are known to occupy developed/landscape land cover. Additionally, roosting bats can use built structures for day and night roosts. Construction of the Merced Station could affect nesting bird species and roosting bat species, including loggerhead shrike, burrowing owl, other nesting migratory birds, pallid bat, and western mastiff bat through noise, vibration, lights, generated during construction or removal of suitable habitat. Ground disturbance and removal of natural land cover (i.e., in a patch of ruderal vegetation located between built structures) could directly affect burrowing owl, if present within burrows, or indirectly through foraging habitat loss. Removal of ruderal vegetation could also affect foraging bats. Construction of the Merced Station would affect special-status wildlife species and their habitat and would result in a potentially significant impact.

Atwater Station Alternative

Golden eagle, short-eared owl, bank swallow, least Bell's vireo, western yellow-billed cuckoo, and mountain plover could forage within suitable habitat of the Atwater Station Alternative; however, these species are not known to nest in the area. Construction of the Atwater Station Alternative would not affect individuals and nests of golden eagle, short-eared owl, bank swallow, least Bell's vireo, western yellow-billed cuckoo, and mountain plover. Thus, impacts to these species would be less than significant.

The Atwater Station Alternative would be constructed within previously disturbed and developed land cover. These land covers are characterized by areas where natural vegetation has been

removed or significantly degraded by past or current human activity and have a low likelihood to affect special-status wildlife given the lack of suitable habitat and routine human disturbance. Although developed/landscape and ruderal land cover provides low quality habitat for most special-status wildlife species, some species such as burrowing owl, can and are known to occupy these land cover types. Ruderal land cover can also provide foraging habitat for migratory nesting birds. Roosting bats may also use built structure for day and night roost and forage over ruderal land cover. Construction of the Atwater Station Alternative would remove and/or disturb developed and ruderal habitat that provides low quality habitat for special status roosting bats and nesting migratory birds. Construction of Atwater Station Alternative would result in impacts on special-status wildlife species and their habitat and would be potentially significant.

Mitigation Measures

Mitigation Measures BIO-2.1 through BIO-2.16 would apply to the Proposed Project for construction impacts on special-status wildlife species and their habitat. Mitigation Measures BIO-2.1 through BIO-2.16 are described in Section 3.4.4.5, *Mitigation Measures for Biological Resources*. Table 3.4-13 in Section 3.4.4.5 identifies which mitigation measures would apply to which specific improvements.

Mitigation Measures BIO-2.1, BIO-2.7, BIO-2.10, BIO-2.11, and BIO-2.13 would apply to the Atwater Station Alternative.

Significance with Application of Mitigation

Implementation of Mitigation Measures BIO-2.1 through BIO-2.16 would reduce the likelihood of wildlife injury or mortality during construction and require compensation for habitat loss through in-kind habitat preservation, enhancement, and/or creation. With implementation of these measures, impacts on special-status wildlife species during construction of the Proposed Project would be less than significant.

Likewise, with the implementation of Mitigation Measures BIO-2.1, BIO-2.7, BIO-2.10, BIO-2.11, and BIO-2.13, impacts on special-status wildlife species during construction of the Atwater Station Alternative would be less than significant.

Comparison of the Proposed Livingston Station and Atwater Station Alternative

Implementation of the Livingston Station could affect six special-status wildlife species, compared to the Atwater Station Alternative, which could affect three special-status wildlife species, if present. Both the Livingston Station and the Atwater Station Alternative could affect migratory nesting birds and roosting bats. The Livingston Station, compared to the Atwater Station Alternative, could result in greater wildlife habitat disturbance. Nonetheless, both the Atwater Station Alternative and the Livingston Station would result in a less-than-significant impact on special-status wildlife species after implementation of mitigation.

Impact BIO-3	Construction of the Proposed Project could injure or kill special-status fish and remove or degrade their habitat.
Level of Impact	**Potentially significant impact** Proposed Project Ceres to Merced Extension Alignment **No impact** Proposed Project Turlock Station Livingston Station Merced Station Merced Layover & Maintenance Facility Alternative Analyzed at an Equal Level of Detail Atwater Station Alternative
Mitigation Measures	BIO-2.1: Conduct a worker environmental training program for construction personnel BIO-3.1: Implement noise reduction measures for pile driving BIO-3.2: Develop and implement a hydroacoustic monitoring plan to minimize noise effects on fish BIO-3.3: Implement seasonal restrictions for in-water work BIO-4.1: Avoid and protect wetlands during construction BIO-4.2: Compensate for impacts on jurisdictional wetlands and non-wetland waters of the United States (aquatic resources) prior to improvements impacts during construction BIO-5.1: Avoid and protect sensitive natural communities, including riparian habitat, during construction BIO-5.2: Compensate for loss of sensitive natural communities (including riparian habitat) HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters
Level of Impact after Mitigation	**Less than significant impact**

Impact Characterization

Construction for the majority of the Proposed Project would occur in the existing UPRR ROW and would disturb areas that were previously disturbed with low-quality habitat for special-status fish species. Special-status fish species have the potential to occur in natural land cover with suitable habitat characteristics (e.g., stream crossings for new bridges). The Merced River and Bear Creek provide habitat for Central Valley steelhead, Chinook salmon, Pacific and Kern Brook lamprey, splittail, and hardhead. The Merced River in the study area provides adult and juvenile salmonid migration habitat and also juvenile salmonid rearing habitat. It provides rearing habitat for the other special-status species. However, both migration habitat and rearing habitat is listed as periodic and poor for salmonids (National Oceanic and Atmospheric Administration 2020). Bear Creek in the study area has slow moving water and likely warm temperatures during the summer months. The creek is highly disturbed and surrounded by invasive terrestrial vegetation and riprapped banks.

Impact Details and Conclusions

Proposed Project

Construction of the Turlock Station, Livingston Station, Merced Station, and Merced Layover & Maintenance Facility would not affect aquatic habitat and, thus, would have no impact on special-status fish species.

Impacts on Habitat

Table 3.4-6 identifies the area of special-status fish habitat that could be affected by the Proposed Project due to the installation of bridges over the Merced River and Bear Creek (as a part of the Ceres to Merced Extension Alignment).

Table 3.4-6. Habitat Impacts on Special-Status Fish Species Due to the Ceres to Merced Extension Alignment

Special-Status Fish Species Habitat (acres)				
Central Valley Steelhead	**Central Valley Fall/ Late-Fall Run Chinook Salmon**	**Pacific and Kern Brook Lamprey**	**Hardhead**	**Sacramento Splittail**
0.2	0.2	0.2	0.2	0.2

Note: The following calculations were conducted to determine the potential impact to habitat for special-status fish species.

- The bridge over the Merced River would have no permanent impact on habitat for special-status fish species because no piles would be permanently placed in the Merced River. The bridge over Bear Creek would permanently affect 81 square feet (0.002 acre) of habitat for special-status fish species habitat. This is due to the placement of 27 H-piles in the water, each of which would affect 3 square feet of Bear Creek.
- The estimated surface area of the temporary work trestle over the Merced River is 5,000 square feet (0.11 acre) and the estimated surface area of the temporary work trestle over Bear Creek is 4,000 square feet (0.09 acre). The temporary impact to the Merced River and Bear Creek is conservatively estimated to be 5,000 square feet and 4,000 square feet, respectively. The actual impacts on this river and creek would be lower because the temporary impact area would be limited to the areas where the piles would be installed within the water for the construction of the temporary work trestle. No dewatering would be required for the installation of a temporary work trestle.
- In summary, the installation of the bridges is expected to result in a 0.002-acre permanent impact and 0.2-acre temporary impact on the habitat of special-status fish species.

Direct impacts on habitat would be limited to the installation of piles in the Merced River and Bear Creek. No piles would be placed in the Merced River; therefore, there would be no permanent direct impact on the Merced River. A total of 27 piles would be placed in Bear Creek, which would result in a permanent direct impact of 81 square feet (0.002 acre). The installation of the bridges over the Merced River and Bear Creek would both require the installation of temporary work trestles over the river and creek. These work trestles would be removed when construction is completed and would, therefore, be considered a temporary impact. The temporary impact on the Merced River and Bear Creek is conservatively estimated to be 5,000 square feet (0.11 acre) and 4,000 square feet (0.09 acre), respectively. The actual impacts on this river and creek would be lower because the temporary impact area would be limited to the areas where the temporary piles would be installed within the water for the construction of the temporary work trestle.

If and where fish species are present, ground-disturbance activities could result in impacts on special-status species through degradation or loss of habitat and reduction in number of available prey. SRA cover, which is defined as nearshore aquatic habitat and adjacent woody riparian habitat

that provides shade and cover in the stream or river, is important habitat for special-status fish species. Construction of new bridges could result in loss of riparian habitat. Riparian vegetation removal along creek and riverbanks affects fish habitat. Removal of SRA can cause an increase in water temperature, decrease in cover, and decrease in invertebrates that are prey for fish. Additionally, there is potential for runoff of sediment and contaminants (i.e., oil, grease, concrete) into waterbodies that may be adjacent to construction activities, which would decrease water quality for aquatic species.

The permanent and temporary impacts on aquatic habitat, the loss of SRA cover, and the potential impacts on water quality due to construction of the bridges over the Merced River and Bear Creek (as a part of the Ceres to Merced Extension Alignment) could result in a potentially significant impact on special-status fish.

Impacts due to Noise from Pile Driving

Construction noise and vibration from pile driving could result in a temporary impact on special-status fish species.

Thresholds for Noise Impacts on Special-Status Fish

The assessment of impacts on special-status fish species due to noise from pile driving was based on consideration of specific noise thresholds and ambient noise levels.

Noise, vibrations, and other physical disturbances can harass fish, disrupt or delay normal activities, or cause injury or mortality. In fish, the hearing structures and swim bladder and surrounding tissues are particularly vulnerable to high-pressure sounds (Popper et al 2006). The type and severity of effects depends on several factors, including the intensity and characteristics of the sound, the distance of the fish from the source, the timing of actions relative to the occurrence of sensitive life stages, and the frequency and duration of the noise-generating activities. The range of effects includes physical injury (including hearing loss), stress, mortality, and behavioral effects. Pile driving could harm fish because of the underwater noise it produces. Sound levels from project-related impact pile driving in or near open water often have the intensity to injure or kill fish within a certain radius. These high sound-pressure levels can rupture the swim bladder and damage other sensitive tissues and organs. Noise from Proposed Project-related pile driving can also damage hearing organs, which can temporarily affect hearing sensitivity, communication, and the ability to detect predators or prey. Pile driving can also produce continuous lower-energy sounds, below the thresholds associated with direct injury, that cause behavioral effects (e.g., startle or avoidance responses) as well as temporary hearing loss or physiological stress, depending on the duration of exposure.

Since 2000, transportation agencies, resource agencies, ports, and other entities have been developing criteria for determining impacts and appropriate mitigation measures to protect fish from substantial harm due to underwater pile-driving sounds. In 2004, the California Department of Transportation (Caltrans) established a Fisheries Hydroacoustic Working Group (FHWG) to facilitate the development of interim criteria, based on best available scientific information. The FHWG includes participants from Caltrans, the Washington Department of Transportation, Oregon Department of Transportation, NMFS, USFWS, CDFW, and USACE. The FHWG is supported by a panel of hydroacoustic and fisheries experts and overseen by a steering committee composed of managers with decision-making authority from each of the members' organizations.

In June 2008, member agencies of the FHWG agreed in principle to interim criteria for assessing injuries to fish from underwater sound pressure caused by in-water use of an impact hammer. The criteria identified thresholds, both for the peak sound-pressure level (i.e., the largest absolute value of instantaneous sound pressure) and the cumulative sound exposure level (SEL) (i.e., the sum of acoustical energy over all pile strikes), for the onset of physical injury to fish. Different cumulative SELs are established for fish that are greater than or equal to 2 grams and fish that are less than 2 grams. This is because smaller fish are more susceptible to injury. Physical injury to fish is expected if either of these thresholds is exceeded. The FHWG thresholds for peak noise levels and accumulated sound levels are identified in Table 3.4-7.

Table 3.4-7. Summary of Impact Pile Driving Noise Thresholds for Fish

Peak Noise Level Injury Evaluation	
Injury Threshold (dB)	206 dB
Peak Noise Level Injury Evaluation	
Injury Thresholds (Cumulative SEL)	Fish ≥ 2 g (187 dB); Fish < 2 g (183 dB)
Peak Noise Level Injury Evaluation	
NMFS Threshold (RMS)	150 dB
Upper Range of Background levels	160 dB

Source: California Department of Transportation 2005.
dB = decibels.
SEL = sound exposure level.
NMFS = National Marine Fisheries Service.
RMS = root mean squared.

The injury thresholds criteria above are not considered appropriate for assessing the effects of Proposed Project-related vibratory pile driving. Vibratory hammers generally produce less sound than impact hammers because they generally produce continuous and lower-intensity sound that is below the levels known to cause injury in fish. Vibratory drivers are often included in mitigation measures to reduce the adverse effects on fish that result from impact pile driving. There are no established injury criteria for fish related to vibratory pile driving, and resource agencies in general are not concerned about vibratory pile driving resulting in adverse effects on fish. (California Department of Transportation 2015).

Little is known about how pile driving and other sources of human-generated noise actually affect behavior in fish. However, it is thought that underwater noise may disrupt or alter essential behavior or activities (e.g., migration, feeding, sheltering) and affect a fish's ability to grow, survive, or reproduce (California Department of Transportation 2015). NMFS recommends a separate threshold of 150 decibels (dB) root mean squared (RMS) for the behavioral effects of listed salmonids when evaluating impact pile driving (California Department of Transportation 2015). However, there is no scientific support for this criterion or evidence to determine its applicability to particular species.

Noise from vibratory pile driving and cast-in place piles, which are drilled, are not expected to result in injury to fish. Noise from pile driving due to the installation of the bridge over the Merced River and Bear Creek for the Ceres to Merced Extension Alignment could, however, affect special-status fish, kill or injure special-status fish and furthermore, riparian vegetation removal along the creek banks due to the Ceres to Merced Extension Alignment would decrease fish habitat quality.

Merced River

For the bridge over the Merced River, an estimated twenty H-piles (16-inch) would be installed 45 to 185 feet away from the water's edge using an impact hammer. The assessment of pile-driving noise from an impact hammer was based on measured sound levels from similar pile-driving projects (California Department of Transportation 2015). The sound analysis considered impact pile driving without the use of an attenuation method to mitigate underwater sound levels as no pile driving would be taking place in the water. Approximately 500 hammer strikes would be required to install each pile. The Project engineer estimated that five H-piles would be driven per day; based on this rate of construction, impact driving would occur over 2 working days. The resultant sound-level estimates for impact hammer pile driving relative to the injury thresholds as well as the behavioral effects threshold are shown in Table 3.4-8.

Peak sound levels (206 dB) generated by impact pile driving would not exceed the injury thresholds for fish within 33 feet from pile driving; such sound levels would be unlikely to result in fish injury. Cumulative sound levels from pile driving for fish both greater than and less than 2 grams exceed the injury thresholds within 141 feet to 223 feet of the piles, respectively (Table 3.4-8).

In addition to potential injury effects on fish, pile driving may also result in behavioral effects if sound levels exceed both the NMFS behavioral threshold (150 dB RMS) and the upper range of background levels (160 dB RMS). The analysis shows that sound levels would exceed 150 dB RMS within 1,213 feet of the pile-driving location (Table 3.4-8). Therefore, behavioral effects could occur in proximity to pile driving. However, as noted, behavioral effects on fish are not well understood; therefore, it is difficult to assess the definitive significance of such effects in the limited area in proximity to impact pile-driving separate from the injury effects. Given the poor quality habitat for listed fish species and the limited construction period, it is not expected that impact pile-driving effects on fish behavior would result in measurable long-term physical effects on listed fish populations, although individual fish may experience temporary stress.

Bear Creek

For the bridge over Bear Creek, an estimated eighteen H-piles (14-inch) would be installed 5 to 35 feet away from the water's edge and 27 H-piles (14-inch) would be installed in the water using an impact hammer. Approximately 500 hammer strikes would be required to install each pile. The Project engineer estimated that five H- piles would be driven per day; based on this rate of construction, impact driving would occur over 9 working days. The resultant sound-level estimates for impact hammer pile driving relative to the injury thresholds as well as the behavioral effects threshold are shown in Table 3.4-9.

Peak sound levels (206 dB) generated by impact pile driving would not exceed the injury thresholds for the protection of fish within 33 feet from pile driving; such sound levels would be unlikely to result in fish injury. Cumulative sounds levels from pile driving for fish both greater than and less than 2 grams exceed the injury thresholds within 305 feet to 482 feet of the piles, respectively (Table 3.4-9).

In addition to potential injury effects on fish, project-related impact pile driving may also result in behavioral effects if sound levels exceed both the NMFS behavioral threshold (150 dB RMS) and the upper range of background levels (160 dB RMS). The analysis shows that sound levels would exceed 150 dB RMS within 2,611 feet of the pile-driving location (Table 3.4-9). Therefore, behavioral effects could occur in proximity to pile driving. However, as noted, behavioral effects on fish are not well

understood; therefore, it is difficult to assess the definitive significance of such effects in the limited area in proximity to impact pile-driving separate from the injury effects. Given the poor quality habitat for listed fish species and the limited construction period, it is not expected that impact pile-driving effects on fish behavior would result in measurable long-term physical effects on listed fish populations, although individual fish may experience temporary stress.

Table 3.4-8. Summary of Effects of Impact Pile Driving from Merced River Bridge on Special-Status Fish

Pile Location	Pile Diameter/ Type	Driver	Piles per Day	Project Engineers Estimate of Strikes per Pile	Estimate of Total Strikes per Day	Underwater Sound Level Assumptions[a]				Cumulative SEL at Reference Distance	Transmission Loss Constant	Distance (feet) to Threshold			
												Onset of Physical Injury			Behavior
												Peak	Cumulative SEL dB		RMS
												dB	Fish ≥ 2 g	Fish < 2 g	dB
						Peak	SEL	RMS	Reference Distance (m)			206 dB	187 dB	183 dB	150 dB
Land - 135 feet from water's edge	14-inch H-pile	Impact Hammer	5	500	2500	181	158	169	20	192	15	**	141	223	1,213
Land - 105 feet from water's edge	14-inch H-pile	Impact Hammer	5	500	2500	181	158	169	20	192	15	**	141	223	1,213
Land - 75 feet from water's edge	14-inch H-pile	Impact Hammer	5	500	2500	181	158	169	20	192	15	**	141	223	1,213
Land - 45 feet from water's edge	14-inch H-pile	Impact Hammer	5	500	2500	181	158	169	20	192	15	**	141	223	1,213
Land - 185 feet from water's edge	14-inch H-pile	Impact Hammer	8	500	2500	181	158	169	20	192	15	**	141	223	1,213

[a] Source: California Department of Transportation 2015. Table I.2-3b. Weiser River Bridge 14-inch H piles driven on land. Reduced by 5 dB for pile driving on land.

** Criterion not exceeded beyond 33 feet.
SEL = sound exposure level.
RMS = root mean square.
m = meters.
dB = decibels.
g = grams.

Table 3.4-9. Summary of Effects of Impact Pile Driving from Bear Creek Bridge on Special-Status Fish

Pile Location	Pile Diameter/ Type	Driver	Piles per Day	Project Engineers Estimate of Strikes per Pile	Estimate of Total Strikes per Day	Underwater Sound Level Assumptions[a]				Cumulative SEL at Reference Distance	Transmission Loss Constant	Distance (feet) to Threshold			
												Onset of Physical Injury			Behavior
												Peak	Cumulative SEL dB		RMS
												dB	Fish ≥ 2 g	Fish < 2 g	dB
						Peak	SEL	RMS	Reference Distance (m)			206 dB	187 dB	183 dB	150 dB
On land 35 feet from water's edge	14-inch H-pile	Impact Hammer	5	500	2500	181	158	169	20	192	15	**	141	223	1,213
On land 20 feet from water's edge[b]	14-inch H-pile	Impact Hammer	5	500	2500	186	163	174	20	197	15	**	305	561	2,611
On land 5 feet from water's edge	14-inch H-pile	Impact Hammer	5	500	2500	186	163	174	20	197	15	**	305	561	2,611
On land 5 feet from water's edge	14-inch H-pile	Impact Hammer	5	500	2500	186	163	174	20	197	15	**	305	561	2,611
On land 20 feet from water's edge	14-inch H-pile	Impact Hammer	5	500	2500	186	163	174	20	197	15	**	305	561	2,611
On land 35 feet from water's edge	14-inch H-pile	Impact Hammer	5	500	2500	181	158	169	20	192	15	**	141	223	1,213
In water	14-inch H-pile	Impact Hammer	5	500	2500	186	163	174	20	197	15	**	305	561	2,611

[a] Source: California Department of Transportation 2015. Caltrans 2015. Table I.2-3b. Weiser River Bridge 14-inch H piles driven on land. Reduced by 5 dB for pile driving on land.
[b] Source levels for H piles are piles driven on land. 5 dB added to source levels for piles driven in water or located 20 feet or less from the water.
** Criterion not exceeded beyond 33 feet.
SEL = sound exposure level.
RMS = root mean squared.
m = meters.
dB = decibels.
g = grams.

Summary of Impacts at Merced River and Bear Creek

Due to the poor quality of habitat and warm water temperatures, it is unlikely that special-status fish species would be present in the pile driving area. Once impact pile driving begins, individual fish that approach the study area are likely to detect the sounds and avoid or bypass the potential injury impact zone. Opportunities for fish to avoid impact pile-driving sounds would also occur during periods when pile driving ceases (e.g., while repositioning equipment) and at night when pile driving would be suspended. Nonetheless, without the implementation of measures to protect special-status fish species, there is the potential for the Proposed Project to significantly impact special-status fish.

Atwater Station Alternative

Construction of the Atwater Station Alternative would not affect aquatic habitat and, thus, would have no impact on special-status fish species. Neither the proposed Livingston Station nor the Atwater Station Alternative would affect special-status fish species as they both lack suitable aquatic habitat to support fish species. Therefore, there would be no difference between the Atwater Station Alternative and the proposed Livingston Station with respect to impacts on special-status fish species because they would both result in no impact on special-status fish species.

Mitigation Measures

Mitigation Measures BIO-2.1, BIO-3.1, BIO-3.2, BIO-3.3, BIO-4.1, BIO-4.2, BIO-5.1, BIO-5.2, and HYD-1.2 would apply to the Ceres to Merced Extension Alignment for impacts on special-status fish species. Mitigation Measures BIO-2.1, BIO-3.1, BIO-3.2, BIO-3.3, BIO-4.1, BIO-4.2, BIO-5.1, and BIO-5.2 are described in Section 3.4.4.5, *Mitigation Measures for Biological Resources*. Mitigation Measure HYD-1.2 is described in Section 3.10, *Hydrology and Water Quality*.

Significance with Application of Mitigation

Mitigation Measure BIO-2.1, BIO-3.1, BIO-3.2, and BIO-3.3 would minimize the potential impacts on special-status fish species due to the noise from pile driving. Mitigation Measure BIO-2.1 would require training of construction personnel, including restrictions and guidelines when working in and near sensitive habitat, such as the Merced River and Bear Creek. Mitigation Measure BIO-3.1 identifies measures that would be implemented to reduce the noise from impact pile driving. Mitigation Measure BIO-3.2 requires monitoring the noise that is generated during pile driving, as well as monitoring for the potential stress, injury, or mortality of the fish species in the area. Mitigation Measure BIO-3.3 requires that pile driving take place between June 15 to October 15, when adult steelhead and Chinook salmon would not be migrating upstream to spawn. Other special-status fish species (Pacific and Kern Brook lamprey, hardhead and splittail) in the study area during the time of impact pile driving (June 15 through October 15) would most likely be large juveniles and adults and would, therefore, be capable of moving out of the potential injury impact zone before harmful sound levels are reached. With implementation of Mitigation Measures BIO-3.1, BIO-3.2, and BIO-3.3, the potential mortality or injury of special-status fish species would be less than significant.

Mitigation Measures BIO-4.1, BIO-4.2, BIO-5.1, BIO-5.2, and HYD-1.2 would minimize the potential impacts on habitat for special-status fish species. Mitigation Measures BIO-4.1, BIO-5.1, and HYD-1.2 would require the protection of nearby riverine habitat not directly affected by the Proposed

Project, the protection of nearby riparian habitat not directly affected by the Proposed Project, and the implementation of measures to protect the water quality of the Merced River and Bear Creek during construction. Implementation of these measures would ensure the protection of nearby aquatic habitat, nearby SRA, and the water quality of habitat. As such, these potential indirect impacts on special-status fish habitat would be less than significant after mitigation. Mitigation Measures BIO-4.2 and BIO-5.2 would require compensation for the loss of aquatic and riparian habitat. As such, implementation of these measures would compensate for the loss of habitat from the Proposed Project, and the impact from the loss of special-status fish species habitat would be less than significant.

In summary, implementation of Mitigation Measures BIO-2.1, BIO-3.1, BIO-3.2, BIO-3.3, BIO-4.1, BIO-4.2, BIO-5.1, BIO-5.2, and HYD-1.2 would reduce impacts associated with the Proposed Project (due to the Ceres to Merced Extension Alignment) to a less-than-significant level by reducing the likelihood of fish mortality or injury during construction and compensating for riparian habitat loss through in-kind habitat preservation, enhancement, and/or creation.

Impact BIO-4	Construction of the Proposed Project could remove or degrade state or federally regulated wetlands and other aquatic resources.
Level of Impact Prior to Mitigation	**Potentially significant impact** Proposed Project Ceres to Merced Extension Alignment **No impact** Proposed Project Turlock Station Livingston Station Merced Station Merced Layover & Maintenance Facility Alternative Analyzed at an Equal Level of Detail Atwater Station Alternative
Mitigation Measures	BIO-4.1: Avoid and protect wetlands during construction BIO-4.2: Compensate for impacts on jurisdictional wetlands and non-wetland waters of the United States (aquatic resources) due to proposed impacts during construction
Level of Impact after Mitigation	**Less than significant impact**

Impact Characterization

The majority of the Proposed Project would occur within the existing UPRR ROW; thus, for the most part, construction of the Proposed Project would disturb areas of a ruderal and previously disturbed character, the majority of which do not support wetlands or other aquatic resources. Although the majority of the ROW is disturbed or developed, aquatic resources are present in limited portions of the Ceres to Merced Extension Alignment.

Construction activities involving ground disturbance in or near aquatic resources could affect resources through direct fill, restricting layer perforation, grading, degradation through partial

filling of the aquatic resource, or sedimentation resulting from construction-derived erosion and vegetation removal. Removal of vegetation could lead to the introduction of nonnative or invasive plants, changes to inundation duration, and degradation or loss of aquatic resources. Other temporary impacts on wetlands and other aquatic resources resulting from construction activities would include air pollution from dust and construction and removal of vegetation that would regenerate within 1 year. Additionally, there is potential for runoff of sediment and contaminants (i.e., oil, grease, concrete) into upland areas and other aquatic resources adjacent to construction activities, which would decrease the quality of aquatic resources.

Impact Details and Conclusions

Proposed Project

The Turlock Station, Livingston Station, Merced Station, and Merced Layover & Maintenance Facility do not support aquatic or wetland land cover (Table 3.4-1). Thus, these proposed stations and layover & maintenance facility would result in no impact on state or federally regulated wetlands or other aquatic resources.

Most of the Ceres to Merced Extension Alignment is in developed and cropland areas, with small areas of natural land cover primarily associated with aquatic riverine and freshwater wetland habitat along natural waterways or agricultural canals. The Ceres to Merced Extension Alignment would include the construction of new bridges over the Merced River, Canal Creek, Weber Canal, Black Rascal Canal, and Bear Creek, which would impact aquatic riverine and freshwater wetland habitats. Furthermore, the Ceres to Merced Extension Alignment would be constructed within 100 feet of one vernal pool feature adjacent to the environmental footprint.

Table 3.4-10 shows the area of aquatic resources and wetlands that are located within the environmental footprint of the Ceres to Merced Extension Alignment, and that could be directly affected by the Ceres to Merced Extension Alignment. Construction of the Ceres to Merced Extension Alignment could result in impacts on state- and federally regulated wetlands and other aquatic resources shown in Table 3.4-10. Results of the wetlands survey are included in Appendix K, *Supporting Biological Resources Information*. Both state- and federally regulated wetlands and other aquatic resources would be filled, their restricting layer perforated, graded, or a portion of their area eliminated or degraded by construction activities. The water quality of federally and state-regulated wetland resources that are adjacent to the Ceres to Merced Extension Alignment may be indirectly affected during construction. Both direct and indirect impacts on state- and federally regulated wetlands and other aquatic resources would be significant.

Table 3.4-10. Impacts on Wetland and Other Aquatic Resource (acres)

Proposed Facility	Riverine Aquatic Feature	Freshwater Marsh
Ceres to Merced Extension Alignment	0.68	0.70

Notes: Proposed and alternative facilities not listed in this table do not contain wetland or other water resource impacts. The numbers presented in this table provide a conservative estimate of the potential impacts on aquatic resources. The actual impacts might be lower than what is presented here.

Atwater Station Alternative

The Atwater Station Alternative does not support aquatic or wetland land cover (Table 3.4-1). Thus, the Atwater Station Alternative would result in no impact on state or federally regulated wetlands or other aquatic resources. Neither the proposed Livingston Station nor the Atwater Station

Alternative would affect state or federally regulated wetlands. Therefore, there would be no difference between the Atwater Station Alternative and the proposed Livingston Station with respect to impacts because they would both result in no impact on wetlands.

Mitigation Measures

Mitigation Measures BIO-4.1 and BIO-4.2 would apply to the Ceres to Merced Extension Alignment. Mitigation Measures BIO-4.1 and BIO-4.2 are described in Section 3.4.4.5, *Mitigation Measures for Biological Resources*.

Significance with Application of Mitigation

Implementation of Mitigation Measures BIO-4.1 and BIO-4.2 would avoid, minimize, or compensate for impacts on state- and federally regulated wetlands and other aquatic resource. Erosion and sedimentation measures would be employed during construction to minimize impacts on adjacent and downstream resources, and in-kind watershed restoration activities would mitigate for loss of wetland and aquatic resources. As such, impacts on state- and federally regulated wetlands and other aquatic resource from the Proposed Project (due to the Ceres to Merced Extension Alignment) would be reduced to a less-than-significant level.

Impact BIO-5	Construction of the Proposed Project could remove or degrade sensitive natural communities, including riparian habitat, identified in local or regional plans, policies, and regulations or by CDFW or USFWS.
Level of Impact Prior to Mitigation	**Potentially significant impact** Proposed Project Ceres to Merced Extension Alignment **No impact** Proposed Project Turlock Station Livingston Station Merced Station Merced Layover & Maintenance Facility Alternative Analyzed at an Equal Level of Detail Atwater Station Alternative
Mitigation Measures	BIO-4.1: Avoid and protect wetlands during construction BIO-4.2: Compensate for impacts on jurisdictional wetlands and non-wetland waters of the United States (aquatic resources) due to Proposed Project impacts during construction BIO-5.1: Avoid and protect sensitive natural communities, including riparian habitat, during construction BIO-5.2: Compensate for loss of sensitive natural communities (including riparian habitat)
Level of Impact after Mitigation	**Less than significant impact**

Impact Characterization

Table 3.4-11 identifies the potential impacts on riparian habitat and other sensitive natural communities from the Proposed Project. Table 3.4-10 provided under Impact BIO-4 identifies the impacts on aquatic and wetland habitat, which are considered sensitive natural communities. Impacts on aquatic and wetlands, their significance, and mitigation are described in detail under Impact BIO-4.

Impact Details and Conclusions

Proposed Project

The Turlock Station, Livingston Station, Merced Station, and Merced Layover & Maintenance Facility are located within developed, cropland, and ruderal land cover and would not affect sensitive natural communities given the presence of other incompatible land cover types and routine agricultural disturbance (Table 4.4-1). The Turlock Station, Livingston Station, Merced Station, and Merced Layover & Maintenance Facility would not affect sensitive natural communities and would result in no impact.

Most of the Ceres to Merced Extension Alignment is in developed and cropland areas, with small areas of natural land cover primarily associated aquatic riverine, wetlands, and riparian habitat along natural waterways. The Ceres to Merced Extension Alignment would construct new bridges over the Merced River, Canal Creek, Weber Canal, Black Rascal Canal, and Bear Creek, which would impact riparian habitats, including 0.49 acre of the sensitive natural community known as Valley Foothill Riparian and 0.52 acre of mixed riparian forest and woodland (Table 3.4-11).

Construction of the Ceres to Merced Extension Alignment could result in impacts on sensitive natural communities, including aquatic riverine resources, wetland, and riparian habitat. Where present within the affected area, portions of sensitive natural communities, including riparian habitat, would be removed or degraded. Impacts on sensitive natural communities, including riparian habitat, would be significant.

Table 3.4-11. Impacts on Sensitive Natural Communities

Proposed Facility	Valley Foothill Riparian (acres)	Mixed Riparian Forest and Woodland (acres)
Ceres to Merced Extension Alignment	0.49	0.52

Note: Proposed and alternative facilities not listed above would not involve impacts to sensitive natural communities. The numbers presented in this table provide a conservative estimate of the potential impacts on sensitive natural communities. The actual impacts might be lower than what is presented here.

Atwater Station Alternative

The Atwater Station Alternative is located within developed and ruderal land cover and would result in no impact on sensitive natural communities (Table 3.4-1). Neither the proposed Livingston Station nor the Atwater Station Alternative would affect sensitive natural communities and there would be no difference in impacts between the Atwater Station Alternative and the proposed Livingston Station (both would result in no impact).

Mitigation Measures

Mitigation Measures BIO-4.1 BIO-4.2, BIO-5.1, and BIO-5.2 would apply to the Ceres to Merced Extension Alignment. Mitigation Measures BIO-4.1, BIO-4.2, BIO-5.1, and BIO-5.2 are described in Section 3.4.4.5, *Mitigation Measures for Biological Resources*.

Significance with Application of Mitigation

Implementation of Mitigation Measures BIO-4.1, BIO-4.2, BIO-5.1, and BIO-5.2 would avoid or compensate for impacts on sensitive natural communities. Erosion and sedimentation measures would be employed during construction to minimize impacts on adjacent and downstream resources and in-kind riparian restoration activities would mitigate for loss of sensitive natural community resources. As such, impacts associated with the Proposed Project (due to the Ceres to Merced Extension Alignment) would be reduced to a less-than-significant level.

Impact BIO-6	Construction of the Proposed Project could substantially interfere with native resident or migratory fish or wildlife species movement, established migration corridors, or their use of nursery areas.
Level of Impact	**Potentially significant impact** Proposed Project Ceres to Merced Extension Alignment **No impact** Proposed Project Turlock Station Livingston Station Merced Layover & Maintenance Facility Merced Station Alternative Analyzed at an Equal Level of Detail Atwater Station Alternative
Mitigation Measures	BIO-2.3: Avoid valley elderberry longhorn beetle BIO-2.7: Avoid nesting birds BIO-2.8: Avoid Swainson's hawk BIO-2.9: Compensate for Swainson's hawk foraging habitat loss BIO-2.10: Avoid burrowing owl BIO-2.11: Compensate for burrowing owl habitat loss BIO-2.12: Avoid song sparrow (Modesto population), tricolored blackbird, and yellow-headed blackbird BIO-2.13: Avoid roosting bats BIO-3.3: Implement seasonal restrictions for in-water work HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters
Level of Impact after Mitigation	**Less than significant impact**

Impact Details and Conclusions

Proposed Project

Turlock Station, Livingston Station, Merced Layover & Maintenance Facility, and Merced Station

Construction of the Turlock Station, Livingston Station, Merced Layover & Maintenance Facility, and Merced Station are not expected to affect native resident or migratory terrestrial wildlife species movement, because (1) the improvement locations are within a significantly fragmented or developed area, surrounded by human-altered landscape; (2) the location of the improvement locations are immediately adjacent to an existing movement barrier (e.g., State Route 99); and/or (3) the improvements location is not within a known or identified movement corridor or essential connectivity areas as identified by the California Essential Habitat Connectivity Project (California Department of Fish and Wildlife 2020c). Construction of the Turlock Station, Livingston Station, Merced Layover & Maintenance Facility, and Merced Station would not affect riverine and riparian habitat; therefore, construction of these facilities would not have an impact on native and resident fish or wildlife migration or movement corridors.

Ceres to Merced Extension Alignment

CDFW's Areas of Conservation Emphasis (ACE) identifies the lands surrounding the Merced River and Bear Creek as areas that provide conservation planning linkages to the northern Sierra Nevada foothill ecoregion, east of the study area (California Department of Fish and Wildlife 2020d). Riparian corridors are important areas that maintain connectivity throughout California and provide movement opportunities for a variety of terrestrial wildlife species, include gray fox, black-tailed jackrabbit, bobcat, mule deer, wood rat, and western pond turtle. The Merced River is identified as a major east–west corridor (California Department of Fish and Wildlife 2020e). Construction of the Ceres to Merced Extension Alignment could affect native and resident wildlife movement in riverine aquatic habitat and riparian habitat.

Construction in riverine aquatic habitat and associated riparian habitat (i.e., mixed riparian woodland and valley foothill riparian) could directly deter or prevent fish or wildlife movement through vegetation removal or disturbance, which provide cover for fish and wildlife movement; the presence of physical barriers (e.g., coffer dams, dewatering activities), construction equipment, or human presence; visual, noise and vibratory disturbance, changes in water quality (e.g., temperature, dissolved oxygen, siltation etc.); and alteration of hydrology. Construction in these habitats could indirectly deter or prevent fish or wildlife movement through vibration, noise, and light generated by construction; vegetation composition alteration, including loss of elderberry shrubs; and the introduction of invasive plants (e.g., Brazilian Egeria [*Egeria densa*], yellow-star thistle, milk thistle [*Silybum marianum*]) and pests (e.g., red swamp crayfish [*Procambarus clarkia*], quagga mussel [*Dreissena bugensis*], New Zealand mudsnail [*Potamopyrgus antipodarum*].

Most of the Ceres to Merced Extension Alignment would be constructed within developed/landscaped land cover, with multiple parcels of natural land cover associated with ruderal, riverine (irrigation canal, river, stream), cropland (row crops and orchard), pond, annual grassland, woodland, riparian, and freshwater marsh land covers, as shown in Table 3.4-1. These natural land covers offer potential for fish and wildlife movement, however, the potential for terrestrial wildlife movement is limited due to these undeveloped parcels being small and noncontiguous.

The Ceres to Merced Extension Alignment would construct new bridges over rivers, creeks, and canals. The San Joaquin Valley has undergone a high degree of human urbanization and agricultural development and many of the natural streams and rivers in the San Joaquin Valley have been augmented by agricultural drainage and spill flows (CDFW, USFWS, and NMFS 2014); as a result, the remaining natural land cover is of high importance for fish and wildlife migration and movement corridors. Existing UPRR tracks, urban development, and agricultural development significantly limit wildlife movement through the area and limit access to remaining movement corridors, such as rivers and streams. Construction of new tracks for the Ceres to Merced Extension Alignment, which would cross over aquatic habitat, has the potential to disrupt and further limit native and resident fish and wildlife movement at water crossings.

Construction of bridges or tracks over riverine habitat also has the potential to damage and remove riparian forest. The Central Valley's riparian forests have experienced extensive vegetation loss due to expansive agricultural and urban development (Katibah 1984), and in many places have been reduced to discontinuous, narrow corridors. Elderberry shrubs, the host plant of valley elderberry longhorn beetle, can be found on floodplain terraces above the river, along canals, and agricultural ditches (U.S. Fish and Wildlife Service 2017). Because valley elderberry longhorn beetle has limited physical dispersal capability, removal or disturbance of suitable riparian vegetation (whether occupied or unoccupied) can increase the distance between beetle metapopulations. This fragmentation decreases the likelihood of successful colonization of unoccupied habitat, which can result in reduced or eliminated subpopulations (U.S. Fish and Wildlife Service 2017). Removal or disturbance of riparian vegetation could have an adverse impact on the long-term persistence of valley elderberry longhorn beetle (U.S. Fish and Wildlife Service 2017).

Construction of facilities (e.g., culverts) over freshwater marsh and agricultural and irrigations canals could also affect special-status wildlife species, including western pond turtle and giant garter snake movement and dispersal through this natural land cover type. Overall, construction of the Ceres to Merced Extension Alignment would affect riverine or riparian habitat; therefore, construction of these improvements could have an impact on native and resident fish or wildlife migration or movement corridors because riverine and riparian habitat provide natural land cover for fish and wildlife movement. Fish and wildlife movement could be affected by construction-related noise and vibration disturbance, the presence of construction vehicles and machinery, and habitat removal or degradation. Impacts on native resident and migratory fish and wildlife corridors from construction of the Ceres to Merced Extension Alignment would be potentially significant.

Atwater Station Alternative

Construction of the Atwater Station Alternative would not interfere with native resident or migratory fish or wildlife species movement because the Atwater Station Alternative would not be located in a waterway with known fish occurrences, in riverine or riparian habitat, or be surrounded by existing urban development, which currently reduces and/or limits wildlife movement. Construction of the Atwater Station Alternative would not affect riverine and riparian habitat; therefore, construction of this station would not have an impact on native and resident fish or wildlife migration or movement corridors.

Neither the proposed Livingston Station nor the Atwater Station Alternative would affect riverine or riparian habitat. Therefore, there would be no difference between the Atwater Station Alternative and the proposed Livingston Station with respect to impacts on native and resident fish or wildlife migration or movement corridors.

Mitigation Measures

Mitigation Measures BIO-2.3, BIO-2.7 through BIO-2.13, BIO-3.3, and HYD-1.2 would apply to the Ceres to Merced Extension Alignment for impacts on the movement of native resident and migratory fish and wildlife. Mitigation Measures BIO-2.3, BIO-2.7 through BIO-2.13, and BIO-3.3 are described in Section 3.4.4.5, *Mitigation Measures for Biological Resources*. Mitigation Measure HYD-1.2 is described in Section 3.10, *Hydrology and Water Quality*.

Significance with Application of Mitigation

Mitigation Measures BIO-2.3 and BIO-2.7 through BIO-2.13 would include measures (including pre-construction surveys, monitoring, buffers, etc.) to protect elderberry longhorn beetle, nesting and special-status birds, and roosting bats during construction. As such, these measures would avoid or minimize impacts on native and resident wildlife movement and wildlife corridors.

Mitigation Measure BIO-3.3 requires that in-water work at the Merced River and Bear Creek be limited to June 15 to October 15. Native fish species typically use areas of cooler water temperatures during the summer months, and they would not likely occur in the Merced River and Bear Creek during the time in which in-water work is expected to take place. Mitigation Measure HYD-1.2 requires specific procedures for work adjacent to, within, or crossing surface waters, which would limit the amount of sedimentation release into the Merced River and Bear Creek. As such, these measures would avoid or minimize impacts on native and resident fish movement and fish corridors.

In summary, implementation of Mitigation Measures BIO-2.7 through BIO-2.13, BIO-3.3, and HYD-1.2 would avoid or minimize impacts on native and resident fish and wildlife movement and wildlife corridors, reducing impacts associated with the Ceres to Merced Extension Alignment to a less-than-significant level.

Impact BIO-7	Construction of the Proposed Project could conflict with local biological resource policies, including tree preservation policies or ordinances.
Level of Impact Prior to Mitigation	**Potentially significant impact**
Mitigation Measures	BIO-1.1: Conduct preconstruction surveys for special-status plant species BIO-1.2: Prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species BIO-1.3: Document affected special-status plant species BIO-1.4: Prevent introduction or spread of invasive plant species BIO-2.1: Conduct a worker environmental training program for construction personnel BIO-2.2: Avoid vernal pool–endemic species BIO-2.3: Avoid valley elderberry longhorn beetle BIO-2.4: Avoid California tiger salamander and western spadefoot toad BIO-2.5: Avoid western pond turtle and giant garter snake BIO-2.6: Avoid coast horned lizard and Northern California legless lizard BIO-2.7: Avoid nesting birds BIO-2.8: Avoid Swainson's hawk BIO-2.9: Compensate for Swainson's hawk foraging habitat loss BIO-2.10: Avoid burrowing owl BIO-2.12: Avoid Song sparrow (Modesto population), tricolored blackbird, and yellow-headed blackbird BIO-2.13: Avoid roosting bats BIO-2.14: Avoid San Joaquin kit fox and American badger BIO-3.1: Implement noise reduction measures for pile driving BIO-3.2: Develop and implement a hydroacoustic monitoring plan to minimize noise effects on fish BIO-3.3: Implement seasonal restrictions for in-water work BIO-4.1: Avoid and protect wetlands during construction BIO-5.1: Avoid and protect sensitive natural communities, including riparian habitat, during construction HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters BIO-7.1: Compensate for tree removal during construction
Level of Impact after Mitigation	**Less than significant impact**

Impact Characterization

Construction of the Proposed Project and the Atwater Station Alternative could conflict with local biological resource policies (including tree preservation policies and the protection of sensitive plant and wildlife habitat policies or ordinances) by removing locally regulated trees and/or disturbing sensitive plant and wildlife habitat during construction. Appendix G of this EIR, *Regional Plans and Local General Plans*, includes a summary of the local polices related to tree preservation and protection of biological resources.

Tree removal is expected during construction, as part of ground-disturbance activities. As discussed under Section 3.4.2.3, *Regional and Local Plans,* tree regulations do not apply inside or outside the UPRR ROW because UPRR is a federally regulated rail carrier and the SJRRC is a joint powers authority that benefits from the exemption contained in Public Utilities Code Section 103200.

Construction of the Proposed Project and the Atwater Station Alternative would avoid tree removal unless it is necessary. Tree removals would be limited in areas within the existing UPRR ROW because existing UPRR maintenance actions routinely prune and remove trees in the ROW as necessary for safe operation. Tree removals are expected in some portions of the existing ROW and in environmental footprints outside the existing ROW.

The analysis below identifies the potential impacts on trees. Impacts on special-status plants and their habitat are discussed under Impact BIO-1; impacts on special-status wildlife and their habitat are discussed under Impact BIO-2; and impacts on special-status fish and their habitat are discussed under Impact BIO-3.

Impact Details and Conclusions

Proposed Project

The Ceres to Merced Extension Alignment would affect a high number of trees; however, many of these are orchard trees, which are not protected by local ordinances. The number of protected trees to be removed is relatively low (<4.8 per hectare). The Ceres to Merced Extension Alignment would affect approximately 19 native, 25 native-landscaped, and 248 nonnative trees with diameter at breast height (DBH) ranging from 10 to 45 inches. Construction of the Ceres to Merced Extension Alignment would result in the removal of protected trees, which would be considered a potentially significant impact.

The Turlock Station and Merced Layover & Maintenance Facility are located within developed and ruderal land cover and would affect a low number of trees. Construction of the Turlock Station would impact 1 native-landscaped and 19 nonnative trees. Construction of the Merced Layover & Maintenance Facility would remove approximately 19 native-landscaped and 26 nonnative trees. The Turlock Station and Merced Layover & Maintenance Facility would, therefore, result in a potentially significant impact.

The proposed Livingston Station and Merced Station are located within developed and ruderal land cover and would not affect any trees. There would be no impact.

While compliance with local ordinances is not legally required for construction of the Proposed Project, the loss of numerous trees from areas outside the UPRR ROW would be significant and would conflict with local policies or ordinances, such as tree preservation policies or ordinances. Therefore, the impacts from tree removal due to the Ceres to Merced Extension Alignment, Turlock Station, and Merced Layover & Maintenance Facility would be significant.

Table 3.4-12 summarizes the anticipated tree removals due to the Proposed Project.

Table 3.4-12. Proposed Tree Removal Impacts

	Trees [a]			
Proposed Project Facility[b]	**Native**	**Native -Landscaped**	**Nonnative**	**Total**
Ceres to Merced Extension Alignment	19	25	248	292
Turlock Station	0	1	19	20
Merced Layover & Maintenance Facility	0	19	46	65

[a] Trees reported above have a diameter at breast height of 6 inches or more.

[b] Proposed and alternative facilities not listed above would not involve impacts on sensitive natural communities.

In addition, there are local policies related to the protection of plants, wildlife, and fish species. These local policies are identified in Appendix G, *Regional Plans and Local General Plan,* and include policies from the Stanislaus County General Plan, Merced County General Plan, Delhi Community Plan, City of Ceres General Plan, and City of Livingston General Plan. As described in Impact BIO-1, BIO-2, and BIO-3, construction of the Proposed Project would result in a potentially significant impact on special-status plants, wildlife, and fish species. As such, construction of the Proposed Project could conflict with local biological resource policies, resulting in a potentially significant impact.

Atwater Station Alternative

The Atwater Station Alternative is located within developed and ruderal land cover and would not affect any trees. No impact would occur related to conflicts with tree preservation polices.

In addition, there are local policies related to the protection of wildlife species. These local policies are identified in Appendix G and include policies from the City of Atwater General Plan. As described in Impact BIO-2, construction of the Atwater Station Alternative would result in a potentially significant impact on special-status plants, wildlife, and fish species. As such, construction of the Atwater Station Alternative could conflict with local biological resource policies, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measures BIO-1.1 through BIO-1.4, BIO-2.1 through 2.10, BIO-2.12 through BIO-2.14, BIO-3.1 through BIO-3.3, BIO-4.1, BIO-5.1, and HYD-1.2 would apply to the Proposed Project for construction impacts that could result in an inconsistency with a local policy. Table 3.4-13 in Section 3.4.4.5, *Mitigation Measures for Biological Resources*, identifies which mitigation measures would apply to which specific facilities. Mitigation Measures BIO-1.1 through BIO-1.4, BIO-2.1 through BIO-2.10, BIO-2.12 through BIO-2.14, BIO-3.1 through BIO-3.3, BIO-4.1, BIO-5.1, and HYD-1.2 are described in Section 3.4.4.5, *Mitigation Measures for Biological Resources*. Mitigation Measure HYD-1.2 is described in Section 3.10, *Hydrology and Water Quality*.

Mitigation Measures BIO-2.1, BIO-2.7, BIO-2.10, BIO-2.11, BIO-2.13, and HYD-1.2 would apply to the Atwater Station Alternative for construction impacts that could result in an inconsistency with a local policy.

Significance with Application of Mitigation

Implementation of Mitigation Measures BIO-1.1 through BIO-1.4, BIO-2.1 thorough BIO-2.8, BIO-2.10, BIO-2.12 through BIO-2.14, and HYDRO-1.2 would require the protection of sensitive resources from development and/or disturbance through standard surveys, protection of native habitat through buffers and set-back, and protections of waterways from erosion and siltation. Implementation of these measures would minimize potential conflicts with local biological resource policies for the protection of special-status plant and wildlife habitat and species (e.g., Stanislaus County General Plan Conservation and Open Space Policies; Merced County General Plan Natural Resource Goal NR-1, NR-1.12, NR-1.13, and NR-1.21; Delhi Community Plan Open Space/Conservation Policies; City of Livingston Open Space, Conservation and Recreation Objective). The Proposed Project would be consistent with the Delhi Community Plan Open Space/Conservation

Policies by surveying and identifying special-status species of concern in the Delhi Community Plan through the implementation of mitigation. The Proposed Project would be consistent with the Ceres General Plan Agricultural and Natural Resources Policy 4.D.5 of protecting bird nesting habitat through implementation of Mitigation Measure BIO-2.7. In addition, the Proposed Project would be consistent with the requirements of Ceres General Plan Agricultural and Natural Resource Policy 4.D.6 through the implementation of Mitigation Measure BIO-2.9, which requires Swainson's Hawk habitat compensation. Furthermore, the Proposed Project would be consistent with the Merced Vision 2030 General Plan Goal Area OS-1 through the implementation of Mitigation Measures BIO-3.1 through BIO-3.3, which would protect wildlife corridors that support fish and wildlife species. Implementation of Mitigation Measures BIO-4.1 and BIO-5.1 would provide protection to wetlands and sensitive communities, which would be consistent with the requirements of Merced County General Plan Natural Resource Goals and Stanislaus County General Plan Conservation/Open Space polices. Implementation of Mitigation Measure BIO-7.1 would require the compensation of trees removed using ratios derived from applicable local ordinances. With implementation of these mitigation measures, construction of the Proposed Project would result in a less-than-significant impact related to conflicts with local biological resource policies.

For the Atwater Station Alternative, implementation of Mitigation Measures BIO-2.1, BIO-2.7, BIO-2.10, BIO-2.11, BIO-2.13, and HYD-1.2 would require the protection of sensitive resources from development and/or disturbance through standard surveys, protection of native habitat through buffers and set-back, and protections of waterways from erosion and siltation. The Atwater Station Alternative would conflict with local biological resource policies for the protection of special-status wildlife habitat and species (e.g., City of Atwater Open Space and Conservation Goals) after the implementation of mitigation. With implementation of these mitigation measures, construction of the Atwater Station Alternative would result in a less-than-significant impact related to conflicts with local biological resource policies.

Comparison of the Proposed Livingston Station and Atwater Station Alternative

There would be no difference in the impacts on trees during construction between the Livingston Station and the Atwater Station Alternative (both would result in no impact). As described in Impact BIO-2, the Livingston Station compared to the Atwater Station Alternative could result in greater wildlife habitat disturbance. Nonetheless, both would result in a less-than-significant-impact related to conflicts with local biological resource policies after implementation of mitigation.

Impact BIO-8	Construction of the Proposed Project would not conflict with provisions of adopted habitat conservation plans, natural community conservation plans, or approved local, regional, or state habitat conservation plans.
Level of Impact	**No impact**

Impact Details and Conclusions

No HCPs, natural community conservation plans (NCCPs), or other approved local, regional, or state HCP cover the geographic area where the Proposed Project would be located. Construction of the Proposed Project would, therefore, not conflict with adopted HCPs, NCCPs, or approved local, regional, or state HCP provisions, and there would be no impact.

For the same reasons as the Proposed Project, construction of the Atwater Station Alternative would have no impact related to conflicts with adopted HCPs, NCCPs, or approved local, regional, or state HCP provisions.

Impact BIO-9	Operation of the Proposed Project could injure or kill special-status wildlife species.
Level of Impact	**Potentially significant impact**
Mitigation Measures	BIO-9.1: Avoid nesting bird impacts during operation and maintenance activities BIO-9.2: Avoid roosting bat impacts during operation and maintenance activities BIO-9.3: Conduct pre-activity survey for special-status wildlife species prior to conducting maintenance activities
Level of Impact after Mitigation	**Less than significant impact**

Impact Details and Conclusions

Proposed Project

Ceres to Merced Extension Alignment

Project operations would entail the extension of ACE passenger rail service from Ceres to Merced. With the extension to Merced, ACE trains would operate on new or upgraded tracks within the existing UPRR ROW. With the Ceres to Merced Extension Alignment, ACE trains would be introduced to areas that currently do not experience passenger rail traffic between Ceres and Merced. However, freight trains currently operate on the existing UPRR subdivisions in these areas, and the additional train traffic generated by operation of ACE from Ceres to Merced (i.e., four trains in the morning and four trains in the evening) would not be substantial. Increased passenger train traffic would occur following construction of the Ceres to Merced Extension Alignment, but operational conditions along the UPRR ROW are not expected to be significantly different from existing conditions with respect to special-status wildlife species. Noise and occasional train strikes from operation of the Ceres to Merced Extension Alignment could affect special-status wildlife, including pollinators such as monarch butterfly and individual birds, but these effects are expected to be similar in magnitude to the operational noise and train strikes experienced from existing freight service in this area. There are currently approximately 22 freight trains per day. Operation of the Ceres to Merced Extension Alignment would not significantly change habitat conditions along the corridor after construction is completed. Operations impacts from rail service on sensitive and special-status wildlife species and their associated habitats from increased train service would be less than significant.

The Ceres to Merced Extension Alignment would operate on bridges over Canal Creek, Weber Creek, an irrigation canal at milepost (MP) 147.08 on the Fresno Subdivision, a drainage at MP 148.21 on the Fresno Subdivision, Black Rascal Canal, Bear Creek, and Merced River. The presence of the new bridges over these water features could likely contribute to predation on aquatic wildlife (e.g., California tiger salamander, western pond turtle hatchlings, juvenile giant garter snake); however, existing bridges are in operation at these locations. The operation of the new bridges immediately adjacent to existing bridges would not significantly alter environmental predation pressures at these locations because the area is already developed and disturbed. The level of predation is not expected

to substantially change from existing conditions. Therefore, the new bridge structures would not significantly increase predation on wildlife species above existing levels.

Operation of bridges would also require maintenance. Maintenance of bridges would include routine removal of woody debris, sediment, and other materials that accumulate near the piers of the bridges. Special-status species, such as western pond turtle and giant garter snake, could take refuge on river and canal banks below bridges, as well as forage, hunt, and bask near the piers of bridges. Maintenance activities that would occur as a result of bridge maintenance could affect special-status wildlife species. This impact would be potentially significant.

The Ceres to Merced Extension Alignment would include construction and operation of new culvert structures on the Ceres Main Canal, multiple irrigation canals (as listed in Chapter 2 *Project Description*, Table 2-3), and a cross-swale drainage. Irrigation canals, ditches, and agricultural drainages can provide habitat for special-status wildlife species, including western pond turtle, giant garter snake, tricolored-black bird, song sparrow (Modesto population), other migratory nesting birds, and valley elderberry longhorn beetle (where elderberry shrubs are present). Maintenance activities (vegetation management as well as ground disturbing activities, like grading) that would occur as a result of operation and maintenance of culvert structures could affect special-status wildlife species. This impact would be potentially significant.

Vegetation management and herbicide/insecticide application on the Ceres to Merced Extension Alignment within the UPRR ROW could affect nesting birds, if management activities are conducted during the bird nesting season (February 1 to August 31). Destruction of an active bird nest would violate the MBTA and California Fish & Game Code and would, therefore, be a significant impact. Vegetation management and application of herbicide/insecticide could degrade or kill host and nectar plants for invertebrates such as monarch butterfly. Additionally, vegetation management activities could affect roosting bats. Destruction of bat roosts, including roosts for pallid bat, western mastiff bat, western red bat, and Townsend's big-eared bat—all state species of special concern and relevant under CEQA—would be a significant impact. Vegetation management could affect valley elderberry longhorn beetle through the removal of host plants and direct impacts to individual beetles. Impacts on special-status species and their habitat from vegetation management would be potentially significant.

Turlock Station, Livingston Station, Merced Layover & Maintenance Facility, and Merced Station

Maintenance activities conducted as part of standard operational procedures at the Turlock Station, Livingston Station, Merced Layover & Maintenance Facility, and Merced Stations could include vegetation management and herbicide, insecticide or pesticide application. Vegetation management and application of chemicals could affect nesting birds, if management activities are conducted during the bird nesting season (February 1 to August 31). Destruction of an active bird nest would violate the MBTA and California Fish & Game Code and would, therefore, be a significant impact. Vegetation management and application of herbicide/insecticide could degrade or kill host and nectar plants for invertebrates such as monarch butterfly. Additionally, vegetation management activities could affect roosting bats. Destruction of bat roosts, including roosts for pallid bat, western mastiff bat, western red bat, and Townsend's big-eared bat—all state species of special concern and relevant under CEQA—would be a significant impact.

Atwater Station Alternative

Vegetation management and herbicide or pesticide application implemented as standard operation and maintenance activities for the Atwater Station Alternative could affect nesting birds, if management activities are conducted during the bird nesting season (February 1 to August 31). Destruction of an active bird nest would violate the MBTA and California Fish & Game Code and would, therefore, be a significant impact. Vegetation management and application of herbicide/insecticide could degrade or kill host and nectar plants for invertebrates such as monarch butterfly. Additionally, vegetation management activities could affect roosting bats. Destruction of bat roosts, including roosts for pallid bat, western mastiff bat, western red bat, and Townsend's big-eared bat—all state species of special concern and relevant under CEQA—would be a significant impact.

Mitigation Measures

Operation of the Proposed Project could injure or kill special-status wildlife species. Mitigation Measure BIO-9.1, BIO-9.2 and BIO-9.3 would apply to operation of the Proposed Project.

In addition, operation of the Atwater Station Alternative could injure or kill special-status wildlife species. Mitigation Measure BIO-9.1, BIO-9.2 and BIO-9.3 would apply to operation of the Atwater Station Alternative.

Significance with Application of Mitigation Measures

Implementation of Mitigation Measure BIO-9.1, BIO-9.2, and BIO-9.3 would reduce and/or avoid impacts associated with maintenance activities of the Proposed Project through conducting maintenance activities outside of sensitive timeframes (e.g. the general bird nesting season [Feb 1 to Aug 31] and bat maternity and pupping season [Sep 15 to Oct 31]). Where avoidance is not feasible, Mitigation Measure BIO-9.3 requires conducting pre-activity surveys for special-status species prior to conducting maintenance activities. With the implementation of Mitigation Measures BIO-9.1, BIO-9.2, and BIO-9.3, impacts on special-status wildlife species from the operation of the Proposed Project would be less than significant.

For the same reasons as the Proposed Project, maintenance of the Atwater Station Alternative would be less than significant after implementation of Mitigation Measures BIO-9.1, BIO-9.2, and BIO-9.3.

Comparison of the Proposed Livingston Station and Atwater Station Alternative

Operation impacts on special-status wildlife species due to the Atwater Station Alternative would not significantly differ compared to the Livingston Station. Both would result in less-than-significant impacts after application of mitigation.

Impact BIO-10	Operation of the Proposed Project could injure or kill special-status fish and remove or degrade their habitat.
Level of Impact	**Potentially significant impact** Proposed Project Ceres to Merced Extension Alignment **No impact** Proposed Project Turlock Station Livingston Station Merced Layover & Maintenance Facility Merced Station Alternative Analyzed at an Equal Level of Detail Atwater Station Alternative
Mitigation Measures	BIO-10.1: Model hydraulics of new bridges before construction
Level of Impact after Mitigation	**Less than significant impact**

Impact Characterization

Operation of new bridge crossings can affect fish habitat. Anadromous fish migratory habitat could change as a result of the installation of new piles in the waterbodies. New structures could cause shading and changes to channel morphology and hydraulics.

Channel morphology describes the linear, aerial, and volumetric features of a channel, including depth, length, width, and the shape or configuration of the channel (e.g., the characteristics of secondary channels, riffles, runs, pools, backwaters, and sloughs). Channel morphology, along with flow, affects stream hydraulics, which refers to a stream's depth, surface elevation, velocity, and turbulence. Together, channel morphology and hydraulics influence the conditions that support fish migration and movement. Channel morphology and hydraulics have a major effect on cover and water temperature. River lamprey, Central Valley steelhead, Central Valley Chinook salmon, and hardhead migration could be affected if water velocities exceed swimming speeds of each fish species.

In-water structures can alter local channel hydraulics and underwater light conditions and provide potentially favorable holding conditions for juvenile and adult fish and species that prey on small or juvenile fishes. Permanent shading from the new bridges could potentially reduce primary productivity of affected habitats and increase the number of predatory fishes in the study area and/or their ability to prey on juvenile fishes.

Impact Details and Conclusions

Proposed Project

The Turlock Station, Livingston Station, Merced Layover & Maintenance Facility, and Merced Station would not include any bridges over water and would not affect suitable fish habitat. No impact

would occur from the Turlock Station, Livingston Station, Merced Layover & Maintenance Facility, and Merced Station.

The Ceres to Merced Extension Alignment would include new bridges over the Merced River and Bear Creek. Special-status fish species that could be affected by the new bridges include Central Valley steelhead, Central Valley Chinook salmon, hardhead, Pacific and Kern Brook lamprey, and Sacramento splittail.

The new Merced River Bridge would be approximately 17 feet wide and supported by two abutments on each end of the bridge and six piers located along the length of the structure. The 390-foot-long bridge would consist of seven total spans with four 30-foot spans on the northern end approaching the Merced River, as well as three 90-foot spans crossing the Merced River for the remaining portions of the structure. Three supporting piers for the bridge would be placed on land outside of the active river channel in the Merced River. As a result, the addition of these three piers is not expected to result in any substantial change in river velocities or to affect the ability of special-status fish species to migrate past the new bridge.

The new Bear Creek Bridge would be a new 225-foot, single-track concrete bridge that would be 17 feet wide with two abutments at each end and 13 piers located between the span sections in the creek. At this bridge crossing, the pilings in the water could affect stream velocities, which could affect special-status fish or degrade their habitat within or outside of the study area. Operation of the Proposed Project (due to the Ceres to Merced Extension Alignment) could result in potentially significant impacts on Pacific and Kern Brook lamprey, Central Valley steelhead, Central Valley Chinook salmon, hardhead, and Sacramento splittail. The increased number of in-water structures due to the new bridge over Bear Creek could affect channel velocities and affect fish movement, as well as instream erosion. Given the bridge designs, this is unlikely to result in substantial change in velocities or erosion, but pending further evaluation, is considered potentially significant.

Furthermore, shading would occur from the new bridges, which could increase predation. However, since the bridges are only 17 feet wide, shading would be minimal. shading would not occur all day in any particular location and, therefore, is not expected to strongly affect juvenile native and special-status fish species. Additionally, because of the height of the bridges over the water, ambient light levels generally would be expected to penetrate into the water, thereby minimizing the effects of bridge shading on aquatic habitats. Thus, shading is considered a less-than-significant impact on special-status fish species.

Atwater Station Alternative

The Atwater Station Alternative would not include any bridges over water and would not affect suitable fish habitat. There would be no impact resulting from the Atwater Station Alternative. There would be no difference in operations impacts on special-status fish species between the proposed Livingston Station and Atwater Station Alternative (both would result in no impact).

Mitigation Measures

Mitigation Measure BIO-10.1 would apply to the Ceres to Merced Extension Alignment for impacts on special-status fish species. Mitigation Measure BIO-10.1 is described in Section 3.4.4.5, *Mitigation Measures for Biological Resources*.

Significance with Application of Mitigation Measures

New piles in the channel may increase velocities in the bridge area, preventing steelhead and Chinook salmon from accessing upper spawning areas during the winter and spring, especially in Bear Creek. Modeling expected hydraulics from the new bridge structure and revising the bridge design if necessary, will ensure salmonids are able to pass upstream unimpeded. Implementation of Mitigation Measures BIO-10.1 would reduce operations impacts of new bridge associated with the Proposed Project (due to the Ceres to Merced Extension Alignment) to a less-than-significant level by verifying water velocities and allowing migration of anadromous fish.

Impact BIO-11	Operation of the Proposed Project would not substantially interfere with native resident or migratory fish or wildlife species movement, established migration corridors, or their use of nursery areas.
Level of Impact	**Less than significant impact**

Impact Characterization and Significance Conclusion

This impact addresses fish or wildlife movement impacts other than those related to new bridges, which are discussed under Impact BIO-10.

Proposed Project

Ceres to Merced Extension Alignment

The Proposed Project would increase train traffic along the UPRR ROW but the increased traffic is not expected to have significantly different effects on wildlife species from existing operational conditions. This is because the Ceres to Merced Extension Alignment would add only limited additional rail traffic (i.e., four trains in the morning and four trains in the evening) to existing railroad lines and existing railroad traffic. The greatest extent of disturbance that could interfere with fish and wildlife movement would occur during the construction of the Ceres to Merced Extension Alignment. Once construction is completed, operations would occur entirely within areas previously disturbed and cleared of natural landcover during construction. Apart from the special-status fish and wildlife species impacts related to new bridges and culverts (discussed under Impact BIO-10), operation of the Ceres to Merced Extension Alignment is not expected to be significantly different from existing operations with regard to fish or wildlife movement along stream corridors, riparian habitat, or wetland complexes, and thus would have a less-than-significant impact on fish or wildlife movement, migration corridors, or nursery areas.

Merced Layover & Maintenance Facility, Turlock Station, Livingston Station, and Merced Station

Increased noise, vehicle traffic, lighting and presence of humans would result from operation of the Merced Layover & Maintenance Facility, Turlock Station, Livingston Station, and the Merced Station. However, these facilities would be operated in an area that already has routine human activity from prior development, is generally devoid of natural vegetation cover, and is not connected to large areas of contiguous natural land cover or aquatic features; thus, this area currently provides little to no opportunity for wildlife movement. Vegetation management activities that occur as a result of operation of the Merced Layover & Maintenance Facility, Turlock Station, Livingston Station and the Merced Station could affect nesting birds and roosting bats; however, these impacts are described

and addressed under Impact BIO-9. Apart from vegetation maintenance and herbicide/pesticide application activities required for operation of these facilities, operation and maintenance activities associated with the Merced Layover & Maintenance Facility, Turlock Station, Livingston Station, and the Merced Station would not substantially affect wildlife movement, and the impact would be less than significant. The Merced Layover & Maintenance Facility, Turlock Station, Livingston Station, and the Merced Station are not located within riverine habitat; therefore, the operation of these facilities would not impact resident or migratory fish movement.

Atwater Station Alternative

Increased noise, vehicle traffic, lighting, and presence of humans would result from operation of the Atwater Station Alternative. However, the station would be operated in an area that already has routine human activity from prior development, is generally devoid of natural vegetation cover, and is not connected to large areas of contiguous natural land cover or aquatic features; thus, the area provides little to no opportunity for wildlife movement. Apart from vegetation maintenance and herbicide/pesticide application activities required for operation of the Atwater Station Alternatives, as described and addressed under Impact BIO-9, operations and maintenance activities associated with the Atwater Station Alternative would not substantially affect wildlife movement, and the impact would be less than significant. The Atwater Station Alternative is not located within riverine habitat; therefore, the operation of the station would not impact resident or migratory fish movement.

Operation of the Atwater Station Alternative instead of the proposed Livingston Station would have a similar less-than-significant impact on fish or wildlife movement, migration corridors, or nursery areas.

Impact BIO-12	Operation of the Proposed Project could conflict with local biological resource policies, including tree preservation policies or ordinances.
Level of Impact	**Potentially significant impact**
Mitigation Measures	BIO-9.1: Avoid nesting bird impacts during operation and maintenance activities BIO-9.2: Avoid roosting bat impacts during operation and maintenance activities BIO-9.3: Conduct pre-activity survey for special-status wildlife species prior to conducting maintenance activities
Level of Impact after Mitigation	**Less than significant impact**

Impact Details and Conclusions

Proposed Project

Operation of the Proposed Project is not expected to affect trees regulated by local tree preservation policies or ordinances because tree removal would occur during construction of the Proposed Project. Routine vegetation management, including tree pruning for ROW clearance associated with operations would occur entirely within areas previously disturbed and cleared during construction of the Proposed Project. As noted in Impact BIO-7, local tree regulations do not apply within the UPRR ROW. Local tree ordinances would not legally apply to tree removal or pruning associated with the operation of the Proposed Project. Furthermore, operational tree removal would be limited because tree removals necessary for the Proposed Project would be removed during construction;

operations effects would be limited to pruning to maintain clearance zones established during construction. Thus, operation of the Proposed Project would not conflict with tree preservation policies or ordinances, and this impact would be less than significant.

In addition, there are local policies related to the protection of special-status species. These local policies are identified in Appendix G of this EIR, *Regional Plans and Local General Plans*, and include policies from the Merced County General Plan and Turlock General Plan. Pertinent policies include the Merced County General Plan (Natural Resource Policy NR-1.2.1, *Special Status Species Surveys and Mitigation*) and Turlock General Plan (Conservation Policy 7.4-3, *Identify and protect nesting habitat*). As described in Impact BIO-9, operation of the Proposed Project could result in a potentially significant impact on special-status plants, wildlife, and fish species. As such, operation of the Proposed Project could conflict with local biological resource policies, resulting in a potentially significant impact.

Atwater Station Alternative

Operation of the Atwater Station Alternative could conflict with City of Atwater General Plan (Open Space and Conservation Goals CO-5 and CO-6, as identified in Appendix G). As described in Impact BIO-9, operation of Atwater Station Alternative could result in a potentially significant impact to special-status wildlife species. As such, operation of the Atwater Station Alternative could conflict with local biological resource policies, resulting in a potentially significant impact.

Mitigation Measures

Mitigation Measures BIO-9.1, BIO-9.2 and BIO-9.3 would apply to the operation of the Proposed Project. In addition, Mitigation Measures BIO-9.1, BIO-9.2 and BIO-9.3 would apply to the operation of the Atwater Station Alternative. Mitigation Measures BIO-9.1, BIO-9.2, and BIO-9.3 are described in Section 3.4.4.5, *Mitigation Measures for Biological Resources*.

Significance with Application of Mitigation Measures

Implementation of Mitigation Measure BIO-9.1, BIO-9.2, and BIO-9.3 would ensure operation of the Proposed Project is consistent with local biological resource polices protecting special-status wildlife habitat and species by incorporation of survey standards and mitigation requirements that protect resources, identify and protect nesting habitat prior to disturbance, and protect wildlife habitat (e.g. bat roosting habitat). With the implementation of Mitigation Measures BIO-9.1, BIO-9.2 and BIO-9.3, operation of the Proposed Project would be less than significant.

For the same reasons as the Proposed Project, operation of the Atwater Station Alternative would be consistent with local biological resource policies protecting special-status wildlife habitat and species after implementation of Mitigation Measures BIO-9.1, BIO-9.2, and BIO-9.3, and the operations impacts would be less-than-significant.

Comparison of the Proposed Livingston Station and Atwater Station Alternative

Operations impacts related to conflicts with local biological resources due to impacts on special-status wildlife species due to the Atwater Station Alternative would not significantly differ compared to the Livingston Station. Both would result in less-than-significant impacts after application of mitigation.

Impact BIO-13	Operation of the Proposed Project would not conflict with provisions of adopted Habitat Conservation Plans, Natural Community Conservation Plans, or approved local, regional, or state habitat conservation plans.
Level of Impact	**No impact**

Impact Details and Conclusions

No HCPs, NCCPs, or other approved local regional, or state HCPs cover the area where the Proposed Project would be located. Operation of the Proposed Project would, therefore, not conflict with adopted HCPs, NCCPs, or approved local, regional, or state HCP provisions, and there would be no impact.

For the same reasons as the Proposed Project, operation of the Atwater Station Alternative would have no impact due to conflicts with adopted HCPs, NCCPs, or approved local, regional, or state HCP provisions.

3.4.4.4 Overall Comparison of the Proposed Livingston Station and Atwater Station Alternative

The Atwater Station Alternative and the proposed Livingston Station contain the same land cover (developed/landscaped and ruderal). As such, both are expected to have a similar impact on biological resources. The main difference between the Atwater Station Alternative and the proposed Livingston Station is identified in Impact BIO-2. Implementation of the Livingston Station could affect six special-status wildlife species, compared to the Atwater Station Alternative, which could affect three special-status wildlife species, if present.

Overall, both the Atwater Station Alternative and the proposed Livingston Station would result in similar impacts on biological resources. However, overall, the proposed Livingston Station would have slightly greater impacts on biological resources than the Atwater Station Alternative.

3.4.4.5 Mitigation Measures for Biological Resources

Table 3.4-13 identifies which mitigation measures would apply to the Proposed Project and the Atwater Station Alternative. The description of the mitigation measures identified for the Proposed Project and the Atwater Station Alternative are identified and described in detail following the table.

Table 3.4-13. Applicability of Mitigation Measures for the Proposed Project and the Atwater Station Alternative

	BIO-1.1: Conduct preconstruction surveys for special-status plant species	BIO-1.2: Prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species	BIO-1.3: Document affected special-status plant species	BIO-1.4: Prevent introduction or spread of invasive plant species	BIO-2.1: Conduct a worker environmental training program for construction personnel	BIO-2.2: Avoid vernal pool-endemic species	BIO-2.3: Avoid valley elderberry longhorn beetle	BIO-2.4: Avoid California tiger salamander and western spadefoot toad	BIO-2.5: Avoid western pond turtle and giant garter snake	BIO-2.6: Avoid coast horned lizard and Northern California legless lizard	BIO-2.7: Avoid nesting birds	BIO-2.8: Avoid Swain son's hawk	BIO-2.9: Compensate for Swainson's hawk foraging habitat loss	BIO-2.10: Avoid burrowing owl	BIO-2.11: Compensate for burrowing owl habitat loss	BIO-2.12: Avoid Song sparrow (Modesto population), tricolored blackbird and yellow-headed blackbird	BIO-2.13: Avoid roosting bats	BIO-2.14: Avoid San Joaquin kit fox and American badger	BIO-2.15: Compensate for San Joaquin kit fox and American badger habitat loss	BIO-2.16: Avoid Direct Impacts on Monarch Butterfly Host Plants & Provide Compensatory Mitigation for Impacts on Monarch Butterfly Habitat	BIO-3.1: Implement noise reduction measures for pile driving	BIO-3.2: Develop and implement a hydroacoustic monitoring plan to minimize noise effects on fish	BIO-3.3: Implement seasonal restrictions for in-water work	BIO-4.1: Avoid and protect wetlands during construction	BIO-4.2: Compensate for impacts on jurisdictional wetlands and non-wetland waters of the United States (aquatic resources) prior to impacts during construction	BIO-5.1: Avoid and protect sensitive natural communities, including riparian habitat, during construction	BIO-5.2: Compensate for loss of sensitive natural communities (including riparian habitat)	BIO-7.1: Compensate for tree removal during construction.	BIO-9.1: Avoid nesting bird impacts during operational vegetation management	BIO-9.2: Avoid roosting bat impacts during operational vegetation management	BIO-9.3: Conduct pre-activity survey for special-status wildlife species prior to conducting maintenance activities	BIO-10.1: Model hydraulics of new bridges before construction	HYD-1.2: Avoid water quality impacts from construction adjacent to, within, and crossing over surface waters
Ceres to Merced Extension Alignment	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Turlock Station	--	--	--	--	X	--	--	--	--	--	X			X	X	--	X	--	--	--	--	--	--	--	--	--	--	--	X	X	X	X	--	--
Merced Layover & Maintenance Facility	--	--	--	--	X	--	--	X	X	--	X	X	X	X	X	--	X	--	--	--	--	--	--	--	--	--	--	--	X	X	X	X	--	--
Livingston Station	--	--	--	--	X	--	--	--	--	--	X	X	X	X	X	--	X	X	X	--	--	--	--	--	--	--	--	--	--	X	X	X	--	--
Merced Station	--	--	--	--	X	--	--	--	--	--	X	--	--	X	X	--	X	--	--	--	--	--	--	--	--	--	--	--	--	X	X	X	--	--
Atwater Station Alternative	--	--	--	--	X	--	--	--	--	--	X	--	--	X	X	--	X	--	--	--	--	--	--	--	--	--	--	--	--	X	X	X	--	--

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Mitigation Measure BIO-1.1: Conduct preconstruction surveys for special-status plant species

The San Joaquin Regional Rail Commission (SJRRC) will retain a qualified botanist to conduct preconstruction surveys for special-status plant species in suitable habitat. During appropriate species-specific identification periods prior to the initiation of construction, the qualified botanist will survey suitable habitat in the environmental footprint for the species below in accordance with California Department of Fish and Wildlife (CDFW) protocols (California Department of Fish and Wildlife 2018b). The results of the surveys, which will require multiple visits due to varying blooming periods and differences in the construction initiation, will be documented in brief reports or technical memoranda. If the survey demonstrates absence of special-status plant species in the environmental footprint, no further actions will be required.

Special-Status Plant Species to Be Surveyed
Sanford's arrowhead
Delta button-celery
Watershield

Mitigation Measure BIO-1.2: Prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species

If the protocol-level botanical survey reveals the presence of special-status plant species in the study area, the SJRRC or its contractor(s) will notify the U.S. Fish and Wildlife Service (USFWS) and/or CDFW. A qualified botanist or restoration ecologist will prepare a salvage, relocation, or propagation and monitoring plan in coordination with USFWS and/or CDFW prior to construction to address affected special-status plant species. The plan will include provisions that address the techniques, location, 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. The following performance standards will apply.

Monitoring and success criteria applicable to special-status plant salvage, relocation, or propagation will require the following.

- At least two surveys by a qualified botanist or ecologist per monitoring year.
- At least 80 percent of the planted area must support vegetation composition and density consistent with reference population conditions.
- At least 80 percent of the planted area must support target species amounts similar to reference feature conditions.
- A minimum of 5 consecutive years of monitoring to ensure success criteria are met.
- Remedial actions to restore intended ecological function of planted areas that fail to meet the success criteria for 3 consecutive years.

Mitigation Measure BIO-1.3: Document affected special-status plant species

All directly affected areas of special-status plants will be documented by a qualified botanist or ecologist retained by SJRRC or its contractor(s) prior to impacts. Documentation will include

density and percent cover; key habitat characteristics, including soil type, associated species, hydrology, and topography; and photographs of preconstruction conditions.

Mitigation Measure BIO-1.4: Prevent introduction or spread of invasive plant species

SJRRC's contractor(s) will implement the following actions to avoid and minimize the spread or introduction of invasive plant species.

- Clean construction equipment and vehicles in a designated wash area prior to entering and exiting the construction site.
- Educate construction supervisors and managers about invasive plant identification and the importance of controlling and preventing the spread of invasive plant infestations.
- Treat small, isolated infestations with eradication methods that have been approved by or developed in conjunction with CDFW and USFWS to prevent or destroy viable plant parts or seeds.
- Minimize surface disturbance to the greatest extent feasible to complete the work.
- Use native, noninvasive species or nonpersistent hybrids in erosion-control plantings to stabilize site conditions and prevent invasive plant species from colonizing.
- Use weed-free imported erosion-control materials (or rice straw) in upland areas.

One year after construction, conduct a monitoring visit to each active or previously active (within 1 year) environmental footprint to ensure that no new occurrences of invasive plant species not previously present have become established.

Mitigation Measure BIO-2.1: Conduct a worker environmental training program for construction personnel

Before any equipment staging, grading, or vegetation removal in areas supporting or potentially supporting sensitive biological resources (e.g., aquatic, cropland, developed/landscape, grassland, riparian, ruderal and wetlands habitat; habitat for special-status wildlife species; active bird nests, active bat roosts), SJRRC's contractor(s) will prepare and implement a worker environmental awareness training program. The training program will be provided to all construction personnel (contractors and subcontractors) to brief them on the need to avoid effects on sensitive biological resources and penalties for not complying with applicable state and federal laws and permit requirements. The training program will be delivered by a biologist and will include information on the life history and habitat requirements of special-status species potentially occurring in or adjacent to the environmental footprint, the importance of protecting habitat, and the terms and conditions of resource protection measures from applicable permits for the project. The training program will also cover general restrictions and guidelines that must be followed by all construction personnel to reduce or avoid effects on sensitive biological resources during construction.

Mitigation Measure BIO-2.2: Avoid vernal pool-endemic species

If any construction work remains to be completed after the start of the rainy season (October 15 to June 1), SJRRC or its contractor(s) will install exclusion fencing and erosion control measures prior to any ground disturbance within 50 feet of wetlands and vernal pools under the guidance of a qualified biologist. The fencing will be installed around the perimeter of grassland landcover

containing vernal pools and other seasonal wetlands. The contractor, under the supervision of a qualified biologist, will erect and maintain the exclusion fencing for the duration of the construction activity. Fencing will be removed as soon as construction activities are completed.

Mitigation Measure BIO-2.3: Avoid valley elderberry longhorn beetle

Before ground disturbance within 100 feet of upland and riparian habitat with potential to support valley elderberry longhorn beetle (unless disturbance is unavoidable), a qualified biologist will identify any shrubs in and along improvement areas with potential to support valley elderberry longhorn beetle. SJRRC or its contractor(s) will comply with the following avoidance and minimization measures from the 2017 USFWS' Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle:

- Areas with elderberry shrubs will be avoided during construction activities. Areas with elderberry shrubs will be fenced, flagged, or both. Fencing and/or flagging will be placed as close to the construction limits as feasible.
- Activities that may damage or kill an elderberry shrub (e.g., trenching, paving, pile driving), may need an avoidance area of at least 20 feet from the drip line.
- A qualified biologist will provide training for all contractors and any on-site personnel on the status of the valley elderberry longhorn beetle, its host plant and habitat, the need to avoid damaging elderberry shrubs, and the possible penalties for noncompliance.
- A qualified biologist will monitor the work area at Project-appropriate intervals to verify that all avoidance and minimization measures are implemented.
- To the extent feasible, all activities that could occur within 65 feet of an elderberry shrub would be conducted outside the flight season of the valley elderberry longhorn beetle (March-July).
- Trimming of elderberry shrubs would occur between November and February and would avoid the removal of any branches or stems that are 1 inch or more in diameter.
- Herbicides would not be used within the drip line of elderberry shrubs. All chemicals would be applied using a backpack sprayer or similar direct application method.
- Mechanical vegetation removal within the drip line of elderberry shrubs would be limited to the season when adults are not active (August-February) and would avoid damaging elderberry shrubs.

SJRRC's contractor(s) will be responsible for ensuring that the contractor maintains the buffer area fences around elderberry shrubs throughout construction. SJRRC's contractor(s) will ensure that the environmental footprint is watered down as necessary to prevent fugitive dust from becoming airborne and accumulating on elderberry shrubs in environmental footprints and adjacent to construction areas activities (including unpaved access routes).

Where avoidance of elderberry shrubs is not feasible, SJRRC will provide compensatory mitigation for impacts on valley elderberry longhorn beetle habitat, including through transplantation and replacement of elderberry shrubs and maintenance of replacement shrubs, consistent with the 2017 USFWS' Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle as follows:

- Suitable riparian habitat would be replaced at a minimum of 3:1 (acres of mitigation to acres of impact).
- Suitable non-riparian habitat would be replaced at a minimum of 1:1 (acres of mitigation to acres of impact).
- Individual elderberry shrubs in riparian areas would be replaced through a purchase of two credits at a USFWS-approved bank for each shrub that would be trimmed or removed regardless of the presence of exit holes.
- Individual elderberry shrubs in non-riparian areas would be replaced through a purchase of one credit at a USFWS-approved bank for each shrub that would be trimmed if exit holes have been found in any shrub in or within 165 feet of the work area.
- If an elderberry shrub is to be completely removed by the activity, the entire shrub would be transplanted to a USFWS-approved location in addition to the specified credit purchase.
- For transplanted elderberry plants, a survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants must be maintained throughout the 10-year monitoring period. If survival rates drop below 60 percent during the monitoring period, failed plantings would be replaced and maintained until the 60 percent survival rate is achieved.

Mitigation Measure BIO-2.4: Avoid California tiger salamander and western spadefoot toad

SJRRC will retain a USFWS and/or CDFW-approved biologist (as appropriate) to identify and flag (pin flags or 4-foot lath) all suitable aquatic habitat for California tiger salamander and western spadefoot toad outside of but adjacent to environmental footprints and ground-disturbance areas prior to staging, vegetation clearing, grading, or other construction activities.

Prior to any ground-disturbing activity, SJRRC's construction contractor(s), under the direction of a qualified biologist will install wildlife exclusion fence along the boundary of the work area containing California tiger salamander and Western spadefoot toad habitat or would implement similar measures as otherwise required pursuant to regulatory authorizations issued under the FESA or CESA. The wildlife exclusion fence must be trenched into the soil at least 4 inches in depth, with the soil compacted against both sides of the fence for its entire length to prevent tiger salamanders from passing under the fence, and must have must have intermittent exit points. During the dry season (June 1–October 15), the qualified biologist will inspect the wildlife exclusion fence at least twice weekly on nonconsecutive days and on a daily basis between October 15 and June 1 or following any rain event. The wildlife exclusion fence will be installed with turn-arounds at access points to direct California tiger salamander or Western spadefoot toad away from gaps in the fencing.

During the dry season (June 1-October 15), and prior to any ground-disturbing activity, a qualified biologist will conduct a preconstruction survey of suitable upland habitat within the construction work area and extending out 100 feet from the boundary of the work area, where accessible, to determine if California tiger salamander and western spadefoot toad are present.

When ground-disturbing activities take place during the rainy season (October 15- June 1), in addition to upland surveys, the qualified biologist would survey work areas that are adjacent to

potential breeding habitat for the presence of California tiger salamander and western spadefoot toad.

With approval from USFWS and/or CDFW, an approved biologist will relocate individual salamanders or toads if found within the construction footprint. Individuals will be moved immediately to a relocation site that is a minimum of 330 feet from the construction boundary. The relocation site will be determined in coordination with USFWS and/or CDFW prior to the commencement of construction activities.

If feasible, construction activities near drainages and wetland complexes identified as potential movement corridors will take place between July 1 and October 1, when the California tiger salamander and western spadefoot toad are least likely to be present in the construction areas.

To discourage California tiger salamander and western spadefoot toad from entering the construction areas via ditches, the ditches will be equipped with lightweight, one-way flow gates. These will be designed so that water can easily pass from the construction site to the ditches, but small vertebrates such as salamanders, toads, or frogs cannot move upstream from ditches to the construction areas.

To the extent feasible, construction activities would not be conducted within 250 feet of areas identified as occupied California tiger salamander breeding habitat during the rainy season (October 15–June 1). However, construction activities may begin within such areas after April 15 if the breeding habitat is no longer inundated.

If California tiger salamander are discovered within the construction area and full impact avoidance of California tiger salamander habitat is not possible, SJRRC will provide compensatory mitigation for occupied habitat at a ratio of 3:1, unless higher ratios are required through regulatory authorizations issued under FESA or CESA. Compensatory mitigation will be provided using an agreed upon method during permit consultation.

Mitigation Measure BIO-2.5: Avoid western pond turtle and giant garter snake

SJRRC's contractors(s) will implement the following measures to avoid impacts on western pond turtle and giant garter snake during construction.

Giant garter snake

- To reduce the likelihood of snakes entering construction areas within or adjacent to freshwater wetlands, slow-moving riverine aquatic habitat, marshes, ditches, and canals in the environmental footprint, SJRRC or its contractor(s) will install exclusion fencing along the freshwater marsh, aquatic riverine features, and open water areas outside of the environmental footprint (areas within 200 feet of suitable habitat). The exclusion fencing will be installed and maintained by SJRRC and its construction contractor(s) for the duration of construction within or adjacent to these features. The fencing will consist of 3- to 4-foot-tall erosion fencing buried at least 6 to 8 inches below-ground. To ensure that construction equipment and personnel do not affect aquatic habitat for giant garter snake outside the construction corridor, orange barrier fencing or other high-visibility flagging (such as t-post and rope) will be erected in addition to the exclusion fencing to clearly define the aquatic habitat to be avoided.

- Prior to construction each morning, construction personnel will inspect exclusion and orange barrier fencing to ensure they are in good condition. Observations of snakes within the environmental footprint and access routes will be immediately reported to the biologist, and all activities will cease until appropriate corrective measures have been completed, the snake leaves the construction site under its own volition, or the biologist determines that the snake will not be harmed.
- A qualified biologist will conduct a preconstruction survey in suitable habitat no more than 24 hours before groundbreaking construction. The survey will take place within each construction footprint, as well as 200 feet outside of each footprint. If construction stops for a period of two weeks or more, a new preconstruction survey will be completed no more than 24 hours prior to preinitiation of work.
- Vegetation clearing within 200 feet of the banks of potential giant garter snake aquatic habitat will be limited to the minimum area necessary. Giant garter snake habitat outside but adjacent to the construction area will be flagged and designated as an environmentally sensitive area, to be avoided by all construction personnel.
- The movement of heavy equipment within 200 feet of the banks of potential giant garter snake aquatic habitat will be confined to designated access and haul routes to minimize habitat disturbance.
- Prior to moving vehicles or equipment, all construction personnel will check under the vehicle/equipment for any sensitive wildlife, including giant garter snake. If an animal is observed, the vehicle/equipment will not be moved until the individual has vacated the area of its own accord.
- Time construction activities in giant garter snake habitat to occur within the active season for giant garter snake (approximately May 1 to October 1) when the species is more likely to be moving around and can more easily avoid being disturbed. For any work that needs to occur outside of the active season in giant garter snake habitat, ground-disturbing activities must first be initiated during the active season (prior to September 15). This way no habitat within the construction areas will be available for giant garter snake to sue as refugia during the inactive season and will deter individuals from moving into active construction zones.
- Any dewatered habitat will remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling the dewater habitat.
- A qualified biologist will be present onsite to monitor for giant garter snake during initial groundbreaking construction activities in giant garter snake habitat. If giant garter snake is detected during preconstruction surveys, the biologist may remain on-site during construction; in such an event SJRRC will coordinate with wildlife agencies on establishing a monitoring schedule.
- To prevent inadvertent entrapment of giant garter snake, or other wildlife during construction, all excavated, steep-walled holes or trenches measuring more than 6 inches deep either will be covered at the close of each working day using plywood or similar material. If holes/trenches cannot be fully covered, at least one escape ramp will be constructed of earth fill or wooden planks. All holes or trenches will be checked daily for trapped wildlife. Before holes or trenches are filled, they will be thoroughly inspected for trapped wildlife.

- All construction pipes, culverts, or similar structures on the construction site for one or more overnight periods will be capped or sealed with tape (or similar material) or stored at least 3 feet above ground. They will be inspected thoroughly for special-status wildlife before capping, burying or otherwise using the structures. If an individual is discovered during this inspection, the structure will not be disturbed until the individual leaves on its own accord.
- To avoid entangling giant garter snake, erosion control methods will not utilize plastic, monofilament or other woven fiber netting.
- If a live giant garter snake is encountered during preconstruction or construction activities, work will stop in the vicinity of the individual and the qualified biologist will monitor the snake an allow it to move away unharmed, and of its own accord without being disturbed.

Western pond turtle

- Prior to the start of construction within western pond turtle habitat (i.e., any undeveloped areas within 400 feet of riverine aquatic habitat, ponds, vernal pools, or seasonal wetlands) during the nesting or overwintering season, SJRRC will retain a qualified biologist (one who is familiar with different species of turtles) to conduct preconstruction surveys 1 week before and within 24 hours of beginning work. The surveys will be time to coincide with the time of day when turtles are most likely to be active (i.e., during the cooler part of the day between 8:00 a.m. and 12:00 p.m. during spring and summer). Prior to conducting the surveys, the biologist will locate the microhabitats for turtle basking (logs, rocks, brush thickets) and determine a location to observe turtles. Each survey will include a 30-minute wait time after arriving onsite to allow startled turtles to return to open basking areas. The survey will consist of a minimum 15-minute observation time per area where turtles could be observed. If western pond turtle is observed during either survey, a biological monitor will be present during construction activities in the aquatic habitat where the turtle was observed and will capture and relocate, if possible, any entrapped turtles.
- The biological monitor will also be mindful of suitable nesting and overwintering areas in proximity to suitable aquatic habitat and periodically inspect these areas for nests and turtles. If preconstruction surveys identify active nests, the biologist will establish 50-foot no-disturbance buffer zones around each nest using temporary orange construction fencing with a 4-inch-tall gap below the fence. The fencing will be permeable to young turtles and allow them to move away from the nest following hatching. The buffer zones and fencing will remain in place until the biologist has confirmed that the young have left the nest.
- If western pond turtles are found in the construction footprint, construction will cease until the turtle has left the work area. If approved by CDFW, the biological monitor will remove and relocate the turtle to suitable habitat outside the construction footprint. Relocation sites will be subject to CDFW approval.

Mitigation Measure BIO-2.6: Avoid coast horned lizard and Northern California legless lizard

SJRRC's contractors(s) will implement the following measures to avoid impacts on coast horned lizard and silvery legless lizard during construction activities.

A qualified biologist will conduct preconstruction surveys (within 24 hours prior to starting project activities) and construction monitoring of work in suitable habitat (i.e., grassland and

scrub with sandy, friable soils) to protect coast horned lizard and Northern California legless lizard. Prior to construction or restoration activities in California annual grassland and riparian habitat with sandy soils or dense leaf litter, the biologist will conduct a preconstruction survey for coast horned and Northern California legless lizard. This survey will include the following steps.

- Systematic subsurface searching (coast horned lizard and Northern California legless lizard are fossorial [burrowing]). Subsurface searching will include hank raking litter or duff to a depth of two inches and inspecting the ground surface in work areas for litter and loose soil burrowing species.
- Staking the limits of the survey areas and fencing them with small-mesh construction fencing, buried to a minimum depth of 6 to 10 inches below-ground, to reduce the likelihood of lizards reentering the active construction area.
- Capture and release of found coast horned lizards and Northern California legless lizards into nearby similar habitat areas designated by the biologist.
- Removal of the lizard exclusion fence following completion of construction.

During construction in coast horned lizard and Northern California legless lizard habitat, a qualified biologist will be present and have the authority to temporarily stop construction activities if they find coast horned lizards or Northern California legless lizards in the environmental footprint. Work will not resume until the biologist has successfully relocated the animals and determined that they would not be harmed by construction.

Mitigation Measure BIO-2.7: Avoid nesting birds

SJRRC or its contractor(s) will conduct construction activities near nesting areas outside of the bird nesting season (February 1 to August 31) to the extent feasible. If construction in the nesting season is unavoidable, SJRRC or its contractor(s) will retain a qualified biologist with demonstrated nest-searching experience to conduct preconstruction surveys for nesting birds (including raptors, but excluding Swainson's hawk and burrowing owl) within 300 feet and including the environmental footprints. Adjacent lands outside the environmental footprints will be scanned with binoculars from the limit of ground disturbance, the Union Pacific Railroad (UPRR) right-of-way (ROW), and publicly accessible areas. Preconstruction surveys will occur no more than 3 days prior to the onset of ground-disturbing activities (including clearing, grubbing, and staging) at each improvement area. If active nests are found in the environmental footprints, the biologist will establish a no-disturbance buffer around the nest and mark the buffer perimeter with high-visibility fencing, flagging, or pin flags. The size of the buffer will be based on the species' sensitivity to disturbance and planned work activities in the vicinity; typical buffer sizes are 250 feet for raptors and 50 feet for other birds. The buffer will remain in place until the nest is no longer active, as determined by the biologist. Buffers for any nests found outside but within 300 feet of environmental footprints will be established based on the biologist's best professional judgment whether the work would result in nest abandonment. If a lapse in construction activities of 15 days or longer at a previously surveyed environmental footprint occurs, another preconstruction survey will be conducted.

To the extent possible, SJRRC or its contractor(s) will initiate structure demolition/modification outside of the nesting season to avoid impacts on active nests affixed to structures before they become active during the nesting season (February 1 to August 31). If structure demolition

activities cannot occur outside of the nesting season, SJRRC or its contractor(s) will remove inactive nests from the structure to be demolished and install nest exclusion measures (e.g., fine mesh netting, panels, or metal projectors) outside of the nesting season. All exclusionary devices will be monitored and maintained throughout the breeding season to ensure that they are successful in preventing the birds from accessing the cavities or nest sites. No more than 3 days prior to structure demolition activities, a qualified biologist will conduct a preconstruction survey of all potential nesting habitat on the structures to be demolished/modified and the surrounding areas for the presence of active nests. If active nests are found on the structures or in the affected area, then demolition/modification activities will not proceed until the biologist verifies that all nests on the structures are inactive.

After all surveys and/or nest deterrence activities are completed at the environmental footprint, the biologist will complete a memorandum detailing the survey effort and results and submit the memorandum to SJRRC within 7 days of survey completion.

Mitigation Measure BIO-2.8: Avoid Swainson's hawk

To protect Swainson's hawk nesting habitat inside the Ceres General Plan coverage area, SJRRC or its contractor(s) will implement Ceres General Plan Agricultural and Natural Resources Policy 4.D.5, *Swainson's Hawk Protection* (City of Ceres 2018) (see Appendix G of this environmental impact report (EIR), Section G.5.2.1).

To protect Swainson's hawk nesting habitat outside of the Ceres General Plan coverage area (e.g., Stanislaus County, City of Turlock, City of Atwater etc.), SJRRC or its contractor(s) will conduct focus surveys for Swainson's hawk and Swainson's hawk nests. Surveys will be conducted prior to construction activities occurring from March 1 to August 31. Surveys will be conducted by a qualified biologist within 0.5 mile and inclusive of the construction areas. The survey buffer may be smaller in areas where topography (e.g., hills) obstructs the line of sight from the construction area. Survey buffer areas lacking suitable nest trees or with an obstructed line of sight will not be surveyed. Biologists will focus on suitable nest trees within and immediately adjacent to the construction areas that have the highest likelihood for disturbance. The number of surveys needed to determine the status of nesting will be dependent on the conditions during the surveys and observed Swainson's hawk behavior. Survey methods will follow those prescribed in *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (2000 Swainson's Hawk Survey Protocol) (Swainson's Hawk Technical Advisory Committee 2000), and generally be conducted between February and July. Survey methods and results will be reported to CDFW.

If active nests are found, SJRRC or its contractor(s) will maintain a 0.5-mile buffer between construction activities and the active nest(s) until it has been determined that young have fledged. The buffer may be reduced in consultation with CDFW if the biologist demonstrates via daily observations (minimum of 2 hours before and during construction activity) that adults tending the nest (on eggs or feeding nestlings) are not disturbed by construction noise. If the biologist observes signs of adult agitation or stress from construction (e.g., alarm-calling, flying away from nest when construction starts), construction activities will cease until the qualified biologist, in consultation with CDFW, determines that young have fledged.

Mitigation Measure BIO-2.9: Compensate for Swainson's hawk foraging habitat loss

Inside the Ceres General Plan coverage area (City of Ceres 2018), SJRRC will provide compensatory mitigation for Swainson's hawk foraging habitat loss (i.e., replacement of existing grassland or agricultural field with new structures and ballast) through or in an amount consistent with the Ceres General Plan Agricultural and Natural Resources Policy 4.D.6., *Swainson's Hawk Habitat Mitigation* (City of Ceres 2018) (see Appendix G of this EIR, Section G.5.2.1).

To compensate for impacts on Swainson's hawk foraging habitat outside of the Ceres General Plan coverage area (e.g., Stanislaus County, City of Turlock, City of Atwater), SJRRC or its contractor(s) will preserve offsite habitat management lands as described in California Department of Fish and Game's (now CDFW) *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California* (California Department of Fish and Game 1994) at a 1:1 to 0.25:1 ratio (acreage preserved: acreage affected), depending on the distance between the construction areas and the nearest active nest. The location of the closest nest to where construction will occur will be identified during Swainson's hawk surveys conducted under Mitigation Measure BIO-2.8. If acceptable to CDFW, SJRRC may alternatively or additionally purchase mitigation credits for Swainson's hawk foraging habitat from a CDFW-approved mitigation or conservation bank that offers service coverage for the impact location. If no active nests are found during the surveys, a search of the CNDDB will be conducted, and CDFW will be contacted to determine the nearest active nest in relation to each construction site.

Mitigation Measure BIO-2.10: Avoid burrowing owl

Prior to any construction activity planned during the fall and winter non-nesting season (September 1 through January 31) or at any time during the construction process, SJRRC will retain a qualified wildlife biologist to conduct non-breeding season surveys for burrowing owls. Survey methodology will follow the guidance provided by CDFW's *Staff Report on Burrowing Owl Mitigation, Appendix D* (California Department of Fish and Game 2012). Surveys will be conducted at each area of suitable habitat that will be disturbed. The survey area will cover all suitable burrowing owl habitat subject to disturbance pursuant to CDFW's *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 2012). If any burrowing owls are found within the disturbance area, SJRRC or its contractor(s) will notify CDFW and will proceed under CDFW direction.

If construction is planned to occur during the nesting season (February 1 through August 31), SJRRC will retain a qualified wildlife biologist to conduct breeding season burrowing owl surveys prior to construction. The survey will be conducted to determine if there is a breeding pair within approximately 500 feet of the construction footprint, unless the biologist determines that a smaller survey buffer around the construction footprint is warranted based on preexisting background disturbance and conditions. Survey visits will be timed in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation, Appendix D, Breeding and Non-Breeding Season Surveys and Reports* (California Department of Fish and Game 2012). This will provide the project team advance notice of nesting owls and allow ample time to discuss appropriate avoidance measures with CDFW.

In addition, take avoidance surveys will be conducted no less than 14 days prior to ground-disturbing activities and a final survey will be conducted within 24 hours prior to ground

disturbance in all areas of the environmental footprint supporting burrowing owl habitat. If the biologist identifies the presence of a burrowing owl nest in an area scheduled to be disturbed by construction, a 660-foot (~200 meter) no-activity buffer will be established and maintained around the nest while it is active. Surveys and buffer establishment will be performed by qualified wildlife biologists, will be coordinated with CDFW, and will be subject to CDFW review and oversight.

Mitigation Measure BIO-2.11: Compensate for burrowing owl habitat loss

SJRRC will provide compensatory mitigation for the loss of occupied owl habitat before construction impacts occur. Occupancy of owl habitat will be determined during implementation of Mitigation Measure BIO-2.10, in the environmental footprints that will be permanently affected. Burrows within areas that will undergo temporary impacts will be avoided. Compensatory mitigation may occur in the form of mitigation credit purchase from a CDFW-approved bank with burrowing owl habitat credits and/or preservation of suitable habitat. Mitigation credit purchase or habitat preservation will occur at a 3:1 ratio (compensation area: habitat loss area).

Habitat preservation will require the development and implementation of a management plan to ensure the preserved area is managed as suitable burrowing owl habitat in perpetuity. The details and specifications of a management plan will be developed in consultation with CDFW, prior to impact on burrowing owl habitat, and will at minimum include the following success criteria.

- Perform routine mowing or grazing to maintain vegetation height consistent with burrowing owl habitat requirements.
- Conduct biological monitoring surveys to confirm suitable owl habitat conditions and document ground squirrel and burrowing owl presence for a minimum of 5 years.
- Restrict deeds to maintain and manage the preserve for burrowing owl in perpetuity, with the ability to grant the preserve to a conservation entity.
- Preserve maintenance and funding reserves.

Mitigation Measure BIO-2.12: Avoid song sparrow (Modesto population), tricolored blackbird, and yellow-headed blackbird

To the extent possible, SJRRC or its contractor(s) will conduct construction within 300 feet of freshwater marsh or streambank habitat during the bird non-breeding season (September 1 through January 31). The construction window will avoid disturbance-related effects on tricolored blackbirds and yellow-headed blackbirds potentially breeding in or near streambanks and freshwater marsh.

If construction activities in or within 300 feet of freshwater marsh or streambank habitat occur during the bird breeding season (February 1 through August 31), SJRRC will retain a qualified biologist to conduct surveys for the presence of tricolored blackbird and yellow-headed blackbird nesting colony or nests. If an active nest colony or nest is observed by the qualified biologist, then a no-disturbance buffer of 250 feet will be established until the end of the breeding season or until the nesting colony or nest is determined inactive by the qualified biologist. Nest buffers may be reduced if site-specific conditions reduce the possibility of disturbance, as determined by the qualified biologist in coordination with CDFW.

Mitigation Measure BIO-2.13: Avoid roosting bats

Where feasible, construction activities that have potential to affect bats with potential to occur within the construction site (i.e., pallid bat, Townsend's big-eared bat, western mastiff bat, hoary bat, other common species of bats) will be conducted outside of the maternity season of bats (April 1 to September 15) and prior to the beginning of the hibernation period (November 1).

Measures to avoid and minimize impacts on sensitive bats species will be determined in coordination with CDFW and may include the following.

Trees

- To avoid and minimize impacts on maternity roosts and hibernating bat species, trees will be removed or trimmed between September 1 and October 30. Tree removal conducted between September 15 and October 30 corresponds to a time period when bats have not yet entered torpor or would be caring for nonvolant young.
- If tree removal and trimming cannot be conducted between September 15 and October 30, a qualified biologist (i.e., a biologist with experience with tree-roosting habitats and life histories of local bats) will examine trees for suitable bat roosting habitat (e.g., large tree cavities, loose or peeling bark, basal hollows, large snags, palm trees with intact thatch) 7 to 14 days before tree removal or trimming. Trees will also be evaluated to determine if they provide suitable habitat for foliage-roosting bats. Riparian woodland, orchards, and stands of mature broadleaf trees should be considered potential habitat for solitary foliage-roosting bat species.
- If the biologist determines that trees to be removed or trimmed provide suitable bat roosting habitat, the biologist will monitor tree removal/trimming.
- The biologist will make recommendations to implement measures to avoid and minimize disturbance or mortality of bats, such as conducting trimming and removal in the late afternoon or evening when it is closer to the time that bats would normally arouse, removing the tree in pieces rather than felling an entire tree, and gently shaking each tree with construction equipment and waiting several minutes before felling trees or removing limbs to allow bats time to arouse and leave the tree. The biologist will search downed vegetation for dead and injured bats. The presence of dead or injured bats that are species of special concern will be reported to CDFW. The biologist will prepare a biological monitoring report, which will be provided to the SJRRC and CDFW.
- Passive monitoring using full spectrum bat detectors may be needed if identification of bat species is required. Survey methods will be discussed with CDFW prior to the start of surveys.
- If a maternity roost is located, whether solitary or colonial, that roost will remain undisturbed until September 15 or a qualified biologist has determined the roost is no longer active.

Human-Made Structure and Natural Structures

- At least 30 days prior to structure removal or disturbance, a qualified biologist will conduct an initial daytime survey to assess the structure for potential bat roosting habitat and look for bat sign (e.g., guano, urine staining). The biologist will examine the entire structure

(i.e., inside and outside for human-made structure and all cracks, seams, and fissures for natural structures) for potential roosting habitat as well as routes of entry to the structure.

- If no habitat or limited habitat for roosting bats is present and no signs of bat use are present, a preconstruction survey of the entire structure by a qualified biologist will be conducted within 24 hours of demolition.
- If signs of bat use are found or if all areas of the structure cannot be examined and the structure provides moderate or high potential habitat, the biologist will prepare a memo with recommended measures to exclude bats from using the structure as a roost site. The memo will include recommendations for excluding bats from using the structure to roost, such as sealing off entry points or using lights and other means to deter bats. The memo will include specifications on when and how exclusion measures should be implemented and will be provided to the SJRRC and CDFW.

Mitigation Measure BIO-2.14: Avoid San Joaquin kit fox and American badger

Within 1 year but no less than 3 months prior to initiating construction for the Ceres to Merced Extension Alignment, SJRRC will retain qualified biologists to identify potential San Joaquin kit fox dens in the construction footprints and surrounding 200 feet in accordance with the *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (2011 USFWS Standard Recommendations) (U.S. Fish and Wildlife Service 2011). USFWS and CDFW will be consulted in the final survey design and methods given the large environmental footprints. This survey will also identify potential American badger dens. The biologists will prepare a report summarizing the survey observations and results, including maps depicting the locations of potential kit fox dens and badger dens and, if possible, occupancy. The report will be submitted to SJRRC, USFWS, and CDFW.

Different San Joaquin kit fox den types are defined per the 2011 USFWS Guidance.

- Known Den—Any existing natural den or built structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records, past or current radiotelemetry or spotlighting data, kit fox sign such as tracks, scat, and/or prey remains, or other reasonable proof that a given den is being or has been used by a kit fox. USFWS discourages use of the terms “active” and “inactive” when referring to any kit fox den because a great percentage of occupied dens show no evidence of use, and because kit foxes change dens often, with the result that the status of a given den may change frequently and abruptly.
- Potential Den—Any subterranean hole within the species’ range that has entrances of appropriate dimensions for which available evidence is insufficient to conclude that it is being used or has been used by a kit fox. Potential dens will include the following: (1) any suitable subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for kit fox use.
- Natal or Pupping Den—Any den used by kit foxes to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually

whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two; therefore, for purposes of this definition either term applies.

Prior to construction, SJRRC will retain qualified biologists to implement preconstruction surveys of previously identified potential kit fox dens to determine if they are known dens or natal or pupping kit fox dens or American badger dens per the 2011 USFWS Standard Recommendations, no less than 14 days and no more than 30 days before the initiation of construction at each environmental footprint). Construction activities will not occur within 100 feet of a potential den during the natal period (February 1 to September 30). If a known den or natal or pupping den is present and is located 100 feet outside of the permanent construction footprint, then a 200-foot no-disturbance exclusion zone during the natal period (100-foot buffer during the non-natal period) will be established around the den with orange construction fence at the edge of the disturbance limits nearest the den. If a known den or natal or pupping den is present within the construction footprint or within 200 feet of the construction footprint during the natal period (100-foot buffer during the non-natal period), the foxes or badger(s) will be excluded outside of the natal period (from November 1 to January 31). A summary report will be prepared by the biologists and submitted to SJRRC, CDFW, and USFWS following completion of all fox and badger avoidance and exclusion activities.

Mitigation Measure BIO-2.15: Compensate for San Joaquin kit fox and American badger habitat loss

SJRRC will provide compensatory mitigation for the loss of occupied San Joaquin kit fox and American badger habitat before construction impacts occur. The occupancy of suitable habitat will be determined during implementation of Mitigation Measure BIO-2.14. Compensatory mitigation may occur in the form of mitigation credit purchase from a USFWS- and CDFW-approved bank with San Joaquin kit fox habitat credits or preservation and enhancement of suitable habitat. Mitigation credit purchase or habitat preservation and enhancement will occur at a 3:1 ratio (compensation area: habitat loss area).

Habitat preservation and enhancement will require the development and implementation of a management plan with the following success criteria to ensure the preserved area is managed as suitable San Joaquin kit fox and American badger habitat in perpetuity.

- Conduct routine eradication of invasive species to maintain the intended vegetation diversity, density, and height consistent with San Joaquin kit fox and American badger habitat requirements for a minimum of 5 years.
- Conduct biological monitoring surveys to confirm suitable San Joaquin kit fox and American badger habitat conditions and document ground squirrel presence.
- Restrict deeds to maintain and manage the preserve for San Joaquin kit fox and American badger in perpetuity, with the ability to grant the preserve to a Habitat Conservancy, public agency, or other local habitat management entity.
- Preserve maintenance and funding reserves.

Mitigation Measure BIO-2.16: Avoid Direct Impacts on Monarch Butterfly Host Plants & Provide Compensatory Mitigation for Impacts on Monarch Butterfly Habitat

Prior to construction, a qualified biologist will survey for Western monarch butterfly egg and larvae host plant – native and non-native milkweed species —within suitable habitat. If host plants are found, the qualified biologist will conduct surveys for adult butterflies during the peak of the flight period to determine presence/absence. Where adult butterflies are present, construction personnel would avoid host plants outside permanent impact areas, by establishing a no-work buffer around host plants. The size and configuration of the no-work buffer would be based on best professional judgement of a qualified biologist and, at minimum, provide 20 feet of clearance around the resources and maintain a disturbance-free airspace. No herbicides/insecticides will be applied within the no-work buffer.

To the extent feasible, SJRRC's contractor(s) will implement pollinator conservation measures in the Xerces Society Best Management Practice for Pollinators in Rangelands (Xerces Society 2018), conservation measures in the Nationwide Candidate Conservation Agreement for Monarch Butterfly on Energy and Transportation Lands (Cardno 2020), or other applicable sources.

If full avoidance of monarch habitat is not feasible, SJRRC will provide compensatory mitigation at a minimum of 1:1 ratio for occupied breeding and foraging habitat unless a higher ratio is required by FESA. SJRRC, in accordance with authorizations issued under FESA, will determine the compensatory mitigation required to offset impacts on habitat for monarch butterfly. Mitigation for monarch butterfly will prioritized any areas with existing monarch butterfly populations and suitable milkweed populations to support breeding.

Mitigation Measure BIO-3.1: Implement noise reduction measures for pile driving

Potential injury and mortality associated with pile driving, which may be required for the pile installation for the new and replacement bridges, will be minimized by implementing the following measures. SJRRC's contractor(s) will implement the following measures, developed in coordination with project design engineers, to minimize the exposure of special-status fish species to potentially harmful underwater sounds.

- If feasible, SJRRC's contractor(s) will vibrate all piles to the maximum depth possible before using an impact hammer.
- During impact driving, SJRRC's contractor(s) will limit the number of strikes per day to the minimum necessary to complete the work.
- The smallest pile driver and minimum force necessary will be used to complete the work.
- During impact driving, SJRRC's contractor(s) will use a bubble ring or similar device to minimize the extent to which the interim peak and cumulative sound exposure level (SEL) thresholds are exceeded.
- No pile driving activity will occur at night.
- A "soft start" technique shall be employed upon initial pile-driving activities every day to allow fish an opportunity to vacate the area. Soft starts require an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 1-minute waiting period between subsequent three-strike sets. Soft starts for vibratory hammers will initiate noise at

15 seconds at reduced energy, followed by a 1-minute waiting period between subsequent starts. This process should continue for a period of no less than 20 minutes.

Mitigation Measure BIO-3.2: Develop and implement a hydroacoustic monitoring plan to minimize noise effects on fish

SJRRC's contractor(s) will develop and implement a hydroacoustic monitoring plan. The monitoring plan will be submitted to the resource agencies (i.e., CDFW, NMFS, USFWS) for approval at least 60 days before the start construction. The plan will include the following requirements.

- SJRRC's contractor(s) will monitor underwater noise levels during all impact pile driving activities on land and in water to ensure that that peak and cumulative SELs do not exceed estimated values.
- The monitoring plan will describe the methods and equipment that will be used to document the extent of underwater sounds produced by pile driving, including the number, location, distances, and depths of the hydrophones and associated monitoring equipment.
- The monitoring plan will include a reporting schedule that includes provision of daily summaries of the hydroacoustic monitoring results to the resource agencies and more comprehensive reports on a monthly basis during the pile driving season.
- The reports will include the number of piles installed per day, the number of strikes per pile, the interval between strikes, the peak sound pressure level, SEL, root mean square per strike, and accumulated SEL per day at each monitoring station.
- SJRRC's contractor(s) will ensure that a qualified fish biologist is on site during impact pile driving to document any occurrences of stressed, injured, or dead fish. If stressed, injured, or dead fish are observed during pile driving, SJRRC's construction contractor(s) will reduce the number of strikes per day to ensure that fish are no longer showing signs of stress, injury, or mortality.

Mitigation Measure BIO-3.3: Implement seasonal restrictions for in-water work

There will be a construction work window of June 15 to October 15 for all work within creek and river channels. This time period will minimize impacts on migrating special-status fish species, such as adult steelhead and Chinook salmon. In-water work within flowing streams will only dewater up to half of the wetted stream at any time to allow fish passage.

Mitigation Measure BIO-4.1: Avoid and protect wetlands during construction

SJRRC will ensure that a qualified resource specialist (i.e., wetland biologist, ecologist, or soil scientist) will clearly identify wetland areas to be preserved abutting the Project areas and wetland areas outside of the direct construction area with high-visibility construction fencing or markers (e.g., lath or pin flags) before site preparation. Construction will not encroach upon jurisdictional wetlands identified by the resource specialist. A formal wetland delineation will be completed prior to construction and the resource specialist will use the verified wetland delineation to confirm the location of wetland boundaries based on existing conditions at the time of the avoidance marking. Exclusion fencing or markers will be installed before construction activities are initiated, and the fencing will be maintained throughout the construction period. No construction activity, traffic, equipment, or materials will be permitted

in fenced wetland areas. Exclusion fencing and markers will be removed following the completion of construction activities.

All conditions imposed by the state and federal permits will be implemented as part of the Project. The conditions will be clearly identified in the construction plans and specifications and monitored during and after construction to ensure compliance.

Mitigation Measure BIO-4.2: Compensate for impacts on jurisdictional wetlands and non-wetland waters of the United States (aquatic resources) prior to improvements impacts during construction

SJRRC and/or its contractor(s) will develop an aquatic resource (wetlands and non-wetland waters of the United States) mitigation plan, subject to approval by USACE, which will ensure no net loss of wetlands from Project impacts. The plan will detail the amount and type of wetlands (based on the verified wetland delineation) that will be compensated for (through preservation, creation, or restoration) for impacts on existing wetlands and non-wetland waters of the United States (aquatic resources) and outline the monitoring and success criteria for the compensation of wetlands and non-wetland waters of the United States. Additional enhancement options include fish barrier removal, riparian restoration, floodplain restoration, and streambank layback to improve overall ecologic function and connectivity of wetland and non-wetland waters. Enhancement sites will be located as near the impact location as possible but, in the event that local enhancement opportunities are not available, such activities will occur within the same stream system or watershed to provide improved ecologic function and connectivity of wetlands and non-wetland waters affected by the Project.

Monitoring and success criteria applicable to created or restored wetlands will require the following.

- At least two surveys by a qualified wetland biologist, botanist, or ecologist per monitoring year.
- At least 80 percent of the created or restored features support vegetation consistent with reference feature conditions.
- At least 80 percent of the created or restored features support hydrologic regimes similar to reference feature conditions.
- A minimum of 5 consecutive years of monitoring to ensure success criteria are met.
- Remedial actions to restore intended ecological function of created or restored features that fail to meet the success criteria for 3 consecutive years.

Once the plan is approved, SJRRC will implement the aquatic resource compensation measures prior to the initiation of Project construction. SJRRC will be responsible for funding compensatory mitigation, monitoring of the created or restored features per the mitigation plan, and any remedial actions necessary. All conditions that are attached to the state and federal permits will be implemented as part of the Project. The conditions will be clearly identified in the construction plans and specifications and monitored during and after construction to ensure compliance.

Mitigation Measure BIO-5.1: Avoid and protect sensitive natural communities, including riparian habitat, during construction

SJRRC will ensure that a qualified resource specialist (i.e., biologist, botanist, ecologist, or soil scientist) will clearly identify sensitive natural communities, including riparian habitat, to be preserved abutting the Project areas and outside of the direct construction area with high-visibility construction fencing or markers (e.g., lath or pin flags) before site preparation. Construction will not encroach upon sensitive natural communities identified by the resource specialist. The resource specialist will use the verified wetland delineation, soils data, and land cover data to confirm the location of sensitive natural community boundaries based on existing conditions at the time of the avoidance marking. Exclusion fencing or markers will be installed before construction activities are initiated, and the fencing will be maintained throughout the construction period. No construction activity, traffic, equipment, or materials will be permitted in fenced sensitive natural community areas. Exclusion fencing and markers will be removed following completion of construction activities.

All conditions imposed by the state and federal permits will be implemented as part of the Project. The conditions will be clearly identified in the construction plans and specifications and monitored during and after construction to ensure compliance.

Mitigation Measure BIO-5.2: Compensate for loss of sensitive natural communities (including riparian habitat)

For direct effects on sensitive natural communities (including riparian habitat) that cannot be avoided, SJRRC will compensate for the loss of sensitive natural communities to ensure no net loss of habitat functions and values. Compensation ratios will be based on site-specific information and determined through coordination with the appropriate state and federal agencies during the permitting process. At a minimum, the compensation ratio will be 2:1 (e.g., 2 acres restored/created/enhanced or credits purchased for every 1 acre removed) for permanent impacts and 1:1 for temporary impacts (where riparian habitat will regenerate to pre-activity character within 1 year). Compensation may be a combination of offsite restoration or mitigation credits. SJRRC or its contractor(s) will develop a restoration and monitoring plan that describes how riparian habitat will be enhanced or recreated and monitored over at least 5 years, or as determined by the appropriate state and federal agencies.

If SJRRC or its contractor(s) identifies suitable onsite areas (adjacent to the permanent construction footprint) that are outside the ROW vegetation management zone and chooses to compensate onsite or in the Project vicinity, a revegetation plan will be prepared. The revegetation plan will be developed prior to the removal of existing riparian vegetation and will be conducted onsite or in the Project vicinity to the extent feasible; however, mitigation site selection will avoid areas where future improvements are likely. The revegetation plan will be prepared by a qualified botanist or restoration specialist with experience in riparian restoration and reviewed by the appropriate agencies. The revegetation plan will specify the planting stock appropriate for each riparian land cover type and each mitigation site, ensuring the use of genetic stock from the corresponding Project area. The plan will employ the most successful techniques available at the time of planting. Success criteria will be established as part of the plan and will include a minimum of 70 percent revegetation success after 3 years, 80 percent revegetation success at the end of 5 years, and 75 percent vegetative coverage after 5 years.

SJRRC or its contractor(s) will retain a qualified botanist, restoration ecologist, or biologist with experience in riparian restoration to monitor the plantings as necessary for 5 years. SJRRC or its contractor(s) will be responsible for maintaining the plantings, including managing invasive plants (as defined by the California Invasive Plant Council) and other weeds, and implementing irrigation and plant protection if necessary. SJRRC or its contractor(s) will submit annual monitoring reports to the regulatory agencies issuing permits related to habitat effects, including CDFW, the U.S. Army Corps of Engineers (USACE), the National Marine Fisheries Service (NMFS), and USFWS. Replanting will be necessary if success criteria are not met, and replacement plants subsequently will be monitored and maintained to meet the success criteria. The riparian habitat mitigation will be considered successful when the sapling trees established meet the success criteria, the habitat no longer requires substantial active management, and vegetation is arranged in groups that, when mature, replicate the area, natural structure, stratification, and species composition of similar riparian habitats in the region.

Mitigation Measure BIO-7.1: Compensate for tree removal during construction

A tree avoidance, minimization, and replacement plan will be developed in consultation with a certified arborist and in consultation with cities, counties, and affected property owners along the Project route.

The plan will contain the following provisions.

- The definition of what is and is not a tree for the purposes of this mitigation will be the same as the tree definition used in each municipality (Table 3.4-14).
- Prior to the construction phase, SJRRC and/or its contractor(s) will assess the potential to modify the construction methods and access of stations and other facilities to avoid or minimize the amount of tree removal or pruning necessary to be consistent with maintenance, operational, and safety requirements. SJRRC or its contractor(s) will consult with each jurisdiction along the route to identify where tree removals can and cannot be avoided with Project design measures.
- Tree pruning during construction will be done in accordance with arboricultural industry recommended practices.
- If pruning will result in the loss of 25 percent or more of an individual tree's canopy, then SJRRC and/or its contractor(s) will consider the tree removed and it will be replaced in a manner consistent with the following replacement requirements.
    - For trees removed outside of the UPRR ROW, the following requirements will apply.
        - Where specific replacement ratios or specifications are provided in the local tree ordinance or guidance (cities of Ceres, Turlock, Livingston, Atwater, and Merced, and Stanislaus and Merced Counties), SJRRC will replace protected trees using the local requirements (Table 3.4-14).
        - Where specific replacement ratios or specifications are not provided in local tree ordinances (cities of Ceres, Turlock, Livingston, Atwater, Merced, and Stanislaus and Merced Counties, as specifically described in Table 3.4-14), SJRRC and/or its contractor(s) will replace protected trees on a 2:1 basis using 15-gallon trees (i.e., two 15-gallon trees would be planted for each protected tree removed).

- For unprotected trees in all locations outside the ROW, SJRRC and/or its contractor(s) will replace trees on a 1:1 basis using 15-gallon trees (i.e., one 15-gallon tree would be planted for each unprotected tree removed).

- For trees within the UPRR ROW, the following requirements will apply.
  - Protected trees will be replaced on a 1:1 basis using 15-gallon trees (i.e., one 15-gallon tree will be planted for every tree removed), where feasible. Unprotected trees will be replaced on the same basis, where feasible in nonindustrial areas. Unprotected trees in industrial areas will not be replaced.
  - Trees will be replaced with a tree of the same species wherever possible, unless that species in a nonnative, invasive, or undesirable species. Alternative species to the tree removed may be planted with concurrence of the landowner and local municipality.
  - If onsite tree replacement cannot occur on the UPRR ROW (where trees are removed from the ROW) or on adjacent property (where trees are removed outside of the ROW), then tree replacement may occur on other parts of the affected property (with concurrence of the landowner) or other parts of the local area (with concurrence of the local municipality). Alternatively, SJRRC may pay into a local urban forestry fund to support local tree planting programs, provided SJRRC and local municipalities can agree on the appropriate fund and amount. The replacement requirements described above will apply in determining the equivalent funding amount.

Mitigation Measure BIO-9.1: Avoid nesting bird impacts during operation and maintenance activities

SJRRC or its contractor(s) will conduct vegetation and structural maintenance activities outside of the general bird nesting season (February 1 to August 31) to the extent feasible. If vegetation and structural maintenance during the nesting season is unavoidable, SJRRC or its contractor(s) will retain a qualified wildlife biologist with demonstrated nest-searching experience to conduct pre-activity surveys for nesting birds within 300 feet of the vegetation removal location. Adjacent lands outside the ROW will be scanned with binoculars from Project operations areas, the ROW, and publicly accessible areas. The preconstruction surveys will occur no more than 3 days prior to vegetation removal activities (including removing or trimming vegetation, modifying structures that provide nesting habitat, clearing, grubbing, and staging) at each contiguous vegetation removal area.

If active nests are found in the area to undergo maintenance activities, no-disturbance species-specific buffer zones will be established by the biologist and marked with high-visibility fencing, flagging, or pin flags. No maintenance activities will be allowed within the buffer zones. The size of the buffer will be based on the species' sensitivity to disturbance and planned work activities in the vicinity; typical buffer sizes are 250 feet for raptors and 50 feet for other birds (i.e., passerines). The buffer will remain in effect until the nest is no longer active, as determined by the biologist. Buffers for any nests found outside of the area to undergo vegetation removal but within 250 feet of the vegetation removal location will be established based on the biologist's best professional judgment whether the work would result in nest abandonment. If a lapse in vegetation removal activities of 3 days or longer at a previously surveyed area occurs, another preconstruction survey will be conducted.

After all surveys activities are completed at each continuous vegetation removal area, the biologist will complete a memorandum detailing the survey effort and results and submit the memorandum to SJRRC within 7 days of survey completion.

Mitigation Measure BIO-9.2: Avoid roosting bat impacts during operation and maintenance activities

SJRRC or its contractor(s) will conduct maintenance activities (e.g., operational tree removal and trimming, structure modification or removal) in roosting bat habitat from September 15 to October 30 to the extent feasible to avoid maternity bat roosts, roosting bats in torpor (reduced metabolic function similar to hibernation), or nonvolant (flightless) young. If operational maintenance activities cannot be conducted between September 15 and October 30, SJRRC or its contractor(s) will retain qualified biologists who will examine trees and structures to be removed, trimmed, or modified for suitable bat roosting habitat no more than 2 weeks before conducting the maintenance activity. High-quality habitat features (e.g., large tree cavities, basal hollows, loose or peeling bark, larger snags, palm trees with intact thatch, etc.) will be identified and the area around these features searched for bats and bat signs (e.g., guano, culled insect parts, urine staining, etc.). Riparian woodland, orchards, and stands of mature broadleaf trees should be considered potential habitat for solitary foliage-roosting bat species. Survey methods will be discussed with CDFW prior to the start of surveys.

Measures to avoid and minimize impacts on sensitive bats species will be determined in coordination with CDFW and may include the following.

- Tree removal will be avoided between April 1 and September 15 (the maternity period) to avoid effects on pregnant females and active maternity roosts (whether colonial or solitary).
- Tree removal, tree trimming, structure modification, or removal of trees that provide suitable habitat for bats will be conducted between September 15 and October 30, which corresponds to a time period when bats have not yet entered torpor or caring for nonvolant young.
- Each tree will be removed in pieces rather than felling the entire tree.
- Trees and tree limbs that do not provide habitat will be removed prior to removing trees and limbs that do provide roosting habitat.
- If a maternity roost is located, whether solitary or colonial, that roost will remain undisturbed until September 15 or a qualified biologist has determined the roost is no longer active.
- Passive monitoring using full spectrum bat detectors may be needed if identification of bat species is required.

If avoidance of nonmaternity roost trees is not possible, and tree removal or trimming must occur between October 30 and September 15, qualified biologists will monitor tree trimming and removal. If possible, tree trimming and removal should occur in the late afternoon or evening when it is closer to the time that bats would normally arouse. Prior to removal and trimming, each tree will be shaken gently and several minutes should pass before felling trees or limbs to allow bats time to arouse and leave the tree. The biologists will search downed vegetation for dead and injured bats. The presence of dead or injured bats that are species of special concern, or candidate threatened or endangered species, will be reported to CDFW. The

biologist will prepare a biological monitoring report, which will be provided to the SJRRC and CDFW no more than 30 days following completion of all bat surveys.

Mitigation Measure BIO-9.3: Conduct pre-activity surveys for special-status wildlife species prior to conducting maintenance activities.

SJRRC or its contractor(s) will retain a qualified biologist to conduct a pre-activity survey for special-status wildlife species prior to conducting maintenance activities within suitable habitat for special-status wildlife (i.e., within any undeveloped natural land cover). The pre-activity survey will be conducted immediately prior to the start of maintenance activities. The survey area will include all suitable habitat within the work area boundary plus a 250-foot buffer zone around the work area boundary.

If special-status wildlife species, nest colonies, or floral resources are observed, maintenance activities will not begin until the special-status species passively moves out of the work area and a no-work buffer around nest colonies and floral resources identified during surveys has been established. The size and configuration of the no-work buffer would be based on best professional judgement of a qualified biologist and, at minimum, provide 20 feet of clearance around the resources and maintain a disturbance-free airspace. No herbicides/insecticides will be applied within the no-work buffer, except when applied to cut stumps. Biological monitoring may be required for the duration of the maintenance activity and will be determined by the discretion of the qualified biologist. If special-status wildlife species are observed, the biologist will notify USFWS and CDFW. Following completion of the pre-activity survey, the surveying biologist will prepare a memo describing the survey methods and conditions, summarize the survey effort and results. The memorandum will include any survey data form and or map showing the location of special-status wildlife species observed. The survey memo will be provided to SJRRC.

If special-status wildlife species are not observed, maintenance activities can begin upon completion of the pre-activity survey.

Mitigation Measure BIO-10.1: Model hydraulics of new bridges before construction

SJRRC or its contractor(s) will perform a hydraulic analysis for all new bridge crossings that expand in-water footprints to determine if changes in velocities will occur and identify the most feasible option with the least impact on the geomorphic integrity of the creek. Any change in velocities will be compared to the swimming velocities of the special-status fish species that are present in the waterbody to determine if upstream migration can still occur after the installation of the piles. If velocities would impede fish migration, the bridge design(s) will be changed to reduce velocities that allow migration by reducing the bulk or number of pier structures within stream margins. Additionally, SJRRC or its contractor(s) will involve Regional Water Boards, CDFW, USACE, USFWS, and NMFS in development of scope of work and methodology, analysis of the options, and development of a draft report.

Consistent with Federal Executive Order 13112 on invasive species, when SJRRC or its contractor replaces trees, SJRRC will use native tree species insofar as it is practicable. Within the UPRR ROW, SJRRC will not plant invasive tree species as defined by the California Invasive Plant Council. For replacement of trees outside the UPRR ROW, SJRRC will replant or pay for others to replant trees that are desired by the landowner or local municipality. Landowners may prefer that replacement trees be nonnative trees to match nonnative trees that were removed or to match surrounding vegetation.

Table 3.4-14. Regulated Trees, Relevant Activities, Replacement Requirements, and Recommended Tree Replacement Ratios

Jurisdiction	Definition of Protected Trees	Removal Permit Needed?	Pruning Permit Needed?	Replacement Requirement	Recommended Replacement Ratios
Stanislaus County Code Ordinance CS 442 Section 1 (Stanislaus County 1991)	Any tree within a street (right-of-way).	Yes for protected (street) trees	Yes for protected (street) trees	Not stated, at discretion of Director of Public Works	Inside UPRR ROW: 1:1 for all trees Outside UPRR ROW: 5:1 for protected tree 1:1 for unprotected tree
Street Tree Ordinance of the City of Ceres (City of Ceres 1995)	Any street tree (single upright woody trunk exceeding 15 feet tall when mature with a canopy of 12 feet) in a right-of-way or planting easement.	Yes for protected (street) trees	Yes for protected (street) trees	Replacement trees at a 1:1 ratio, no smaller than 15-gallon	Inside UPRR ROW: 1:1 for all trees Outside UPRR ROW: 1:1 for protected tree 1:1 for unprotected tree
City of Turlock Tree Municipal Code Chapter 7-7 (City of Turlock 2000)	Any street tree in a right-of-way or planting easement (5 feet of parcel frontage).	Yes for protected (street) trees	Yes for protected (street) trees	Replacement trees at a 1:1 ratio of tree on the Street Tree List	Inside UPRR ROW: 1:1 for all trees Outside UPRR ROW: 1:1 for protected tree 1:1 for unprotected tree
County of Merced Code 13.30.040 (Merced County 1999)	Any roadside (street) tree in a road right-of-way.	Yes for protected (street) trees	Yes for protected (street) trees	Not stated, at discretion of Director of Director of Public Works	Inside UPRR ROW: 1:1 for all trees Outside UPRR ROW: 1:1 for protected tree 1:1 for unprotected tree

Jurisdiction	Definition of Protected Trees	Removal Permit Needed?	Pruning Permit Needed?	Replacement Requirement	Recommended Replacement Ratios
City of Livingston Street Tree Regulations Chapter 2 (City of Livingston 2016)	Any street tree in a right-of-way or planting easement (5 feet on either side of right-of-way).	Yes for protected (street) trees	Yes for protected (street) trees	5:1 replacement for protected tree removal with each replacement tree 24-inch box size	Inside UPRR ROW: 1:1 for all trees Outside UPRR ROW: 5:1 for protected tree 1:1 for unprotected tree
City of Atwater Trees Chapter 12.32 (City of Atwater 1991)	Any street tree in a right-of-way or planting easement.	Yes for protected (street) trees	Yes for protected (street) trees	1:1 replacement for protected tree removal with each replacement tree 15-gallon size	Inside UPRR ROW: 1:1 for all trees Outside UPRR ROW: 2:1 for protected tree 1:1 for unprotected tree
Street Tree Ordinance of the City of Merced: Chapter 14.12 (City of Merced 1983)	Any street tree in the road right-of-way of the City or in easements adjacent thereto.	Yes for protected (street) trees	Yes for protected (street) trees	Not stated, at discretion of Director of Recreation and Parks	Inside UPRR ROW: 1:1 for all trees Outside UPRR ROW: 1:1 for protected tree 1:1 for unprotected tree

Notes:
The City of Ripon does not have a tree protection or tree removal ordinance; therefore, the County of San Joaquin Tree Ordinance would be applicable to areas within the City of Ripon.
UPRR = Union Pacific Railroad
ROW = right-of-way