

Stratford Kings River Bridge Replacement

NES



Natural Environment Study

State Route 41 in Kings County, CA

Southwest of Stratford, CA

06-KIN-41-[32.5/33.1]

Project ID 616000208

EA 06-0V110

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 U.S.C. 327 and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans.


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Natural Environment Study

STATE OF CALIFORNIA
Department of Transportation

Prepared By:  Date: 2/13/20
Rachel Flanagan, Environmental Planner (N/S)
559-445-6442
Central Region Biology
District 6/Central Region

Recommended
for Approval By:  Date: 2/13/20
Christina Anderson, Associate Environmental Planner (N/S)
559-445-6468
Central Region Biology
District 6/Central Region

Approved By:  Date: 2/13/2020
Kari Kyler Daniska, Acting Biology Branch Chief
559-445-6456
Central Region Biology
District 6/Central Region

For individuals with sensory disabilities, this document is available in Braille, in large print, on audiocassette, or computer disk. To obtain a copy in one these alternative formats, please call or write to Caltrans, Attn: Kari Kyler Daniska, Central Region Biology Branch South, 855 M Street, Suite 200, Fresno, CA 93721; (559) 445-6456, or use the California Relay Service 1-800-735-2929 (TTY), 1-800-735-2929 (Voice) or 711.

Summary

The proposed project is located on State Route 41 in Kings County at the Stratford Kings River Bridge (Bridge No. 45-0007), 5 miles south of Lemoore, and approximately 1 mile south-east of the town of Stratford. This project will replace the Kings River Bridge with a new bridge structure. During construction, traffic on State Route 41 will be redirected onto a 32-mile detour. Traffic heading south from Fresno would be routed onto State Route 198, to Avenal-Cutoff Road, then to Interstate 5 and back onto State Route 41. Traffic heading north from the Central Coast would be routed onto Interstate 5, onto Avenal-Cutoff Road and to State Route 198, then back onto State Route 41. The detour will require electrical work on-pavement to accommodate temporary traffic signals at the intersection of Avenal-Cutoff Road and Interstate 5.

The purpose of this project is to address superstructure, substructure, and seismic deficiencies of the bridge to ensure the safety and reliability of State Route 41. The existing Kings River Bridge is 77-years-old, built in 1942 and widened in 1987, and is exhibiting signs of bridge deck deterioration and corrosion of the support columns. Further studies found that a bridge replacement was required to address the structural and seismic deficiencies.

To replace the Kings River Bridge, it is estimated that 200 working days over two construction seasons will be required. No night work is anticipated. A temporary, 50-foot wooden trestle will be installed south of the bridge, connecting with the eastern bank, from which demolition and construction of the new bridge will be conducted. Dewatering and pile driving will be required for the trestle installation, and for installation of the new bridge piers. Construction will involve the demolition of the old bridge structure, the partial removal of its pilings to at least below the mudline, and installation of the new bridge and pilings. The new bridge will be an incremental precast slab bridge 297 feet in length and approximately 43.5 feet wide. The new bridge will have 6 piles per bent, at a diameter of 24 inches. The alignment and centerline of the new bridge will be the same. The new bridge's abutments would be set 8 feet further out from the shoreline on both sides relative to the current bridge's abutments. Embankments will be recontoured to accommodate the new bridge length. The bridge profile and the approach to the bridge will be unchanged. No utility relocation is anticipated. No new right-of-way will be required, but temporary construction easements will be necessary. No ground disturbance or off-pavement work is anticipated for the 32-mile detour associated with the project.

The project's action area is approximately 386.89 acres, with 179.94 acres of potential habitat for special-status species, while the remainder of habitat is classified as barren, developed roadway, or residential, and is not suitable for special-status species. Of the 179.94 acres of potential habitat, approximately 178.62 acres will be temporarily impacted, and 1.32 acres permanently impacted. Temporary indirect impacts (163.46 acres) primarily affect agricultural land and are associated with increased dust, noise, and minor vibrations from construction equipment. Temporary direct impacts (15.16 acres) affect riverine/canal habitat, valley foothill riparian habitat, and agricultural lands, and are associated with incidental foot traffic by construction personnel, equipment

operations, vehicular traffic, trestle installation, pile removal, bridge demolition, vibration from pile driving, and vegetation removal. Areas that are temporarily directly impacted by the proposed project will be restored to pre-project conditions through passive restoration or by implementation of a restoration/erosion control plan.

Approximately 1.32 acres will be directly and permanently impacted. These permanent impacts are expected due to the relocation of the bridge abutments, approach embankments, and bridge piles. Compensatory mitigation is proposed for permanent impacts to habitat.

The proposed project has the potential to affect the following special-status species: western red bat, hoary bat, loggerhead shrike, western pond turtle, northern harrier, and Swainson's hawk. Tricolored blackbird, black-crowned night heron, and yellow-headed blackbird were not observed during surveys but were determined to have the potential to be present, and therefore have potential to be affected by the proposed project. No federally listed species are anticipated to be affected by the construction of the proposed project.

Vegetation removal will occur outside of the nesting bird season, February 1 to September 30, and therefore will not directly impact special-status species. Swainson's hawk has been confirmed to actively nest within the action area and there are no plans to remove the nest tree that was found during surveys. If Swainson's hawk are present and nesting within the action area at the time of construction a 500-foot no work buffer will be established around the nest and a biological monitor will be present to monitor the nesting birds for any signs of distress. If a 500-foot no work buffer cannot be maintained, the project may result in take of the species and an incidental take permit may be required from the California Department of Fish and Wildlife.

The project is anticipated to impact waters that may be considered jurisdictional under the authority of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and the California Department of Fish and Wildlife. Impacts to jurisdictional waters will likely require a Section 404 Nationwide permit from the U.S. Army Corps of Engineers, a Section 401 Water Quality Certification from the Regional Water Quality Control Board, and a Section 1602 Lake and Streambed Alteration Agreement from the California Department of Fish and Wildlife. A Preliminary Jurisdictional Determination has been prepared that defines the presence, boundaries, and impacts to all Waters of the U.S. in the action area and has been submitted to the U.S. Army Corps of Engineers.

Mitigation for permanent impacts to Waters of the U.S. will be fulfilled through the purchase of conservation credits with the National Fish and Wildlife Foundation. Onsite (if feasible) or offsite tree replanting or purchase of riparian credits is proposed to compensate for the loss of riparian habitat within California Department of Fish and Wildlife jurisdictional areas. If a 500-foot no work buffer cannot be maintained, proposed mitigation for the potential take of nesting Swainson's hawk may include the purchase of conservation credits, creation of nesting habitat, or purchase and protection of land/conservation easements containing nesting habitat.

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Chapter 1. Introduction

The purpose of this project is to address superstructure, substructure, and seismic deficiencies of the bridge to ensure the safety and reliability of State Route 41. The existing Stratford Kings River Bridge (Bridge No. 45-0007) is 77 years old, built in 1942 and widened in 1987, and is exhibiting signs of bridge deck deterioration and corrosion of the support columns. Further studies found that a bridge replacement was required to address the structural and seismic deficiencies.

1.1. Project History

The Stratford Kings River Bridge has extensive superstructure and substructure distress, and the top ten feet of soil have high susceptibility to liquefaction at estimated peak ground acceleration. A Structure Maintenance and Investigations Bridge Maintenance Strategy Meeting determined that replacement of the Stratford Kings River Bridge was the most cost-effective alternative to the continued seismic retrofitting of the bridge. Replacement is preferable considering the current state of the bridge and the cost of continued seismic retrofits that would not address the age and structural issues of the bridge.

A value analysis study was initiated in April 2019 to assess the value of this project and review and eliminated potential alternatives. Conclusions of the value analysis were released in May 2019, and the preferred alternative was chosen. Alternatives considered, but ultimately rejected, included the following:

- Alternative 1A-This alternative would demolish the old structure and construct a new bridge at the same location. Traffic would be temporarily detoured onto a temporary bridge that would have been constructed upstream of State Route 41.
- Alternative 1B-This alternative would demolish the old structure and construct a new bridge at the same location. Traffic would be temporarily detoured onto a temporary bridge that would have been constructed downstream of State Route 41.
- Alternative 2- This alternative proposed to replace the Stratford Kings River Bridge with a new bridge. Two temporary wood trestles would be erected between the existing bridge for dismantling and building the new bridge. Traffic on State Route 41 would be redirected onto a 3-mile detour using local county roads Laurel Avenue and 22nd Avenue. County roads would be repaved and widened to 12 feet from centerline under an agreement with Kings County. Temporary construction easements would be required at the intersections entering and existing the detour as well as the intersection of Laurel Avenue and 22nd Avenue. All three intersections will be widened to accommodate truck turning movement for truck traffic. The county bridge (No. 45-C0114) is sufficiently rated for proposed traffic and no work would be done on that bridge. A temporary traffic signal would be required at the intersection of Laurel Avenue and 22nd Avenue and speed limits would be reduced during construction.

Alternatives 1A and 1B were estimated to cost \$17,750,000.00 in 2017, and Alternative 2 was estimated to cost \$20,200,000.00 in 2019.

Alternatives 1A and 1B were eliminated from further consideration due to environmental impacts to riparian and wetland habitat, and the degree of streambed alterations required. Both alternatives would have required acquisition of properties for temporary re-alignment of State Route 41 and the temporary bridges.

Alternative 2 was eliminated after the value analysis was conducted in April 2019 when a new, cost-saving alternative was identified. The value analysis identified safety concerns for the old detour's bridge (Bridge No. 45-C0114) on Laurel Avenue, and Alternative 2 would have required utility relocation at the intersection of Laurel Avenue and 22nd Avenue. In addition to the value analysis results, Alternative 2 was eliminated because construction along the Kings River would impact wetlands and require streambed alterations that would require long-term mitigation.

At the end of the value analysis a modified version of Alternative 2 was determined to be the preferred alternative. The preferred alternative would replace the Stratford Kings River Bridge with a new bridge and use one temporary wood trestle to dismantle and build the new bridge structure minimizing impacts to wetlands. Traffic on State Route 41 would be redirected onto a 32-mile detour to avoid and minimize impacts habitat and environmentally sensitive areas.

1.2. Project Description

The proposed project is located on State Route 41 in Kings County between postmile 30.6 and 33.0, at the Stratford Kings River Bridge (postmile 32.3), 5 miles south of Lemoore, and approximately 1 mile south-east of Stratford (Figure 1). The elevation is roughly 200 feet above sea level, and the project is in the Stratford USGS 7.5-minute quadrangle, Township 20 south, Range 20 east, Sections 17, 18, 19, and 20. The project would replace the existing Stratford Kings River Bridge with a new, incremental precast slab bridge 297 feet in length (17 feet longer than the existing bridge). The old bridge will be dismantled piece by piece from the ends of the bridge and a temporary trestle.

The alignment and centerline of the new bridge will match the existing bridge, accommodating two 12-foot lanes and two 8-foot shoulders, and will be approximately 43.5 feet wide as well as 330 feet long. The new bridge will have seven bents with 6 piles per bent, at a diameter of 24 inches. The new bridge's abutments would be set 8 feet further out from the Kings River South Fork than the current bridge's abutments, and the new bridge will have the same profile as the old bridge. Maximum depth of excavation at the bridge site would be 20 feet. State Route 41 would not require adjustments to its profile on the approach to the bridge, though some minor slope changes may be necessary for the addition of drainage inlets. The bottom of the new bridge deck will be at a height equal to that of the current bridge's deck, and as no rock slope protection for the abutments is anticipated, no fill will be required for the bridge abutments.

A temporary 50-foot wooden trestle of up to 208 feet in length will be built on the eastern side of the existing bridge for the piece-by-piece dismantling the old bridge and installing the new bridge structure. The trestle will be erected from the southeastern bank of the Kings River and end just before the southwestern bank and its associated wetlands.

Temporary fill in the form of clean rocks will be placed on the eastern bank of the South Fork Kings River to support the beginning of the trestle, while the remainder of the trestle would be supported by piles. Piles would be driven from the shore and from the rock platform established for the trestle at the shore. Dewatering would also be required for trestle installation. All piles and rock associated with the trestle would be removed at the end of construction, and the contours of the riverbed restored to their original state. No permanent fill will result from the temporary trestle. Staging will be on the east side of the bridge on the northeastern and southeastern corners of the project footprint.

The selected changes to the project from the value analysis were a switch from two 30-foot trestles on either side of the bridge to one 50-foot trestle on the east side of the bridge, and a change in the detour from use of Laurel Ave and 22nd Ave to a 32-mile detour using State Route 198, Avenal-Cutoff Road, and Interstate 5.

The new detour would direct traffic heading south from Fresno onto State Route 198, Avenal-Cutoff Road, and Interstate 5 then back onto State Route 41 towards the Central Coast. Traffic heading north from the Central Coast would be directed onto Interstate 5, Avenal-Cutoff Road, and State Route 198, then back onto State Route 41. Residents near the action area will be able to use Laurel Avenue and 22nd Avenue to navigate around construction.

For the detour, no utility relocation is anticipated. Temporary traffic signals will be set up on Avenal-Cutoff Road at two intersections, where Avenal-Cutoff Road intersects with State Route 198, and where it intersects with State Route 269. Both traffic signals will be temporary portable signals and will not require any ground disturbance for installation and use. To ensure that traffic uses the intended detour, a Construction Zone Enhancement Enforcement Program will be implemented at both ends of State Route 41. California Highway Patrol will be present at both ends of the detour to direct traffic and ensure the safety of both the travelling public and construction work crews.

No new right-of-way will be required, but temporary construction easements will be necessary. Construction is estimated to take 200 working days over 2 construction seasons. Irrigation districts may introduce work windows for in-water work that alter the timeline. No night work will be required.

The contractor would follow best management practices (Appendix E) during construction. All equipment parking, project access, equipment maintenance, and other project-related activities will occur within the Caltrans right-of-way and temporary construction easements acquired by Caltrans. Designated staging areas for equipment storage, vehicle parking, and other project-related activities would be pre-approved by the Caltrans biologist. The following table lists construction equipment that may be used:

Table 1: Construction Equipment and Purpose During Construction

| Equipment | Construction Purpose |
|---------------------------------|---|
| Asphalt paver/roller | Asphalt-concrete delivery/placement |
| Backhoe | Soil manipulation and drainage work |
| Bidwell and roller screeds | Bridge structure construction |
| Bobcat | Pavement construction |
| Bulldozer/loader | Earthwork construction, clearing and grubbing |
| Chainsaw | Vegetation clearing |
| Compressor | Bridge structure construction |
| Concrete pump | Pavement construction |
| Concrete truck mixers | Pavement construction |
| Crane | Drainage work |
| Dump truck | Asphalt-concrete delivery |
| Excavator | Soil manipulation |
| Flatbed truck | Drainage work |
| Fork lift | Drainage work |
| Front-end loader | Dirt or gravel manipulation |
| Genie man lift | Bridge structure construction |
| Grader | Ground leveling |
| Haul truck | Earthwork construction, clearing and grubbing |
| Motor grader | Earthwork construction |
| Paint/stripping truck | Pavement stripping/delineation |
| Pavement roller | Pavement construction |
| Pile driver/drill rig | Bridge structure construction |
| Pump truck | Bridge structure construction |
| Redi-mix truck | Concrete delivery |
| Roller/compactor | Earthwork construction |
| Roller screeds | Pavement construction |
| Saw cutting/stripping equipment | Pavement construction |
| Scraper | Earthwork construction, clearing and grubbing |
| Shoulder paver | Shoulder paving |
| Truck with seed sprayer | Landscaping |
| Water truck | Earthwork construction and dust control |

Figure 1: Project Location Map

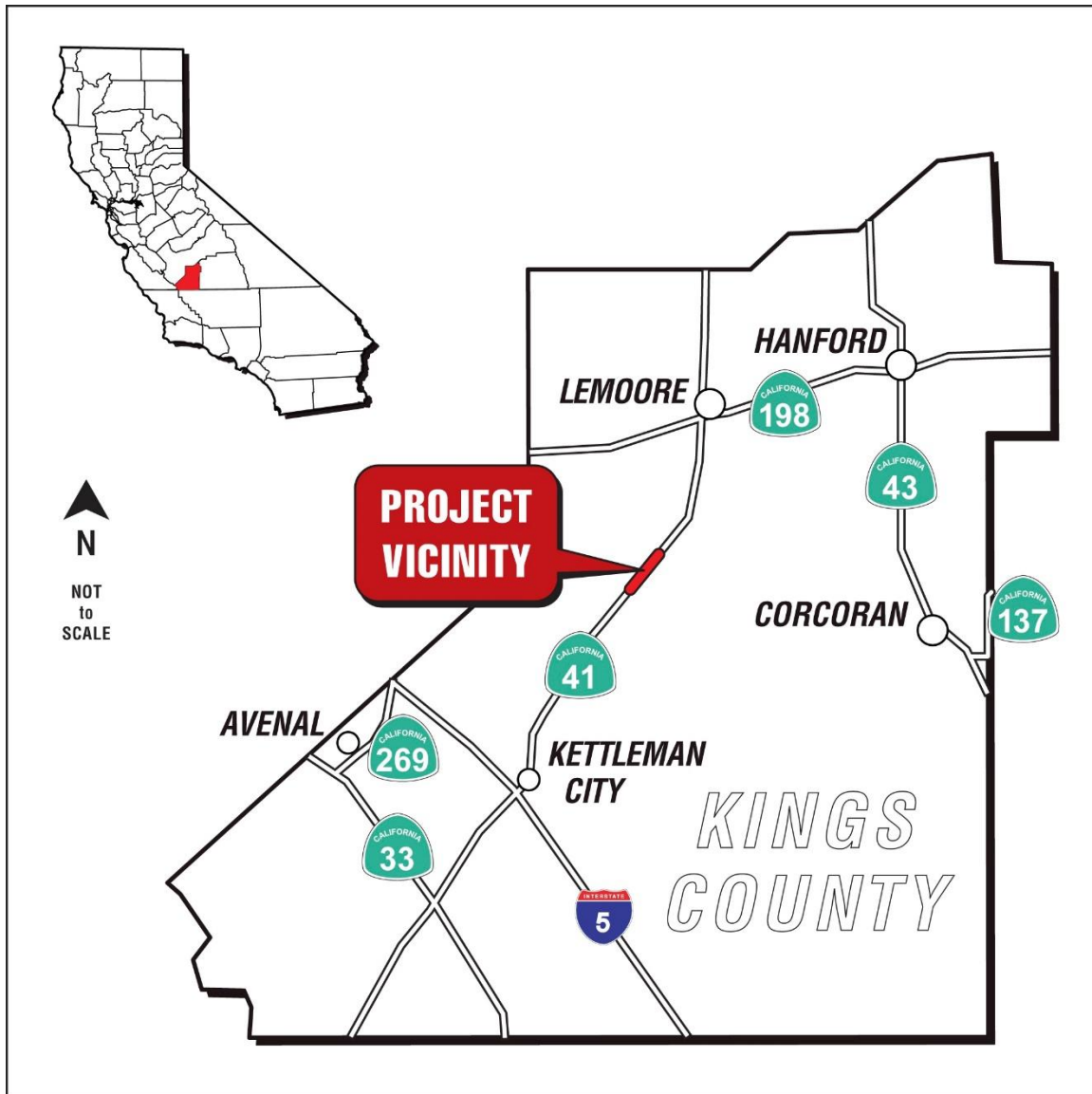


Figure 2: Project Vicinity Map



Chapter 2. Study Methods

The following chapter discusses the survey methods used to determine potential for special-status species or their habitat to be present within or near the project and what laws and regulatory requirements applicable to the project.

2.1. Regulatory Requirements

National Environmental Policy Act of 1969

The National Environmental Policy Act (NEPA) established policy and procedures to bring environmental considerations into the planning process for federal projects. Implementing regulations by the Council on Environmental Quality (CEQ; 40 Code of Federal Regulations Parts 1500-1508) requires federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Federal agencies are further directed to emphasize significant environmental issues in project planning and to integrate impact studies required by other environmental laws and Executive Orders into the NEPA process. The NEPA process should be an overall framework for the environmental evaluation of federal actions.

California Environmental Quality Act of 1970

The California Environmental Quality Act (CEQA) institutes a statewide policy of environmental protection. CEQA does not directly regulate land uses, but instead requires state and local agencies within California to follow a protocol of analysis and public disclosure of environmental impacts of proposed projects and, in a departure from NEPA, adopt all feasible measures to mitigate those impacts. CEQA makes environmental protection a mandatory part of every California state and local (public) agency's decision-making process.

Federal Endangered Species Act of 1973

The federal Endangered Species Act (ESA), is jointly administered by the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration Fisheries (National Marine Fisheries Service) and provides guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend. In general, the National Marine Fisheries Service is responsible for protection of ESA-listed marine species and anadromous fishes, whereas other listed species are under the jurisdiction of the U.S. Fish and Wildlife Service. *Endangered* refers to species, subspecies, or distinct population segments that are in danger of extinction through all or a significant portion of their range. *Threatened* refers to species, subspecies, or distinct population segments that are likely to become endangered in the near future.

Section 7 (a)(1) of the ESA requires federal agencies to consult with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Other paragraphs of this section establish the requirement to conduct conferences on

proposed species, allow applicants to initiate early consultation, require the U.S. Fish and Wildlife Service and National Marine Fisheries Service to prepare biological opinions (BO) and issue incidental take statements.

Section 9 of the ESA lists those actions that are prohibited under the Act. Take of a species listed in accordance with the act is prohibited. There are two (2) processes whereby take is allowed when it is incidental to an otherwise legal activity.

Section 10 of the ESA provides a means whereby a non-federal action with a potential to result in the take of a listed species could be allowed under an incidental take permit. Application procedures are found at the 50 CFR, parts 13 and 17, for species under the jurisdiction of the U.S. Fish and Wildlife Service and 50 CFR, parts 217, 220, and 222, for species under the jurisdiction of National Marine Fisheries Service.

California Endangered Species Act of 1970

The California Endangered Species Act (CESA) is administered by the California Department of Fish and Wildlife and states that all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a *threatened* or *endangered* designation, will be protected or preserved. The California Department of Fish and Wildlife will work with all interested persons, agencies and organizations to protect and preserve such sensitive resources and their habitats.

California Department of Fish and Game Code

Sections 1602, 3503 and 3503.5, 3511, 3513, 4150-4154, and 5901 of the California Department of Fish and Game Code (CDFGC) apply to the proposed project and are described below.

Section 1602 states that entities may not substantially divert or obstruct the natural flow, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake, unless the California Department of Fish and Wildlife is notified and/or a permit is issued.

Sections 3503 and 3503.5 prohibits the destruction of bird and raptor nests.

Section 3511 prohibits the *take* of fully protected species and lists fully protected birds. The CDFGC definition of *take* is to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill. Except for *take* related to scientific research, all *take* of fully protected species is prohibited.

Section 3513 prohibits the *take* or possession of any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

Section 4150-4154 prohibits the *take* or possession of any nongame mammals naturally occurring in California. A nongame mammal is any mammal that is not a game mammal, fully protected mammal, or fur bearing mammal. A nongame mammal may not be taken or possessed except as provided in the code or in accordance with regulations adopted by the commission.

Section 5901, Article 3.5 mandates that Caltrans locate, assess, and remediate barriers to fish passage, which is defined as the ability of anadromous fish to access appropriate habitat at all point of its life cycle, including spawning and rearing, and that all projects be constructed without presenting barriers to fish passage.

California Code of Regulations

Title 14, section 251.1-Harassment of Animals- prohibits a person from harassing, herding or driving any game or nongame bird or mammal or furbearing mammal, except as otherwise authorized in these regulations or in the Fish and Game Code. For the purposes of this section, harass is defined as an intentional act which disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding or sheltering. This section does not apply to a landowner or tenant who drives or herds birds or mammals for the purpose of preventing damage to private or public property, including aquaculture and agriculture crops.

Clean Water Act of 1972

The Clean Water Act, provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters, including wetlands.

Section 401: Requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the U.S, must obtain a state certification that the discharge complies with other provisions of Clean Water Act. The Regional Water Quality Control Boards administer the certification program in California.

Section 404: U.S. Army Corps of Engineers jurisdiction over fill materials in essentially all water bodies, including wetlands. All federal agencies are to avoid impacts to wetlands whenever there is a practicable alternative. Section 404 established a permit program administered by U.S. Army Corps of Engineers regulating the discharge of dredged or fill material into waters of the U.S. (including wetlands).

Under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act is the principle law governing water quality in California and established a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act established the nine Regional Water Quality Control Boards and that State Water Resource Control Board, which are

charged with implementing its provisions and protecting water quality. The State Water Resource Boards and Regional Water Quality Control Boards issue National Pollution Discharge Elimination System permits and Waste Discharge Requirement permits for point source and non-point source discharges that may result in water quality impacts.

Fish and Wildlife Coordination Act of 1934

The Fish and Wildlife Coordination Act required consultation with the U.S. Fish and Wildlife Service and the fish and wildlife agencies of the State where the “waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted... or otherwise controlled or modified” by any agency under a Federal permit or license. Consultation is to be undertaken for the purpose of “preventing loss and damage to wildlife resources.”

Migratory Bird Treaty Act of 1918

The federal Migratory Bird Treaty Act (MBTA) implemented the treaties between Great Britain, Mexico, Japan, and the Soviet Union, with the United States of America 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. Most actions that result in taking or in permanent or temporary possession of a protected species constitute violations of the MBTA. The U.S. Fish and Wildlife Service is responsible for overseeing compliance with MBTA.

California Native Plant Protection Act of 1977

The California Native Plant Protection Act (CNPPA) prohibits importation of rare and endangered plants into California, take of rare and endangered plants, and sale of rare and endangered plants. The CESA defers to the CNPPA, which ensures that state-listed plant species are protected when state agencies are involved in projects.

Federal Noxious Weeds Act of 1975

The federal Noxious Weeds Act requires federal agencies to 1) designate an office or person adequately trained in managing undesirable plant species to develop and coordinate a program to control such plants on the agencies land, 2) establish and adequately fund this plant management program through the agency’s budget process, 3) complete and implement cooperative agreements with the States regarding undesirable plants on agency land, and 4) establish integrated management systems to control or contain undesirable plants targeted under the cooperative agreements.

Executive Order 13112: Invasive Species (signed February 3, 1999)

Executive Order (EO) 13112 directs all federal agencies to prevent and control the introduction of invasive species in a cost-effective and environmentally sound manner. The EO established the National Invasive Species Council, which is composed of federal agencies and departments, and a supporting Invasive Species Advisory Committee composed of state, local, and private entities. In 2008, the NISC released an updated national invasive species management plan (NISC 2008) that recommends objectives and measures to implement the EO and prevent the introduction and spread of invasive species. The EO requires consideration of invasive species, including their identification

and distribution, their potential impacts, and measures to prevent or eradicate them. Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State's invasive species list, maintained by the California Invasive Species Council to define the invasive plants that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project.

Executive Order 11990: Protection of Wetlands

Executive Order (EO) 11990, signed May 24, 1977, established a national policy to avoid adverse impacts on wetlands whenever there is a practicable alternative. The U. S. Department of Transportation (USDOT) promulgated DOT Order 5660.1A in 1978 to comply with this direction. On federally funded projects, impacts to wetlands must be identified. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included.

An additional requirement is to provide early public involvement in projects affecting wetlands.

2.2. Studies Required

Biological resources within the action area were identified through database and literature reviews, field surveys, and agency coordination. These methods are described in greater detail in the sections below.

Database and Literature Review

The action area was researched for recent and historical species occurrences using the United States Fish and Wildlife Service's Information for Planning and Consultation online tool and the California Department of Fish and Wildlife's California Natural Diversity Database (Appendix B). The United States Fish and Wildlife Service's Information for Planning and Consultation online tool was queried using the project action area, and the California Natural Diversity Database was queried using the *Stratford* United States Geological Survey 7.5-minute quadrangle, and 8 other quadrangles surrounding the action area. These additional quadrangles include the *Stratford SE*, *Vanguard*, *Lemoore*, *Hanford*, *Guernsey*, *El Rico Ranch*, *Kettleman City*, and *Westhaven* United States Geological Survey 7.5-minute quadrangles. Because of the detour, additional quadrangles, *Huron*, *La Cima*, and *Avenal* were also included in the query.

The project is located outside the National Marine Fisheries Service's jurisdiction, in an area where there are no identified National Marine Fisheries Service species or habitats; therefore, a species list was not requested (Appendix A). The California Fish Passage Assessment Database was used to assess fish passage status in the South Fork Kings River, both in and upstream of the action area, as well as the irrigation canals in the action area and bodies of water within the general vicinity (Appendix A).

The California Native Plant Society's Electronic Inventory of Rare and Endangered Plants was also queried for the above-mentioned 7.5-minute quadrangles (Appendix B). Species that were returned by the Inventory query, but which are not State- or federally-listed were given equal consideration based on state and global rank, as well as California Native Plant Society rare plant rank. Additional research was done for sensitive plant species using the Consortium of California Herbaria search portal, the CCH22. The CCH22 was queried for a 5-mile radius of the project location (Appendix A). Herbarium collection records returned by CCH22 (Appendix B) were evaluated with the same criteria as the California Native Plant Society Inventory results and were based on the criteria in the Section 1901 of the California Native Plant Protection Act, regardless of rank or listing.

Current and historical aerial imagery were viewed using Google Earth Pro and CalVeg mapping and the available habitat types were evaluated to help determine habitat suitability for special-status species within the action area.

Field Reviews

Based on habitat present within the action area and the database and literature review, it was determined that an aquatic resource report and jurisdictional determination would likely be required to complete the proposed project. Additionally, general wildlife surveys, botanical surveys, migratory nesting bird and raptor surveys, Swainson's hawk surveys, and bats surveys were determined to be necessary to assess potential species impacts. Field reviews and surveys are discussed in greater detail in Section 2.3.

Survey Methods

The following protocols and guidelines were implemented when conducting surveys relevant to the proposed project:

- *Wetlands Delineation Manual* (U.S. Army Corps of Engineers 1987)
- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (U.S. Army Corps of Engineers 2008)
- *Arid West 2016 Regional Wetland Plant List* (United States Army Corps of Engineers 2016)
- *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West region of the Western United States* (U.S. Army Corps of Engineers 2008).
- *A Field Guide to Lake and Streambed Alteration Agreements* (California Department of Fish and Game 1994)
- *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (U.S. Fish and Wildlife Service 2000)
- *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (California Department of Fish and Wildlife 2018)

- The Swainson's Hawk Technical Advisory Committee's *Recommended Timing and methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (May 2000)

2.3. Personnel and Survey Dates

Surveys were conducted by Caltrans biologists and Rincon biologists working under a task order for a contract with HDR Inc. All Rincon biologists submitted resumes to Caltrans for approval prior to surveys, outlining experience with the relevant species and survey protocols. All of the biologists involved have, at minimum a bachelor's degree in a relevant biological field, and have experience conducting biological surveys.

Reconnaissance Survey

March 2, 2018: a reconnaissance survey of the action area was conducted by Caltrans biologists Emma Fryer and Alyssa Anderson. Surveyors obtained complete visual coverage of the project footprint to assess habitat type and potential for listed species.

Diameter at Breast Height Survey

April 23, 2018: A diameter-at-breast height surveys were conducted by Caltrans biologists Emma Fryer and Alyssa Anderson, for all trees with a diameter over two inches that occurred within a 50-feet of the project footprint.

Wetland Delineation

March 12, 2019: A wetlands delineation and preliminary jurisdictional determinations were conducted by Rincon biologists Carolyn Daman and Sophia Murrell. The Kings River South Fork and the associated wetlands within the action area were evaluated for aquatic resources, and preliminary jurisdictional determination was completed for California Department of Fish and Wildlife and United States Army Corps of Engineers for jurisdictional verification. Wetlands were delineated using the *Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. The United States Army Corps of Engineers *Arid West 2016 Regional Wetland Plant List* was also referenced for hydrophytic species. Waters of the U.S. were preliminarily determined using physical characteristics to identify the ordinary high-water mark as outlined in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West region of the Western United States*. Water sources and connections to Traditionally Navigable Waters and Relatively Permanent Waters downstream of the action area were also evaluated, and Regional Water Quality Control Board jurisdiction was determined by the same methods as United States Army Corps of Engineers jurisdictional wetlands and waters of the U.S.

Preliminary determination of California Department of Fish and Wildlife jurisdiction was conducted based on Section 1602 of the Fish and Game Code, and *A Field Guide to Lake*

and Streambed Alteration Agreements in conjunction with wetlands delineation and preliminary determination of United States Army Corps of Engineers jurisdiction.

Delineations and the extent of jurisdictional features, sample points, and photo points were mapped to sub-meter accuracy with a Trimble Geo 7X Global Positioning System unit and plotted on aerial photos. Aerial photos were utilized in assessing aquatic resources, and delineations and jurisdictional features were mapping in a geographic information system suite. (Appendix C, Aquatic Resources Delineation)

General Wildlife Surveys

April 11 & 17, 2018: General wildlife surveys were conducted by Rincon biologist Carie Wingert, with a focus on San Joaquin kit fox (*Vulpes macrotis mutica*), Tipton kangaroo rat (*Dipodomys nitratoide nitratoide*), burrowing owl (*Athene cunicularia*), western snowy plover (*Charadrius alexandrinus nivosus*), and western pond turtle (*Emys marmorata*). All habitat types, animal species, and animal sign observed during general wildlife surveys were recorded, regardless of state, federal, or other ranking status. Surveys were conducted on foot and from a vehicle as necessary to obtain complete visual coverage where legal access to portions of the action area that fall within private property could not be obtained.

Botanical and Rare Plant Surveys

The 2018 season botanical surveys (March 12, April 14, May 15, and June 1, 2018) were conducted by Rincon biologists Kyle Weichert and Sophia Murrell. Surveys were conducted over 4 non-consecutive days spanning from March and June to capture the maximum possible range of blooming periods within the period of the contract under which surveys were conducted, and in accordance with the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* and *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. Transects were walked within the survey area to achieve complete visual coverage, and areas not legally accessible were visually assessed to ensure visual coverage of the entire action area. Potential special-status species with reported occurrences in the project vicinity include: recurved larkspur (*Delphinium recurvatum*), vernal barley (*Hordeum intercedens*), San Joaquin woollythreads (*Monolopia congdonii*), mud nama (*Nama stenocarpa*), and San Joaquin bluecurls (*Trichostema ovatum*). These species were given additional consideration during the botanical surveys and some of the surveys were completed to target the blooming season of these species. Plants encountered were identified to the taxonomic level necessary to determine rarity and ranking, if any, and whether the species were invasive, non-native, or native. Habitat types within the action area were assessed for likelihood to support ranked and rare plant species with California Native Plant Society or California Natural Diversity Database reported occurrences in the project vicinity.

The 2019 season botanical surveys (April 12, May 25, and July 12, 2019) were conducted for rare plant species with documented occurrences in the project vicinity, or with potential to occur in habitat found within the project vicinity. These surveys were

conducted to allow for observation of any special-status species that may have been absent during the 2018 blooming season. Several factors may limit detection of special-status species during any given survey season. Herbarium records indicate that crown scale was once found in the project vicinity (Consortium of California Herbaria, 2019) and this species could still be present in the seed bank even though this species was not identified in 2018. Additionally, the 2018 surveys were not performed during the correct blooming period for San Joaquin bluecurls and additional surveys were required to confirm this species was not present within the project site.

Prior to the 2019 season botanical surveys, Caltrans biologists Emma Fryer and Christina Anderson visited a reference population of San Joaquin bluecurls at Tejon Ranch on October 22, 2018, in advance of 2019 surveys. Caltrans biologists Emma Fryer, Theresa Tillson, and Devon Hamblett surveyed suitable habitat for in the riparian within the project footprint for recurved larkspur, San Joaquin woollythreads, and vernal barley on April 12, 2019. On May 23, 2019, a follow-up site visit was conducted by Caltrans biologists Emma Fryer and Alyssa Anderson to collect blooming catkins from a thicket of willows to confirm the identification of this species. Survey reports from Rincon biologists indicated conflicting species identifications for the willow species that were found within the proposed project area. An additional survey, focused on San Joaquin bluecurls and crown scale was conducted July 12, 2019 by Caltrans biologists Emma Fryer and Christina Anderson.

Bat Surveys

May 24, June 11, July 16, and July 19, 2018: Bat surveys were conducted for the Kings River Bridge by Rincon biologists Wendy Knight, Alana Garza, and Kirsten Bates over four non-consecutive days. The first survey was conducted during the day to visually inspect the bridge structures for roosting bats, potential roost locations, and bat sign such as guano. The remaining three days of surveys included emergence surveys using bat detectors. Emergence surveys were conducted from dusk (one hour prior to sunset) until three hours after sunset, and Pettersson Elektronik D240X and SM2BAT (Sonobat) bat detectors were used to record vocalizations, which were later analyzed with Sonobat software. Survey efforts focused on the bridge structure and its immediate surroundings.

MBTA and Raptor Surveys

March 19 & 27, April 3, 4, 10, 11, 17, June 12, 19, 26, 2018: Rincon biologists Sophia Murrell, Kirsten Bates, and Alana Garza conducted surveys for migratory nesting birds, raptors, and Swainson's hawk. These surveys were conducted concurrently, with nesting bird and raptor surveys scheduled to overlap with the dates for Swainson's hawk surveys as outlined by the Swainson's Hawk Technical Advisory Committee's *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley*. All avian species observed were recorded, regardless of State, federal, or other status. Periods I, II, III, and V were completed as outlined in the Recommended Timing Methodology, but Period IV was not included, as surveys conducted were only intended to determine presence of this species. Surveys were conducted within the action area and within an additional half-mile buffer of the project. Target species and incidental species

observations were recorded. Nests that were observed to be active were checked on subsequent survey dates.

April 25, 2019: Follow-up surveys focused on Swainson's hawk, raptors, and tricolored blackbird were conducted by Nicolas Meyer and Alexander Rodriguez. Known nests were checked for occupancy, and potential habitat for tricolored blackbird in the project vicinity was surveyed in addition to the action area.

Detour Field Reviews

September 20, 2019: A windshield survey was performed by Alexander Rodriguez and Kari Kyler Daniska at the detour location. No special-status species were observed.

September 30, 2019: A general wildlife surveys was performed by Emma Fryer and Alexander Rodriguez at the detour location. No special-species were observed but small mammal burrows were detected south of Avenal Cutoff RD and SR 269 intersection. Recommendation that a habitat assessment be conducted for special-status species.

November 21, 2019: A habitat assessment was performed by Christina Anderson and Rachel Flanagan at the detour location. No special-status species were observed. Small mammal activity confirmed on the western side of Interstate 5, south of the Avenal Cutoff Road. Habitat in this area is considered marginally suitable alkaline scrub habitat.

Other Field Reviews

A field review was held October 8, 2018 between Caltrans Environmental, Construction, and Design functional units to assess and discuss project design and potential environmental impacts. Caltrans biologist Emma Fryer and supervising biologist Javier Almaguer were in attendance.

2.4. Agency Coordination and Professional Contacts

November 6, 2018: Caltrans biologists Emma Fryer, Javier Almaguer, Nicolas Meyer, and Steven Hulbert, Caltrans' California Department of Fish and Wildlife liaison, performed a site visit and early coordination meeting to discuss California Department of Fish and Wildlife jurisdiction, species of concern, and potential conservation measures. Following the site visit, Emma Fryer emailed Steven Hulbert the meeting minutes.

March 11, 2019: Emma Fryer emailed Debra Mahnke, Caltrans' Central Valley Regional Water Quality Control Board liaison, regarding the Water Quality Certification application for geotechnical work required for the project.

March 12, 2019: Emma Fryer emailed Jennifer Schofield, Caltrans' liaison for the United States Fish and Wildlife Service, regarding the no effect determination for federally listed species, and the need for Section 7 consultation, under the Federal Endangered Species Act, documentation for the anticipated United States Army Corps of Engineers Nationwide permit.

March 14, 2019: Emma Fryer, Javier Almaguer, and Steven Hulbert had a conference call regarding the Lake and Streambed Alteration Agreement application for geotechnical work required for the project, and to discuss California Department of Fish and Wildlife jurisdiction, species of concern, and potential conservation measures. San Joaquin kit fox was discussed as having no suitable habitat within the action area, but that pre-construction surveys may be required by the Department of Fish and Wildlife.

June 17, 2019: Emma Fryer and Debra Mahnke emailed regarding the type of Water Quality Certification required for geotechnical work in light of the anticipated Nationwide permit.

June 19, 2019 to June 21, 2019: Emma Fryer and Steven Hulbert emailed regarding details of the Lake and Streambed Alteration Agreement application for geotechnical work required for the project.

July 15, 2019: Kari Kyler Daniska called Jennifer Schofield regarding the project and no effect determination for federally listed species, including tricolored-blackbird (at time of correspondence the status of tricolored blackbird was under review; it has since been determined unwarranted for listing).

July 19, 2019: Kari Kyler Daniska received email guidance that the anticipated no effect determination for federally listed species including tricolored blackbird was appropriate for a species under review for federal listing.

August 28, 2019: Emma Fryer emailed Jen Schofield requesting the United States Fish and Wildlife Service's comments regarding Caltrans' Federal Endangered Species Act determinations for this project.

August 30, 2019: Email exchange between Emma Fryer and Jen Schofield regarding Caltrans "no effect" determination for federally listed species. United States Fish and Wildlife Service replied that they had no further comments based on the project description and Caltrans determination.

2.5. Limitations That May Influence Results

Presence/absence (general) and protocol-level wildlife surveys may confirm the presence of a special-status species, but negative results do not guarantee that the species is absent. However, for practical purposes, surveys that adhere to the published State and federal survey protocols provide reasonable evidence that the specified special-status species does not occur within the action area of the proposed project.

Water flow changes in the Kings River presented safety risks during surveys. Access to the underside of the bridge was limited during bat surveys, as biologists could not directly inspect the underside of the Stratford Kings River Bridge over the center of the river. Access to the riparian areas surrounding the bridge were also limited. Based on these limitations, it is assumed that bat species that were recorded during surveys are the only species present or with potential to be present within the action area. In addition,

cliff swallow nests on the bridge eaves and underside also reduced visibility for bat surveys.

Bat surveys focused on the bridge structure, and therefore may have missed bats roosting in trees within the action area that were located further away from the bridge, and so were not picked up by equipment during surveys.

Additionally, protocol-level surveys were not conducted in the action area surrounding the detour, as all work associated with the detour will occur between edges of pavement. Because all work associated with the detour is between edges of pavement it is assumed that no additional habitat types or species will be affected than those discussed in this document

Protocol-level botanical surveys may confirm the presence of a special-status plant within the action area, but negative results do not guarantee that a special-status plant species is absent. For practical purposes; however, surveys that adhere to the published State and federal survey protocols provide reasonable evidence that the specified special-status plant species does not occur in the action area of the proposed project.

First season botanical surveys concluded before the blooming period for San Joaquin bluecurls, and the second season of surveys were conducted only during the first month of the blooming period for the species. A reference population was visited by Emma Fryer and Christina Anderson prior to the 2019 season botanical surveys to enable identification of vegetative features, which is feasible for San Joaquin bluecurls. Focused botanical surveys were conducted in the 2019 season to cover the bloom period for all rare plants with potential to be present in the action area, but as only the first month of the blooming period for San Joaquin bluecurls was included in second season surveys, it remains possible that some individuals were not observed during second season botanical surveys.

Seeds may not germinate for several biological reasons, and available botanical survey protocols advise multiple years of surveys to increase the likelihood of detection of special status plants that may be present in the seed bank. While botanical surveys were conducted over a period of two years, only the 2018 surveys were protocol, and as 2019 surveys were focused on rare plants species with potential to be present, there remains the possibility that additional plant species are present in the seed bank that had not germinated the years surveys were conducted or were not observed during 2019 surveys.

Lower than average rainfall patterns were observed in 2018 as of the dates of the botanical survey efforts, and this may have affected the breadth and number of species observed in surveys. Some annual species may not germinate each year, so single- and two-year survey efforts may not include all species present in the seed bank.

Chapter 3. Environmental Setting

This chapter discusses the environmental setting of the project, including the project location and vicinity, the study area defined for studies, topography, soils, hydrology, biological resources, and degree of human or natural disturbance.

3.1. Description of the Existing Biological and Physical Conditions

The project is located in central Kings County, from post mile 32.5 to post mile 33.1 on State Route 41. Traffic on State Route 41 would be redirected onto a 32-mile detour, which will use existing State and County routes. Traffic heading south from Fresno would be redirected onto State Route 198/Avenal-Cutoff Road/Interstate 5 and back onto State Route 41 towards the Central Coast. Traffic heading north from the Central Coast would use Interstate 5/Avenal-Cutoff Road/State Route 198 and back onto State Route 41. Local residences near the project footprint will be able to use Laurel Avenue and 22nd Avenue to navigate around construction.

3.2. Action Area

The action area encompasses all areas that could conceivably be affected (directly or indirectly) by implementation of the project. This includes the project footprint associated with the bridge replacement, adjacent areas subject to indirect effects (500-foot buffer surrounding the project footprint), and any additional staging areas not included in the project footprint as well as the project detour with a 50-foot buffer that may be subject to indirect effects.

The project action area is approximately 386.89 acres and includes the Stratford Kings River Bridge, State Route 41 and the surrounding Caltrans right-of-way, and the 32-mile detour. The action area also includes the Kings River South Fork and its banks, irrigations canals and banks, as well as surrounding ruderal and agricultural lots within 500-feet of the bridge. Most of the lands in the action area that do not fall within Caltrans right-of-way are agricultural, including fallow or grazed lots, row crops, and fields of dry grain crops. The Kings River South Fork runs through the action area and diverts into three irrigation canals south of the Stratford Kings River Bridge. The river banks of the Kings River South Fork host black willow thickets, emergent soft rush marshes, and other wetland species. The irrigation canals that are adjacent to the Kings River are heavily disturbed and barren and appear to be routinely maintained. The roadway and shoulders of State Route 41 cut through the center of the project footprint and cross over irrigation canals that run through the project site. Water from these canal systems cross underneath the highway through culverts. Some of these smaller irrigation canals host emergent freshwater vegetation. A single rural residential lot sits on the northeastern section of the action area, and frontage roads run along some of the canals and agricultural fields.

The 32-mile detour action area consists of Caltrans right-of-way which contains ruderal and invasive species. The action area also includes the Avenal Kings River bridge and its banks, and the California Aqueduct. Most of the lands in the action area preceding south on Avenal Cutoff Rd that do not fall within Caltrans right-of-way are agricultural, including fallow or grazed lots, row crops, and fields of dry grain crops. The action area phases into valley salt scrub and valley grassland west of I-5 and borders I-5 to the west all the way to the Kettleman City exit. Continuing north on SR 41 through Kettleman City, the action area consists of ruderal and invasive species bordered by agricultural fields just outside the Caltrans right-of-way.

Figure 3: Action Area and Project Footprint

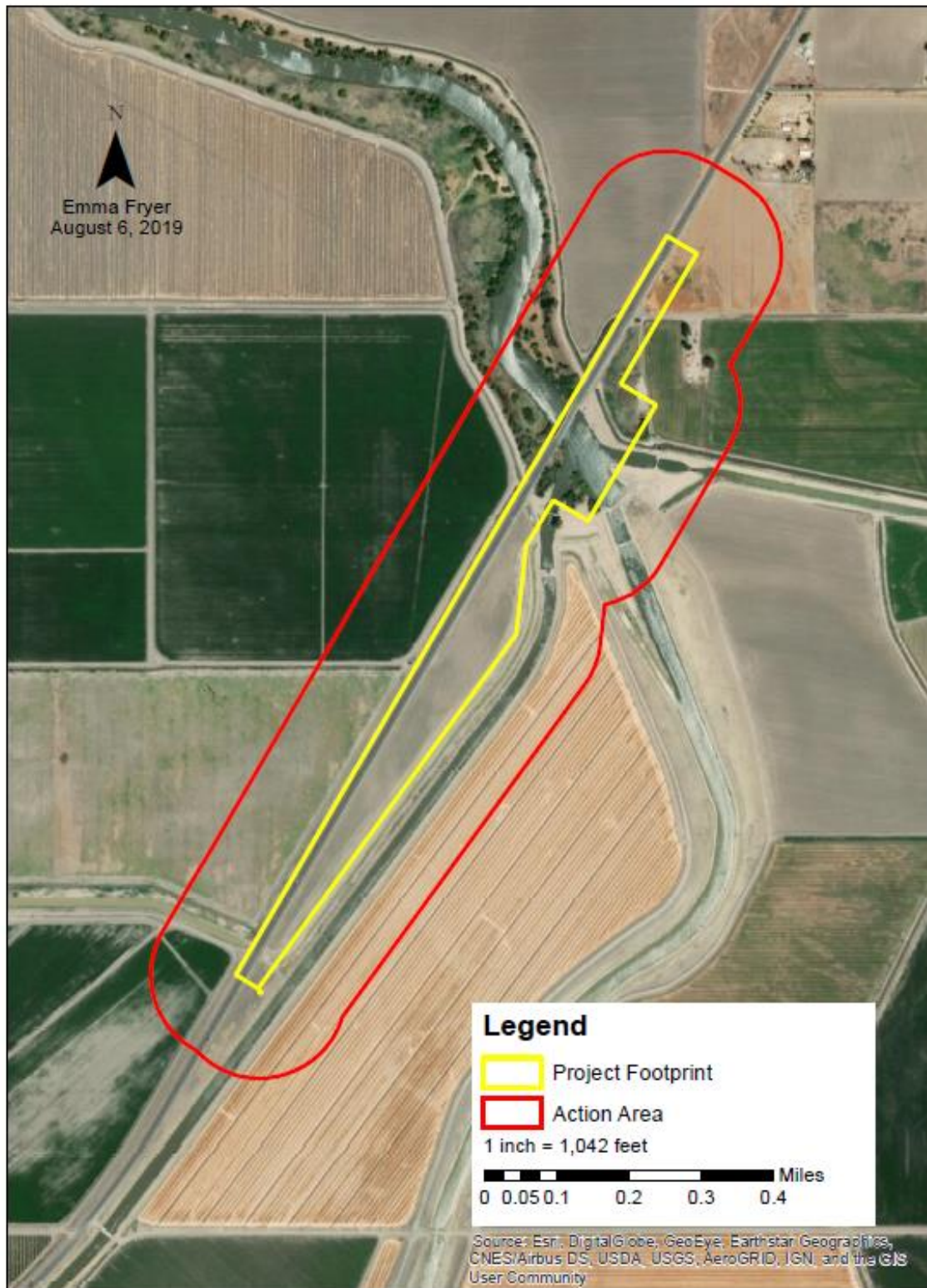


Figure 4: Detour Action Area



3.3. Physical Conditions

Topography

The action area is located at an elevation of approximately 195 feet above sea level, at the edge of the Tulare Lakebed, on the western edge of the southern San Joaquin Valley. The project footprint is essentially flat, with the bridge remaining at the elevation and slope of State Route 41. The banks of the South Fork Kings River slope down to the river's edge at roughly 170 feet above sea level, and the embankments of State Route 41 are therefore raised to maintain the road's elevation. The elevation at the northeastern end of the project footprint is approximately 200 feet above sea level, and the southwestern end is approximately 190 feet above sea level. A topographic map of the action area is located in Appendix A.

Soils

Soils within the action area consist of Houser clay, partially drained (map code 126), Tulare clay, partially drained (map code 163), Boggs sandy loam (map code 103), Pitco clay, partially drained (map code 153), and Grangeville sandy loam, saline-alkali (map code 119). Detailed descriptions of these soil types are located in Appendix D. The soils map for the action area (Natural Resources Conservation Service, 2019) may be found in Appendix A.

Climate and Hydrology

The San Joaquin Valley has a Mediterranean climate characterized by dry, hot summers and short winters and frequent winter fogs. Kettleman City, located approximately 14 miles southwest of the action area, averages a high temperature of 99 degrees Fahrenheit in July and averages a low temperature of 38.4 degrees Fahrenheit in December. The average total annual precipitation for Kettleman City is 6.71 inches (Western Regional Climate Center, 2018).

The action area is located within the South Valley Floor Hydrologic Unit Code and the Town of Lemoore-Kings River sub-watershed (Hydrologic Unit Code 12 180300120704). The action area sits just north of the Tulare Lakebed. Hydrological features within the action area includes several unnamed irrigation ditches and the Kings River South Fork, which is diverted at Empire Weir No. 2 to the Blakeley Canal, Kings River South Fork, and the Tulare Lake Canal. The Kings River South Fork is a perennial riverine system that is highly regulated upstream of the action area, fed by runoff from the Sierra Nevada Foothills and Pine Flat Lake, which is impounded by Pine Flat Dam roughly 70 miles northeast of the action area. The Kings River South Fork hosts freshwater emergent soft rush marshes, as well as wetlands on both sides of the Stratford Kings River Bridge, though the largest wetland is located south of the bridge, on either side of the mouth of the Blakely Canal. The Blakely Canal, Kings River South Fork, and Tulare Lake Canal are channelized, and managed by an irrigation district.

3.4. Biological Conditions in the Action Area

Natural Communities

The action area is primarily dominated by agriculture. According to California Department of Fish and Wildlife's California Wildlife Habitat Relationships System, habitat types within the action area include irrigated row and field crops and dryland grain crops as the dominant habitat types, followed by valley foothill riparian, fresh emergent wetland, riverine, and barren habitat. Additionally, a single rural residential property is within the action area.

Irrigated row and field crops: Within the action area, annual crops such as cotton and alfalfa are cultivated on a yearly cycle, typically planted in the spring and harvested in summer or fall. Irrigated row and field crops do not progress through natural habitat stages and are instead regulated by the annual crop cycle in California. These crops are likely planted in rotation with other irrigated crops in the same field and may also be alternated with dryland grain crops in order to maintain soil productivity and interrupt agricultural pest life cycles.

Dryland grain and seed crops: Within the action area, dryland grain or seed crops are cultivated, typically planted in fall for harvest in spring. Like irrigated row and field crops, dryland grain and seed crops do not progress through natural habitat stages, but rather shift with the crop cycle and agricultural practices. Dryland grain and seed crops may also be planted in rotation with other crops to maintain soil and prevent agricultural pests and may shift to irrigated row and field crops or other agricultural habitat types seasonally or over a longer timeframe.

Valley sink scrub: Within the detour action area, valley sink scrub is found west of Interstate 5 before the landscape phases into the Kettleman Hills. The landscape is dominated by cattle spinach (*Atriplex polycarpa*), wildoats (*Avena fatua*), mustard (*Brassica tournefortii*), and valley sky lupine (*Lupinus nanus*).

Valley foothill riparian: Within the action area, valley foothill riparian habitat is found on the banks of the Kings River South Fork west of State Route 41, and on the banks at the mouth of the Blakely Canal. The canopy is dominated by black willow (*Salix gooddingii*), with few Fremont's cottonwoods (*Populus fremontii*), and red willows (*Salix laevigata*). The canopy consists of fragmented but dense stands, with a thick understory hosting occasional shrubby thickets of California blackberry (*Rubus ursinus*) and Hind's willow (*Salix exigua* var. *hindsiana*) where low-hanging black willow branches don't dominate the understory. Various grasses and forbs, including Himalayan blackberry (*Rubus armeniacus*), bur chervil (*Anthriscus caucalis*), spiny sowthistle (*Sonchus asper*), London rocket (*Sysymbrium irio*), lambs' quarters (*Chenopodium album*), pepper grass (*Lepidium nitidum*), and puncture vine (*Tribulus terrestris*) grow in the openings in the canopy and understory, and in the larger breaks between stands. This black willow-dominated habitat transitions abruptly where it meets the adjacent agricultural fields and the disturbed shoulders of State Route 41, and where it meets fresh emergent wetland habitat.

Fresh emergent wetland: Within the action area, dense fresh emergent wetland is found on the banks of the Kings River South Fork and Blakely Canal, grading with the riverine and valley foothill riparian habitat on either side. Soft rush marshes are typical of seasonally flooded areas, wetlands and wet meadows at elevations up to 4,265 feet. The controlled flow of the Kings River South Fork for both irrigation and flood control introduces occasional flooding onto the banks which, combined with a high water table, introduces a flux in the size of this habitat type within the action area, as lower water levels expose shallow slopes of the bank, and high water covers what may have been emergent vegetation a season prior. The transition between valley foothill riparian to fresh emergent wetland is fairly abrupt for most of the bank's length. Fresh emergent wetland inwith action area hosts predominately soft rush (*Juncus effusus*), and in smaller patches, cattails (*Typha latifolia*), stinging nettle (*Urtica dioica*), bull thistle (*Cirsium vulgare*), flat sedge (*Cyperus eragrostis*), common tule (*Schoenoplectus acutus*) and Himalayan blackberry (*Rubus armeniacus*).

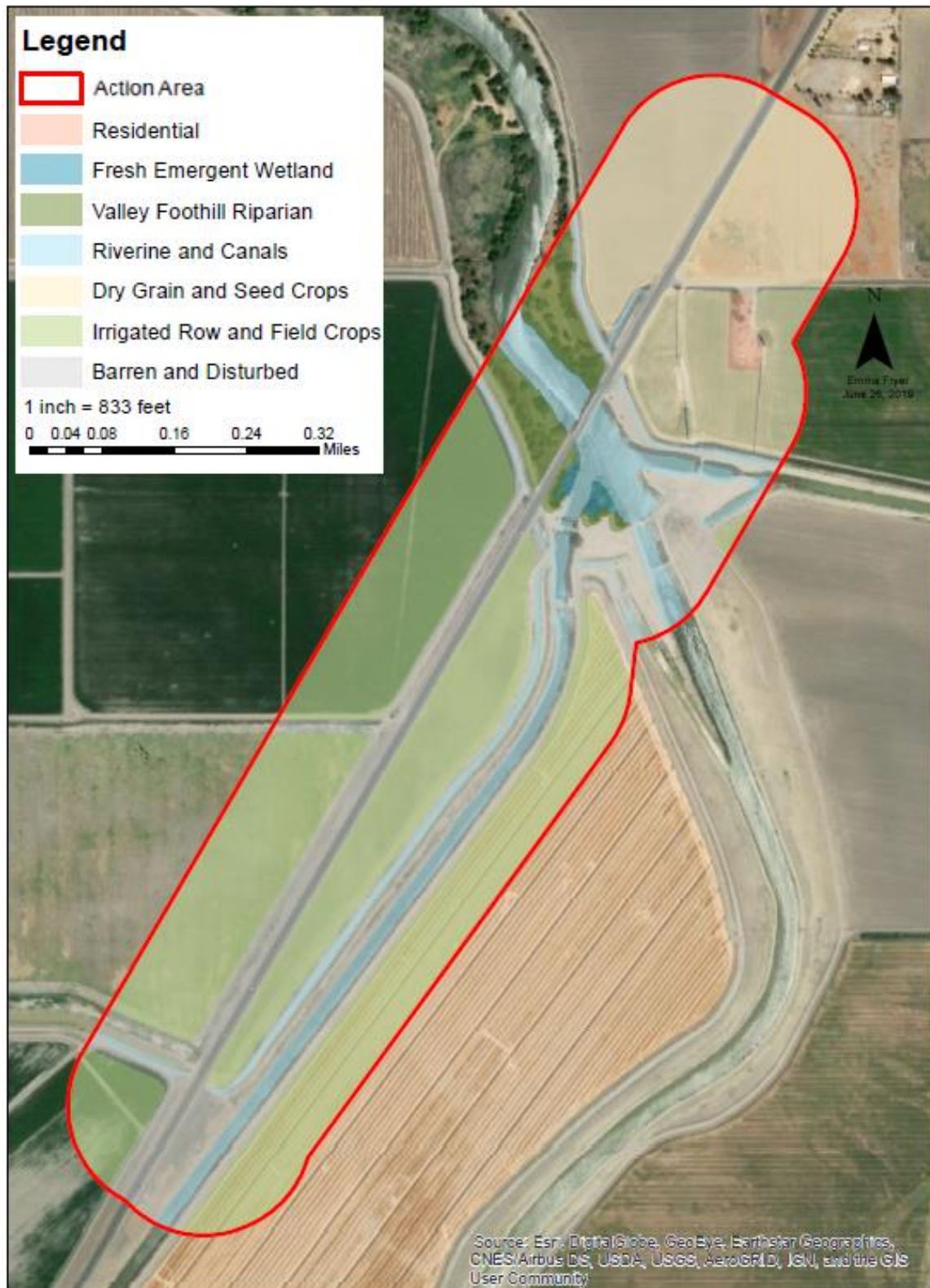
Riverine: The action area contains riverine habitat in the Kings River South Fork. Marginal riverine habitat also persists in the diverted channels of the Blakely Canal, Kings River South Fork, and Tulare Lake Canal. Irrigation canals in the action area may also intermittently retain some features of a slow-moving, shallow riverine system, depending on flow and irrigation needs at the time. The Kings River South Fork makes up the largest and most intact area of this habitat type within the action area. It is a low velocity, high temperature, heavily sedimented and highly managed river, which undergoes increased human intervention south of State Route 41 after Empire Weir No. 2 diverts it into three channels.

Barren: The action area contains a substantial amount of barren habitat, including the shoulders of State Route 41 and farm roads, levees, and graded banks of the waterways located to the east of State Route 41. Within the action area, this habitat type covers all paved roadways, dirt roads, levees, canal banks, and other areas repeatedly disturbed by human activity.

Other Habitat Types: One property in the northeast corner of the action area is a rural residential lot, with regular maintenance and human activity. While not barren, the residential property hosts crop and ornamental, nonnative plant species, and low vegetation cover.

A map of how the above habitat types are distributed within the action area is shown in Figure 4.

Figure 5: Habitat Types within the Action Area



Vegetation Communities

Only two vegetation communities, as described by California Native Plant Society and the Manual of California Vegetation, are found within the action area; black willow thickets and soft rush marshes. These vegetation communities correspond to California Department of Fish and Wildlife's valley foothill riparian and fresh emergent wetland habitat types, respectively.

Black Willow Thicket: Black willow thickets are composed mainly of black willow, which are fast-growing and have some tolerance of seasonal flooding, suited to riparian habitat. This alliance also includes Fremont's cottonwood, Himalayan blackberry, and multiple other willow species; the thickets within the action area is dominated by black willows, and include Fremont's cottonwood,

Soft Rush Marsh: This alliance is dominated by soft rush, a perennial, clumping rush, which makes up half or more of the vegetative cover wherever this alliance occurs, and may include species such as bull thistle, cattails, stinging nettles, and occasionally Himalayan blackberry.

Aquatic Resources

Aquatic resources within the action area are primarily bodies of water used, maintained, and controlled for irrigation and flood control. These aquatic resources include the Kings River South Fork, the Blakely Canal, the Tulare Lake Canal, and multiple unnamed irrigation canals running along State Route 41. Despite the observed wetland and riparian features, the Kings River South Fork is heavily maintained by the irrigation district.

The Kings River South Fork Canal is located below Empire Weir No. 2, on the eastern side of State Route 41. Following the diversion of the Kings River South Fork, the river south of Empire Weir No. 2 is channelized, and the banks are devoid of vegetation, as they are maintained and graded. Existing water management infrastructure include pumps systems, gates, and weirs; all of which enable bidirectional pumping and diversion of water into different canal systems as necessary. The Kings River South Fork Canal has a hydrological connection to the Tulare Lakebed, just as the Kings River once did.

The Tulare Lake Canal is east of State Route 41, north of the Kings River South Fork Canal, and managed by the Empire West Side Irrigation District. The canal begins in the action area, controlled by a weir, and management is such that the canal retains water year-round. While most of the bank is barren, sections include concrete rip-rap, and the canal has a traceable connection to the Tulare Lakebed.

The Blakely Canal is the southernmost of the three canal systems that stem from the Kings River South Fork. The northern terminus of the Blakely Canal, where it meets the Kings River South Fork, has vegetated banks with black willow thickets and fresh emergent wetlands. The mostly barren and contains rip-rap south of the weir and gate. Like the Tulare Lake Canal, the Blakely Canal also has a hydrological connection to the Tulare Lakebed, and is flooded year-round.

Invasive Species

The following table lists the invasive plant species found within the action area during botanical surveys. The table includes their California Invasive Plant Council inventory listing (California Invasive Plant Council, 2019) and their impact score, where applicable, as evaluated by the Invasive Species Council of California (California Invasive Species Council, 2010). The Invasive Species Council of California provides scores for approximately 200 of the most important invasive species in their database.

Table 2: Invasive Species Observed Within the Action Area

| Scientific Name | Common Name | Cal-IPC Inventory Listing | ISCC Impact |
|--|----------------------------|---------------------------|----------------|
| <i>Acroptilon repens</i> | Russian knapweed | Moderate | 19 |
| <i>Amaranthus albus</i> | tumbleweed | not ranked | not scored |
| <i>Anthriscus caucalis</i> | bur chervil | not ranked | not applicable |
| <i>Avena fatua</i> | wild oat | Moderate | 9 |
| <i>Bassia hyssopifolia</i> | bassia | Limited | not scored |
| <i>Bromus diandrus</i> | ripgut brome | Moderate | 18 |
| <i>Bromus hordeaceus</i> | soft chess | Limited | 7 |
| <i>Bromus madritensis</i> ssp. <i>rubens</i> | red brome | High | 17 |
| <i>Capsella bursa-pastoris</i> | shepherd's purse | not ranked | not scored |
| <i>Centaurea melitensis</i> | toalote | Moderate | not scored |
| <i>Chenopodium album</i> | lamb's quarters | not ranked | not applicable |
| <i>Chenopodium murale</i> | pigweed | not ranked | not applicable |
| <i>Convolvulus arvensis</i> | bindweed | not ranked | 8 |
| <i>Cynodon dactylon</i> | Bermuda grass | Moderate | not scored |
| <i>Echinochloa crus-galli</i> | barnyard grass | not ranked | not applicable |
| <i>Erigeron bonariensis</i> | flax-leaved horseweed | not ranked | not applicable |
| <i>Erodium cicutarium</i> | redstem filaree | Limited | not scored |
| <i>Eucalyptus globulus</i> | blue gum | Limited | 12 |
| <i>Festuca perennis</i> | ryegrass | Moderate | not applicable |
| <i>Hirschfeldia incana</i> | perennial mustard | not applicable | not scored |
| <i>Hordeum murinum</i> | wall barley | Moderate | not scored |
| <i>Hordeum vulgare</i> | cultivated barley | not ranked | not applicable |
| <i>Hypochaeris glabra</i> | smooth cat's ear | Moderate | not scored |
| <i>Lactuca serriola</i> | prickly lettuce | not ranked | not scored |
| <i>Malva parviflora</i> | cheeseweed | not applicable | not scored |
| <i>Marrubium vulgare</i> | horehound | Limited | not scored |
| <i>Medicago polymorpha</i> | bur clover | Limited | not scored |
| <i>Melilotus albus</i> | white sweetclover | not ranked | not applicable |
| <i>Melilotus indicus</i> | sour clover | not ranked | not applicable |
| <i>Phalaris minor</i> | little-seeded canary grass | not ranked | not applicable |
| <i>Phoenix canariensis</i> | Canary Island palm | Limited | not scored |
| <i>Polygonum aviculare</i> | common knotweed | not applicable | not applicable |
| <i>Polypogon monspeliensis</i> | rabbitsfoot grass | Limited | not scored |

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| <i>Portulaca oleracea</i> | purslane | not ranked | not scored |
| <i>Pseudognaphalium luteoalbum</i> | cudweed | not ranked | not applicable |
| <i>Rumex acetosella</i> | sheep sorrel | Moderate | not scored |
| <i>Rumex crispus</i> | curly dock | Limited | not scored |
| <i>Salsola tragus</i> | Russian thistle | Limited | 16 |
| <i>Senecio vulgaris</i> | groundsel | not ranked | not scored |
| <i>Silybum marianum</i> | milk thistle | Limited | not scored |
| <i>Sisymbrium irio</i> | London rocket | Limited | not scored |
| <i>Sonchus asper</i> | prickly sow thistle | not ranked | not scored |
| <i>Sonchus oleraceus</i> | common sow thistle | not ranked | not scored |
| <i>Sorghum bicolor</i> | sorghum | not ranked | not scored |
| <i>Spergularia rubra</i> | spurrey | not ranked | not applicable |
| <i>Tamarix parviflora</i> | small-flower salt-cedar | High | 16 |
| <i>Tribulus terrestris</i> | puncture vine | limited | not scored |

Cal-IPC Inventory Listing Rankings are “Watch List”, “Limited”, “Moderate” and “High”. Introduced species not currently ranked in the Inventory are not ranked. Species not in the inventory, but nonetheless invasive are denoted here as not applicable.

Invasive Species Council of California Impact Scores are the sum of scores for the species' impact in terms of spread rate, spread amount, ecological damage, agricultural damage, infrastructure damage, cultural damage, and damage to public health, with the sum of scores determined for ecological, agricultural, infrastructure, cultural, and public health benefits subtracted. Scores can range from 0 (least damaging) to 35 (most damaging), though benefits may reduce impact scores that might otherwise be higher. Species listed by the Invasive Species Council of California that do not have published scores are denoted here as not scored, and species not in the Council's species list, but nonetheless invasive, are denoted here as not applicable.

Habitat Connectivity and Fish Passage

Most of the land near the action area is dominated by intensive agricultural practices, with residential and commercial lots sparsely scattered throughout. Farm and county roads cut between agricultural fields, and the banks of the Kings River South Fork are the least disturbed land for roughly 4 miles from the action area. While the diversion of the Kings River South Fork into three canals is the effective terminus of the valley foothill riparian habitat that lines the river, the action area and bridge may serve as an outlet for wildlife travelling south along the river, or as an access point for the use of the river banks for wildlife moving north. While wildlife cameras were not set up due to concerns about theft, tracks observed on several site visits support the possibility that the banks of the Kings River South Fork function as a wildlife corridor, and possible linkage between less disturbed areas. The culverts near the bridge were blocked by debris at time of surveys, and are likely not functioning as part of this corridor, though some species may use the canal banks south of the diversion for additional passage.

The CalFish California Fish Passage Assessment Database shows a natural total barrier to fish passage recorded by the California Department of Fish and Wildlife approximately 2 miles upstream of the Stratford Kings River Bridge on the South Fork Kings River. The barrier is described as the historical upstream limit for multiple anadromous salmonids. Based on this barrier, this project does not create a potential barrier to fish passage, and there is no potential for fish passage barriers downstream of the recorded barrier, as the

Kings River South Fork is diverted into irrigation immediately downstream of the action area. A map of the fish passage assessment database results for the action area and surrounding area may be found in Appendix A.

3.5. Regional Species and Habitats and Natural Communities of Concern

Complete lists of plants and animals observed within the action area during surveys may be found in surveys reports located in Appendix C. All regional species and habitat and natural communities of concern are discussed in the table below.

Table 3: Listed, Proposed Species, Natural Communities, and Critical Habitat Potentially Occurring or Known to Occur in the Project Area

| Common Name | Scientific Name | Status | General Habitat Description | Habitat Present/ Absent | Rationale |
|----------------------------------|-------------------------------|----------------|--|---------------------------------|--|
| Habitat | | | | | |
| Valley Sink Scrub | Not applicable | G1, S1.1 | Saline and alkaline clay soils, high ground water, hosting low succulent shrubs tolerant of alkaline soils, especially <i>Allenrolfea occidentalis</i> and <i>Sueda</i> sp. Little to no understory, if any present, often <i>Bromus rubens</i> . Corresponds to Manual of California Vegetation's bush seepweed and iodine bush series. | Habitat Present: Detour Only | Project Area: Dominant species found in valley sink scrub (bush seepweed and iodine bush) communities do not occur within the action area. While soils in the action area are somewhat saline and the water table is relatively high, no halophytic species are dominant in any of the vegetation types found within the action area. Detour: Although dominant species found in valley sink scrub (bush seepweed and iodine bush) communities do occur within the 50-foot action area, detour construction is not anticipated to require any ground disturbance. |
| Valley Foothill Riparian Habitat | Not applicable | Not applicable | Typically dominated by winter-deciduous trees, with the canopy making most of the cover, over a subcanopy and an understory shrub layer. | Habitat Present | In the action area, the riparian forest along the Kings River South Fork has a canopy dominated by black willow (<i>Salix gooddingii</i>), Fremont's cottonwoods (<i>Populus fremontii</i>), and red willows (<i>Salix laevigata</i>) in fragmented, dense stands, and the understory is made up of dense, shrubby thickets of California blackberry (<i>Rubus ursinus</i>) and Hind's willow (<i>Salix exigua</i> var. <i>hindsiana</i>). |
| Fresh Emergent Wetlands | Not applicable | Not applicable | Fresh emergent wetlands must be flooded regularly, and are characterized by erect hydrophytes, typically perennial monocots. | Habitat Present | The action area has sections along the river that are dominated by soft rush with patches of cattails, stinging nettle, flat sedge, and common tule. |
| Riverine | Not applicable | Not applicable | An intermittent or continually running body of water. Riverine habitat hosts numerous species, ranging from insect larvae, fish, mollusks, crustaceans, and aquatic plants | Habitat Present | There are multiple bodies of water running through the action area. |
| Mammals | | | | | |
| San Joaquin kit fox | <i>Vulpes macrotis mutica</i> | FE, ST | San Joaquin kit foxes are typically found in the southern portion of California, in annual grasslands or grassy, open stages of vegetation dominated by scattered brush, | Habitat Present: Detour Only | Project Area: Suitability of most habitat within the action area is poor at best, and soils are not friable or ideal for burrow excavation. California Natural Diversity Database records in the 9- |

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| | | | shrubs, or scrub. They prefer loose-textured, friable soils for burrow excavation, and open areas with little human disturbance, but kit foxes are occasionally supported by agricultural and even developed areas. | | <p>quadrangle area around the action area historically supported San Joaquin kit fox; however, with the conversion to agriculture the species and suitable habitat is no longer present within the action area.</p> <p>Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance.</p> |
| Giant kangaroo rat | <i>Dipodomys ingens</i> | FE, SE | Annual grasslands on the western side of the San Joaquin Valley, marginal habitat in alkali scrub. Mainly inhabit sandy loam soils on level or gently sloping ground. Elevation: < 550 meters. | Habitat Present: Detour Only | <p>Project Area: Suitability of most habitat within the action area is poor at best, and soils are not friable or ideal for burrow excavation.</p> <p>Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. No observations have been reported for the species within 5-miles of the detour (CNDDDB 2019). Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance.</p> |
| Fresno kangaroo rat | <i>Dipodomys nitratoides exilis</i> | FE, SE | Found in alkali desert scrub, grasslands, or herbaceous habitat with scattered shrubs, Fresno kangaroo rats are primarily found in the southwestern San Joaquin valley, in recent years between 200 and 300 feet above sea level. Kangaroo rats prefer level terrain, with sandy to loamy soils for burrow excavation and may use low herbaceous vegetation as a form of cover in addition to burrows. | Habitat Present: Detour Only | <p>Project Area: Alkali desert scrub is not found within the action area, though present in the greater vicinity, nor is the habitat within the action area suitable for Fresno kangaroo rat in terms of cover, soil type, or vegetation. California Natural Diversity Database records show no occurrences within the last 20 years in the 9-quadrangle area surrounding the action area.</p> <p>Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. No observations have been reported for the species within 5-miles</p> |

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| | | | | | (CNDDB 2019). Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance. |
| Tipton kangaroo rat | <i>Dipodomys nitratooides nitratooides</i> | FE, SE | Like the Fresno kangaroo rat, Tipton kangaroo rat is found in alkali habitat with scattered shrub cover and found primarily in the southern San Joaquin valley. They prefer fairly even terrain and sandy to loamy soils for burrowing. | Habitat Present: Detour Only | Project Area: No alkali desert scrub occurs within the action area, and the nearest California Natural Diversity Database record is nearly 5 miles from the action area, separated by distance, intensive agricultural activity, and roadways. As with Fresno kangaroo rat, the action area cover, soil type, and vegetation is not suitable for Tipton kangaroo rat. Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance. |
| Hoary bat | <i>Lasiurus cinereus</i> | WBWG: M | Hoary bats are found throughout much of the state, migrating between the coast in winter and breeding inland during the summer. Forests with dense foliage and medium to large trees are preferable for breeding and roosting habitat, which occurs in the tree canopy, though mosaic habitat is ideal, with access to trees for cover and open areas or transitions in habitat for feeding. | Habitat Present | Valley foothill riparian habitat's transition to riverine, fresh emergent wetland, and agricultural lands is abrupt, and the abrupt transition of habitats creates a mosaic suitable to hoary bat for both roosting and foraging, with both riverine and agricultural habitat to provide forage and trees on the river banks for roosting. Species within the riparian habitat in the action area are not the preferred conifers of hoary bat for roosting, so likelihood of presence is somewhat marginal. No records from the last 20 years were found in California Natural Diversity Database for the surrounding 9-quadrangle area. The most recent occurrence dates from 1991. |
| Western red bat | <i>Lasiurus blossevillii</i> | WBWG: H, SSC | Western red bats prefer to roost in dark, sheltered trees, particularly those associated with riparian forests. | Habitat Present | Valley foothill riparian habitat occurs within the action area, and hosts riparian forest, though no records were found in California Natural Diversity Database for the surrounding 9-quadrangle area. |
| Tulare grasshopper mouse | <i>Onychomys torridus tularensis</i> | SSC | Tulare grasshopper mice are typically found in arid grassland arid shrubland communities, in blue oak woodlands, upper Sonoran scrub, | Habitat Present: Detour Only | Project Area: No alkali desert scrub occurs within the action area. Suitable habitat for this species does not occur within the action area. |

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| | | | alkali sink, and mesquite associations on the San Joaquin valley floor. | | <p>No records from the last 20 years were found in California Natural Diversity Database for the surrounding 9-quadrangle area. The nearest occurrence dates from 1932 (CNDDDB 2019).</p> <p>Detour: Suitable habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and scrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance.</p> |
| American badger | <i>Taxidea taxus</i> | SSC | Variable; most common in dry open stages of shrub, forest, and herbaceous habitats with friable soils, the American badger is somewhat tolerant of human activity. | Habitat Present: Detour Only | <p>Project Area: The action area is located in an area with a high water table, and least disturbed habitat types in the action area are too wet for American badger; all other habitat is regularly disrupted by human activity, and soils along the canals and irrigation ditches are compacted and regularly graded. No records from the last 20 years were found in California Natural Diversity Database for the surrounding 9-quadrangle area. The nearest occurrence dates from 1939.</p> <p>Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance.</p> |
| Nelson's antelope squirrel | <i>Ammospermophilus nelsoni</i> | ST | Found between 165 and 3,600 feet above sea level, Nelson's antelope squirrel is found in dry, sparsely vegetated alkali scrub with loamy soils. This species appears to prefer slopes of 0 to 20 degrees and may also be found where these areas have broken terrain, such as washes and gullies. | Habitat Present: Detour Only | <p>Project Area: Suitable habitat does not occur within the action area, and no records from the last 20 years were found in California Natural Diversity Database for the surrounding 9-quadrangle area. The nearest occurrence to the action area dates from 1951.</p> <p>Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses</p> |

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| | | | | | and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance. |
| Birds | | | | | |
| Western snowy plover | <i>Charadrius nivosus nivosus</i> | FT, SSC, BCC, MBTA | Western snowy plover is found in sandy marine and estuary shores, where it nests, but will also nest on salt pond levees, and on shores of some alkali lakes in the Central Valley. The western snowy plover requires sandy, gravelly, or otherwise friable soils for nesting and may even use bare ground. Only the Pacific Coast Distinct Population Segment (DPS) are listed as federally threatened; the action area does not fall within the range of this DPS. | Habitat Absent | Suitable habitat and nesting substrate for this species does not occur within the action area. No records from the last 20 years were found in California Natural Diversity Database for the surrounding 9-quadrangle area. |
| Tricolored blackbird | <i>Agelaius tricolor</i> | ST, MBTA | Tricolored blackbird breed near freshwater, nesting in emergent freshwater wetlands, usually in dense tule rush or cattails, though also in blackberry, willow, or tall herbs. Nesting habitat is usually near or on freshwater, and must be large enough for colonial nesting, but may be as far as 4 miles from foraging habitat. | Habitat Present | Freshwater emergent wetlands are present in and around the action area, though the emergent vegetation is of variable size due to flow controls upstream of the action area, and the total area of emergent vegetation in the action area is low. Thickets of blackberry and willow within the action area along the Kings River South Fork may combine with freshwater emergent vegetation in the wetlands to provide habitat of sufficient size for colonial nesting by tricolored blackbird. California Natural Diversity Database records include recent occurrences within the surrounding 9-quadrangle area. |
| Burrowing owl | <i>Athene cunicularia</i> | SSC, BCC, MBTA | Found in dry, open grasslands, range and agricultural lands, desert habitats, and in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitat, burrowing owls may occur from 200 feet below sea level to up to 9,000 feet above sea level. In California, the highest elevation recorded is 5,300 feet above sea level. | Habitat Present | Agricultural lands are present within the action area, though degree and manner of agricultural activity combined with land use around agricultural properties reduces the suitability of habitat significantly, potential for presence remains, particularly if fields are left fallow. Several recent occurrences are in California Natural Diversity Database records within the surrounding 9-quadrangle area. |
| Yellow-headed blackbird | <i>Xanthocephalus xanthocephalus</i> | SSC, MBTA | Yellow-headed blackbirds nest in fresh emergent wetlands with dense vegetation and deep water, along borders of lakes and ponds, and forages in emergent wetlands and open, wet areas including the margins of lacustrine habitat and croplands. In winter, yellow- | Habitat Present | Suitable habitat is present within the action area, and California Natural Diversity Database has recent occurrences in the surrounding 9-quadrangle area. |

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| | | | headed blackbirds are less common in the Central Valley, typically only found in the western valley. | | |
| Swainson's hawk | <i>Buteo swainsoni</i> | ST, BCC, MBTA | Swainson's hawk are residents and migrants in the Central Valley, often breeding in stands of trees in otherwise open areas, in riparian areas, and oak savannah. Foraging habitat includes grasslands, some grain croplands, alfalfa fields, and livestock pastures. Nests are typically in tall trees, but Swainson's hawks may nest lower, or on the ground in rare cases. | Habitat Present | Suitable habitat is present within the action area, and California Natural Diversity Database has recent occurrences in the surrounding 9-quadrangle area. |
| Black-crowned night heron | <i>Nycticorax nycticorax</i> | MBTA | Black-crowned night herons are found in lowlands, foothills, and wetlands; they feed in lacustrine and riverine margins, fresh and saline emergent wetlands, and roost in dense foliage and dense emergent wetlands. | Habitat Present | Suitable habitat is present within the action area, and there has been a recent occurrence reported to California Natural Diversity Database in the surrounding 9-quadrangle area. |
| Loggerhead shrike | <i>Lanius ludovicianus</i> | SSC, MBTA | Loggerhead shrike prefers open habitat with scattered shrubs, fences, posts, and other perches, in open-canopied valley foothill riparian, valley foothill hardwood, and valley foothill hardwood-conifer, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. Loggerhead shrike may also be found in open croplands. | Habitat Present | Suitable habitat is present within the action area, but no records were returned by a California Natural Diversity Database search for the surrounding 9-quadrangle area. |
| Merlin | <i>Falco columbarius</i> | MBTA | Merlin prefer coastlines, open grasslands, savannahs, woodlands, lakes, wetlands, edges, and early successional stages. Occurs in most of the western half of California below 1500 meters. | Habitat Present | Suitable habitat is present within the action area and only one record was returned by a California Natural Diversity Database search for the surrounding 9-quadrangle area. The observation reported is located 5-miles west of the project detour and 15 miles west of the project footprint. |
| Northern harrier | <i>Circus cyaneus</i> | SSC, MBTA | In California, northern harriers are found in annual grasslands up to lodgepole pine and alpine meadow habitat, in rangelands, desert sink, and both freshwater and saltwater emergent wetlands. They are rarely found in wooded areas, and roost on the ground. | Habitat Present | Suitable habitat is present within the action area, but no records were returned by a California Natural Diversity Database search for the surrounding 9-quadrangle area. |
| Reptiles | | | | | |
| Blunt-nosed leopard lizard | <i>Gambelia sila</i> | SE, FE, FP, SSC | Blunt-nosed leopard lizards are found in sparsely vegetated alkali and desert scrub habitat with low relief and arid nonnative grasslands at elevations between 100 to 2,400 feet above sea level. Suitable habitats include alkali flats, large washes, arroyos, canyons, and low foothills. They do not | Habitat Present: Detour Only | Project Area: No alkali or desert scrub occurs in the action area; no suitable habitat is present within the action area. No records from the last 20 years were found in California Natural Diversity Database for the surrounding 9-quadrangle area. The nearest occurrence dates from 1990. |

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| | | | excavate their own burrows, and so are typically found in areas where other burrowing animals, such as kangaroo rats, occur. | | Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance. |
| Giant garter snake | <i>Thamnophis gigas</i> | ST, FT | Found primarily in marshes, sloughs, and occasionally slow-moving creeks, giant garter snake is not typically found in rivers, and is likely extirpated south of Fresno County, with the exception of western Kern County. Emergent vegetation may be used as shelter or for basking. | Habitat Absent | While the fresh emergent wetlands in the action area and the slow-moving Kings River South Fork with its associated canals may meet some criteria for giant garter snake habitat, there are no California Natural Diversity Database observations in Kings County, and this project is outside the current range described by California Department of Fish and Wildlife for giant garter snake. |
| Western pond turtle | <i>Emys marmorata</i> | SSC | Western pond turtles are found throughout California, in permanent and semi-permanent bodies of water with adequate basking sites, such as floating vegetation, partially submerged logs, or open mud banks, and banks for nesting. Nests may be made on sandy banks, or females may travel from the water to sites as far as 325 feet away to find sufficiently deep and moist soil for nesting. | Habitat Present | A historic California Natural Diversity Database record is located at the Stratford Kings River Bridge in the Kings River South Fork, and suitable habitat is present in the action area. |
| San Joaquin coachwhip | <i>Masticophis flagellum ruddocki</i> | SSC | Chenopod scrub, valley and foothill grassland with open dry areas and saltbush scrub. Requires mammal burrows for refuge reproduction. | Habitat Present: Detour Only | Project Area: Most of the action area has long been converted to agricultural land, and the remaining habitat is either highly disturbed to barren, or includes numerous nonnative species. No habitat within the action area is suitable for the species. Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance. |
| Amphibians | | | | | |
| California red-legged frog | <i>Rana draytonii</i> | FT, SSC | California red-legged frogs inhabit quite pools in marshes, streams, and occasionally ponds, typically below 3,936 feet above sea level. | Habitat Absent | No permanent pools exist within the action area; and therefore, no suitable larval habitat is present. While the combination of fresh |

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| | | | Shorelines with extensive vegetation and pools with a depth of at least 3 feet are required for cover, and pools must be permanent for larval development. They may occasionally breed in stock ponds, but generally require a matrix of upland and riparian habitat. | | emergent wetland, valley foothill riparian habitat, and vegetation within the action area might otherwise suggest suitable habitat, no California Natural Diversity Database records of California red-legged frog exist for Kings County, and the species has been extirpated from 70% of its former range, currently most common on the central coast. |
| California tiger salamander | <i>Ambystoma californiense</i> | FE, FP, ST | Most commonly found in annual grassland habitat, but also occurs in the grassy understory of valley-foothill hardwood habitats, and uncommonly along stream courses in valley-foothill riparian habitats. | Habitat Absent | No suitable habitat is present within the action area and no records were returned by a California Natural Diversity Database search for the surrounding 9-quadrangle area. |
| Western spadefoot | <i>Spea hammondi</i> | SSC | Western spadefoots are typically found in grasslands, at elevations up to 4,460 feet above sea level, but also occur in valley-foothill woodlands. Breeding requires shallow, temporary pools formed by winter rainfall, and the species' ideal habitat is grassland where shallow, temporary pools form annually following winter rains. | Habitat Absent | No suitable habitat is present within the action area. No records from the last 20 years were found in California Natural Diversity Database for the surrounding 9-quadrangle area. The nearest occurrence dates from 1998. |
| Fishes | | | | | |
| Delta smelt | <i>Hypomesus transpacificus</i> | FT, SE | Delta smelt is endemic to the San Francisco Estuary. Delta smelt is an estuarine species, with local migrations upstream in winter to spawn in the spring or summer and fall migrations downstream. | Habitat Absent | No suitable estuarine habitat is present in the action area; the lack of hydrologic connection and limitations of delta smelt migrations preclude presence. |
| Crustaceans | | | | | |
| Vernal pool fairy shrimp | <i>Branchinecta lynchi</i> | FT | Endemic to the Central Valley, central coast mountains, and the south coast mountains of California, vernal pool fairy shrimp are found in vernal pools and swales that are temporarily inundated by seasonal rains, as the species' life cycle depends on periodic drying and wetting of the pools. Additional potential habitats include natural and artificial seasonal wetland habitats, like alkali pools, ephemeral drainages, stock ponds, roadside ditches, vernal swales, and rock outcrop pools | Habitat Absent | No temporary pools or wetland occur with sufficient regularity or longevity within the action area to serve as habitat for vernal pool fairy shrimp. There are no California Natural Diversity Database records of vernal pool fairy shrimp for the surrounding 9-quadrangle area. |
| Vernal pool tadpole shrimp | <i>Lepidurus packardii</i> | FE | Endemic to the northern portion of the San Joaquin valley, vernal pool tadpole shrimp are reliant on temporary pools, as the species' life cycle depends on periodic drying and wetting of the pools. Additional potential habitats include both natural and artificial seasonally | Habitat Absent | No temporary pools or wetland occur with sufficient regularity or longevity within the action area to serve as habitat for vernal pool tadpole shrimp. There are no California Natural Diversity Database records of vernal pool tadpole shrimp for the surrounding 9-quadrangle area. |

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| | | | ponded habitat types including: vernal pools, swales, ephemeral drainages, stock ponds, reservoirs, ditches, backhoe pits, and ruts or ditches caused by vehicles. | | |
| Plants | | | | | |
| Recurved larkspur | <i>Delphinium recurvatum</i> | CNPS 1B.2 | Recurved larkspur grows primarily in alkaline soils, occurring in sufficiently alkaline habitats including chenopod scrub, cismontane woodlands, and valley and foothill grasslands. Competition from nonnative species, trampling, and conversion of habitat to agriculture has reduced habitat for this species significantly. | Habitat Absent | Most of the action area has long been converted to agricultural land, and the remaining habitat is either highly disturbed to barren, or includes numerous nonnative species which present competition for recurved larkspur. No habitat within the action area is suitable for the species. |
| California jewelflower | <i>Caulanthus californicus</i> | FE, SE, CNPS 1B.1 | Found on flats, slopes, generally in non-alkaline, sandy soil grassland. Blooming period: February-May. Elevation: 70 – 1000 meters. | Habitat Present: Detour Only | Project Area: Most of the action area has long been converted to agricultural land, and the remaining habitat is either highly disturbed to barren, or includes numerous nonnative species which present competition for California jewelflower. No habitat within the action area is suitable for the species. Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance. |
| Lemmon's jewelflower | <i>Caulanthus lemmonii</i> | CNPS 1B.2 | Pinyon and juniper woodland, valley and foothills grassland. Blooming Period: February-May. Elevation: 80 1580 meters. | Habitat Absent | Project Area: Most of the action area has long been converted to agricultural land, and the remaining habitat is either highly disturbed to barren, or includes numerous nonnative species which present competition for Lemmon's jewelflower. No habitat within the action area is suitable for the species. Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance. |

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| Kern mallow | <i>Eremalche parryi</i> ssp. <i>kernensis</i> | FE, CNPS 1B.2 | Shadscale scrub, valley grassland, eroded hillsides, and alkali flats. Blooming Period: March-May. Elevation: 60 - 1524 meters | Habitat Present: Detour Only | Project Area: Most of the action area has long been converted to agricultural land, and the remaining habitat is either highly disturbed to barren, or includes numerous nonnative species which present competition for Kern mallow. No habitat within the action area is suitable for the species. Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance. |
| California alkali grass | <i>Puccinellia simplex</i> | CNPS 1B.2 | Alkaline, vernal mesic, sinks, flats, lake margins, chenopod scrub, meadows, seeps, valley grassland, foothill grassland, and vernal pools. Blooming Period: March-May. Elevation: 2 - 930 meters. | Habitat Present: Detour Only | Project Area: Most of the action area has long been converted to agricultural land, and the remaining habitat is either highly disturbed to barren, or includes numerous nonnative species which present competition for Lemmon's jewelflower. No habitat within the action area is suitable for the species. Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance. |
| Hoover's eriastrum | <i>Eriastrum hooveri</i> | CNPS 4.2 | Chenopod scrub, pinyon and juniper woodland, valley and foothill grassland. Elevation: 50 – 915 meters. | Habitat Present: Detour Only | Project Area: Most of the action area has long been converted to agricultural land, and the remaining habitat is either highly disturbed to barren, or includes numerous nonnative species which present competition for Lemmon's jewelflower. No habitat within the action area is suitable for the species. Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the |

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| | | | | | species. Detour construction is not anticipated to require any ground disturbance. |
| Vernal barley | <i>Hordeum intercedens</i> | CNPS 3.2 | Vernal barley is found in coastal dunes, coastal scrub, valley and foothill grassland in saline flats and depressions, and in vernal pools. Development, construction and competition from nonnative species have led to significant habitat loss. | Habitat Present | While no coastal habitat occurs in the action area, some portions of the riparian habitat both at the water's edge and on the bank in areas where soils is saline enough to host salt grass (<i>Distichlis spicata</i>) may retain water seasonally or from rises in the water table to a degree that presents potential habitat for vernal barley. |
| San Joaquin woollythreads | <i>Monolopia congdonii</i> | FE,CNPS 1B.2 | San Joaquin woollythreads is found in sandy portions of valley and foothill grassland and chenopod scrub. Agricultural conversion, energy development, grazing, development, and vehicles have reduced and degraded much of the species' remaining habitat. | Habitat Present: Detour Only | No chenopod scrub or grasslands occur within the action area; no suitable habitat is present. |
| Mud nama | <i>Nama stenocarpa</i> | CNPS 2B.2 | Mud nama is found in marshes, swamps, lake margins, and riverbanks. | Habitat Present | Suitable habitat is present within the action area. |
| San Joaquin bluecurls | <i>Trichostema ovatum</i> | CNPS 4.2 | San Joaquin bluecurls are found in chenopod scrub and valley and foothill grasslands, | Habitat Present: Detour Only | Project Area: No grasslands occur within the action area; habitat within the action area is not suitable for San Joaquin bluecurls. Detour: Habitat is present to the west of Interstate 5. The habitat is considered suboptimal since it is composed of scattered brush and shrub, as well as non-native grasses and invasive species. Adjacent habitat of Kettleman hills to the south of the Interstate 5 and Avenal Cutoff Rd is more suitable for the species. Detour construction is not anticipated to require any ground disturbance. |
| Crownscale | <i>Atriplex coronata</i> var. <i>coronata</i> | CNPS 4.2 | Crownscale is found in habitats with alkaline, often clay soils, in chenopod scrub, valley and foothill grasslands, freshwater wetlands, and vernal pool communities. | Habitat Present | The action area soils are suitable for crownscale, and freshwater wetland habitat occurs within the action area. CCH22 herbarium records show collections made within 5 miles of the action area. |

Status: Federal Endangered (FE); Federal Threatened (FT); Federal Proposed (FP, FPE, FPT); Federal Candidate (FC), Federal Species of Concern (FSC); State Endangered (SE); State Threatened (ST); Fully Protected (FP); State Species of Special Concern (SSC); State Candidate (SCE, SCT); Migratory Bird Treaty Act (MBTA); Western Bat Working Group: High Concern, Medium Concern, Least Concern (WBWG: H, M, L); Population Segment (DPS).

California Native Plant Society (CNPS): Plants rare, threatened, or endangered throughout their range, fairly threatened (1B.2), least threatened (1B.3); Plants rare, threatened, or endangered in California, but more common elsewhere, fairly threatened (2B.2), least threatened (2B.3); Plants in California with a limited distribution "watch list", fairly threatened (4.2), least threatened (4.3).

Habitat Absent - no habitat present and no further work needed. Habitat Present - habitat is or may be present. Critical Habitat - project footprint is located within a designated critical habitat unit but does not necessarily mean that appropriate habitat is present.

Chapter 4. Results: Biological Resources, Discussion of Impacts and Mitigation

4.1. Habitats and Natural Communities of Special Concern

In addition to lands dominated primarily by agriculture, the action area contains valley foothill riparian habitat, fresh emergent wetlands, and riverine habitat. These habitats present the most potential to host sensitive species. No critical habitat for listed species or natural communities of special concern are present within the action area.

4.1.1. Discussion of Valley Sink Scrub

Valley sink scrub is typically dominated by alkali scrub or sink vegetation. This habitat generally occurs at lower to middle elevations, in the San Joaquin Valley, scrubland borders on annual grassland habitat. In many locations, scrubland overlaps with perennial grassland (CDFW 1988).

Survey Results

Disturbed valley sink scrub habitat was found to be within the detour action area south of the Avenal Cutoff Rd and SR 269 intersection. Adjacent scrub habitat outside of Caltrans right-of-way was observed to be less disturbed and more suitable for special-status species. Beyond that to the south, the landscape phases into valley grassland habitat called the Kettleman Hills.

Project Impacts

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No project impacts are anticipated for valley sink scrub.

Avoidance and Minimization Efforts

Although ground disturbance is not anticipated for this construction detour, Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species and natural communities of concern.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.1.2. Discussion of Valley Foothill Riparian Habitat

Valley foothill riparian habitat is typically dominated by winter-deciduous trees, with the canopy making up 20 to 80 percent of cover, over a subcanopy and an understory shrub layer. In the action area, the canopy is dominated by black willow (*Salix gooddingii*), with few Fremont's cottonwoods (*Populus fremontii*), and red willows (*Salix laevigata*). The canopy occurs in fragmented, dense stands, and there is a thick understory of shrubby thickets of California blackberry (*Rubus ursinus*) and Hind's willow (*Salix exigua* var. *hindsiana*). An herbaceous layer grows in the openings in the canopy and in the spaces between the dense canopy stands.

Survey Results

Valley foothill riparian habitat was found to be within the action area, both the banks of the Kings River South Fork west of State Route 41, and on the banks south of State Route 41 at the mouth of the Blakely Canal. A total of 9.42 acres are present within the action area; the extent of this habitat within the action area is shown in the map located in Figure 4.

The valley foothill riparian habitat in the action area transitions abruptly to both agricultural fields and the disturbed shoulders of State Route 41 and borders the fresh emergent wetland habitat also found within the action area. The entirety of this habitat type found within the action area is California Department of Fish and Wildlife jurisdictional.

Project Impacts

Valley foothill riparian habitat is now much less abundant in the San Joaquin Valley than it once was, due to the management of Valley waterways for irrigation, and mass conversion of land to agriculture. (Barbour, 2007) The valley foothill riparian habitat is one of the few habitat types within the action area that supports several special-status species in the area. This habitat also likely serves as a wildlife corridor through the intense agricultural activity and human disturbance in the area.

Work on the Kings River Bridge will require access as well as maneuvering space for equipment and workers around the bridge, with potential for tree and vegetation removal. Total temporary impacts from these and other work activities to valley foothill riparian habitat are anticipated to be up to 8.43 acres. Up to 0.99 acres of permanent impacts are anticipated due to changes in the location of the bridge abutments and embankments, for a total of 9.42 acres of impacts. Additional permanent impacts are anticipated in the removal of up to 22 mature trees for equipment access and operation.

The expected temporary impacts to valley foothill riparian habitat are relatively low-intensity for much of the 9.42 acres potentially affected, in the form of vibrations, human foot traffic, equipment and vehicle access, and clearing and grubbing.

The anticipated permanent impacts to up to 0.99 acres will include clearing and grubbing, equipment traffic, tree removals, excavation, and grading. These permanent impacts will occur around the roadway and bridge, in an area that experiences a higher degree of

disturbance. As the new bridge will have wider abutments and greater length than the current bridge, some loss of valley foothill riparian habitat is expected.

The new abutment location is 8 feet further off-shore from the South Fork Kings River than the original bridge. This offset may increase permanent impacts but may improve the use of the valley foothill riparian habitat in the action area as a wildlife corridor.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to habitats and natural communities of special concern. Permits with the United States Army Corps of Engineers, the Central Valley Regional Water Quality Control Board, and the California Department of Fish and Wildlife are anticipated to be required to complete the proposed project. Compliance measures associated with these permits will be implemented during construction.

In addition to the best management practices, the following avoidance and minimization measures will be implemented:

- 1) Pre-construction botanical surveys will be conducted no more than 30 days prior to construction.
- 2) The boundaries of the work area will be delineated by Environmentally Sensitive Area fencing where necessary to protect sensitive habitat and resources that occur outside of the project area.
- 3) Where possible, work within the river bed will be conducted during low flow or dry conditions.
- 4) Any foot traffic or equipment that cannot avoid passing over wetlands will do so only on wetland protection mats placed for that purpose.
- 5) Staging and storage areas will be located outside of all valley foothill riparian, riverine, and fresh emergent wetland habitat.
- 6) Vegetation removal will be reduced to the minimal amount necessary to complete the work.

Compensatory Mitigation

- 1) Any trees removed will be replanted based on diameter at breast height. Trees of 24 or more inches in diameter (heritage trees) will be replaced at a ratio of 10:1, and trees of between 4 and 24 inches in diameter will be replaced at a ratio of 3:1.

Cumulative Impacts

The following projects have been completed recently or will be completed within or near the action area: Stratford geotechnical investigation, Stratford seismic restoration, and Stratford-Lemoore CAPM projects. None of these projects are anticipated to have cumulative impacts to valley foothill riparian habitat.

The impacts to valley foothill riparian habitat associated with this project, permanent impacts of up to 0.99 acres and temporary impacts of 8.43 acres, are not expected to result in any measurable cumulative effects.

4.1.3. Discussion of Fresh Emergent Wetlands

Fresh emergent wetlands are characterized by erected hydrophytes, primarily perennial monocots. Flooding must occur frequently enough that roots of these plants are capable of functioning in an anaerobic environment.

Survey Results

In the action area, this habitat type is dominated by soft rush with patches of cattails, stinging nettle, flat sedge, and common tule. These wetlands occur along banks of the Kings River South Fork and Blakely Canal, and forms the boundary between the riverine and valley foothill riparian habitat on either side. Wetland delineations determined that there are 1.06 acres of fresh emergent wetlands within the action area.

The soft rush marshes that make up the fresh emergent wetlands of the action area are typical of seasonally flooded areas, wetlands and wet meadows at elevations up to 4,265 feet. within the action area, both irrigation and flood control introduce occasional flooding onto the banks which combine with a high-water table to support the wetlands, though there is a resultant flux in the size of this habitat type shifts as the water level changes.

All fresh emergent wetlands within the action area have been determined to be under the jurisdiction of both California Department of Fish and Wildlife and United States Army Corps of Engineers.

Project Impacts

Fresh emergent wetlands in the Central Valley have declined in size and number dramatically over the last century, and remain threatened by water pollution, the intensive management of waterways for agricultural use, and development (Barbour, 2007). Wherever possible, work for this project will avoid the fresh emergent wetlands found within the action area; ingress, access and staging will avoid wetlands. The planned temporary trestle will end before reaching the southwestern bank's wetlands and anticipated impacts to the wetlands are predominantly temporary in nature.

Up to 0.73 acres of temporary impacts are anticipated, and where there are changes in the western bridge abutment's dimensions and placement, and up to 0.33 acres of permanent impacts are expected. Total impacts to fresh emergent habitat anticipated for this project may total as high as 1.06 acres.

Temporary impacts are expected to be limited to incidental foot and equipment traffic over wetland protection mats, and potential temporary shifts in soil hydrology as excavation for the bridge abutments (to a depth of up to 20 feet) is conducted nearby.

Permanent impacts will affect a small area restricted to the margins of the fresh emergent wetlands on the northern bank of the Blakely Canal where it joins the western bank of the Kings River South Fork. Vegetation removal and major modifications to the embankment during the bridge abutment replacement will make up the bulk of these impacts, as environmentally sensitive area fencing will be installed to protect the maximum area of wetlands possible.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to habitats and natural communities of special concern. Permits with the United States Army Corps of Engineers, the Central Valley Regional Water Quality Control Board, and the California Department of Fish and Wildlife are anticipated to be required to complete the proposed project. Compliance measures associated with these permits will be implemented during construction.

In addition to the best management practices, measures 1 through 6 listed in section 4.1.1 will also be applied to protect this habitat type. The following avoidance and minimization measure will also be implemented:

- 1) Any foot traffic or equipment that cannot avoid passing over wetlands will do so only on wetland protection mats placed for that purpose.

Compensatory Mitigation

The following mitigation measures will be applied:

Any permanent impacts to wetlands will be mitigated for in acreage equal to that of the permanent impacts through the purchase of conservation credits from the National Fish and Wildlife Foundation, or other In-Lieu Fee /banking program, or habitat will be created as a part of a permittee-responsible project.

Cumulative Impacts

This project, the geotechnical investigation for this project, and a seismic restoration project on the Kings River Bridge are the only Caltrans work associated with this bridge location within the past 5 years, or that will be in construction within the next 5 years and may affect the fresh emergent wetlands in the action area.

The geotechnical investigation for this project and the seismic restoration of the Stratford Kings River Bridge both took place in the waters of the Kings River South Fork. The barge used for the seismic restoration project's work was accessed from the barren

southeastern shore, and so did not affect the fresh emergent wetlands. The planned geotechnical work for this project will be done at two bore locations, both accessed from the roadway; neither bore location falls within or immediately adjacent to the fresh emergent wetlands within the action area, and any effects would be negligible. Additional projects are planned or recently completed that include the roadway within this project's action area, but did not or will not come close enough to waterways or fresh emergent wetlands to combine with this project to cause cumulative impacts beyond those of this project. The impacts to fresh emergent wetland habitat created by this project are not compounded by the geotechnical investigation, seismic restoration project, or other known past or upcoming Caltrans projects in the area.

Therefore, no cumulative impacts to fresh emergent wetland habitat are anticipated.

4.1.4. Discussion of Riverine Habitat

Riverine habitat is any intermittent or continually running body of water; rivers and streams provide habitat for numerous species, ranging from insect larvae, fish, mollusks, crustaceans, and aquatic plants, and supports the prey of many upland species

Survey Results

In the action area, riverine habitat is found in the Kings River South Fork, and somewhat degraded in the diverted channels of the Blakely Canal, Kings River South Fork, and Tulare Lake Canal. The Kings River South Fork is a low velocity, high temperature, heavily sedimented and highly managed river that is moderated by human intervention upstream by controlled flows as far up as Pine Flat Dam, and downstream, where Empire Weir No. 2 diverts it into three channels. Irrigation canals within the action area may retain some features of a slow-moving, shallow riverine system. The Kings River South Fork is the largest and most intact area of this habitat within the action area, and the combined acreage of riverine habitat from the river and canals adds up to a total of 26.3 acres.

Project Impacts

Riverine habitat in the Central Valley has been dramatically altered and degraded over the last century (Barbour, 2007). The South Fork Kings River is a highly managed river, though riparian and wetland vegetation and features persist, and as it's diverted south of the Stratford Kings River Bridge into the Blakely Canal, Tulare Lake Canal and the Kings River South Fork, quality of riverine habitat is somewhat reduced. While management is also intense upstream of the bridge, the maintained banks and levees of the canals prevent riparian vegetation from establishing on the banks, and emergent vegetation is less common. Both the river and canals are highly sedimented and flow at a relatively low velocity, which somewhat reduces some of the impacts anticipated by the project. Sediment disturbance and changes in flow due to dewatering are likely to be less dramatic on a slower, already highly sedimented river (Grenfell, 1988).

Impacts to riverine habitat by this project will consist of up to 6.00 acres of temporary impacts, and 0.003 acres of permanent impacts. Temporary impacts originate from both geotechnical investigation activity, trestle and falsework installation, the bridge

demolition, and the replacement bridge's work to follow. Impacts to water quality within riverine habitat will be dramatically reduced by the best management practices to a relatively low in intensity. Trestle installation would involve the temporary placement of cleaned rock in the river, laid on plastic sheeting or by other methods on the easternmost portion of the trestle to extend the bank before the trestle transitions to piles, to ensure restoration of the original streambed contours upon the trestle's removal. Other temporary impacts include those resulting from vegetation trimming and removal on the banks on both sides of the river and the resultant runoff of soil into the river, removal of piles during demolition, changes in flow, sediment disturbance from work, vibratory impacts, and dewatering.

Permanent impacts will be limited to the installation of 42 piles for the new bridge structure, to be installed at an anticipated depth of 100 feet below the streambed for the new bridge. Old piles will be partially removed at least as far as below the mudline, and the original streambed contours restored.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to habitats and natural communities of special concern. Permits with the United States Army Corps of Engineers, the Central Valley Regional Water Quality Control Board, and the California Department of Fish and Wildlife are anticipated to be required to complete the proposed project. Compliance measures associated with these permits will be implemented during construction.

In addition to the best management practices, measures 1 through 6 listed in section 4.1.1 will also be applied to protect this habitat type. The following avoidance and minimization measure will also be implemented:

- 1) All dewatering will be conducted with a qualified biologist present to provide biological monitoring.
- 2) All tree removal will be done in such a manner that the root ball is left in place and soil is not removed, except where excavation requires it.
- 3) Work shall avoid the immediate shore of the Kings River South Fork wherever possible; if the work must take place on the shore, turbidity curtains will be used where appropriate to prevent increased turbidity in the river.

Compensatory Mitigation

Mitigation for 0.003 permanent impacts to riverine habitat is anticipated as part of the Section 401 and 404 permits. Mitigation will be purchased in the form of conservation credits from the National Fish and Wildlife Foundation, or other In-Lieu Fee/banking program, or habitat will be created as a part of a permittee-responsible project.

Cumulative Impacts

This project, its associated geotechnical investigation, and the seismic restoration of the Stratford Kings River Bridge are the only Caltrans projects that have occurred within the past five years or will occur in the next five years that may affect the riverine habitat at the Stratford Kings River Bridge. The impacts of the geotechnical investigation will be greatly mitigated by the permit requirements, best management practices, and the manner of drilling planned and so are not expected to be substantial. The seismic restoration work that was recently completed was conducted from a barge and used similar best management practices, resulting in little to no effect on the riverine habitat at the Stratford Kings River Bridge. Cumulative effects are therefore not anticipated from this project combined with Caltrans' past or planned projects.

The management of the Kings River and Kings River South Fork and the agricultural activities in the project's vicinity and upstream of the project area are likely sources of impacts to the riverine habitat of the Kings River South Fork. These impacts are the result of agricultural fertilizer and soils runoff, changes in flow and depth due to dam releases, and maintenance activities for the levees and canals the river feeds. The permanent impacts to riverine habitat within the action area are relatively small, and the temporary impacts will be heavily mitigated by permit measures and avoidance and minimization measures. Given the scope of the impact of management and agricultural activity on the health of the riverine habitat in the Kings River South Fork, this project is not expected to contribute substantially to the cumulative impacts on the Kings River South Fork's riverine habitat.

Therefore, no cumulative impacts to riverine habitat are anticipated.

4.2. Special-Status Plant Species

Literature searches yield six special-status plant species with potential to be present in or near the action area. These species were: recurved larkspur, San Joaquin woollythreads (*Monolopia congdonii*), mud nama (*Nama stenocarpa*), vernal barley (*Hordeum intercedens*), San Joaquin bluecurls (*Trichostema ovatum*), and crownscale (*Atriplex coronata* var. *coronata*). Only San Joaquin woollythreads is listed (federally listed as endangered, not listed at the state level); all other species were determined to be rare or of limited distribution based on their ranking by California Native Plant Society at a minimum of a 4.2 on the California Rare Plant Rank ranking system.

Of these special-status species, only mud nama, crownscale, and vernal barley have potential to occur within the habitat types present within the action area. Botanical surveys indicated that these were not present within the project site, but they may still be present in the seed bank and will be further discussed. Literature searches yield six special-status plant species with potential to be present in or near the detour action area. These species were: California jewelflower (*Caulanthus californicus*), kern mallow (*Eremalche parryi* ssp. *kernensis*), California alkali grass (*Puccinellia simplex*), Hoover's eriastrum (*Eriastrum hooveri*), San Joaquin woollythreads (*Monolopia congdonii*), and San Joaquin bluecurls (*Trichostema ovatum*) California jewelflower, kern mallow, and

San Joaquin woollythreads are listed; all other species were determined to be rare or of limited distribution based on their ranking by California Native Plant Society at a minimum of a 4.2 on the California Rare Plant Rank ranking system.

Although ground disturbance is not anticipated, all species have the potential to be within the detour action area and will be further discussed.

Species occurrences within 5-miles of the action area are shown in the map located in Appendix A.

4.2.1. Discussion of California Jewelflower

California jewelflower (*Caulanthus californicus*), is an annual herb that belongs to the mustard family (Brassicaceae). It is a native species that is endemic to California. This species is typically found in shadescale scrub, valley grassland, or pinyon-juniper woodland in non-alkaline soil. It blooms maroon and white flowers usually from mid-March to the beginning of May (Calflora 2019, CDFW 2019).

California jewelflower is a federally endangered species and is ranked 1B.1 by the California Native Plant Society rare and endangered plant inventory. This species is seriously threatened by agriculture, urbanization, energy development, grazing, and possibly by non-native plants (CNPS 2019).

Survey Results

No records for California jewelflower occur within 5 miles of the detour action area (CNDDDB 2019). Habitat within the detour action area is potentially suitable for California jewelflower but the surveys performed in 2019 yielded no observations.

Project Impacts

Neither temporary nor permanent impacts are anticipated for California jewelflower, as California jewelflower is unlikely to be found within the action area, based on 2019 surveys conducted for this project, and the available literature and database information.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species. Impacts to these vegetation types are not anticipated.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour.

Avoidance and Minimization Efforts

Although ground disturbance is not anticipated for this construction detour, Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby

incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

Compensatory Mitigation

There is no compensatory mitigation proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.2.2. Discussion of Kern Mallow

Kern mallow (*Eremalche kernensis*), is an annual herb that is native and endemic to California. Kern mallow belongs in the family Malvaceae and can typically be found blooming on eroded hillsides and alkali flats and in dry, open sandy to clay soils (Calflora 2019, CNPS 2019).

Kern mallow is a federally endangered species and ranked 1B.2 by the CNPS rare and endangered plant inventory. This species is threatened by agriculture, grazing, road construction and maintenance, vehicles and oil development (CNPS 2019).

Survey Results

Only one observation has been reported for Kern mallow within 5-miles of the detour project area that dates back to 1973. The report states that the location is unknown (CNDDDB 2019). Habitat within the detour action area is potentially suitable for Kern mallow but the surveys performed in 2019 yielded no observations.

Project Impacts

Neither temporary nor permanent impacts are anticipated for Kern mallow, as the species is unlikely to be found within the action area, based on 2019 surveys conducted for this project, and the available literature and database information.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species. Impacts to these vegetation types are not anticipated.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for Kern mallow.

Avoidance and Minimization Efforts

Although ground disturbance is not anticipated for this construction detour, Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

Compensatory Mitigation

There is no compensatory mitigation proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.2.3. Discussion of San Joaquin Woollythreads

San Joaquin woollythreads (*Monolopia congdonii*), is an annual herb that belongs to the sunflower family (Asteraceae). It is a native species that is limited to the State of California alone. This species is typically found in chenopod scrub, and valley and foothill grasslands, on alkaline or loamy plains. San Joaquin woollythreads is often in sandy soils, often with grasses within chenopod scrub (Calflora 2019, CDFW 2019).

San Joaquin woollythreads is a federal-endangered species and is ranked 1B.2 by the CNPS rare and endangered plant inventory. This species is seriously threatened by agricultural conversion, energy development, urbanization, grazing, trampling, and vehicles (CNPS 2019).

Survey Results

Observations have been reported as close as a mile away from the detour project area and dates back to 2017 (CNDDDB 2019). Habitat within the detour action area is potentially suitable for San Joaquin woollythreads but the surveys performed in 2019 yielded no observations.

Project Impacts

Neither temporary nor permanent impacts are anticipated for San Joaquin woollythreads, as the species is unlikely to be found within the action area, based on 2019 surveys conducted for this project, and the available literature and database information.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species. Impacts to these vegetation types are not anticipated.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for San Joaquin woollythreads.

Avoidance and Minimization Efforts

Although ground disturbance is not anticipated for this construction detour, Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

Compensatory Mitigation

There is no compensatory mitigation proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.2.4. Discussion of Vernal Barley

Vernal barley (*Hordeum intercedens*) is an annual grass (in Poaceae) found in coastal dunes, coastal scrub, vernal pools, and in saline flats, alkaline grasslands, and depressions of valley and foothill grasslands. Vernal barley blooms from March to June and is found at elevations from 16 to 3,280 feet above sea level. While its range extends to Baja California, within California, vernal barley is found in the San Joaquin Valley, western coastal range, Peninsular ranges, San Jacinto Mountains, and the Channel Islands. Vernal barley is a California Rare Plant Rank of 3.2, or “fairly endangered in California”, but for which “more information is needed”. There is potential for survey bias with this species, as it is easily confused with low barley (*Hordeum depressum*), and therefore may either more or less common than current records suggest (California Native Plant Society Rare Plant Program, 2019). However, more than half the occurrences recorded for vernal barley are from lands that have been protected somehow, whether in lands trusts, state or national parks, or held as government property (Sims, 2013). Vernal barley is not state or federally listed, and no critical habitat has been designated.

Survey Results

No records for vernal barley occur within 5 miles of the action area, and the nearest recorded occurrence dates to 1935; an herbarium record of a collection made near Coalinga, which is the only record of vernal barley within Kings County. Habitat within the action area is potentially suitable for vernal barley, but both 2018 and 2019 botanical surveys yielded no observations or evidence of the species within the action area.

Project Impacts

The state of vernal barley populations in the Central Valley appears to be poor- only 7 vouchers are in CCH2 herbarium records, and the threats to vernal barley (agricultural conversion and monocultures of Mediterranean barley, development and urbanization, and agricultural practices such as tilling (Sims, 2013)) are abundant in the area around the project. While vernal barley is relatively abundant and widespread in the California Floristic Province, in the Central Valley populations are especially uncommon, and little suitable habitat remains. In mainland California, vernal barley is found in vernal pools, saline flats and depressions in valley and foothill grasslands (Smith, 2012). There are areas within the action area that are potentially suitable to vernal barley, but none located within the project footprint.

Direct impacts to vernal barley are very unlikely, on the basis that it's unlikely that the species is present within the action area, and the most suitable habitat for vernal barley is located distant enough from the bridge location to avoid direct impacts. Should vernal barley be found in future botanical surveys, there is potential for indirect impacts. These indirect impacts would be due to changes in the hydrology of soils relatively close to the bridge abutments during excavation. However, this would be a marginal risk, and only present if vernal barley were found near the abutments, which is not ideal habitat.

Neither temporary nor permanent impacts are anticipated for vernal barley, as vernal barley is unlikely to be found within the action area, based on 2018 and 2019 surveys conducted for this project, and the available literature and database information.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, the following avoidance and minimization measures will be implemented:

- 1) Worker Environmental Awareness Training will be provided to all workers by a qualified biologist to educate them on the special-status species with potential to occur within the work area, best management practices, permit conditions, environmental laws, and the consequences of violating them.
- 2) Focused botanical surveys for vernal barley will be conducted the blooming season prior to the start of construction.
- 3) Populations that cannot be avoided by work will have their locations recorded, the top soil will be removed and stored safely and at a depth not to exceed 3 feet, and replaced after construction is finished to maintain the original seed bank.
- 4) Populations for which seeds cannot be collected, and which cannot be avoided by work will be excavated along with enough surrounding soil to retain the root

structure intact and transplanted to a suitable location as similar to the original location as possible.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.2.5. Discussion of Mud Nama

Mud nama (*Nama stenocarpa*) is an annual herb in the Boraginaceae that blooms from March to October, and is found in marshes, swamps, lake margins, and riverbeds, at elevations from 16 to 1,640 feet above sea level. Mud nama is native to California and has a California Rare Plant Rank of 2B.2, or “rare or endangered in California, common elsewhere”, and “fairly endangered in California”. Records in the San Joaquin Valley are few, and most herbarium collections of mud nama from California are from southern California; along the south coast, and from the Sonoran Desert and southern Channel Islands (Consortium of California Herbaria, 2019). Mud nama is not state or federally listed, and no critical habitat has been designated.

Survey Results

Records for mud nama in the San Joaquin Valley are limited; only two herbarium collections are recorded: a collection in the San Luis National Wildlife Refuge in 1970, and another from the dry channel just west of Guernsey in 1999. The 1999 voucher is the only collection that’s been made in Kings County and falls roughly 9 miles west of the action area. While there is habitat within the action area that is potentially suitable, no mud nama or evidence of its presence was observed during botanical surveys.

Project Impacts

Mud nama is rare throughout California, though it is slightly more common in Southern California. In the Central Valley only two occurrences (from 1970 and 1999) have been reported, and CCH2 shows only 14 vouchers submitted to herbaria in the last ten years. Given the rarity of the species, the distance from reported occurrences, survey results, and the small quantity of suitable wetlands and riparian marginal habitat that are located within the project footprint and action area, direct and indirect impacts are not anticipated. Temporary and permanent impacts to mud nama are likewise not anticipated, as mud nama has not been observed within or near the action area, though there may be up to 0.33 acres of permanent impacts to potential mud nama habitat as a result of this project.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix X-Caltrans Construction Site best management practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, the avoidance and minimization measures outlined in section 4.2.1 will also cover this species.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.2.6. Discussion of Crownscale

Crownscale (*Atriplex coronata* var. *coronata*) is an annual herb in the Chenopodiaceae that blooms from March to October, and is found in alkaline and clay soils, chenopod scrub, valley and foothill grassland, vernal pools, and freshwater wetlands (Zacharias, 2013). Crownscale is native and endemic to California, found only in the San Joaquin Valley, Sacramento Valley, and eastern Coastal Range. Crownscale has a California Rare Plant Rank of 4.2; of “limited distribution in California”, and “fairly endangered in California”.

Survey Results

Herbarium records show crownscale collections have been made exclusively on the western side of the greater Central Valley, with the most recent and nearest collections to the action area made in 2010 approximately 4 miles southeast of the Stratford Kings River Bridge, from a roadside ditch associated with cattail species (Consortium of California Herbaria, 2019). Potentially suitable habitat is present within the action area, but botanical surveys did not yield observations or evidence of crownscale.

Project Impacts

While there has been little research conducted regarding threats to crownscale, it is likely that the primary threat is the same as that of the closely related Lost Hills crownscale (*Atriplex coronata* var. *vallicola*), and of many other plant species native to the San Joaquin Valley: intensive, widespread agricultural conversion of land and loss of habitat (E.A. Cypher, n.d.).

Crownscale is found only in the western San Joaquin Valley and on the southern border of the western Sacramento Valley. Of the 45 records for crownscale in CCH22, 12 of those vouchers were submitted to herbaria in the last 10 years, though no records at all are found in California Natural Diversity Database.

Permanent impacts with potential for ground disturbance are anticipated for 0.33 acres of habitat suitable for crownscale. However, as crownscale is highly endemic to the alkaline soils of the western San Joaquin Valley, and there is only one recorded occurrence of crownscale in the project’s vicinity, accounting for botanical survey results and the limited amount of suitable habitat within the project footprint and action area, temporary and permanent impacts to crownscale are not anticipated, as no crownscale was found within or near the action area.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, the avoidance and minimization measures outlined in section 4.2.1 will also cover this species.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.2.7. Discussion of California Alkali Grass

California alkali grass (*Puccinellia simplex*) is an annual grass native to California but found in western North America (Calflora 2019). It occurs in mineral springs and other moist habitat with saline soils in the Central Valley, and Mojave Desert. The species can grow up to 25 centimeters tall. The flower head consists of a linear structure with parallel branches bearing small spikelets (CNPS 2019).

California alkali grass is ranked 1B.2 by the CNPS rare and endangered plant inventory. This species is threatened by agriculture, grazing, road construction and maintenance, vehicles and oil development (CNPS 2019).

Survey Results

Observations have been reported as recent as 2017 4-miles east of the detour action area (CNDDB 2019). Habitat within the detour action area is potentially suitable for California alkali grass but the surveys performed in 2019 yielded no observations.

Project Impacts

Neither temporary nor permanent impacts are anticipated for California alkali grass, as the species is unlikely to be found within the action area, based on 2019 surveys conducted for this project, and the available literature and database information.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species. Impacts to these vegetation types are not anticipated.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct

traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for California alkali grass.

Avoidance and Minimization Efforts

Although ground disturbance is not anticipated for this construction detour, Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

Compensatory Mitigation

There is no compensatory mitigation proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.2.8. Discussion of California Native Plant Society Species (3 and 4)

Hoover's eriastrum (*Eriastrum hooveri*) and San Joaquin bluecurls (*Trichostema ovatum*) are both annual herbs native and endemic to California (Calflora 2019). Hoover's eriastrum most often occur on loamy soils, in areas of dense vegetation as well as a wide variety of plant communities. These communities include common saltbush (*Atriplex polycarpa*), and red brome (*Bromus madritensis ssp. rubens*). The plant has thread-like leaves with tiny white to pale blue flowers hidden in tufts of woolly hair (CSU 2019). San Joaquin bluecurls are most often found in disturbed and alkali soils such as chenopod scrub. The plant contains woolly hairs and pointed oval leaves each containing clusters of purple flowers (CNPS 2019).

Hoover's eriastrum and San Joaquin bluecurls both have a California Rare Plant Rank of 4.2. Both plants are threatened by agriculture, grazing, urbanization, energy development, and vehicles (CNPS 2019).

Survey Results

Observations have been reported as recent as 2017 4-miles east of the detour action area (CNDDB 2019). Habitat within the detour action area is potentially suitable for California alkali grass but the surveys performed in 2019 yielded no observations.

Project Impacts

Neither temporary nor permanent impacts are anticipated for California Native Plant Society Rare Plant Ranked 3 and 4 Species, as the species is unlikely to be found within the action area, based on 2019 surveys conducted for this project, and the available literature and database information.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species. Impacts to these vegetation types are not anticipated.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for California Native Plant Society Rare Plant Rank 2 and 4 Species.

No ground disturbance is anticipated for construction detour.

Avoidance and Minimization Efforts

Although ground disturbance is not anticipated for this construction detour, Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

Compensatory Mitigation

There is no compensatory mitigation proposed

Cumulative Impacts

No cumulative impacts are anticipated.

4.3. Special-Status Animal Species Occurrences

Animals are considered to be of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special-status animals occurring onsite.

Of the 22 special-status animals returned by database queries, only hoary bat (*Lasiurus cinereus*), Swainson's hawk (*Buteo swainsoni*), western pond turtle (*Emys marmorata*), tricolored blackbird (*Agelaius tricolor*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), burrowing owl (*Athene cunicularia*), and black-crowned night heron (*Nycticorax nycticorax*) were found to have potential to be present within the action area. Of these, only hoary bat, Swainson's hawk, and western pond turtle were observed during surveys. Surveys also yielded an additional 3 special-status species observed in or near the action area: loggerhead shrike (*Lanius ludovicianus*), northern harrier (*Circus cyaneus*), and western red bat (*Lasiurus blossevillii*). Because of the detour, additional special status species were found to have potential to be present within the detour action

area. These species include: San Joaquin kit fox (*Vulpes macrotis mutica*), Giant kangaroo rat (*Dipodomys ingens*), Fresno kangaroo rat (*Dipodomys nitratoide exilis*), Tipton kangaroo rat (*Dipodomys nitratoide nitratoide*), American badger (*Taxidea taxus*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), Tulare grasshopper mouse (*Onychomys torridus tularensis*), Blunt-nosed leopard lizard (*Gambelia sila*), and San Joaquin coachwhip (*Masticophis flagellum ruddocki*). Those occurrences located within or near the new action area are shown in the California Natural Diversity Database Occurrences Maps in Appendix A.

4.3.1. Discussion of San Joaquin Kit Fox

The San Joaquin kit fox (*Vulpes macrotis mutica*) is designated a federal-endangered species by the USFWS, and state-threatened by the CDFW. Historically the San Joaquin kit fox ranged in semi-arid habitats throughout the Central Valley and arid grasslands of the adjacent foothills, from Tracy south through Kern County, and from the western edge of San Joaquin County east to near La Grange in Stanislaus County (Grinnell et al. 1937). Currently the limits of this species range are similar, but the population has become fragmented with lower densities of animals, especially in the northern and central portions of its range (Smith et al. 2006, B. Parris in litt. 2007).

San Joaquin kit fox occupy valley and foothill grasslands, or grassy open-stage habitats with scattered shrubs, in areas of loose-textured soils, with a suitable prey base (CDFW 2018). However, some populations of San Joaquin kit fox have been shown to adapt to different conditions in areas where their habitat has been altered by development. They may live near and forage in tilled and fallow fields but have been reported to be permanently displaced by lands that are intensively irrigated (Jensen 1972, Morrell 1975, Warrick et al. 2007). San Joaquin kit fox have been impacted from the loss and fragmentation of their habitat from development (urban, agricultural, petroleum fields, wind farms, roads, powerlines, canals, etc.), vehicle mortalities, rodenticides, pesticides, shootings, predation, predation by coyotes (*Canis latrans*), bobcats (*Lynx rufus*), red foxes (*Vulpes vulpes*), American badgers (*Taxidea taxus*), feral dogs (*Canus lupus familiaris*), and large raptors (Accipitridae) (Patton, A. 2008, CDFW 2018, CSU Stanislaus Endangered Species Recovery Program 2018).

San Joaquin kit fox are primarily nocturnal and stay active throughout the year (Grinnell et al. 1937, Morrell 1972). They use dens for shelter, reproduction, protection from predators, and temperature regulation, and their dens typically have a distinct keyhole-shaped entrance. They occupy new dens frequently (for predator avoidance) and many are used in a given year; one study revealed animals were changing dens a median average of every 2 days (CSU Stanislaus Endangered Species Recovery Program 2018). San Joaquin kit foxes' diets change seasonally, but they primarily eat kangaroo rats (*Dipodomys spp.*), black-tailed jackrabbits (*Lepus californicus*), and cottontail rabbits (*Sylvilagus spp.*) (Patton, A. 2008)

Survey Results

California Natural Diversity Database records for San Joaquin kit fox do occur within 5 miles of the detour action area, several occurring inside the action area. However, within those observations the most recent occurrence dates back to 2002.

Potential habitat does exist in the detour action area south of the Avenal Cutoff Rd and SR 269 intersection, but no potential dens were observed during the general wildlife survey.

No critical habitat has been designated for San Joaquin kit fox in detour action area.

Project Impacts

Neither temporary nor permanent impacts are anticipated for San Joaquin kit fox, based on CNDDDB database results, project description, and that no potential dens were observed during wildlife surveys.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for San Joaquin kit fox

No ground disturbance is anticipated for construction detour.

Avoidance and Minimization Efforts

Pre-construction surveys shall occur by a Caltrans approved biologist, 30 days prior to any ground disturbance. Surveys will attempt to identify San Joaquin kit fox or their sign within 50 feet of proposed permanent impacts. Potential burrows in the right-of-way will be avoided as best as possible. Construction equipment staging areas shall be surveyed and cleared by a Caltrans approved biologist prior to use. Staging shall occur in pre-disturbed areas. A Worker Environmental Awareness Training will be presented to all contract workers describing special-status species. All night work will be monitored by a Caltrans approved biologist. No direct impacts to the species are anticipated.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.3.2. Discussion of Giant Kangaroo Rat

The giant kangaroo rat (*Dipodomys ingens*), is a federal- and state-endangered species that is most easily differentiated from other species of kangaroo rats in California by the presence of 5 toes on its hind feet; other kangaroo rats only have 4 toes on their hind feet (Jameson and Peeters 2004).

Historically, giant kangaroo rats occupied grassland and chenopod scrub habitats along the western portion of the San Joaquin Valley, Carrizo Plain, and Cuyama Valley (Grinnell 1932a, Shaw 1934, Hawbecker 1944, 1951). Currently this species range is limited to only 6 geographic locations, one which is located within the Panoche Region of western Fresno County and eastern San Benito County (Williams 1980, 1992, O Farrell et al. 1987a, Williams et al. 1995). Giant kangaroo rats prefer semi-arid sloped habitats with a zero to moderate shrub cover, with loose, friable, sandy loam soils (CSU Stanislaus Endangered Species Recovery Program 2018).

The giant kangaroo rat prefers seeds, but also eats green herbaceous material, and insects. This species has been shown to collect the ripening heads of flowers and grasses and store them in surface pits, which are dug close the animal's burrow for the preservation of foodstuffs prior to bringing them into their underground burrow (Shaw 1934, Williams et al. 1993b). Giant kangaroo rats live in burrow complexes, called precincts. Multiple individuals will live within a precinct and are thought to be a family group comprised of a female with multiple off-spring of varying ages (Randall 1997).

Survey Results

California Natural Diversity Database records for Giant kangaroo rat do not occur within 5 miles of the detour action area.

Potential habitat does exist in the detour action area south of the Avenal Cutoff Rd and SR 269 intersection and kangaroo rat sign (tail drag, small mammal burrows) were observed in Caltrans right-of-way.

No critical habitat has been designated for Giant kangaroo rat in detour action area.

Project Impacts

Neither temporary nor permanent impacts are anticipated for Giant kangaroo rat, based on CNDDDB database results and project description.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for Giant kangaroo rat.

Avoidance and Minimization Efforts

Pre-construction surveys shall occur by a Caltrans approved biologist, 30 days prior to any ground disturbance. Surveys will attempt to identify Giant kangaroo rat or their sign within 50 feet of proposed permanent impacts. Potential burrows in the right-of-way will be avoided as best as possible. Construction equipment staging areas shall be surveyed and cleared by a Caltrans approved biologist prior to use. Staging shall occur in pre-disturbed areas. A Worker Environmental Awareness Training will be presented to all contract workers describing special-status species. All night work will be monitored by a Caltrans approved biologist. No direct impacts to the species are anticipated.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.3.3. Discussion of Fresno Kangaroo Rat

The Fresno kangaroo rat (*Dipodomys nitratoides exilis*) is a federal- and state-endangered sub-species of the San Joaquin kangaroo rat. Historically, the Fresno kangaroo rat could be found on alkali desert scrub and herbaceous habitats with scattered shrubs on the floor of the San Joaquin Valley, (Ahlborn 1999). However, urban, agricultural, and other forms of development have extirpated this species from much of its habitat and currently only few isolated populations remain. Additional threats to this species include flooding of habitat, grazing, competition with Heerman's kangaroo rats, and drought (CDFW 2018).

The Fresno kangaroo rat is the smallest of the three subspecies of San Joaquin kangaroo rat (the short-nosed kangaroo rat (*D. nitratoides brevinasus*) and Tipton kangaroo rat (*D. nitratoides nitratoides*) are the other two subspecies), but can only be reliably distinguished from the other two based on its' geographic origin, or through dissection (Hoffmann 1975, CSU Stanislaus Endangered Species Recovery Program 2018).

Fresno kangaroo rats are a nocturnal animal that stays active year-round. They dig their own burrows in loose friable soils and eats the seeds from annual plants and grasses, as well as green vegetation and insects (CSU Stanislaus Endangered Species Recovery Program 2018). Fresno kangaroo rats were found to live independently, except when females are caring for young (CSU Stanislaus Endangered Species Recovery Program 2018). The animals within this subspecies typically live less than a year, but may be capable of living up to 3 to 5 years in the wild (Williams et al. 1993b).

Survey Results

California Natural Diversity Database records for Fresno kangaroo rat do not occur within 5 miles of the detour action area.

Potential habitat does exist in the detour action area south of the Avenal Cutoff Rd and SR 269 intersection and kangaroo rat sign (tail drag, small mammal burrows) were observed in Caltrans right-of-way.

No critical habitat has been designated for Fresno kangaroo rat within detour action area.

Project Impacts

Neither temporary nor permanent impacts are anticipated for Fresno kangaroo rat, based on CNDDDB database results and project description.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for Fresno kangaroo rat.

Avoidance and Minimization Efforts

Pre-construction surveys shall occur by a Caltrans approved biologist, 30 days prior to any ground disturbance. Surveys will attempt to identify Fresno kangaroo rat or their sign within 50 feet of proposed permanent impacts. Potential burrows in the right-of-way will be avoided as best as possible. Construction equipment staging areas shall be surveyed and cleared by a Caltrans approved biologist prior to use. Staging shall occur in pre-disturbed areas. A Worker Environmental Awareness Training will be presented to all contract workers describing special-status species. All night work will be monitored by a Caltrans approved biologist. No direct impacts to the species are anticipated.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.3.4. Discussion of Tipton Kangaroo Rat

The Tipton kangaroo rat is one of three subspecies of San Joaquin kangaroo rat (*Dipodomys nitratooides*), that is distinguished by geographic range and overall size. It is larger than the Fresno kangaroo rat (*D. n. exilis*) and smaller than the short-nosed kangaroo rat (*D. n. brevinasus*). The historical distribution covered about 1.7 million acres on the floor of the Tulare Basin, southward to the foothills of the Tehachapi Mountains and westward to Kern and Buena Vista lakes, Kern River alluvial fan, northward to Lost Hills, Kern County, Kettleman City, Kings County, and Westhaven, Fresno County. By 1985, this area had been reduced to about 63,000 acres and remains

near that level. The current distribution comprises scattered, isolated populations in Tulare and Kern counties. The southwest boundary in Kern County is considered the California Aqueduct and this subspecies is generally recognized as absent east and south of this barrier (USFWS 1998).

Tipton kangaroo rats occupy arid-land communities on alluvial fan and floodplain soils having level or nearly level topography along the Valley floor of the Tulare Basin. Their burrows are commonly found in slightly elevated mounds, road berms, canal embankments, and railroad beds. Permanent occupancy requires terrain not subject to flooding. Burrow systems are usually located in open areas, but in areas of dense shrub cover, the burrows are hidden beneath shrubs. Two important existing communities for Tipton kangaroo rat are Valley Sink Scrub and Valley Saltbush Scrub, which typically have one or more species of sparsely scattered woody shrubs and a ground cover of native and nonnative grasses and forbs (USFWS 1998).

Survey Results

California Natural Diversity Database records for Tipton kangaroo rat do occur within 5 miles of the detour action area, the most recent occurrence dated in 2008.

Potential habitat does exist in the detour action area south of the Avenal Cutoff Rd and SR 269 intersection and kangaroo rat sign (tail drag, small mammal burrows) were observed in Caltrans right-of-way.

Project Impacts

Neither temporary nor permanent impacts are anticipated for Tipton kangaroo rat, based on CNDDDB database results and project description.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for Tipton kangaroo rat.

Avoidance and Minimization Efforts

Pre-construction surveys shall occur by a Caltrans approved biologist, 30 days prior to any ground disturbance. Surveys will attempt to identify Tipton kangaroo rat or their sign within 50 feet of proposed permanent impacts. Potential burrows in the right-of-way will be avoided as best as possible. Construction equipment staging areas shall be surveyed and cleared by a Caltrans approved biologist prior to use. Staging shall occur in pre-disturbed areas. A Worker Environmental Awareness Training will be presented to all contract workers describing special-status species. All night work will be monitored by a Caltrans approved biologist. No direct impacts to the species are anticipated.

Compensatory Mitigation

No compensatory mitigation proposed.

Cumulative Impacts

No cumulative impacts anticipated.

4.3.5. Discussion of Tulare Grasshopper Mouse

The Tulare grasshopper mouse (*Onychomys torridus tularensis*) is designated a California Species of Special Concern by the CDFW. This species historical range extended from western Merced and eastern San Benito Counties east to Madera County and south the Tehachapi Mountains (Newman and Duncan 1973, Williams and Kilburn 1992). The Tulare grasshopper mouse's current range encompasses the western edge of the Tulare Basin and includes western Kern County, Carrizo Plain Natural Area, the Cuyama side of the Caliente Mountains, San Luis Obispo County, and the Ciervo-Panoche Region in Fresno and San Benito Counties (Williams and Kilburn 1992, Williams unpubl. data).

Tulare grasshopper mice are nocturnal and found in the same arid grassland and saltbush scrub habitats as the listed species of kangaroo rats, blunt-nosed leopard lizard, and San Joaquin kit fox (CSU Stanislaus Endangered Species Recovery Program 2018). This species has a low reproductive rate, low population density, large home range, and short-life span, making it particularly vulnerable to loss of habitat and/or extinction caused by a catastrophic event, such as drought or fire (McCarty 1975, Williams and Kilburn 1992, CSU Stanislaus Endangered Species Recovery Program 2018). Threats to this species include the loss and fragmentation of habitat from agricultural and other developments, poisoning from rodenticide, loss of their primary food (insects) through the use of pesticides, and improper management of existing lands under conservation (CSU Stanislaus Endangered Species Recovery Program 2018).

Survey Results

California Natural Diversity Database records contain one observation of Tulare grasshopper mouse within 5 miles of the detour action area dating back to 1931.

Potential habitat does exist in the detour action area south of the Avenal Cutoff Rd and SR 269 intersection and small mammal burrows were observed in Caltrans right-of-way.

Project Impacts

Neither temporary nor permanent impacts are anticipated for Tulare grasshopper mouse, based on CNDDB database results and project description.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for Tulare grasshopper mouse.

Avoidance and Minimization Efforts

Pre-construction surveys shall occur by a Caltrans approved biologist, 30 days prior to any ground disturbance. Surveys will attempt to identify Tulare grasshopper mouse or their sign within 50 feet of proposed permanent impacts. Potential burrows in the right-of-way will be avoided as best as possible. Construction equipment staging areas shall be surveyed and cleared by a Caltrans approved biologist prior to use. Staging shall occur in pre-disturbed areas. A Worker Environmental Awareness Training will be presented to all contract workers describing special-status species. All night work will be monitored by a Caltrans approved biologist. No direct impacts to the species are anticipated.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.3.6. Discussion of American Badger

The American badger is a Species of Special Concern for the State of California. It has a heavy body with short legs. Coloring is yellowish-grey with a white stripe from the nose over the top of the head. The American badger has white cheeks, a black spot in front of each ear, and all black feet. The badger has extremely long front claws and a short yellowish tail (Burt, 1980). The American badger is an uncommon species, but its range extends throughout most of the state, except for the northern coastal areas.

The American badger prefers dry, open stages of most shrubland and forest or herbaceous habitats. They dig burrows in loose, friable soils for cover and will frequently enlarge and use the abandoned burrows of other wildlife. Badger dens are characteristically oval, with claw marks frequently visible on the sidewalls. This species is carnivorous, with a diet frequently consisting of rats, mice, chipmunks, ground squirrels, pocket gophers, reptiles, insects, earthworms, eggs, birds and carrion. The American badger is active all year-round, mating in summer or early fall and typically producing litters of two to three in March and April (Alhbm 1990).

Survey Results

California Natural Diversity Database records contain one observation of American badger within 5 miles of the detour action area dating back to 1939.

Potential habitat does exist in the detour action area south of the Avenal Cutoff Rd and SR 269 intersection however no dens nor sign of American badger was observed during surveys.

Project Impacts

Neither temporary nor permanent impacts are anticipated for American badger, based on CNDDDB database results, survey observations, and project description.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for American badger.

Avoidance and Minimization Efforts

Pre-construction surveys shall occur by a Caltrans approved biologist, 30 days prior to any ground disturbance. Surveys will attempt to identify American badger or their sign within 50 feet of proposed permanent impacts. Potential burrows in the right-of-way will be avoided as best as possible. Construction equipment staging areas shall be surveyed and cleared by a Caltrans approved biologist prior to use. Staging shall occur in pre-disturbed areas. A Worker Environmental Awareness Training will be presented to all contract workers describing special-status species. All night work will be monitored by a Caltrans approved biologist. No direct impacts to the species are anticipated.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.3.7. Discussion of Nelson's Antelope Squirrel

Nelson's antelope squirrel (*Ammospermophilus nelsoni*) is listed as a state-threatened species by the CDFW. Nelson's antelope squirrels are only found within California, in the San Joaquin Valley, the Cuyama and Panoche Valleys, and the Carrizo and Elkhorn Plains (Best et al. 1990). This species is threatened by loss of habitat due to agricultural and urban developments, grazing, vehicle collisions, and mining (CDFW Rarefind 2019).

Nelson's antelope squirrels prefer dry, open habitats with loosely scattered shrubs, and friable fine-grained, sandy, or gravelly soils. This species lives in the same locations as kangaroo rats, frequently using their abandoned burrows, or those of other mammals. Nelson's antelope squirrels live in family units of 6-8 individuals cohabitating within

extensive underground burrows (Balaji, D. 2012). These squirrels are diurnal but will spend the hottest part of the day underground in their burrows.

Nelson's antelope squirrels only breed once a year, during the late-winter and early-spring months, with females giving birth around March when plants are emerging and green (Balaji, D. 2012). Nelson's antelope squirrels are a short-lived species, with many living less than a year; although some individuals have been reported to live over five years. This species gives alarm trills or calls using a convulsive motion of the body.

Survey Results

California Natural Diversity Database records for Nelson's antelope squirrel do occur within 5 miles of the detour action area however the most recent occurrence dates back to 1993.

Potential habitat does exist in the detour action area south of the Avenal Cutoff Rd and SR 269 intersection however no squirrels or sign were observed during surveys.

Project Impacts

Neither temporary nor permanent impacts are anticipated for Nelson's antelope squirrel, based on CNDDB database results, survey observations, and project description.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for Nelson's antelope squirrel.

Avoidance and Minimization Efforts

Pre-construction surveys shall occur by a Caltrans approved biologist, 30 days prior to any ground disturbance. Surveys will attempt to identify Nelson's antelope squirrel or their sign within 50 feet of proposed permanent impacts. Potential burrows in the right-of-way will be avoided as best as possible. Construction equipment staging areas shall be surveyed and cleared by a Caltrans approved biologist prior to use. Staging shall occur in pre-disturbed areas. A Worker Environmental Awareness Training will be presented to all contract workers describing special-status species. All night work will be monitored by a Caltrans approved biologist. No direct impacts to the species are anticipated.

Compensatory Mitigation

No compensatory mitigation proposed.

Cumulative Impacts

No cumulative impacts anticipated.

4.3.8. Discussion of Blunt-Nosed Leopard Lizard

The blunt-nosed leopard lizard (*Gambelia sila*) is a federal and state endangered species and is fully protected by the California Department of Fish and Wildlife. Blunt-nosed leopard lizards are relatively large terrestrial lizards that range from 3-5 inches from snout to vent. They have granular scales, are typically gray to brown in color with cream-colored crossbands and large dark spots. Blunt-nosed leopard lizards have a pale underside that lightens as their body temperature increases and gray markings on the throat (HERP 2019).

Blunt-nosed leopard lizards are found in semi-arid grasslands, alkali flats, and dry wash habitats. The historical range of this species was found throughout the San Joaquin Valley and adjacent foothills of Southern California, from Stanislaus County to the northern edges of Santa Barbara and Ventura counties, at elevations below 2,600 feet (Jennings 1995, USFWS 1998). However, their current estimated range consists of isolated populations, in areas of undisturbed habitat, on the San Joaquin Valley floor and foothills of the Coast Range (USFWS 1998).

Survey Results

California Natural Diversity Database records for Nelson's antelope squirrel do occur within 5 miles of the detour action area however the most recent occurrence dates back to 1994.

Potential habitat does exist in the detour action area south of the Avenal Cutoff Rd and SR 269 intersection and small mammal burrows were observed in Caltrans right-of-way.

Project Impacts

Neither temporary nor permanent impacts are anticipated for Nelson's antelope squirrel, based on CNDDB database results and project description.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for blunt-nosed leopard lizard.

Avoidance and Minimization Efforts

Pre-construction surveys shall occur by a Caltrans approved biologist, 30 days prior to any ground disturbance. Surveys will attempt to identify Nelson's antelope squirrel or

their sign within 50 feet of proposed permanent impacts. Potential burrows in the right-of-way will be avoided as best as possible. Construction equipment staging areas shall be surveyed and cleared by a Caltrans approved biologist prior to use. Staging shall occur in pre-disturbed areas. A Worker Environmental Awareness Training will be presented to all contract workers describing special-status species. All night work will be monitored by a Caltrans approved biologist. No direct impacts to the species are anticipated.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.3.9. Discussion of San Joaquin Coachwhip

The San Joaquin coachwhip is listed as a California State Species of Special Concern. It is endemic to California and reported to range from Arbuckle in the Sacramento Valley in Colusa County southward to the Grapevine in the Kern County portion of the San Joaquin Valley and westward into the inner South Coast Ranges. The San Joaquin coachwhip occurs in open, dry, treeless areas with little or no cover, including valley grassland and saltbush scrub. They avoid dense vegetation where it cannot move quickly, including mixed oak chaparral woodland. They will take refuge in rodent burrows, under shaded vegetation, and under surface objects (San Joaquin 2019).

The San Joaquin coachwhip is diurnal and can tolerate high heat. This species is a medium sized slender non-poisonous snake with smooth scales, large head and eyes and a thin neck and tail. The average length of adults are three to six feet (Stebbins 2003). San Joaquin coachwhips preferred prey items are lizards and small mammals (San Joaquin 2019). Females lay between 4 to 20 eggs in June and July with eggs hatching in the late summer to early fall (Rodriguez-Robles et. al. 1999).

Survey Results

California Natural Diversity Database records for San Joaquin coachwhip do occur within 5 miles of the detour action area as recent as 2007 however the observation is nearly 4 miles southwest of detour.

Potential habitat does exist in the detour action area south of the Avenal Cutoff Rd and SR 269 intersection and small mammal burrows were observed in Caltrans right-of-way which could be a foraging opportunity for the species.

Project Impacts

Neither temporary nor permanent impacts are anticipated for San Joaquin coachwhip, based on CNDDB database results and project description.

Considering the low habitat value of the type of vegetation profile within the detour project area and that fact that it is subjected to vehicular disturbances, these habitat types normally have very little potential to support habitat for special-status species.

No work will occur off pavement at the detour location. Portable changeable message signs will be temporarily placed off pavement, within disturbed areas, to notify and direct traffic on the detour. No ground disturbance is anticipated for construction detour. No project impacts are anticipated for San Joaquin coachwhip.

No ground disturbance is anticipated for construction detour.

Avoidance and Minimization Efforts

Pre-construction surveys shall occur by a Caltrans approved biologist, 30 days prior to any ground disturbance. Surveys will attempt to identify San Joaquin coachwhip or their sign within 50 feet of proposed permanent impacts. Potential burrows in the right-of-way will be avoided as best as possible. Construction equipment staging areas shall be surveyed and cleared by a Caltrans approved biologist prior to use. Staging shall occur in pre-disturbed areas. A Worker Environmental Awareness Training will be presented to all contract workers describing special-status species. All night work will be monitored by a Caltrans approved biologist. No direct impacts to the species are anticipated.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

No cumulative impacts are anticipated.

4.3.10. Discussion of Hoary Bat

The hoary bat (*Lasiurus cinereus*) is a large, solitary bat with frosted fur that has golden coloration around the face, rounded ears, and a wingspan of nearly 17 inches. They are nocturnal, typically emerging in the evening with peak activity 3 to 5 hours after sunset.

Hoary bats are the most widespread bat in the Americas, with a range extending from southeastern Canada to Hawaii. Hoary bats have been recorded at elevations ranging from sea level to 13,200 feet above sea level and may be found in almost all of California. Hoary bats are migratory, spending winters in warmer habitats, and summers concealed in the foliage of both deciduous and coniferous trees. Within California, hoary bats winter along the coast and in southern California, breeding and spending summers inland and north of winter ranges. Males and females migrate separately, as they are often found in disparate ranges during summer but together in winter, and females begin migration before males. (Harris, Brown, Alley & Duke, 1990)

Hoary bats specialize in feeding on moths but will eat other flying insects, and often will forage with other bat species. Mating occurs in fall, either during migration or in winter, and is likely followed by delayed fertilization, as offspring are born May through July.

Litters range from 1 to 4, but there are typically 2 young to a litter. Young hoary bats are capable of flight 33 days after birth. (Anderson, 2002)

Survey Results

California Natural Diversity Database records for hoary bat do not occur within 5 miles of the action area, and the nearest occurrences are in the city of Hanford, from 1991, and in Corcoran, from 1982. However, bat surveys conducted with a Pettersson bat detector and SM2BAT detector picked up a hoary bat echolocation call. However, although vocalizations were detected, no guano, oil stains, or other sign of bats roosting was found, and no bats were observed emerging from the surrounding foliage during visual surveys. Due to survey limitations it was presumed that the surrounding valley foothill riparian habitat within the action area, and around the bridge may host roosting.

No conifers are present within the action area, and hoary bats prefer conifers to broadleaf trees, and trees at the edge of clearings to those in dense stands. The Stratford King River Bridge is constructed of a solid slab of concrete with no apparent interior where bats might potentially roost in. However, a 1.5 to 2 inch-wide gap was observed running along the center of the underside of the bridge, which may be a potential roosting location. Although the action area does not represent ideal roosting habitat for hoary bat, and surveys did not detect roosting hoary bats, there is some potential for hoary bat to use trees within the action area for roosting. The trees in the valley foothill riparian habitat along the Kings River South Fork are clustered throughout the bank, creating the mosaic pattern that preferred by hoary bat.

No critical habitat has been designated for hoary bat.

Project Impacts

Hoary bats are currently considered fairly common in North America, though their numbers are being reduced by deforestation and a large number are lost to wind turbine collisions (Bolster, n.d.). Loss of roosting habitat is the primary threat, and as the valley foothill riparian habitat in the action area is potential roosting habitat for hoary bat, temporary impacts of up to 8.43 acres in the form of noise from construction, dust, human activity, and vibrations from work are expected. There is potential for permanent impacts of up to 0.99 acres in lost habitat due to the change in bridge abutments.

While the trees in the action area are not conifers, and so are not the ideal roosting habitat for hoary bat, the habitat types present in the action area create the mosaic habitat hoary bats prefer (Anderson, 2002), and so the trees remain potential roosting habitat. The planned removal of up to 22 mature trees and vegetation trimming for the project on the north side of the bridge will reduce the number of roosting trees available to hoary bats, creating a permanent impact in the loss of roosting habitat.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design.

These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, the following avoidance and minimization measures will be implemented:

- 1) Clearing and grubbing will be minimized wherever possible and will occur between September 1 and February 1, when bats have relocated from the area.
- 2) Pre-construction surveys will be conducted for bats in surrounding trees no more than 2 weeks prior to the start of work and will be repeated 5 days prior to bridge demolition.
- 3) If bats are found within jurisdictional areas of the project site, California Department of Fish and Wildlife will be consulted to determine appropriate actions.
- 4) Worker Environmental Awareness Training will be provided to all workers by a qualified biologist to educate them on the special-status species with potential to occur within the work area, best management practices, permit conditions, environmental laws, and the consequences of violating them.

Compensatory Mitigation

As numerous trees of similar age and species distribution as those removed will remain on the banks of the Kings River South Fork, and there is likely to be little impact to the actual availability of suitable roosting trees, no compensatory mitigation is planned.

No compensatory mitigation is proposed.

Cumulative Impacts

The following projects have been completed recently or will be completed within or near the action area: Stratford geotechnical investigation, Stratford seismic restoration, and Stratford-Lemoore CAPM projects. None of these projects are anticipated to have cumulative impacts to hoary bat.

The impacts to valley foothill riparian habitat associated with this project, permanent impacts of up to 0.99 acres and temporary impacts of 8.43 acres, are not expected to result in any measurable cumulative effects to hoary bat. Therefore, no cumulative impacts are anticipated.

4.3.11. Discussion of Western Red Bat

Western red bat (*Lasiurus blossevillii*) is a medium-sized bat with a rust-red to brown-red coat, short, rounded ears, and a body length of 4 inches. They have a widespread distribution, found throughout most of the western United States, through Mexico, Central America, as far south as Argentina, and as far north as southern British Columbia. In California, they are found west of the Sierra Nevada and the Mojave to the

coast, along the length of the State. Western red bats are migratory, but with an apparently small migratory range, migrating in spring and fall. (Bolster, n.d.)

Western red bats roost in the foliage of trees, and occasionally shrubs, at a height between 5 and 40 feet. Roosting locations within such trees are typically dark, sheltered above the roost location, and clear below the roost. Riparian trees are preferred, and western red bat has been associated with cottonwood, willow, and sycamore trees near rivers.

Breeding takes place between late summer and early fall, though relatively little is known of western red bats' mating habits, gestation lasts approximately 80 days after a period of delayed fertilization, and they can have up to 5 pups in a single litter, with an average litter size of 3 pups. Pups are capable of flight between 3 and 6 weeks of age. (Lavender, 2014)

Western red bats eat insects, mainly moths, crickets, and beetles. They will forage the space from the top of the tree canopy to ground level. They begin foraging around two hours after sunset, timing it according to the activity of their nocturnal insect prey.

The primary threat to western red bat is the loss of habitat; riparian forests throughout the west have disappeared, and western red bat populations have declined with these losses. (Harris, Brown, Alley & Duke, 1990)

Survey Results

The nearest California Natural Diversity Database record for western red bat to the action area is a 1999 occurrence approximately 50 miles northwest, in Mendota. Despite this, the action area contains suitable habitat, and falls within the range of western red bat, as supported by the detection of western red bat calls during bat surveys conducted at the Stratford Kings River Bridge. However, although vocalizations were detected, no guano, oil stains, or other sign of bats roosting was found, and no bats were observed emerging from the surrounding foliage during visual surveys. Due to survey limitations it was presumed that the surrounding valley foothill riparian habitat within the action area, and around the bridge may host roosting.

No critical habitat has been designated for western red bat.

Project Impacts

Western red bats are primarily threatened by habitat loss, specifically the loss of large amounts of riparian forests across the west. Their numbers have been in decline, and there are very few reported occurrences of western red bat near the action area, though there are several occurrences throughout other parts of the Central Valley.

The valley foothill riparian habitat in the action area is potential roosting habitat for western red bat, therefore 8.43 acres of temporary impacts in the form of noise from work, dust, human activity, and vibrations are anticipated. Permanent impacts to habitat include the loss of up to 0.99 acres are anticipated due to lost roosting habitat in the loss of valley foothill riparian habitat due to the change in bridge abutments and the removal of up to 22 mature trees and vegetation trimming required for this project. Trimming is usually

a temporary impact; however a clearance around the bridge will need to be maintained and therefore will be permanent.

Avoidance and Minimization Efforts

Avoidance and minimization measures described in section 4.3.10 are applicable to this species and will be implemented to avoid or minimize effects.

Compensatory Mitigation

Mitigation described in 4.3.10 is applicable to this species.

Cumulative Impacts

The following projects have been completed recently or will be completed within or near the action area: Stratford geotechnical investigation, Stratford seismic restoration, and Stratford-Lemoore CAPM projects. None of these projects are anticipated to have cumulative impacts to western red bat.

The impacts to valley foothill riparian habitat associated with this project, permanent impacts of up to 0.99 acres and temporary impacts of 8.43 acres, are not expected to result in any measurable cumulative effects to western red bat. Therefore, no cumulative impacts are anticipated.

4.3.12. Discussion of Loggerhead Shrike

Loggerhead shrike (*Lanius ludovicianus*) is a medium sized passerine, with a grayish back, black wings, white breast, and a distinctive black mask around the eyes and running down the forehead. Loggerhead shrikes are eight to ten inches long, with a 12-inch wingspan, and a hooked beak that differs from most passerines.

Loggerhead shrike is also unique from other passerines in that it is the only known predatory songbird, using its hooked beak to impale vertebrate and invertebrate animals. They will consume mice, insects, small amphibians, and even some small birds, impaling them on barbed wire, sharp twigs, and thorns (“All About Birds: Loggerhead Shrike”, 2017).

Loggerhead shrikes range from central Canada to the Midwest of the United States, as far south as California. In California, loggerhead shrikes are both a year-round resident and winter resident, found in the lowlands and foothills, excluding the coast and Coast Range north of Mendocino. Loggerhead shrike prefers open habitat with scattered shrubs, fences, posts, and other perches, in open-canopied valley foothill riparian, valley foothill hardwood, and valley foothill hardwood-conifer, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. Loggerhead shrike may also be found in open croplands. (Granholm, Mewaldt & Duke, 1990)

Breeding takes place between April and July; males will hunt and kill unnecessarily in a display to attract females, and their nests are built in trees, 8 to 15 feet off the ground. Broods range from 4 to 7, with an average of 5 eggs per nest, which hatch after 14 to 15

days, and the young leave the nest by 20 days, typically living outside parental territory by 3 months. (Porter, 2000)

Loggerhead shrike populations are in decline, and threats to the species are likely rooted in historical pesticide use, secondary pesticide ingestion, development, agricultural conversion, strip-mining, and urban development (Granholm, Mewaldt & Duke, 1990).

Survey Results

The nearest California Natural Diversity Database records is for a 2001 occurrence near Avenal, approximately 14 miles southwest of the action area. The valley foothill riparian habitat and croplands within the action area are suitable for loggerhead shrike, and the action area falls well within its range.

Loggerhead shrike was observed perched both in and near the action area during general wildlife surveys and nesting surveys, but no nests were observed. Much of the action area is suitable habitat for loggerhead shrike, whether as potential nesting habitat, or as foraging habitat, and the observed presence of loggerhead shrike confirms there is at least suitable foraging habitat within the action area.

Loggerhead shrike is a species of special concern and is protected under the Migratory Bird Treaty Act. No critical habitat has been designated for loggerhead shrike.

Project Impacts

Within the action area, valley foothill riparian, and agricultural lands serve as potential foraging habitat. In total, this project will create up to 171.89 acres of potential temporary impacts in the form of increased noise from work, human activity, dust, vibrations, and visual disturbances to loggerhead shrike habitat, and up to 0.99 acres of permanent impacts from tree removals and lost foraging habitat due to the new bridge abutments. Much of the 171.89 acres of potential foraging habitat will be far less affected by the presence of work than the areas nearest the road. The area is dominated by agricultural activity and State Route 41 is a trucking route, so there is disturbance already present in the area. Impacts are unlikely to be substantial unless loggerhead shrikes are nesting, as individuals disturbed by work while foraging would be able to relocate to a greater distance and remain within the same type of foraging habitat. Nesting loggerhead shrikes will be protected by the avoidance and minimization measures below.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, the following avoidance and minimization measures will be implemented:

- 1) Pre-construction surveys will be conducted no more than 30 days prior to the start of construction activities, unless these activities begin outside nesting season (February 1 to September 31).
- 2) If construction activities extends into more than one nesting season, additional nesting surveys will be required at the start of nesting season before work can continue.
- 3) A qualified biologist will be present during all clearing and grubbing activities conducted between February 1 and September 31 to provide biological monitoring.
- 4) Worker Environmental Awareness Training will be provided to all workers by a qualified biologist to educate them on the special-status species with potential to occur within the work area, best management practices, permit conditions, environmental laws, and the consequences of violating them.
- 5) If loggerhead shrike is found nesting in or near the project footprint, a no-work buffer of 100 feet will be applied, until a qualified biologist has confirmed that young have fledged, and a qualified biological monitor required for all work within that buffer to ensure work does not disturb the nest.

Compensatory Mitigation

Mitigation described in 4.3.10 will also cover this species.

Cumulative Impacts

The following projects have been completed recently or will be completed within or near the action area: Stratford geotechnical investigation, Stratford seismic restoration, and Stratford-Lemoore CAPM projects. None of these projects are anticipated to have cumulative impacts to loggerhead shrike.

The 171.89 acres of impacts to valley foothill riparian habitat and the surrounding agricultural lands associated with this project, and permanent impacts of up to 0.99 acres to valley foothill riparian habitat are not expected to result in any measurable cumulative effects to loggerhead shrike. Therefore, no cumulative impacts are anticipated.

4.3.13. Discussion of Northern Harrier

Northern harriers (*Circus cyaneus*) are slender, medium-sized raptors, with a flat, owl-like face, yellow eyes, a long, rounded tail, and 40- to 45-inch wingspan. Northern harriers are sexually dimorphic; males are smaller, with gray on their backs and white below, and black wingtips, while females are larger and brown all over, but streaked with white below.

Northern harriers are found throughout the northern hemisphere. In California, they're found in most of the state, from annual grasslands up to lodgepole pine and alpine meadow habitat, as well as rangelands, desert sink, and both freshwater and saltwater

emergent wetlands. They are rarely found in wooded areas, and roost on the ground (Polite & Bailey, 1990).

During breeding season, northern harriers nest on the ground, on raised mounds of dirt or shrubby vegetation, and are highly territorial of their nests. Northern harriers preferentially nest in emergent wetlands or along rivers and lakes, but will also nest in dryer locations in grasslands, croplands, or sagebrush flats up to several miles from a water source. While females are monogamous, males are not always so, and primary females will breed from April to July, while secondary females will breed from May through September. Broods range from 3 to 5 eggs per nest, hatching at 28 to 36 days. Young fledge at 30 to 35 days (Limas, 2001).

Northern harriers fly low to the ground, diving for their prey. They eat mostly voles and small mammals, as well as birds, frogs, small reptiles, insects, and occasionally fish.

The destruction of wetlands, native grasslands, moist meadows, and the plowing, burning, or other disruptive cultivation efforts on nesting areas conducted early in the northern harrier breeding cycle, prey population reductions due to overgrazing, and secondary pesticide poisoning all contribute to decreased northern harrier populations (“All About Birds: Northern Harrier”, 2017).

Survey Results

The nearest California Natural Diversity Database occurrence falls well outside of Kings County; from 2001 in Panoche Hills, northwest of the action area. While records show no occurrences near the action area, there is suitable habitat for both foraging and nesting in the action area, and northern harrier was observed hunting during nesting surveys near the action area, though no nest was found.

Northern harrier is a species of special concern, and is protected under the Migratory Bird Treaty Act. No critical habitat has been designated for northern harrier.

Project Impacts

Northern harriers are somewhat common, but populations have been in steady decline for decades (Polite & Bailey, 1990). The primary threat to the species is habitat loss, specifically the loss of larger wetlands and annual grasslands, typically to agricultural conversion or urban development. Northern harriers do not tend to nest in wooded habitat (Limas, 2001), and so the habitat within the action area that they are most likely to be found are in the fresh emergent wetlands, and foraging in the agricultural lands in and around the action area.

Temporary impacts in the form of increased noise of up to 163.46 acres of potential foraging habitat are anticipated, but the greater area around the project is predominately agricultural lands as well, and individuals disturbed by work while foraging would be able to relocate further from work to continue foraging in the same habitat, so the impact to northern harriers by work on foraging is low.

As northern harriers nest on the ground, nesting substrate availability is not impacted by the project's planned tree removals; the only suitable habitat type for nesting within the action area is the fresh emergent wetlands. There is potential for temporary impacts in the form of noise from work, human activity, foot and equipment traffic, vibrations, and visual disturbance to affect up to 0.73 acres of fresh emergent wetlands, and for permanent impacts to up to 0.33 acres of it. However, as no northern harrier nests were found during surveys, the permanent impacts to the fresh emergent wetlands in the action area are not anticipated to affect northern harrier.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, measures 1 through 3 listed in section 4.3.12 will also be applied to protect this species, as well as the following measure:

- 1) If northern harrier is found nesting in or near the project footprint, a no-work buffer of 500 feet will be applied, and a qualified biological monitor required for all work within that buffer to ensure work does not disturb the nest.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

The following projects have been completed recently or will be completed within or near the action area: Stratford geotechnical investigation, Stratford seismic restoration, and Stratford-Lemoore CAPM projects. None of these projects are anticipated to have cumulative impacts to northern harrier.

Temporary impacts of up to 0.73 acres, and permanent impacts to up to 0.33 acres of habitat are not expected to result in any measurable cumulative effects to northern harrier. Therefore, no cumulative impacts are anticipated.

4.3.14. Discussion of Tricolored Blackbird

Tricolored blackbird (*Agelaius tricolor*) is a sexually dimorphic, highly colonial passerine bird found in western coastal North America. Males are larger and more colorful than females, with the red shoulder patch and white median coverts on their wings that give the species its name. Females are gray with a lighter throat than males, and males have brown plumage in fall. They are roughly 9 inches long, with a 14-inch wingspan, though the females tend to be somewhat smaller. (Fernandez, 2011)

Tricolored blackbirds are found in marshes, grasslands, and wetlands, always near water, and require foraging grounds and nesting substrate, typically foraging in grasslands or

agricultural pastures, and using aquatic plants for nesting substrate. As they are the most colonial passerine in North America, they also require adequate room and forage for at least 50 mating pairs. Native to California and to parts of Oregon, Washington, and Nevada, tricolored blackbirds are found in the greatest numbers in the Central Valley of California and along the central and southern coast and coastal ranges, though some inland areas in both northern and southern California are occupied seasonally by some populations. (Granholm, Mewaldt & Duke, 2008)

Tricolored blackbirds breed in spring and in fall at separate locations with the seasons as they migrate; spring breeding occurs in March through April, and clutches range from 2 to 6 eggs, usually 3 or 4 eggs per nest. Nests are built with mud and vegetation, built within a few feet of water or on aquatic vegetation in the water. Breeding and nesting is colonial, ranging from 50 to 20,000 nests in a single colony. Eggs hatch 11 to 14 days after being laid, and young take an average of 9 days to fledge, with the young independent of their parents in another 15 days.

Tricolored blackbirds are omnivores, eating grasshoppers, beetles, moths, fly larvae, grains, seeds, rice, and other crops as availability and season dictate. Young are primarily fed insects.

Threats to tricolored blackbird include loss of habitat (wetlands), urbanization and sprawl, agricultural conversion of lands and agricultural activity in breeding areas. (“All About Birds: Tricolored Blackbird”, 2017)

Survey Results

The nearest California Natural Diversity Database record of tricolored blackbird to the action area dates from 2014, on the Lemoore Naval Air Station, roughly 6 miles north-northwest of the action area. Several other occurrences have been reported in the areas surrounding Kettleman City, Avenal, Corcoran, and Pixley, and 2000 observation was reported roughly 8 miles upstream of the action area.

Surveys yielded no observations of tricolored blackbird or its sign, though red-winged blackbirds were observed, and tricolored blackbirds have been known to nest with red-winged blackbird; however, the red-winged blackbirds observed were not found nesting in the action area, nor was any evidence of nesting found. There is potentially suitable habitat within the action area for tricolored blackbird, as there are fresh wetlands with emergent vegetation located within the action area, and thickets of willow and blackberry with dense vegetation along much of the shore of the Kings River South Fork, and along the borders of the wetlands. However, the emergent wetlands do not make up a large area, and the thickets on the shore of the South Fork Kings River may not provide adequate space for a nesting colony, depending on the size of the colony. It remains possible that tricolored blackbird may be observed within the action area in the future, though larger, more suitable nesting habitat may be found in the vicinity.

Tricolored blackbird is protected under the Migratory Bird Treaty Act and is state listed as threatened. No critical habitat has been designed for this species.

Project Impacts

Tricolored blackbird populations have decreased by more than 50% since 1970, and the global breeding population is estimated to sit at 300,000. Loss of habitat due to the widespread of wetlands, urbanization, and conversion of agricultural habitat is the primary threat to the species. With this habitat loss, tricolored blackbirds have begun nesting in agricultural fields, where farming practices often disrupt breeding colonies, resulting in large losses of offspring. (“All About Birds: Tricolored Blackbird”, 2017)

As no tricolored blackbirds, nor evidence of their presence has been observed within or near the action area, the fresh emergent wetlands and thickets along the river’s shore are not ideal habitat, and larger, more suitable habitat is present in the vicinity, future occurrences of the species within the action area is not anticipated. However, the wetlands and thickets within the action area remain potential nesting and foraging habitat for tricolored blackbird, and the project would have temporary impacts in the vegetation trimming required for work, and tree removals that may reduce the thickets along the shore of the Kings River South Fork until replanted vegetation has established. There is also potential for temporary impacts of up to 0.73 acres in the disturbance to wetlands created by construction noise, personnel, and equipment, and up to 0.33 acres of permanent impacts from the footprint of the new bridge’s abutments and embankments.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, measures 1 through 3 listed in section 4.3.12 will also be applied to protect this species, as well as the following measures:

- 1) If tricolored blackbird is found nesting in or near the project footprint, a no-work buffer of 100 feet will be applied, and a qualified biological monitor required for all work within that buffer to ensure work does not disturb the nesting tricolored blackbirds.
- 2) As much suitable tricolored blackbird habitat (emergent wetland vegetation and shoreline thickets) near the project footprint as possible will be demarcated and protected by ESA fencing.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

The following projects have been completed recently or will be completed within or near the action area: Stratford geotechnical investigation, Stratford seismic restoration, and

Stratford-Lemoore CAPM projects. None of these projects are anticipated to have cumulative impacts to tricolored blackbird

Permanent impacts of 0.33 acres and temporary impacts of 0.73 acres of habitat are not expected to result in any measurable cumulative effects to tricolored blackbird. Therefore, no cumulative impacts are anticipated.

4.3.15. Discussion of Burrowing Owl

Burrowing owls (*Athene cunicularia*) are small owls ranging from 7.5 to 10 inches in height, with a wingspan of 21 to 24 inches, long legs, and a short tail. They have yellow eyes, white eyebrows, and lack the ear-tufts seen on other owls. Adult burrowing owls are brown with white or buff brown-flecked chests, a white chin, and spotted back. Juveniles' plumage lacks chest stripes, and young burrowing owls have fewer spots.

Burrowing owls are found from Central America to North America, in most of California, with year-round populations across the Central Valley and in southeastern California. Burrowing owls are found in dry, open grasslands, range agricultural lands, desert habitat, and in pinyon-juniper and ponderosa pine habitat, up to 9,000 feet above sea level. In California, burrowing owls have not been observed above 5,300 feet above sea level. Burrowing owls may also be found in urban vacant lots, airports, golf courses, and fairgrounds within urban areas, and will adopt the burrows of other burrowing animals in addition to digging their own. (Polite, Kiff & CWHR Program Staff, 1999)

Burrowing owls are monogamous, breeding annually between February and May, depending on location, and typically have one clutch of between 2 and 12 young. Eggs take roughly a month to hatch, and young burrowing owls are usually independent by 53 days. They are semi-colonial, in part due to their use of the burrows of colonial burrowing animals. (Brandes, 2016)

Burrowing owls mainly eat insects, but occasionally eat small mammals such as mice, ground squirrels, and bats, or small birds, lizards, or snakes, though insects make up 90% of their diet, and seasonal changes determine its composition.

The primary threat to burrowing owls is habitat loss due to human encroachment and development or agricultural conversion, and the poisoning of ground squirrel populations. ("All About Birds: Burrowing Owl", 2017)

Survey Results

The nearest California Natural Diversity Database records of burrowing owl are located approximately 3 miles northwest of the action area, dated 2016. Additional records exist in the areas around Huron, the Lemoore Naval Air Station, Kettleman City, and Corcoran.

The habitat most likely to support burrowing owls within the action area are the disturbed areas near agricultural lands. However, the regularity of the disturbance of these habitats by human activity reduces the likelihood of burrowing owl remaining in them. Burrowing owls are capable of living in fairly disturbed habitat, including vacant urban lots and

agricultural fields, so it's the frequency of disturbance that's the most likely factor in their presence within the action area. At the time of surveys, the regular agricultural and maintenance activities of those habitats suitable to burrowing owl precludes long term occupancy by the species. Surveys results support this, as no burrowing owls or their sign were observed. It's more likely that any burrowing owl present within the action area would be transient rather than inhabiting the action area.

Burrowing owls are a species of special concern, and are protected under the Migratory Bird Treaty Act. No critical habitat has been designated for burrowing owl.

Project Impacts

Burrowing owl populations declined by a third between 1966 and 2015, and predominant threats to the species are habitat loss, pesticides, and vehicular strikes ("All About Birds: Burrowing Owl", 2017). While burrowing owls can survive in small tracts of suitable habitat, the only suitable habitat within the action area is agricultural land that is routinely disturbed by human activity, and the farming operations create similar disturbance to that of construction planned for this project. While there is potential for work to compound the regular farming operations' disturbance to this habitat, the farming-related disturbance ensures any burrowing owls in the action area would be itinerant, and as no burrowing owl or its sign was found during surveys, the anticipated temporary impacts are negligible. As no habitat suitable for burrowing owl will be permanently altered by the project, and no work is planned within such habitat, no permanent impacts are anticipated.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, measures 1 through 3 listed in section 4.3.12 will also be applied to protect this species.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

The following projects have been completed recently or will be completed within or near the action area: Stratford geotechnical investigation, Stratford seismic restoration, and Stratford-Lemoore CAPM projects. None of these projects are anticipated to have cumulative impacts to burrowing owl.

As no substantial permanent impacts are anticipated and temporary impacts to potential habitat are insubstantial, this project is not expected to result in any measurable cumulative effects to burrowing owl. Therefore, no cumulative impacts are anticipated.

4.3.16. Discussion of Yellow-headed Blackbird

The yellow-headed blackbird (*Xanthocephalus xanthocephalus*) is a black-bodied passerine with a bright yellow hood and white patch on its wing. Females are a gray-brown color, with a duller yellow chest, throat, and stripe over the eye. Female and males both average 9.5 inches in length, and have sharp, pointed black bills.

Yellow-headed blackbirds are found in deep, fresh emergent wetlands in summer, preferring cattails, tule, and bulrush for roosting as well as nesting, and during migration they show preference for open, cultivated lands, fields, and pastures. Their range extends from western and central Canada and the western and central regions of the United States, as far south as northern Baja California. In California, yellow-headed blackbirds are found in summer throughout the Central Valley and east of the Sierra Nevada, into the Mojave and Salton Sea areas, and in winter it may be found in some areas within central and western portion of the Central Valley. (Granholm, Mewaldt, Duke & CWHR Program Staff, 2008)

Yellow-headed blackbirds primarily eat seeds and cultivated grains, but primarily eat insects during breeding season. Young are fed mostly insects, and yellow-headed blackbirds forage in emergent vegetation, along moist shorelines, and in grasslands and croplands near water or moist ground.

Nesting is colonial, and done in dense emergent vegetation, typically in cattails and tule along the margin of a lake or pond, with preference for larger wetlands. Clutches are 3 to 5 eggs, averaging 4, and incubation lasts 11 to 13 days. Chicks fledge within 9 to 12 days of hatching, and typically only one to two broods are raised each year.

While yellow-headed blackbird remains fairly common and is considered secure throughout much of their range, in California numbers are decreasing. The primary threat to yellow-headed blackbird is loss of habitat in the loss of wetlands, and to a lesser degree, herbicides and pesticides ingested with grains and vegetation, and direct baiting, trapping, netting, and shooting by farmers whose crops the yellow-headed blackbirds eat. (Dotzour, 2002)

Survey Results

The nearest California Natural Diversity Database record of yellow-headed blackbird is a 2016 occurrence located roughly 2 miles northwest of the action area, which is recorded as running along an irrigation canal.

While no observations of yellow-headed blackbird or its sign were made during surveys conducted within the action area, the 2016 observation supports the case that the irrigation canals within the action area could serve as suitable habitat for yellow-headed blackbird despite the barren banks, and that depth and presence of emergent vegetation makes these canals suitable at least for roosting, if not for nesting. This is mainly the case with the mouth of the Blakely Canal.

The canals downstream of the Stratford Kings River Bridge lack emergent vegetation, but fresh emergent wetlands are present within the action area, if in patchy, smaller areas,

and are relatively deep, so could provide the necessary vegetative cover for yellow-headed blackbird roosting and nesting, though the small size of the wetlands reduce the likelihood of nesting due to the colonial nesting preference of the species. The size of the wetlands may be offset by their continuity with the shore of the Kings River South Fork, and the fresh emergent wetlands found in the action area still represent potential foraging habitat, though their size reduces the likelihood of nesting by yellow-headed blackbird.

Yellow-headed blackbird is a species of special concern, and is protected under the Migratory Bird Treaty Act. No critical habitat has been designated for yellow-headed blackbird.

Project Impacts

While relatively common nationwide, yellow-headed blackbirds have been in slight decline for decades, and populations have declined more so in California. Their survival seems primarily linked to the continued existence of suitable habitat; the greatest threat to the species is loss of habitat. (“All About Birds: Yellow-headed Blackbird”, 2017)

Temporary impacts from this project to yellow-headed blackbird will consist of up to 0.73 acres of potential nesting habitat and up to 163.46 acres of foraging habitat disturbed by noise, human presence, equipment operation, dust, and vibrations caused by project construction. No nesting yellow-headed blackbirds were observed during surveys, not sign of them, and with application of the following avoidance and minimization measures, the temporary impacts to yellow-headed blackbird will be further reduced. Much of the foraging habitat with potential to be disturbed by work will have very reduced impacts due to distance from work, and the surrounding area is dominated by agricultural lands, so any individuals disturbed by work would be able to relocate to similar foraging habitat easily. Temporary impacts are therefore not expected to have great effect on yellow-headed blackbird.

While there is potential for up to 0.33 acres of permanent impacts to wetlands by this project, all permanent impacts will be mitigated at a 1:1 ratio per the Section 404 Nationwide Permit the project will require, and as no nesting yellow-headed blackbirds were observed during surveys, nor sign of their nesting, no permanent impacts are anticipated.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, measures 1 through 3 listed in section 4.3.12 will also be applied to protect this species, and the following measure will be implemented:

- 1) If yellow-headed blackbirds are found nesting in or near the project footprint, a no-work buffer of 100 feet will be established, and no work will be allowed within the buffer without a qualified biological monitor to ensure the yellow-headed blackbirds are not disturbed by work.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

The following projects have been completed recently or will be completed within or near the action area: Stratford geotechnical investigation, Stratford seismic restoration, and Stratford-Lemoore CAPM projects. None of these projects are anticipated to have cumulative impacts to yellow-headed blackbird.

Permanent impacts of up to 0.33 acres and temporary impacts of up to 164.19 acres of habitat are not expected to result in any measurable cumulative effects to yellow-headed blackbird. Therefore, no cumulative impacts are anticipated.

4.3.17. Discussion of Swainsons Hawk

Swainson's hawks (*Buteo swainsoni*) are raptors, unique in that they have variable coloration; light morphs have dark flight feathers and a brown upper breast, banded tail, and white shoulders, while dark morphs range from reddish brown to dark brown but usually have a banded tail, and lighter shoulders and undertail. They measure 19 to 22 inches in length, with a wingspan of 4 to 4.5 feet. Their diet is largely based on what is available, including mice, gophers, ground squirrels, rabbits, amphibians, reptiles, insects, and fish. (Stabler, 2000)

Swainson's hawks migrate between North America and the Las Pampas region of Argentina annually, with a United States range spanning the western United States. They prefer open grassland, desert and croplands that have single large trees or groves scattered throughout. In California, they're found in the Central Valley, the Mojave, and in the Modoc Plateau.

Swainson's hawks typically prefer to nest near water, building nests in March and April in trees, utility poles, shrubs, or even on the ground. They are usually monogamous, and breeding pairs are likely to return to previously used nesting sites. While social and forming migratory flocks outside breeding season, Swainson's hawks are highly territorial of their nests. The female will have a clutch of 2 to 4 eggs, which incubate up to 30 days before the young hatch, and the young stay in the nest for another 30 days.

Threats to Swainson's hawks include loss of habitat and reduction of prey bases, and in Argentina, the conversion of pastureland to soybean fields has reduced winter foraging habitat. Pesticides used in Argentina that caused the death of thousands of wintering Swainson's hawks in the 1990s have since been banned, though pesticides and rodenticides may still pose a threat to the species. ("All About Birds: Swainson's Hawk", 2017)

Survey Results

The nearest California Natural Diversity Database record of Swainson's hawk is a 2007 occurrence located roughly 10 mile east of the action area, though numerous Swainson's hawk occurrences are recorded for the valley floor within greater Kings County area. Suitable habitat for Swainson's hawk is present within the action area; the agricultural lands around the river and valley foothill riparian habitat are suitable for hunting, and the valley foothill riparian habitat along the Kings River South Fork has several trees that are suitable for nesting.

Nesting surveys found two Swainson's hawks nesting within a half-mile of the project's original action area. One nest was located inside the current action area, in a tree just west of the Kings River South Fork. The second nest is no longer within a half-mile of the action area, as it fell within that buffer for the detour originally planned for the project, in a tree over a half-mile northwest of the action area.

Swainson's hawk is protected under the Migratory Bird Treaty Act and is state-listed as threatened. No critical habitat has been designated for Swainson's hawk.

Project Impacts

California may have once had over 17,000 breeding pairs of Swainson's hawks, which reached estimates as low as 375 pairs, but by 2005 had risen to over 2,000 breeding pairs. The greatest threat to the species is the loss of foraging habitat and breeding habitat. (Polite, Kiff & CWHR Staff, 2006))

Temporary impacts to Swainson's hawk foraging habitat may occur for up to 163.46 acres, in the form of noise, dust, human presence, equipment operation, and vibrations caused by project construction. However, the action area is surrounded by similar foraging habitat, and trees around the bridge will reduce the level of disturbance past the trees to some degree. The agricultural lands in the action area experience regular disturbance and human activity in the course of farm operations, in addition to the continuous disturbance created by traffic on State Route 41, and so the temporary impacts of work may be less severe.

Permanent impacts are anticipated in the loss of 0.99 acres of valley foothill riparian habitat, which serves as nesting habitat, and in the removal of up to 22 mature trees, within nesting habitat, which could compound the widespread loss of nesting habitat for the species.

Due to the nearness of the bridge to a known Swainson's hawk nest, there is potential for take, if work disturbs the nesting hawks, causes distress, or any other effect resulting in nest abandonment or failure. However, there are no plans to remove the nest tree.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design.

These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, the following avoidance and minimization measures will be implemented:

- 1) Protocol surveys for Swainson's hawk will be conducted the year prior to the start of work. If work begins outside nesting season, work may not continue into nesting season until a pre-construction survey or that period's protocol survey for Swainson's hawk has been conducted.
- 2) If Swainson's hawk is found nesting in or near the project footprint, a no-work buffer of 500 feet will be established, and no work will be allowed within the buffer without a qualified biological monitor to ensure the nest is not disturbed by work.
- 3) If clearing and grubbing activities must be completed during the avian nesting season (February 1-September 30), a qualified biologist will perform a site inspection prior to any tree trimming or removal to confirm no active nests will be negatively affected by the work.

Compensatory Mitigation

Mitigation described in 4.3.10 will also cover this species. Additionally, the following mitigation will be applied:

- 1) All Swainson's hawk nesting habitat permanently lost due to project activities will be replaced with the creation of nesting habitat, purchase of mitigation credits, or purchase of land/conservation easements to protect existing Swainson's hawk nesting habitat.

Cumulative Impacts

Temporary impacts to Swainson's hawk foraging habitat may occur for up to 163.46 acres, in the form of noise, dust, human presence, equipment operation, and vibrations caused by project construction. However, the action area is surrounded by similar foraging habitat, and trees around the bridge will reduce the level of disturbance past the trees to some degree. The agricultural lands in the action area experience regular disturbance and human activity in the course of farm operations, in addition to the continuous disturbance created by traffic on State Route 41, and so the temporary impacts of work may be less severe.

Permanent impacts are anticipated, due to the removal of up to 22 mature trees, which will create a permanent impact in the loss of nesting habitat, which could compound the widespread loss of nesting habitat for the species.

Permanent impacts of up to 0.99 acres lost nesting habitat, and temporary impacts of 163.46 acres of habitat are not expected to result in any measurable cumulative effects to Swainson's hawk. Additionally, any permanent impacts from the potential take of

Swainson's hawk at the nest near the bridge will be fully mitigated for under Fish & Game Code Section 2081. Therefore, no cumulative impacts are anticipated.

4.3.18. Discussion of Black-crowned Night Heron

Black-crowned night herons (*Nycticorax nycticorax*) are small, relatively stocky herons, with thick, short necks, large flattened heads, and heavy, pointed bills. They have short legs and broad, rounded wings, with an average wingspan of 45 inches, and average length of 24 inches. Adult black-crowned night herons are light gray, with a black back, black crown, and all-black bills. Juveniles have brown coloration streaked with white, and yellower bills. (Granholm, Raveling, Mewaldt & Duke, 1990)

Black-crowned night herons are found across North America, as far south as coastal Mexico and parts of Central America and the Caribbean. In California, they're found in lowlands throughout most of the state, in both freshwater and saline emergent wetland habitat, feeding along lacustrine and riverine margins, and roosting and nesting in dense-foliaged trees and dense emergent vegetation.

Breeding is colonial, sometimes with dozens of nests in a single tree. Nests are usually built near aquatic or emergent feeding areas, and clutches of 3 to 5 eggs, which incubate 24 to 26 days, the young leaving the nest at 6 to 7 weeks. ("All About Birds: Black-crowned Night-Heron", 2017)

Black-crowned night herons eat a highly varied diet of fish, crustaceans, aquatic insects, reptiles, amphibians, small mammals, and occasionally young birds. They usually hunt in shallow water, either waiting motionless to strike, stalking prey, or luring prey by vibrating their bill in water.

Habitat loss is the primary threat to black-crowned night heron, though water quality due to contaminated runoff and accumulating pollutants are also hazards. (BirdLife International, 2016)

Survey Results

The nearest California Natural Diversity Database record of black-crowned night heron to the action area is a 2007 occurrence located roughly 4.5 miles southwest of the action area. The action area contains both suitable foraging habitat and nesting habitat, and black-crowned night heron was observed during nesting surveys, but no nest was found. The 2007 occurrence was located in the Blakely Canal, downstream of the Stratford Kings River Bridge. Both the nesting survey observation and the California Natural Diversity Database occurrence in the Blakely Canal suggest that black-crowned night heron is likely to be seen within the action area again. While suitable nesting substrate exists within the action area in the willow and blackberry thickets and emergent vegetation, none have been observed or recorded within or near to the action area.

Black-crowned night herons are protected under the Migratory Bird Treaty Act and the species is on California Department of Fish and Wildlife's Special Animals List. No critical habitat has been designated for black-crowned night heron.

Project Impacts

Black-crowned night heron populations have been decreasing, with habitat loss and water quality as the primary threats to the species (Ivory, 2002). Temporary direct impacts of up to 0.73 acres to black-crowned night heron are anticipated, due to disturbance to nesting and foraging habitat in the form of noise, dust, human presence, equipment operation, bioacoustics impacts from pile driving, and vibrations caused by project construction from both bridge work and the installation of the temporary trestle. Indirect impacts in the disturbance of potential prey species due to in-water work is likely. Permanent impacts of up to 0.33 acres due to the loss of wetlands are anticipated.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, measures 1 through 3 listed in section 4.3.12 will also be applied to protect this species, as well as the following measure:

- 1) If black-crowned night heron is found nesting in or near the project footprint, a no-work buffer of 100 feet will be established, and no work will be allowed within the buffer without a qualified biological monitor to ensure the nest is not disturbed by work.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

The following projects have been completed recently or will be completed within or near the action area: Stratford geotechnical investigation, Stratford seismic restoration, and Stratford-Lemoore CAPM projects. None of these projects are anticipated to have cumulative impacts to black-crowned night heron.

Permanent impacts of 0.33 acres and temporary impacts of 0.73 acres of habitat are not expected to result in any measurable cumulative effects to black-crowned night heron. Therefore, no cumulative impacts are anticipated.

4.3.19. Discussion of Western Pond Turtle

Western pond turtles (*Emys marmorata*) have a smooth, wide, yellowish and dark-blotched shell, a marbled, dark brown to olive body, and some sexual dimorphism, with females larger, but males having a larger head, pointer snout, thicker tail and neck, and darker throat markings. This species is omnivorous, and often eats crustaceans, fish, insects, carrion, and vegetation (primarily willow, tule, alder catkins, and algae).

Western pond turtles are native along the west coast, formerly thought to range from Washington to the Central Valley in California. Within California they can be found nearly everywhere from the Central Valley northward, west of the Sierra Nevada, and in the Modoc Plateau. Western pond turtles use aquatic and terrestrial habitats, preferring permanent to semi-permanent bodies of water that have cover in the form of algae or vegetation, and access to basking sites. Terrestrial habitat is used for wintering in burrows, and where western pond turtles lay their eggs. (Morey, Papenfuss, Duke & CWHR Program Staff, 2000)

Western pond turtles mate from May to August, and most females lay eggs only every other year; nests are on average 90 feet from water, in flat, dry areas with low vegetation, though along larger, slow-moving waterways like the Kings River South fork, nests are more typically constructed in sandy banks. Incubation lasts around 3 months, and hatchlings usually remain in the nest chamber through the following spring. There is a high rate of nest predation and failure for western pond turtles.

Threats to western pond turtle include habitat destruction, urbanization, genetic isolation, and drought. Off-road vehicle recreation, chemical spills, and by-catch by fisherman pose additional threats. (Nachman, 2008)

Survey Results

A California Natural Diversity Database record exists for an occurrence of western pond turtle at the Stratford Kings River Bridge; however, this observation is not dated. During botanical surveys, Caltrans biologists observed a turtle leave a basking site. While biologists were not able to identify to species in time, the Kings River South Fork does contain suitable habitat for western pond turtle, and there is high potential for presence within the action area.

No critical habitat has been designated for western pond turtle.

Project Impacts

Western pond turtles were formerly numerous in California, but historic overhunting, habitat destruction, alteration of waterways, water pollution, and lack of genetic variation as populations are increasingly isolated all threaten the species today. (Nachman, 2008)

Impacts to the riverine habitat in the action area will cause 131.88 square feet of permanent impacts from to western pond turtle from the installation of piles for the new structure. Up to 6.00 acres of temporary impacts are anticipated from construction activities, including the removal of old bridge pilings, and installation of the temporary trestle and its pilings.

Impacts to the valley foothill riparian habitat will consist of up to 8.43 acres of temporary impacts due to noise, dust, human presence, equipment operation, vegetation trimming, tree removal activities, bioacoustics, and vibrations caused by project construction, and up to 0.99 acres of permanent impacts from the new bridge abutments. Tree removal and vegetation removal are additional permanent impacts, but will be restricted to habitat near the roadway, where there is already a higher level of disturbance from the highway.

Water quality-related impacts are not anticipated, as this project will comply with National Pollutant Discharge Elimination System, Stormwater Pollution Prevention Plan, and all measures from permits regarding water quality.

As there is little risk of water quality impacts, the permanent loss of 131.88 square feet of riverine habitat will be offset by the removal of the old bridge piles to below the mudline, and permanent impacts to valley foothill riparian habitat are focused in the disturbed area around the roadway, this project is not expected to have substantial negative effects on western pond turtle.

Avoidance and Minimization Efforts

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide), that are hereby incorporated by reference and included in the proposed project design. These best management practices will be implemented as part of the proposed project to avoid or minimize potential effects to special-status species.

In addition to the best management practices, the following avoidance and minimization measures will be implemented:

- 1) Pre-construction surveys for western pond turtle will be conducted no more than 30 days prior to the start of work.
- 2) Whenever possible, work in the riverbed will be done in low-flow and dry periods.
- 3) When restricting work to low-flow and dry periods is not possible, a qualified biologist will be present to monitor all in-water work, to ensure that any western pond turtles found in the project footprint are allowed to leave undisturbed and of their own volition where feasible, and where it is not, to safely relocate the turtle to a suitable location outside the project footprint.
- 4) Exclusionary fencing will be installed in the upland habitat on the boundaries of the project footprint to prevent western pond turtle from entering the work area.
- 5) Worker Environmental Awareness Training will be provided to all workers by a qualified biologist to educate them on the special-status species with potential to occur within the work area, best management practices, permit conditions, environmental laws, and the consequences of violating them.

Compensatory Mitigation

No compensatory mitigation is proposed.

Cumulative Impacts

The following projects have been completed recently or will be completed within or near the action area: Stratford geotechnical investigation, Stratford seismic restoration, and

Stratford-Lemoore CAPM projects. None of these projects are anticipated to have cumulative impacts to western pond turtle.

Permanent impacts of 0.99 acres and temporary impacts of 14.43 acres of habitat are not expected to result in any measurable cumulative effects to western pond turtle. Therefore, no cumulative impacts are anticipated.

Chapter 5. Conclusions and Regulatory Determinations

5.1. Federal Endangered Species Act Consultation Summary

Below are the Federal Endangered Species Act determinations for fifteen species included in the United States Fish and Wildlife Service Official Species List returned for a January 22, 2020 query of the project footprint in the IPaC tool, and one federally listed species returned by California Native Plant Society's Rare Plant Inventory. The table below lists each species' status, habitat type, acreage of impacts to the species' habitat, anticipated impacts accounting for avoidance and minimization measures, and the level of determination under FESA made by Caltrans as the federal lead agency. No designated critical habitat will be impacted as a result of implementation of the proposed project.

Table 4: Federal Endangered Species Act Determinations

| Species | Status | Possible in Which Habitat Type | FESA Determination |
|-----------------------------|--------|--|--------------------|
| San Joaquin kit fox | FE | Annual grasslands or grassy, open stages of vegetation dominated by scattered brush, shrubs, or scrub. | <i>No effect.</i> |
| Tipton kangaroo rat | FE | Alkali habitat with fairly level terrain and scattered shrub cover. | <i>No effect.</i> |
| Western snowy plover | FT | Alkali desert scrub, grasslands, or herbaceous habitat with scattered shrub and fairly level terrain | <i>No effect.</i> |
| Blunt-nosed leopard lizard | FE | Sparsely vegetated alkali and desert scrub or arid nonnative grasslands habitat, with low relief. | <i>No effect.</i> |
| Giant garter snake | FT | Marshes, sloughs, and slow-moving creeks. | <i>No effect.</i> |
| Giant kangaroo rat | FE | Annual grasslands on the western side of the San Joaquin Valley, marginal habitat in alkali scrub. Mainly inhabit sandy loam soils on level or gently sloping ground. | <i>No effect.</i> |
| Fresno kangaroo rat | FE | Alkali habitat with fairly level terrain and scattered shrub cover. | <i>No effect.</i> |
| California red-legged frog | FT | Permanent pools with a depth of at least 3 feet in marshes, streams, or ponds, with a vegetated shoreline. | <i>No effect.</i> |
| California tiger salamander | FE, FP | Most commonly found in annual grassland habitat, but also occurs in the grassy understory of valley-foothill hardwood habitats, and uncommonly along stream courses in valley-foothill riparian habitats. | <i>No effect.</i> |
| Delta smelt | FT | Estuarine; endemic to the San Francisco Estuary. | <i>No effect.</i> |
| Vernal pool fairy shrimp | FT | Seasonally ponded habitat types including: vernal pools and swales, natural and artificial seasonal wetland habitats like alkali pools, ephemeral drainages, stock ponds, roadside ditches, vernal swales, and rock outcrop pools. | <i>No effect.</i> |
| Vernal pool tadpole shrimp | FE | Seasonally ponded habitat types including: vernal pools, swales, ephemeral drainages, stock ponds, reservoirs, ditches, backhoe pits, and ruts or ditches caused by vehicles. | <i>No effect.</i> |
| California jewelflower | FE | Found on flats, slopes, generally in non-alkaline, sandy soil grassland. | <i>No effect.</i> |

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| Kern mallow | FE | Shadscale scrub, valley grassland, eroded hillsides, and alkali flats. | No effect. |
| San Joaquin woollythreads | FE | Sandy portions of valley and foothill grassland and chenopod scrub | No effect. |

Species Status Key: FE = Federal Endangered; FT = Federal Threatened

The project footprint does not fall within the jurisdiction of the National Marine Fisheries Service, and therefore no section 7 consultation was requested.

On August 30, 2019, in an email exchange between Emma Fryer and Jen Schofield, the United States Fish and Wildlife Service replied that they had no further comments based on the project description and Caltrans “no effect” determination for federally listed species.

5.2. Essential Fish Habitat Consultation Summary

According to the National Marine Fisheries Service’s Essential Fish Habitat Mapper, essential fish habitat does not occur within or near the project footprint, consultation is not required.

5.3. California Endangered Species Act Consultation Summary

Below are the species that have potential to occur within the action area and have a listing status with the State of California:

Table 5: California Endangered Species Act Determinations

| Species | Status | Possible in Which Habitat Type | Rationale | Species Impacts Expected After AMMs? |
|-------------------------|--------|--|---|---|
| San Joaquin kit fox | ST | Annual grasslands or grassy, open stages of vegetation dominated by scattered brush, shrubs, or scrub. | Suitability of most habitat within the action area is poor, and soils are not ideal for burrow excavation, but the surrounding agricultural lands may serve as foraging habitat for San Joaquin kit foxes passing through the project vicinity. California Natural Diversity Database records in the 9-quadrangle area around the action area support potential for San Joaquin kit fox in the greater surrounding area, and for potential kit fox passage through the action area. | No Adverse Impact with implementation of avoidance and minimization measures. No take anticipated. |
| American badger | SSC | Variable; most common in dry open stages of shrub, forest, and herbaceous habitats with friable soils. | The action area contains transitional area between habitat types and opening in valley foothill riparian habitat potentially suited to American badger. Suitable habitat is also present within the detour action area. | No Adverse Impact with implementation of avoidance and minimization measures. No take anticipated. |
| Yellow-headed blackbird | SSC | Fresh emergent wetlands with dense vegetation and deep water, along borders of lakes | Suitable habitat is present within the action area. | No Adverse Impact with implementation |

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| | | and ponds, and forages in emergent wetlands and open, wet areas including the margins of lacustrine habitat and croplands | | of avoidance and minimization measures. No take anticipated. |
| Swainson's hawk | ST | Nest in stands of trees in otherwise open areas, in riparian areas, and oak savannah. Foraging habitat includes grasslands, some grain croplands, alfalfa fields, and livestock pastures. | Suitable habitat is present within the action area, nest observed within action area during 2018 surveys. | No Adverse Impact with implementation of avoidance and minimization measures. No take anticipated. If 500-foot "no work" buffer cannot be maintained a 2081 Incidental Take Permit may be required. |
| Burrowing owl | SSC | Found in dry, open grasslands, range and agricultural lands, desert habitats, and in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitat, burrowing owls may occur from 200 feet below sea level to up to 9,000 feet above sea level. In California, the highest elevation recorded is 5,300 feet above sea level. | Suitable habitat present with project action area and detour action area. | No Adverse Impact with implementation of avoidance and minimization measures. No take anticipated. |
| Tricolored blackbird | ST | Tricolored blackbird breed near freshwater, nesting in emergent freshwater wetlands, usually in dense tule rush or cattails, though also in blackberry, willow, or tall herbs. Nesting habitat is usually near or on freshwater, and must be large enough for colonial nesting, but may be as far as 4 miles from foraging habitat. | Suitable habitat is present within the action area. | No Adverse Impact with implementation of avoidance and minimization measures. No take anticipated. If 100-foot "no work" buffer cannot be maintained a 2081 Incidental take Permit may be required. |
| Loggerhead shrike | SSC | Loggerhead shrike prefers open habitat with scattered shrubs, fences, posts, and other perches, in open-canopied valley foothill riparian, valley foothill hardwood, and valley foothill hardwood-conifer, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. Loggerhead shrike | Suitable habitat is present within the action area. | No Adverse Impact with implementation of avoidance and minimization measures. |

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| | | may also be found in open croplands. | | |
| Northern harrier | SSC | In California, northern harriers are found in annual grasslands up to lodgepole pine and alpine meadow habitat, in rangelands, desert sink, and both freshwater and saltwater emergent wetlands. They are rarely found in wooded areas, and roost on the ground. | Suitable habitat present within project action area and detour action area. | No Adverse Impact with implementation of avoidance and minimization measure. No take anticipated. |
| Nelson's antelope squirrel | ST | Found between 165 and 3,600 feet above sea level, Nelson's antelope squirrel is found in dry, sparsely vegetated alkali scrub with loamy soils. This species appears to prefer slopes of 0 to 20 degrees and may also be found where these areas have broken terrain, such as washes and gullies. | Suitable habitat is present within the detour action area. | No Adverse Impact with implementation of avoidance and minimization measure. No take anticipated. |
| Tipton kangaroo rat | SE | Like the Fresno kangaroo rat, Tipton kangaroo rat is found in alkali habitat with scattered shrub cover and found primarily in the southern San Joaquin valley. They prefer fairly even terrain and sandy to loamy soils for burrowing. | Suitable habitat is present within the detour action area. | No Adverse Impact with implementation of avoidance and minimization measure. No take anticipated. |
| Fresno kangaroo rat | SE | Found in alkali desert scrub, grasslands, or herbaceous habitat with scattered shrubs, Fresno kangaroo rats are primarily found in the southwestern San Joaquin valley, in recent years between 200 and 300 feet above sea level. Kangaroo rats prefer level terrain, with sandy to loamy soils for burrow excavation and may use low herbaceous vegetation as a form of cover in addition to burrows. | Suitable habitat is present within the detour action area. | No Adverse Impact with implementation of avoidance and minimization measure. No take anticipated. |
| Blunt-nosed leopard lizard | SE; FP | Blunt-nosed leopard lizards are found in sparsely vegetated alkali and desert scrub habitat with low relief and arid nonnative grasslands at elevations between 100 to 2,400 feet above sea level. Suitable habitats include alkali flats, large washes, arroyos, canyons, and low foothills. They do not excavate their own burrows, and so are typically found in areas where other burrowing animals, such as kangaroo rats, occur. | Suitable habitat is present within the detour action area. | No Adverse Impact with implementation of avoidance and minimization measure. No take anticipated or allowable by law. |
| San Joaquin coachwhip | SSC | Chenopod scrub, valley and foothill grassland with open dry areas and saltbush scrub. Requires mammal burrows for refuge reproduction. | Suitable habitat is present within the detour action area. | No Adverse Impact with implementation of avoidance and |

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| | | | | minimization measure. No take anticipated. |
| Western pond turtle | SSC | Permanent and semi-permanent bodies of water with adequate basking sites, and banks suitable for nesting. | A California Natural Diversity Database record is located within the action area, and suitable habitat is present in the action area. | No Adverse Impact with implementation of avoidance and minimization measures. No take anticipated. |
| California jewelflower | SE | Found on flats, slopes, generally in non-alkaline, sandy soil grassland | Suitable habitat is present within the detour action area. | No Adverse Impact with implementation of avoidance and minimization measures. |
| Kern mallow | CNPS 1B.2 | Shadscale scrub, valley grassland, eroded hillsides, and alkali flats. | Suitable habitat is present within the detour action area. | No Adverse Impact with implementation of avoidance and minimization measures. |
| California alkali grass | CNPS 1B.2 | Alkaline, vernal mesic, sinks, flats, lake margins, chenopod scrub, meadows, seeps, valley grassland, foothill grassland, and vernal pools. | Suitable habitat is present within the detour action area. | No Adverse Impact with implementation of avoidance and minimization measures. |
| Hoover's eriastrum | CNPS 4.2 | Chenopod scrub, pinyon and juniper woodland, valley and foothill grassland. | Suitable habitat is present within the detour action area. | No Adverse Impact with implementation of avoidance and minimization measures. |
| San Joaquin bluecurls | CNPS 4.2 | San Joaquin bluecurls are found in chenopod scrub and valley and foothill grasslands, | Suitable habitat is present within the action area. | No Adverse Impact with implementation of avoidance and minimization measures. |
| Vernal barley | CNPS 3.2 | Vernal barley is found in coastal dunes, coastal scrub, valley and foothill grassland in saline flats and depressions, and in vernal pools. | Suitable habitat is present within the action area. | No Adverse Impact with implementation of avoidance and minimization measures. |
| San Joaquin woollythreads | CNPS 1B.2 | San Joaquin woollythreads is found in sandy portions of valley and foothill grassland and chenopod scrub. | Suitable habitat is present within the detour action area. | No Adverse Impact with implementation of avoidance and minimization measures. |
| Crownscale | CNPS 4.2 | Crownscale is found in habitats with alkaline, often clay soils, in chenopod scrub, valley and foothill grasslands, | Suitable habitat is present within the action area. | No Adverse Impact with implementation of avoidance and |

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| | | freshwater wetlands, and vernal pool communities. | | minimization measures. |
| Mud nama | CNPS 2B.2 | Mud nama is found in marshes, swamps, lake margins, and riverbanks. | Suitable habitat is present within the action area. | No Adverse Impact with implementation of avoidance and minimization measures. |

Species Status Key: SE = State Endangered; ST = State Threatened, SSC = Species of Special Concern

5.4. Wetlands and Other Waters Coordination Summary

The aquatic resources report prepared for this project was included in a Preliminary Jurisdictional Determination packet submitted to the Sacramento District Office of the US Army Corps of Engineers July 31, 2019.

Permit applications for the 401 and 404 nationwide permits under the Clean Water Act will also be prepared and submitted to the United States Army Corps of Engineers and the Central Valley Regional Water Quality Control Board.

A 1602 permit application will be prepared for the Central Region of the California Department of Fish and Wildlife. Early coordination began November 11, 2018 with a meeting with Steve Hulbert, Emma Fryer, Javier Almaguer, and Nick Meyer on-site at the project location.

Mitigation may be required for impacts to wetlands and other waters. These impacts include the habitats of valley foothill riparian (8.43 acres temporary, .99 acres permanent), fresh emergent wetlands (.73 acres temporary, .33 acres permanent) and riverine habitat (6 acres temporary, .003 acres permanent).

5.5. Invasive Species

Caltrans has developed a suite of best management practices (Appendix E-Caltrans Construction Site Best Management Practices Field Manual and Troubleshooting Guide) that will be implemented as part of the proposed project. Best management practices that will be implemented as a part of the proposed project, to control the spread of noxious weeds, are listed below.

1. NS-8 Vehicle and Equipment Cleaning

Prior to any equipment entering or leaving the site, it will be pressure washed or steam cleaned in order to remove non-native seeds.

2. WM-7 Contaminated Soils Management

Excess material from the construction location, which may contain nonnative seeds and plant matter, will be disposed of at a pre-approved disposal location and covered with additional fill material so that propagation of non-native seeds will not occur.

A pre-construction worker environmental awareness training will be held before construction begins. Construction and maintenance workers will be cognizant of environmental regulations and measures established to avoid sensitive habitats and species.

5.6. Other

Migratory Bird Treaty Act:

To avoid impacts to nesting and migratory birds, removal of vegetation and trees will not occur between February 1 and September 30 unless a qualified biologist has surveyed the area and confirmed that no nesting or migratory birds are present. All vegetation and tree removal will be monitored by a qualified biologist.

A qualified biologist will perform preconstruction surveys for nesting and migratory birds within thirty (30) days before construction begins. If active migratory bird nests are discovered within or near the project footprint, applicable no work buffers will be implemented depending on the species, 500-feet for raptors and 100-feet for other bird species. Buffers for non-listed species may be reduced in the presence of a qualified biological monitor but no tree removal may occur for trees containing active nests.

Fish and Game Code; Section 5901:

A pre-construction environmental awareness meeting will be held before construction begins. Construction and maintenance workers will be cognizant of environmental regulations and measures established to avoid sensitive habitats and species.

Fish and Game Code; Section 5901: A natural total barrier to fish passage on the South Fork Kings River, located approximately two miles upstream of the Stratford Kings River Bridge, has been recorded by California Department of Fish and Wildlife as the historical upstream limit for multiple anadromous salmonids. This project therefore does not present a potential barrier to fish passage, and there is no potential for fish passage barriers downstream of the recorded barrier, given the diversion of waters of the Kings River South Fork into irrigation downstream of the action area.

5.7. Standard Special Provisions

Standard Special Provisions (SSPs) typically employed on projects like this include:

- SSP 14-1.01 Environmental Stewardship, including Environmentally Sensitive Areas (ESAs)
- SSP 14-6.02 Species Protection (buffers, work stoppage areas)
- SSP 14-6.03 Bird Protection (nest protection buffers)

The actual implementation of any SSP would depend on specific project circumstances and/or contractual requirements (such as those listed in various environmental permits)

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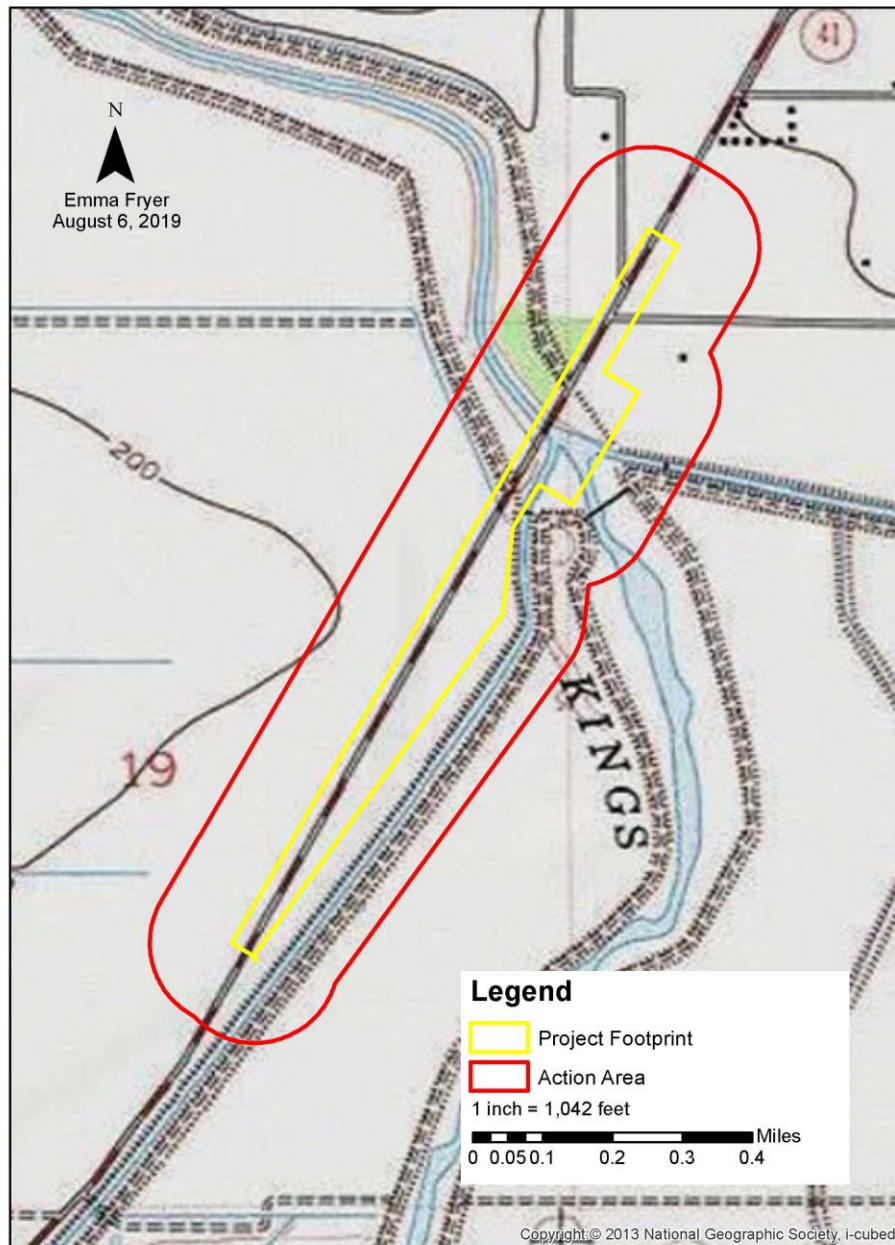
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Appendix A Project Maps

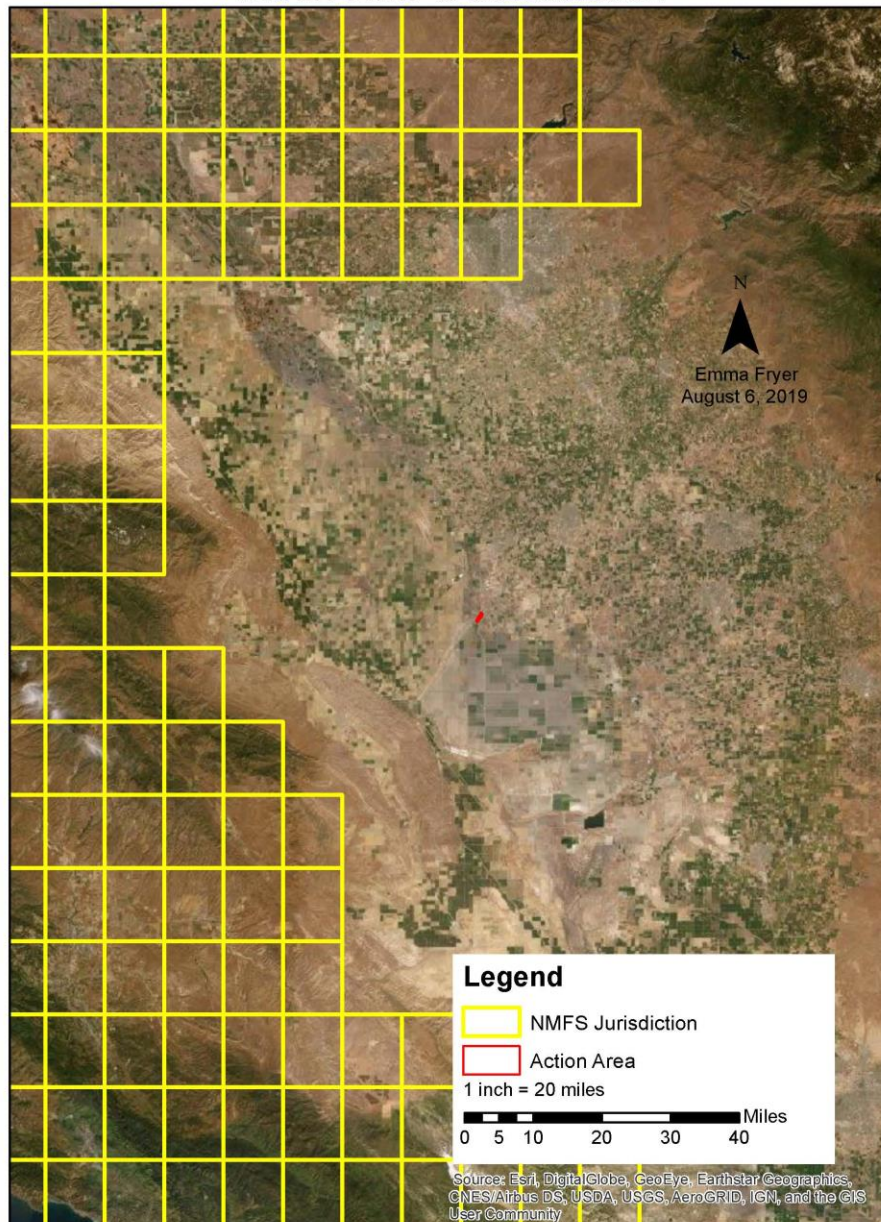
Topographic Map of Action Area and Project Footprint



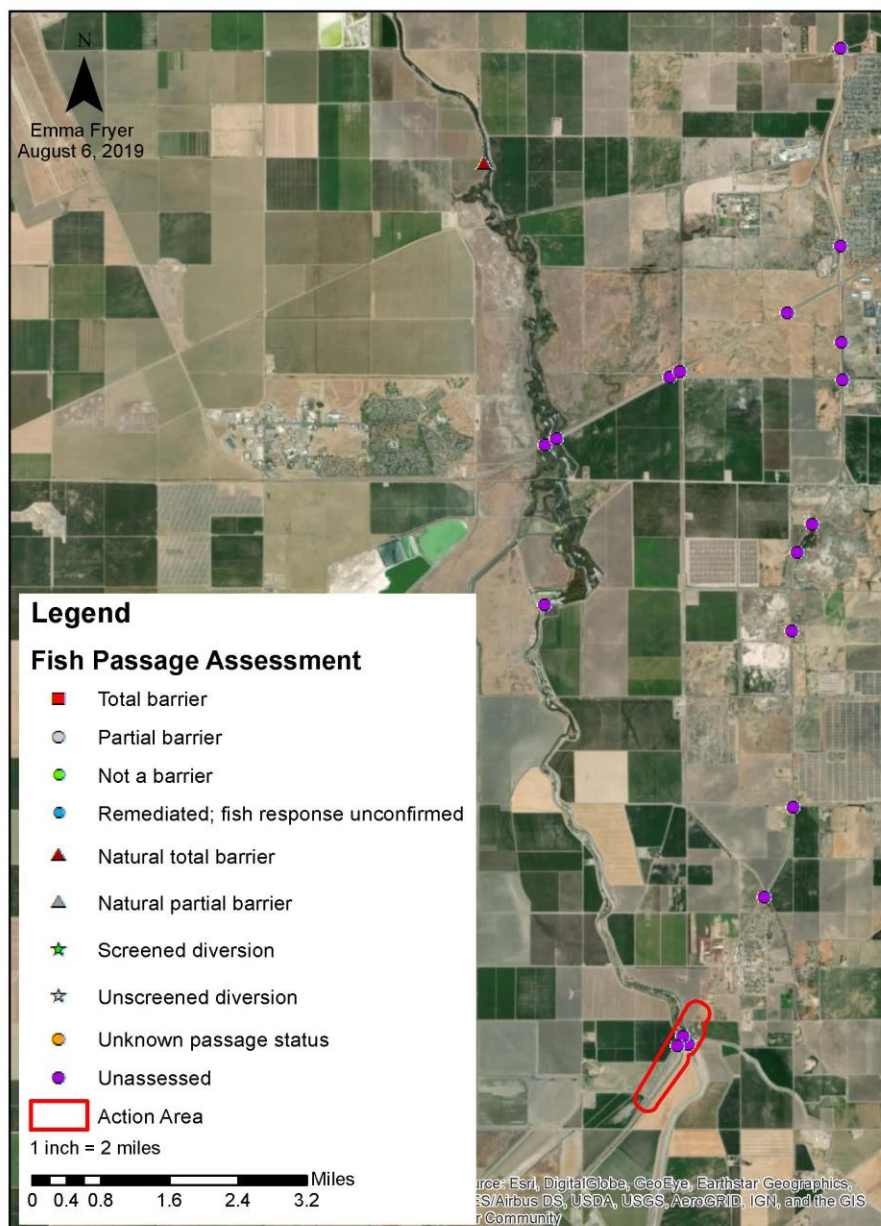
Map of Detour Action Area and Footprint



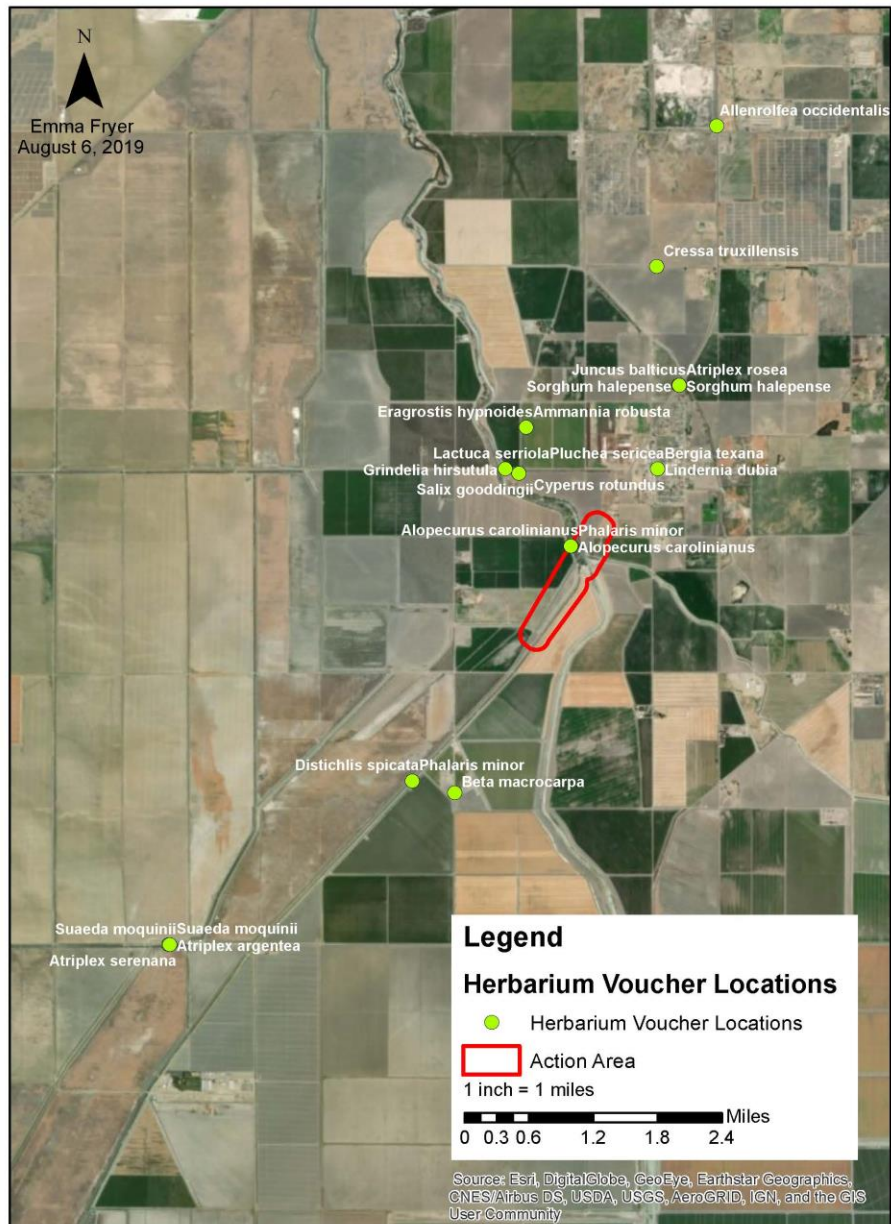
Map of Action Area and USGS 7.5-minute Quadrangles within NMFS Jurisdiction



Fish Passage Assessments Near Action Area



CCH2 Database Results



Appendix B Database Results



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713



In Reply Refer To:

May 22, 2019

Consultation Code: 08ESMF00-2019-SLI-1997

Event Code: 08ESMF00-2019-E-06386

Project Name: Stratford Kings River Bridge Replacement Project Geotechnical Investigation

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-1997

Event Code: 08ESMF00-2019-E-06386

Project Name: Stratford Kings River Bridge Replacement Project Geotechnical Investigation

Project Type: ** OTHER **

Project Description: Geotechnical work: subsurface investigation at two boring locations on State Route 41, to inform design and structure decisions for the Stratford Kings River Bridge Replacement Project.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/36.18015636327105N119.83466798821772W>



Counties: Kings, CA

Endangered Species Act Species

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

| NAME | STATUS |
|---|------------|
| San Joaquin Kit Fox <i>Vulpes macrotis mutica</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873 | Endangered |
| Tipton Kangaroo Rat <i>Dipodomys nitratoideus nitratoideus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7247 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/40/office/11420.pdf | Endangered |

Birds

| NAME | STATUS |
|---|------------|
| Western Snowy Plover <i>Charadrius nivosus nivosus</i> Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035 | Threatened |

Reptiles

| NAME | STATUS |
|---|------------|
| Blunt-nosed Leopard Lizard <i>Gambelia silus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/625 | Endangered |
| Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482 | Threatened |

Amphibians

| NAME | STATUS |
|---|------------|
| California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891 | Threatened |

Fishes

| NAME | STATUS |
|--|------------|
| Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321 | Threatened |

Crustaceans

| NAME | STATUS |
|--|------------|
| Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498 | Threatened |
| Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246 | Endangered |

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Plant List

5 matches found. [Click on scientific name for details](#)

Search Criteria

Found in Quads 3611938, 3611937, 3611936, 3611928, 3611927, 3611926, 3611918 3611917 and 3611916;

[Modify Search Criteria](#) [Export to Excel](#) [Modify Columns](#) [Modify Sort](#) [Display Photos](#)

| Scientific Name | Common Name | Family | Lifeform | Blooming Period | CA Rare Plant Rank | State Rank | Global Rank |
|---------------------------------------|---------------------------|---------------|-------------------------|-----------------|--------------------|------------|-------------|
| Delphinium recurvatum | recurved larkspur | Ranunculaceae | perennial herb | Mar-Jun | 1B.2 | S2? | G2? |
| Hordeum intercedens | vernal barley | Poaceae | annual herb | Mar-Jun | 3.2 | S3S4 | G3G4 |
| Monolopia congdonii | San Joaquin woollythreads | Asteraceae | annual herb | Feb-May | 1B.2 | S2 | G2 |
| Nama stenocarpa | mud nama | Namaceae | annual / perennial herb | Jan-Jul | 2B.2 | S1S2 | G4G5 |
| Trichostema ovatum | San Joaquin bluecurls | Lamiaceae | annual herb | Jul-Oct | 4.2 | S3 | G3 |

Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website <http://www.rareplants.cnps.org> [accessed 22 May 2019].

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Questions and Comments

rareplants@cnps.org



Summary Table Report
California Department of Fish and Wildlife
California Natural Diversity Database



Query Criteria: Quad< IS (Stratford (3611927) OR Vanguard (3611938) OR Lemoore (3611937) OR Hanford (3611936) OR Westhaven (3611928) OR Guernsey (3611926) OR Kettleman City (3611918) OR Stratford Se (3611917) OR El Rico Ranch (3611916))

| | | | | Elev. | | Element Occ. Ranks | | | | | | Population Status | | Presence | | |
|---|--------------|----------------------------|---|-------------|--------------|--------------------|---|---|---|---|---|-------------------|-----------------|----------|---------------|---------|
| Name (Scientific/Common) | CNDDB Ranks | Listing Status (Fed/State) | Other Lists | Range (ft.) | Total EO's | A | B | C | D | X | U | Historic > 20 yr | Recent <= 20 yr | Extant | Poss. Extrap. | Extrap. |
| <i>Agelaius tricolor</i> tricolored blackbird | G2G3 S1S2 | None Threatened | BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern | 180 225 | 952 S:4 | 0 | 0 | 0 | 0 | 1 | 3 | 3 | 1 | 3 | 1 | |
| <i>Ammospermophilus nelsoni</i> Nelson's antelope squirrel | G2 S2S3 | None Threatened | BLM_S-Sensitive IUCN_EN-Endangered | 182 182 | 281 S:1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | |
| <i>Athene cucularia</i> burrowing owl | G4 S3 | None None | BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern | 180 310 | 1984 S:14 | 0 | 6 | 3 | 2 | 0 | 3 | 2 | 12 | 14 | 0 | |
| <i>Buteo swainsoni</i> Swainson's hawk | G5 S3 | None Threatened | BLM_S-Sensitive IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern | 200 220 | 2474 S:4 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 4 | 4 | 0 | |
| <i>Charadrius alexandrinus nivosus</i> western snowy plover | G3T3 S2S3 | Threatened None | CDFW_SSC-Species of Special Concern NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern | 210 210 | 138 S:1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | |
| <i>Cicindela tranquebarica ssp.</i> San Joaquin tiger beetle | G5T1 S1 | None None | | 215 215 | 2 S:1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | |
| <i>Coelus gracilis</i> San Joaquin dune beetle | G1 S1 | None None | BLM_S-Sensitive IUCN_VU-Vulnerable | 480 490 | 11 S:2 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 2 | 0 | |
| <i>Delphinium recurvatum</i> recurved larkspur | G2? S2? | None None | Rare Plant Rank - 1B.2 BLM_S-Sensitive | | 100 S:1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | |



Summary Table Report
California Department of Fish and Wildlife
California Natural Diversity Database



| | | | | Elev. | | Element Occ. Ranks | | | | | Population Status | | Presence | | | |
|---|----------------|----------------------------|--|-------------|-------------|--------------------|---|---|---|---|-------------------|------------------|-----------------|--------|---------------|---------|
| Name (Scientific/Common) | CNDDB Ranks | Listing Status (Fed/State) | Other Lists | Range (ft.) | Total EO's | A | B | C | D | X | U | Historic > 20 yr | Recent <= 20 yr | Extant | Poss. Extirp. | Extirp. |
| <i>Dipodomys nitratoideis exilis</i> Fresno kangaroo rat | G3TH SH | Endangered Endangered | IUCN_VU-Vulnerable | 220 220 | 12 S.1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | |
| <i>Dipodomys nitratoideis nitratoideis</i> Tipton kangaroo rat | G3T1T2 S1S2 | Endangered Endangered | IUCN_VU-Vulnerable | 215 290 | 79 S.4 | 0 | 1 | 0 | 0 | 0 | 3 | 3 | 1 | 4 | 0 | |
| <i>Emys marmorata</i> western pond turtle | G3G4 S3 | None None | BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive | 200 215 | 1367 S.3 | 0 | 0 | 1 | 0 | 0 | 2 | 3 | 0 | 3 | 0 | |
| <i>Gambelia sila</i> blunt-nosed leopard lizard | G1 S1 | Endangered Endangered | CDFW_FP-Fully Protected IUCN_EN-Endangered | 215 215 | 329 S.1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | |
| <i>Lasiurus cinereus</i> hoary bat | G5 S4 | None None | IUCN_LC-Least Concern WBWG_M-Medium Priority | | 238 S.1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | |
| <i>Monolopia congdonii</i> San Joaquin woollythreads | G2 S2 | Endangered None | Rare Plant Rank - 1B.2 SB_UCBBG-UC Berkeley Botanical Garden | 250 250 | 100 S.1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | |
| <i>Nama stenocarpa</i> mud nama | G4G5 S1S2 | None None | Rare Plant Rank - 2B.2 | 215 215 | 22 S.1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | |
| <i>Nycticorax nycticorax</i> black-crowned night heron | G5 S4 | None None | IUCN_LC-Least Concern | 192 192 | 37 S.1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | |
| <i>Onychomys torridus tularensis</i> Tulare grasshopper mouse | G5T1T2 S1S2 | None None | BLM_S-Sensitive CDFW_SSC-Species of Special Concern | 900 900 | 53 S.1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | |
| <i>Perognathus inornatus</i> San Joaquin Pocket Mouse | G2G3 S2S3 | None None | BLM_S-Sensitive IUCN_LC-Least Concern | 450 450 | 126 S.1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | |
| <i>Spea hammondi</i> western spadefoot | G3 S3 | None None | BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened | 211 217 | 907 S.4 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | |
| <i>Taxidea taxus</i> American badger | G5 S3 | None None | CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern | 900 900 | 589 S.1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | |



Summary Table Report
California Department of Fish and Wildlife
California Natural Diversity Database



| Name (Scientific/Common) | CNDDB Ranks | Listing Status (Fed/State) | Other Lists | Elev. Range (ft.) | Total EO's | Element Occ. Ranks | | | | | | Population Status | | Presence | | |
|--------------------------------------|-------------|----------------------------|-------------------------------------|-------------------|------------|--------------------|---|---|---|---|----|-------------------|-----------------|----------|---------------|---------|
| | | | | | | A | B | C | D | X | U | Historic > 20 yr | Recent <= 20 yr | Extant | Poss. Extirp. | Extirp. |
| Valley Sink Scrub | G1 | None | | 210 | 29 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| Valley Sink Scrub | S1.1 | None | | 210 | S:1 | | | | | | | | | | | |
| <i>Vulpes macrotis mutica</i> | G4T2 | Endangered | | 200 | 1017 | 0 | 1 | 4 | 0 | 0 | 15 | 16 | 4 | 20 | 0 | 0 |
| San Joaquin kit fox | S2 | Threatened | | 320 | S:20 | | | | | | | | | | | |
| <i>Xanthocephalus xanthocephalus</i> | G5 | None | CDFW SSC-Species of Special Concern | 207 | 13 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| yellow-headed blackbird | S3 | None | IUCN_LC-Least Concern | 207 | S:1 | | | | | | | | | | | |

Appendix C Reports

Date: August 7, 2018

Consultant Name: Rincon Consultants, Inc. (Rincon Project No. 14-00833)/ HDR Engineering, Inc.

Contract #: 06A2126

Task Order #: 77

District-Project ID # (EA) & Project Name: 06-1600-0208-0 (06-0V110); Stratford Kings River Bridge Replacement

Fiscal Year(s): 17/18 and 18/19

Fund Source: 232

Department Contract Manager: Stephanie Rodriguez **Phone:** (559) 243-3472

Department Task Order Manager: Javier Almaguer **Phone:** (559) 445-6465

Consultant Project Manager: Cindy Adams **Phone:** (916) 679-8331

This report documents the results of nesting bird surveys performed by Rincon Consultants, Inc., sub-consultant to HDR Engineering, Inc., for the on-call contract to provide environmental services to Caltrans for Districts 6 and 10. The purpose of this nesting bird survey effort was to determine if federally and/or State listed or other special-status avian species and their nests were present within the biological study area (BSA) and/or 0.5 mile buffer.

I. Project Location and Description

The BSA is located in central Kings County (County), California approximately 7.0 miles southwest of Lemoore on State Route 41 from post mile 32.5 to post mile 33.1 and along Laurel Avenue (post mile 33.0) and 22nd Avenue (post mile 30.6) for approximately 3.3 miles (Figures 1 and 2).

II. Project Background

Caltrans proposes to replace bridge No. 45-0007 at post mile 32.3 on State Route 41 in the County. The purpose of this project is to address deteriorated bridge columns and outstanding seismic deficiencies. The bridge is in need of a complete seismic retrofitting which includes abutments and pier retrofit, and column replacement. The project will also require pavement repairs from Laurel Avenue west to 22nd Avenue and from 22nd Avenue south to State Route 41 to accommodate detoured traffic.

III. Methodology

Nesting bird surveys were conducted using a combination of windshield and pedestrian surveys such that every portion of the project site was visible. Due to its regional location within potential Swainson's hawk (*Buteo swainsoni*) habitat, the surveys adhered to the Swainson's Hawk Technical Advisory Committee's *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (May 2000). The BSA and 0.5 mile buffer was visually assessed from public access roads. Surveys were conducted over ten days. Habitats within the BSA were documented and all animals encountered, including their sign, were recorded during each survey event.

Page 1 of 13

IV. Results

Environmental Setting

The BSA and surrounding 0.5 mile buffer is heavily disturbed by intensive agricultural activities including irrigated row crops, orchards, dry farm grain production, livestock grazing, and a dairy. Scattered throughout are rural residences. The BSA and 0.5 mile buffer encompasses most of the community of Stratford near the intersection of State Route 41 and Laurel Avenue, where residential and commercial development is densest in the area.

Along Laurel Avenue and 22nd Avenue, agricultural disturbance encroaches upon the edges of the roadbed, with the majority of the road shoulder frequently disturbed and lacking in vegetation. Along State Route 41, the road shoulder is steep and lacking in vegetation. Along the Kings River, there is a riparian corridor co-dominated by red willow (*Salix laevigata*), black willow (*Salix goodingii*), and cottonwood (*Populus fremontii*) and subject to livestock grazing. Non-native grasses, such as bromes (*Bromus* spp.) dominate the understory throughout most of the riparian corridor. In addition to the river, several maintained canals with little to no vegetation are located downstream of the bridge. However, suitable foraging and nesting habitat is present for Swainson's hawk and other raptor species. Precise mapping of aquatic resources within the BSA are provided in the jurisdictional delineation report under separate cover.

Nesting Bird Survey Results

Nesting bird surveys were conducted by Associate Biologists Ms. Sophia Murrell, Ms. Kirsten Bates, and Ms. Alana Garza. Table 1 presents the dates, times, and weather conditions for each survey day. Table 2 includes a list of all wildlife species observed during the nesting bird surveys, as well as all other survey efforts to date for Task Order 77.

Table 1. Timing and Weather Conditions during each Survey Effort

| Date | Time | | Begin Temp (°F) | End Temp (°F) | Winds | Cloud Cover |
|----------------|-------|------|-----------------|---------------|------------|---------------------------|
| | Begin | End | | | | |
| March 19, 2018 | 0820 | 1050 | 41 | 58 | < 5 mph | Clear to hazy |
| March 27, 2018 | 0825 | 1000 | 45 | 50 | 3 - 5 mph | Clear |
| April 3, 2018 | 0715 | 0845 | 51 | 60 | < 5 mph | Partly cloudy |
| April 4, 2018 | 0730 | 0900 | 56 | 62 | < 5 mph | Overcast |
| April 10, 2018 | 0815 | 0953 | 64 | 72 | < 5 mph | Partly cloudy |
| April 11, 2018 | 0855 | 1025 | 62 | 65 | 5 - 12 mph | Partly cloudy |
| April 17, 2018 | 0855 | 1040 | 47 | 53 | < 5 mph | Partly cloudy to Overcast |
| June 13, 2018 | 0720 | 0835 | 71 | 80 | < 5 mph | Clear/Haze |
| June 19, 2018 | 0720 | 0840 | 67 | 74 | 5 - 10 mph | Clear |
| June 26, 2018 | 0710 | 0830 | 69 | 76 | 3 - 10 mph | Clear/Haze |

Table 2. Wildlife Observed

| Common Name | Scientific Name | Listing Status |
|---|---------------------------------|------------------|
| Birds | | |
| American coot | <i>Fulica americana</i> | |
| American kestrel | <i>Falco sparverius</i> | |
| Barn swallow | <i>Hirundo rustica</i> | |
| Brewer's blackbird | <i>Euphagus cyanocephalus</i> | |
| Black-crowned night heron | <i>Nycticorax nycticorax</i> | |
| Black phoebe | <i>Sayornis nigricans</i> | |
| Cliff swallow | <i>Petrochelidon pyrrhonota</i> | |
| Common raven | <i>Corvus corax</i> | |
| Double-crested cormorant | <i>Phalacrocorax auritus</i> | |
| European ring-necked dove | <i>Streptopelia decaocto</i> | |
| European starling | <i>Sturnus vulgaris</i> | |
| Great blue heron | <i>Ardea herodias</i> | |
| Great egret | <i>Ardea alba</i> | |
| Great-tailed grackle | <i>Quiscalus mexicanus</i> | |
| House finch | <i>Haemorrhous mexicanus</i> | |
| House sparrow | <i>Passer domesticus</i> | |
| Killdeer | <i>Charadrius vociferus</i> | |
| Loggerhead shrike | <i>Lanius ludovicianus</i> | CDFW: SSC |
| Mallard | <i>Anas platyrhynchos</i> | |
| Mourning dove | <i>Zenaida macroura</i> | |
| Northern flicker | <i>Colaptes auratus</i> | |
| Northern harrier | <i>Circus cyaneus</i> | CDFW: SSC |
| Northern mockingbird | <i>Mimus polyglottos</i> | |
| Red-tailed hawk | <i>Buteo jamaicensis</i> | |
| Red-winged blackbird | <i>Agelaius phoeniceus</i> | |
| Rock Dove | <i>Columba livia</i> | |
| Swainson's hawk | <i>Buteo swainsoni</i> | CDFW: Threatened |
| Western kingbird | <i>Tyrannus verticalis</i> | |
| White-crowned sparrow | <i>Zonotrichia leucophrys</i> | |
| Mammals | | |
| California ground squirrel | <i>Otospermophilus beecheyi</i> | |
| Pocket Gopher | <i>Thomomys bottae</i> | |
| CDFW = California Department of Fish and Wildlife, SSC = Species of Special Concern | | |

Three special status species were observed within the vicinity of the project: loggerhead shrike (*Lanius ludovicianus*), northern harrier (*Circus cyaneus*), and Swainson's hawk (*Buteo swainsoni*) (Table 3). Northern harrier and loggerhead shrike are both designated as State Species of Special Concern by the California Department of Fish and Wildlife, while Swainson's hawk is listed as threatened under the California Endangered Species

Act. All observations of northern harrier and loggerhead shrike occurred along 22nd Avenue between State Route 41 and Laurel Avenue (Table 3). Each observation of the northern harrier occurred while the bird was foraging above fallow agricultural fields west of 22nd Avenue; no nests were observed. The loggerhead shrike was observed perched upon a power pole wire also along 22nd Avenue between Laurel Avenue and State Route 41; no nests were observed.

Two Swainson's hawk nests were observed within the vicinity of the project (Table 3, Figure 3). The first Swainson's hawk nest was observed on March 19, 2018. A pair of Swainson's hawks were observed: one perched in the nest and the second hawk was soaring nearby, verbally calling. A Swainson's hawk was observed upon this nest during each survey event through April 17, 2018. The second Swainson's hawk nest was observed April 10, 2018. A continued observation of a Swainson's hawk was observed perched in, upon or near the second nest throughout the remainder of the survey effort.

Two red-tailed hawk nests were also observed within the vicinity of the project (Table 3, Figure 3). The first red-tailed hawk nest was observed on April 4, 2018, with a pair of red-tailed hawks observed actively bringing nesting material to the nest. At least one red-tailed hawk was observed in, upon, or perched near the first nest throughout the remainder of the survey effort. The second red-tailed hawk nest was observed on April 17, 2018 with one red-tailed hawk observed perched directly adjacent to the nest. At least one red-tailed hawk was observed in, upon, or perched near the second nest throughout the remainder of the survey effort.

During the last survey event on June 26, 2018, approximately 50 birds including raptors (i.e. Swainson's hawks and red-tailed hawks), common ravens, and great egrets, were observed in an agricultural field at the southeast corner of Laurel Avenue and 22nd Avenue. This agricultural field consisted of alfalfa hay and was actively being harvested during the site visit, presumably creating opportunities for easier foraging as the crop vegetation was trimmed.

All other species observed were non-listed federal/State species typical of natural and agricultural areas. Three separate nesting colonies of cliff swallow (*Petrochelidon pyrrhonota*) were observed at three different bridge locations within the BSA and 0.5 mile buffer (Figure 3). One colony was observed at the bridge on Laurel Avenue, a separate colony was observed at the bridge on State Route 41, and a third, separate colony was observed at the bridge on 22nd Avenue just south of State Route 41. Cliff swallow nesting activity was observed throughout the entirety of the survey effort

Table 3. Special-Status Species and Potentially Sensitive Resources Observed

| Species | Type | Date first observed | Location (Lat/Long) |
|-------------------|---------------------------|---------------------|--|
| Loggerhead shrike | Observation | April 3, 2018 | 36.165414, -119.851744 |
| Northern harrier | Observation 1 | March 19, 2018 | 36.183420, -119.851551 |
| | Observation 2 | April 4, 2018 | 36.163986, -119.856130 |
| | Observation 3 | April 11, 2018 | 36.163605, -119.863930 |
| Cliff swallow | Nest Colony (3 locations) | March 19, 2018 | 36.160474, -119.851657 36.189441, -119.845353 36.180344, -119.834455 |
| Swainson's hawk | Nest #1 | March 19, 2018 | 36.186262, -119.842012 |
| | Nest #2 | April 10, 2018 | 36.179798, -119.835294 |
| Red-tailed hawk | Nest #1 | April 4, 2018 | 36.182500, -119.835900 |
| | Nest #2 | April 17, 2018 | 36.170769, -119.849513 |

Limitations

Weather conditions during each survey event were optimal for the detection of diurnally active avian species and no access issues and/or constraints were encountered. Regionally occurring birds may potentially nest in the BSA where suitable habitat is present, in the future, despite not being detected in 2018.

Attachments

Attachment A – Site Photos

Figure 1. Regional Location



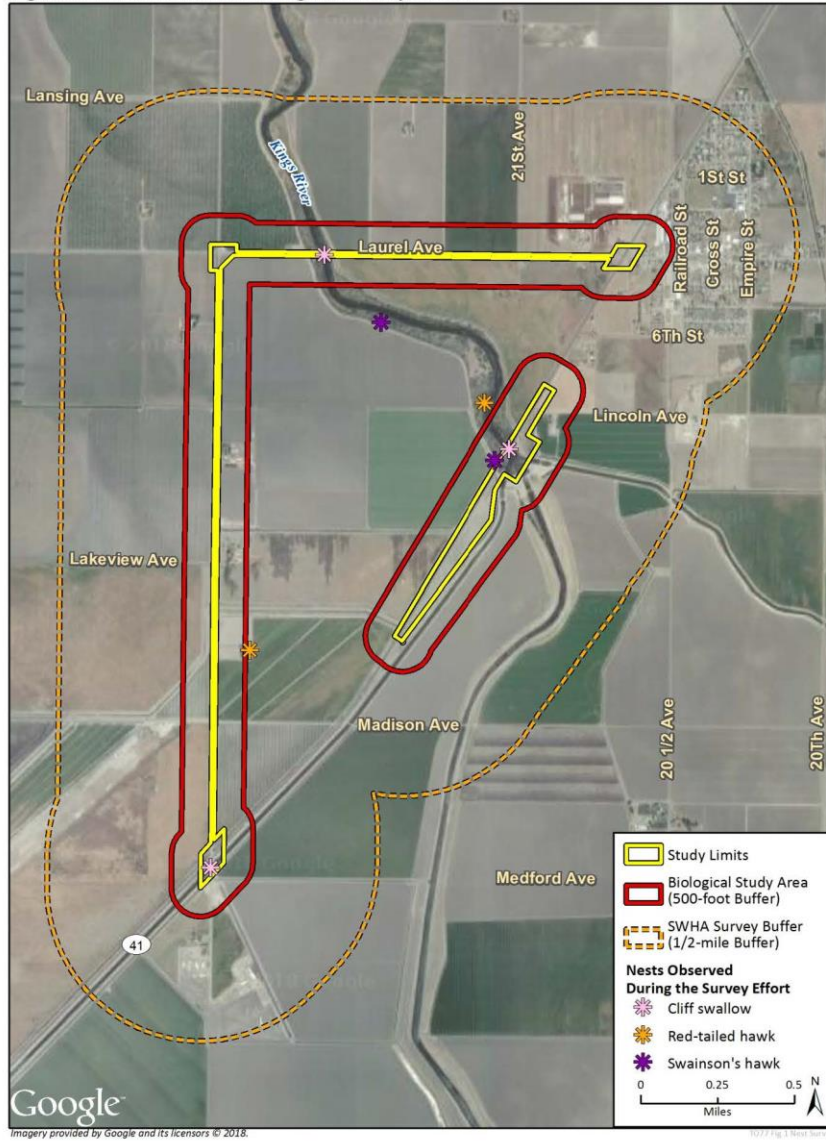
★ Project Location



Figure 2. Project Location



Figure 3. Nests Observed During the Survey Effort.



*Contract: 06A2126
Task Order #: 77
Nesting Bird Survey Report
August 7, 2018*

Attachment A – Site Photos

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April 11, 2018. View of the SR 41 Kings River Bridge; looking north.



April 11, 2018. View of Laurel Avenue looking east towards SR 41 from near the Kings River.



April 11, 2018. View of 22nd Avenue looking north.



April 17, 2018. View of Kings River at the Laurel Avenue bridge and of nesting cliff swallows (red arrow), looking west.



March 19, 2018. View of Swainson's hawk nest (red circle); looking south from Laurel Avenue.



April 12, 2018. View of Swainson's hawk nest (red circle) north of State Route 41 bridge at the Kings River; looking north.



April 17, 2018. View of red-tailed hawk nest tree (red arrow) along the Kings River; looking west from State Route 41 and Lincoln Avenue.



April 17, 2018. View of red-tailed hawk nest tree (red arrow) along 22nd Avenue; looking southeast.

Date: May 1, 2018
Consultant Name: Rincon Consultants, Inc. (Rincon Project No. 14-00833)/ HDR Engineering, Inc.
Contract #: 06A2126
Task Order #: 77
District-Project ID # (EA) & Project Name: 06-1600-0208-0 (06-0V110); Stratford Kings River Bridge Replacement
Fiscal Year(s): 17/18 and 18/19
Fund Source: 232
Department Contract Manager: Stephanie Rodriguez **Phone:** (559) 243-3472
Department Task Order Manager: Javier Almaguer **Phone:** (559) 445-6465
Consultant Project Manager: Cindy Adams **Phone:** (916) 679-8331

This report documents the results of general wildlife surveys performed by Rincon Consultants, Inc., subconsultant to HDR Engineering, Inc., for the on-call to provide environmental services to Caltrans for Districts 6 and 10. The purpose of this general wildlife survey effort was to determine if rare, listed, or special-status species or their sign were present within the biological study area (BSA). Per the task order, these surveys are to focus on San Joaquin kit fox (*Vulpes macrotis mutica*), Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*), burrowing owl (*Athene cunicularia*), western snowy plover (*Charadrius alexandrinus nivosus*), and western pond turtle (*Amys marmorata*).

I. Project Location and Description

The BSA is located in central Kings County (County), California approximately 7.0 miles southwest of Lemoore on State Route (SR) 41 from post mile (PM) 32.5 to PM 33.1 and along Laurel Avenue and 22nd Avenue for approximately 3.3 miles (Figure 1).

II. Project Background

Caltrans proposes to replace bridge No. 45-0007 at PM 32.3 on SR 41 in the County. The purpose of this project is to address deteriorated bridge columns and outstanding seismic deficiencies. The bridge is in need of a complete seismic retrofitting which includes abutments and pier retrofit, and column replacement. The project will also require pavement repairs from Laurel Avenue west to 22nd Avenue and from 22nd Avenue south to SR 41 to accommodate detoured traffic.

III. Methodology

General wildlife surveys were conducted using a combination of windshield and pedestrian surveys such that every portion of the project site was visible. The BSA beyond the project footprint was visually assessed from public access roads. Surveys were conducted on three non-consecutive days. Habitats within the BSA were documented and all animals encountered, including their sign, were recorded during each survey event.

IV. Results

General Habitat Description

Figure 3 depicts the habitat present within the BSA. The BSA is heavily disturbed by intensive agricultural activities including irrigated row crops, orchards, dry farm grain production, livestock grazing, and a dairy. Scattered throughout are rural residences. The BSA just touches the western portion of the community of Stratford near the intersection of SR 41 and Laurel Avenue, where residential and commercial development is densest in the area.

Along Laurel Avenue and 22nd Avenue, agricultural disturbance encroaches upon the edges of the roadbed, with the majority of the road shoulder frequently disturbed and, thus, lacking any vegetation or animal sign. Along SR 41, the road shoulder is steep and lacking in vegetation.

At the SR 41 bridge over the Kings River, there are a few riparian trees including red willow (*Salix laevigata*) and cottonwood (*Populus fremontii*), but the area is otherwise heavily disturbed and lacking in vegetation due to frequent use by members of the public and also likely due to maintenance by the Kings River Conservation District and local farmers.

Along the Kings River is a riparian corridor dominated by red willows and cottonwoods which is subject to livestock grazing. Non-native grasses, such as bromes (*Bromus* spp.), dominate the understory throughout most of the riparian corridor.

In addition to the river, there are several maintained canals that have little to no vegetation.

Please note that Figure 3 maps habitats at a larger, more general scale. More precise mapping of the jurisdictional waters on-site will be provided with the jurisdictional delineation report.

General Wildlife Surveys Results

General wildlife surveys were conducted by Senior Biologist Ms. Carie Wingert. Table 1 presents the dates, times, and weather conditions for each survey day. Table 2 includes a list of all wildlife species observed during the general wildlife surveys, as well as all other survey efforts to date for Task Order 77.

Table 1. Timing and Weather Conditions during each Survey Effort

| Date | Time | | Begin Temp (°F) | End Temp (°F) | Winds | Cloud Cover |
|----------------|-------|------|-----------------|---------------|-----------|-------------------------|
| | Begin | End | | | | |
| April 2, 2018 | 1230 | 1345 | 71 | 74 | 10-15 mph | Partly to mostly cloudy |
| April 11, 2018 | 1445 | 1540 | 74 | 76 | < 5 mph | Mostly cloudy |
| April 17, 2018 | 1026 | 1145 | 52 | 56 | 5-10 mph | Partly cloudy |

Table 2. Wildlife Observed.

| Species | Scientific Name | Species | Scientific Name |
|----------------------------|---------------------------------|-----------------------|-------------------------------|
| American coot | <i>Fulica americana</i> | House sparrow | <i>Passer domesticus</i> |
| American kestrel | <i>Falco sparverius</i> | Killdeer | <i>Charadrius vociferus</i> |
| Barn swallow | <i>Hirundo rustica</i> | Loggerhead shrike | <i>Lanius ludovicianus</i> |
| Brewer's blackbird | <i>Euphagus cyanocephalus</i> | Mallard | <i>Anas platyrhynchos</i> |
| Black phoebe | <i>Sayornis nigricans</i> | Mourning dove | <i>Zenaida macroura</i> |
| California ground squirrel | <i>Otospermophilus beecheyi</i> | Northern flicker | <i>Colaptes auratus</i> |
| Cliff swallow | <i>Petrochelidon pyrrhonota</i> | Northern mockingbird | <i>Mimus polyglottos</i> |
| Common raven | <i>Corvus corax</i> | Pocket Gopher | <i>Thomomys bottae</i> |
| Double-crested cormorant | <i>Phalacrocorax auritus</i> | Red-tailed hawk | <i>Buteo jamaicensis</i> |
| European ring-necked dove | <i>Streptopelia decaocto</i> | Red-winged blackbird | <i>Agelaius phoeniceus</i> |
| European starling | <i>Sturnus vulgaris</i> | Rock Dove | <i>Columba livia</i> |
| Great blue heron | <i>Ardea herodias</i> | Swainson's hawk | <i>Buteo swainsoni</i> |
| Great egret | <i>Ardea alba</i> | Western kingbird | <i>Tyrannus verticalis</i> |
| Great-tailed grackle | <i>Quiscalus mexicanus</i> | White-crowned sparrow | <i>Zonotrichia leucophrys</i> |
| House finch | <i>Haemorhous mexicanus</i> | | |

Two special status species were observed within the vicinity of the project: loggerhead shrike (*Lanius ludovicianus*) and Swainson's hawk (*Buteo swainsoni*). Loggerhead shrike is a state Species of Special Concern and Swainson's hawk is listed as threatened under the California Endangered Species Act. No sign of any other special status species was detected, including those identified as the focal point for these survey effort, likely due highly disturbed habitat conditions. All other wildlife species observed are typical of highly disturbed agricultural areas and canals that are frequently disturbed.

Limitations

Weather conditions during the survey were optimal for the detection of most diurnally active wildlife species and for common sign of nocturnally active wildlife species (e.g., burrows, tail drags, scat, etc.). However, the surveys conducted represent a snapshot in time and do not substitute for focused/protocol surveys, which are typically labor intensive.

Attachments

Attachment A – Site Photos

Figure 1. Regional Location



★ Project Location



Figure 2. Project Location

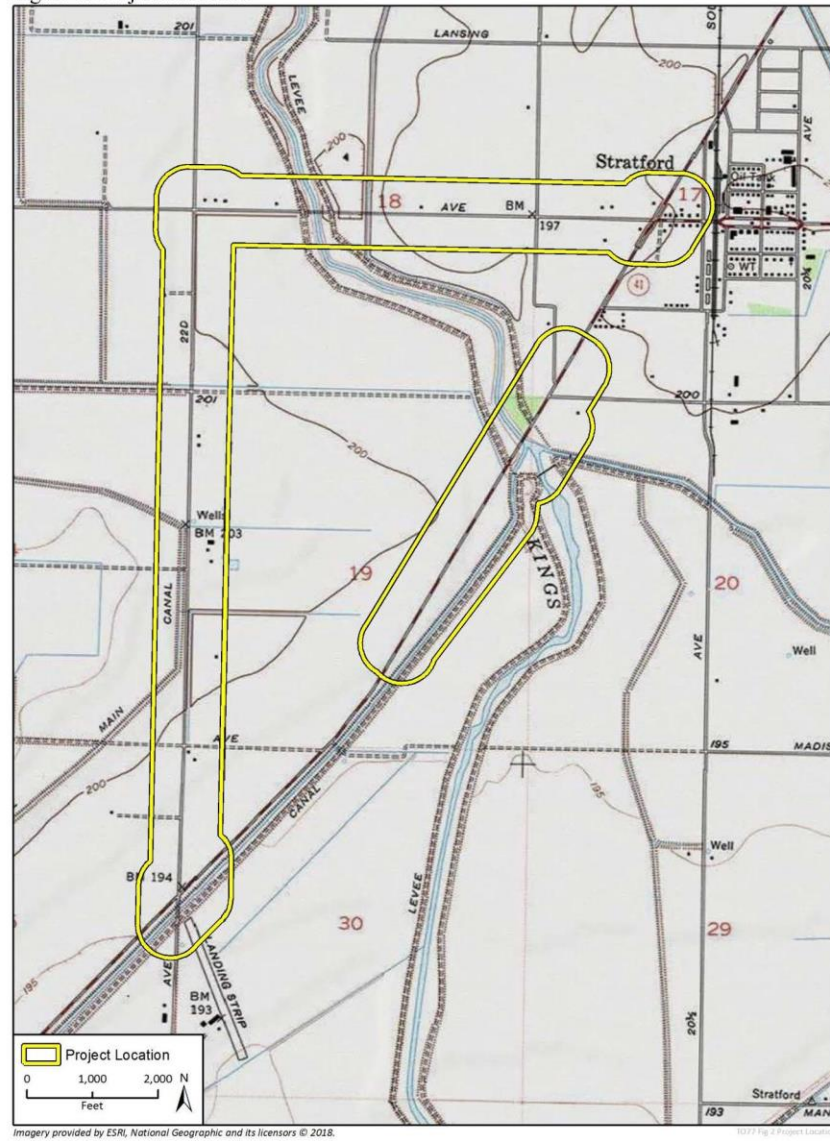


Figure 3a. Habitat Map

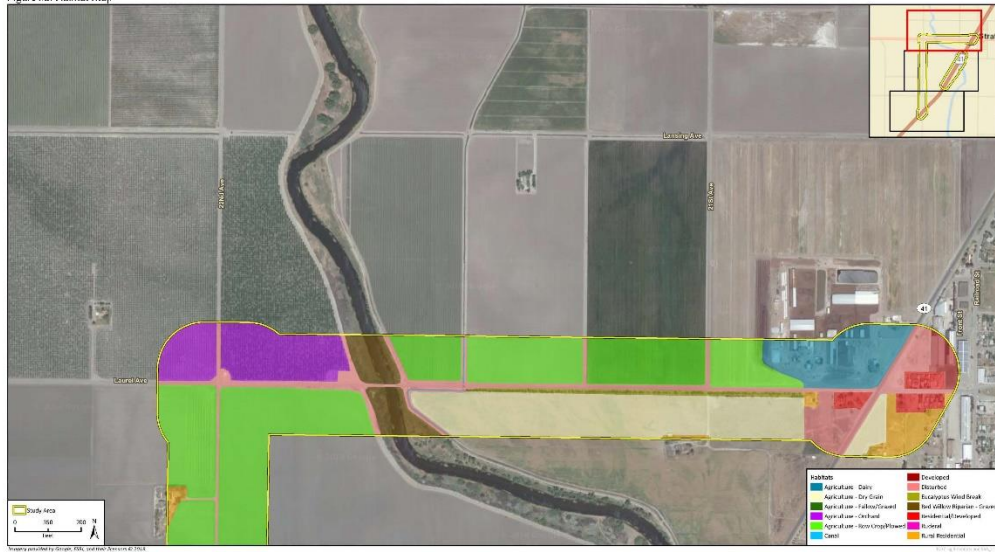


Figure 3b. Habitat Map

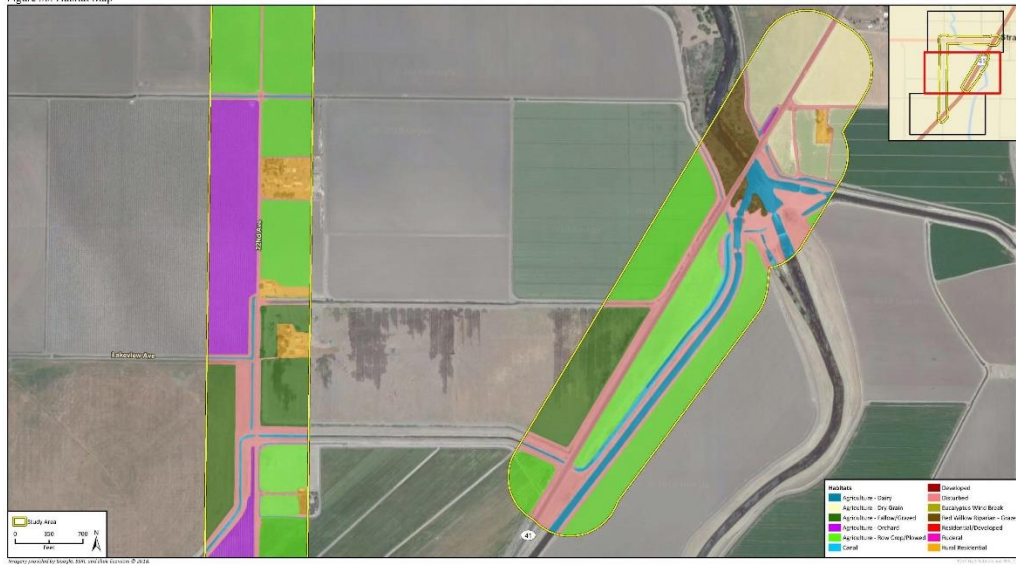


Figure 3e. Habitat Map



Attachment A – Site Photos

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April 11, 2018. View of the SR 41 Kings River Bridge, looking north.



April 11, 2018. View of Laurel Avenue looking east towards SR 41 from near the Kings River.



April 11, 2018. View of 22nd Avenue looking north.



April 17, 2018. View of Kings River at the Laurel Avenue bridge, looking west.



April 17, 2018. View of riparian corridor along Kings River looking west from SR 41.



March 12, 2018. View of barren/disturbed areas next to the Kings River on the east side of SR 41.

Date: July 26, 2018
Consultant Name: Rincon Consultants, Inc. (Rincon Project No. 14-00833)/ HDR Engineering, Inc.
Contract #: 06A2126
Task Order #: 77
District-Project ID # (EA) & Project Name: 06-1600-0208-0 (06-0V110); Stratford Kings River Bridge Replacement
Fiscal Year(s): 17/18 and 18/19
Fund Source: 232
Department Contract Manager: Stephanie Rodriguez **Phone:** (559) 243-3472
Department Task Order Manager: Javier Almaguer **Phone:** (559) 445-6465
Consultant Project Manager: Cindy Adams **Phone:** (916) 679-8331

This report documents the results of botanical surveys performed by Rincon Consultants, Inc. (Rincon), sub-consultant to HDR Engineering, Inc., for the on-call contract to provide environmental services to Caltrans for Districts 6 and 10. The purpose of this botanical survey effort was to determine if federally and/or State listed or other special-status plant species were present within the study limits, specifically in the Caltrans right-of-way and anticipated project impact areas.

I. Project Location and Description

The project is located in central Kings County (County), California approximately 7.0 miles southwest of Lemoore on State Route 41 from post mile 32.5 to post mile 33.1 and along Laurel Avenue and 22nd Avenue for approximately 3.3 miles (Figure 1). The surveyed area was located within the study limits and is an area anticipated to be directly impacted by construction activities. Additionally, vegetation within a 500-foot buffer of the area surveyed was evaluated for its suitability to support special-status plant species (Figure 2).

II. Project Background

Caltrans proposes to replace bridge No. 45-0007 at post mile 32.3 on State Route 41 in the County. The purpose of this project is to address deteriorated bridge columns and outstanding seismic deficiencies. The bridge is in need of a complete seismic retrofitting, which includes abutments and pier retrofit, and column replacement. The project will also require pavement repairs from Laurel Avenue west to 22nd Avenue and from 22nd Avenue south to State Route 41 to accommodate detoured traffic.

III. Methodology

Botanical surveys were conducted within the study limits by Rincon biologist Kyle Weichert on March 12, April 14, and June 1, 2018, and Rincon biologists Kyle Weichert and Sophia Murrell on May 15, 2018. Intuitively controlled transects were walked throughout the surveyed area so that 100 percent visual inspection was achieved. During field surveys, an inventory of all plant species observed was compiled and general site conditions were documented. All plant species were identified to the taxonomic level necessary to determine rarity and listing status.

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Botanical surveys were conducted in accordance with current recommendations from United States Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) for botanical surveys. Specifically, the surveys followed *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 2000) and *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018) to determine presence or absence of any federally and/or State listed or other special-status plant species. Additionally, vegetation within 500 feet from the surveyed area was visually assessed, from public access roads, for its suitability to support special-status plants to consider potential for special-status plants in areas adjacent to anticipated impact areas and thus vulnerable to potential indirect impacts. Additionally, Rincon queried the California Natural Diversity Database (CNDDDB), the California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants, and the USFWS Information for Planning and Consultation (IPaC) tool to determine which special-status plant species have been previously reported from the region and may have the potential to occur in the surveyed area. However, many areas within the County have not been surveyed in decades and as such, the queried databases are likely to be incomplete. Thus, this botanical study did not focus specifically on bloom periods for these regionally occurring species; rather, floristic surveys completed in multiple passes throughout the spring bloom period were an important component of the study.

IV. Results

Setting

The ground within the surveyed area was highly disturbed and consisted mostly of bare compacted dirt. Developed agricultural lands, rural residences, and heavily trafficked paved roadways encompassed the study limits and surveyed area. Specifically, along Laurel Avenue and 22nd Avenue, intense agricultural disturbance encroached upon the edges of the roadbed, with the majority of the road shoulder frequently disturbed by agricultural farming equipment. Along State Route 41, the road shoulder was steep and lacked vegetation. Habitats in the vicinity of the State Route 41 bridge over the King River included areas of native vegetation. Specifically, at the State Route 41 bridge over the Kings River, wetland and riparian vegetation communities were present and included freshwater emergent soft rush marshes and black willow (*Salix gooddingii*) thickets.

Database Query Findings and Evaluation

The special-status plant species with the potential to occur in the surveyed area based on records of regionally occurring special-status plants include recurved larkspur (*Delphinium recurvatum*), vernal barley (*Hordeum intercedens*), San Joaquin woollythreads (*Monolopia congdonii*), mud nama (*Nama stenocarpa*), and San Joaquin bluecurls (*Trichostema ovatum*). Habitat types with the potential to support the majority of these species that are associated with grassland and saltbush scrub communities were not observed within the surveyed area. Some potential habitat for vernal barley and mud nama was present along the river banks. However, no vernal barley and no mud nama were observed during each survey trip. Vegetation within 500 feet of the surveyed area

was visually assessed from public access roads, and did not contain suitable habitat and consisted of developed agricultural land, row crops, and orchards.

Survey Results

Table 1 presents the dates, times, and weather conditions for each survey trip. Special-status plant species and sensitive natural communities were not observed in the surveyed area. Mr. Weichert and Ms. Murrell documented 79 plant species within the area surveyed, listed in Table 2.

Table 1. Conditions During Each Survey Trip.

| Date | Time | | Begin Temp (°F) | End Temp (°F) | Winds | Cloud Cover |
|----------------|-------|------|-----------------|---------------|----------|-----------------------|
| | Begin | End | | | | |
| March 12, 2018 | 0900 | 1420 | 55 | 65 | 0-5 mph | Mostly cloudy, 75% |
| April 14, 2018 | 0930 | 1300 | 60 | 70 | 0-8 mph | Mostly cloudy, 50-75% |
| May 15, 2018 | 0920 | 1205 | 65 | 72 | 0-10 mph | Clear, 0-25% |
| June 1, 2018 | 0915 | 1215 | 72 | 80 | 5-15 mph | Clear, 0-25% |

Table 2. Plant Species Observed.

| Scientific Name | Common Name | Origin | Cal-IPC Inventory ¹ Listing |
|--|---------------------------|------------|--|
| <i>Acroptilon repens</i> | Russian knapweed | Introduced | Moderate |
| <i>Amaranthus albus</i> | tumbleweed | Introduced | NR |
| <i>Amaranthus blitoides</i> | procumbent pigweed | Native | |
| <i>Ambrosia acanthicarpa</i> | annual bur-sage | Native | |
| <i>Amsinckia menziesii</i> | small-flowered fiddleneck | Native | |
| <i>Anthriscus caucalis</i> | bur chervil | Introduced | NR |
| <i>Artemisia douglasiana</i> | mugwort | Native | |
| <i>Artemisia dracunculul</i> | tarragon | Native | |
| <i>Asclepias fascicularis</i> | narrow-leaf milkweed | Native | |
| <i>Atriplex serenana</i> var. <i>serenana</i> | saltscall | Native | |
| <i>Avena fatua</i> | wild oat | Introduced | Moderate |
| <i>Bassia hyssopifolia</i> | bassia | Introduced | Limited |
| <i>Bromus diandrus</i> | ripgut brome | Introduced | Moderate |
| <i>Bromus hordeaceus</i> | soft chess | Introduced | Limited |
| <i>Bromus madritensis</i> subsp. <i>rubens</i> | red brome | Introduced | High |
| <i>Capsella bursa-pastoris</i> | shepherd's purse | Introduced | NR |
| <i>Centaurea melitensis</i> | toalote | Introduced | Moderate |
| <i>Chenopodium album</i> | lamb's quarters | Introduced | NR |
| <i>Chenopodium murale</i> | pigweed | Introduced | NR |
| <i>Convolvulus arvensis</i> | bindweed | Introduced | NR |
| <i>Crassula connata</i> | pygmy-weed | Native | |
| <i>Cressa truxillensis</i> | alkali weed | Native | |
| <i>Cynodon dactylon</i> | Bermuda grass | Introduced | Moderate |
| <i>Cyperus eragrostis</i> | flat sedge | Native | |
| <i>Datura wrightii</i> | Wright's jimson weed | Native | |
| <i>Distichlis spicata</i> | salt grass | Native | |
| <i>Echinochloa crus-galli</i> | barnyard grass | Introduced | NR |
| <i>Erigeron bonariensis</i> | flax-leaved horseweed | Introduced | NR |
| <i>Erigeron canadensis</i> | horseweed | Native | |

| Scientific Name | Common Name | Origin | Cal-IPC Inventory ¹ Listing |
|--|----------------------------|-------------------------|---|
| <i>Erodium cicutarium</i> | redstem filaree | Introduced | Limited |
| <i>Eucalyptus globulus</i> | blue gum | Introduced | Limited |
| <i>Festuca perennis</i> | ryegrass | Introduced | Moderate |
| <i>Grindelia hirsutula</i> | gumweed | Native | |
| <i>Helianthus annuus</i> | common annual sunflower | Native | |
| <i>Heliotropium curassavicum</i> var. <i>oculatum</i> | salt heliotrope | Native | |
| <i>Heterotheca grandiflora</i> | telegraph weed | Native | |
| <i>Hirschfeldia incana</i> | perennial mustard | Introduced | |
| <i>Hordeum murinum</i> | wall barley | Introduced | Moderate |
| <i>Hordeum vulgare</i> | cultivated barley | Introduced (Cultivated) | NR |
| <i>Hypochaeris glabra</i> | smooth cat's ear | Introduced | Limited |
| <i>Juncus effusus</i> | soft rush | Native | |
| <i>Lactuca serriola</i> | prickly lettuce | Introduced | NR |
| <i>Lepidium dictyotum</i> | peppergrass | Native | |
| <i>Leptochloa fusca</i> | Mexican sprangletop | Native | |
| <i>Malva parviflora</i> | cheeseweed | Introduced | N/A |
| <i>Malvella leprosa</i> | alkali mallow | Native | |
| <i>Marrubium vulgare</i> | horehound | Introduced | Limited |
| <i>Medicago polymorpha</i> | bur clover | Introduced | Limited |
| <i>Melilotus albus</i> | white sweetclover | Introduced | NR |
| <i>Melilotus indicus</i> | sour clover | Introduced | NR |
| <i>Persicaria lapathifolia</i> | curlytop knotweed | Native | |
| <i>Phalaris minor</i> | little-seeded canary grass | Introduced | NR |
| <i>Phoenix canariensis</i> | Canary Island palm | Introduced | Limited |
| <i>Phoradendron leucarpum</i> ssp. <i>macrophyllum</i> | mistletoe | Native | |
| <i>Polygonum aviculare</i> | common knotweed | Introduced | N/A |
| <i>Polypogon monspeliensis</i> | rabbitsfoot grass | Introduced | Limited |
| <i>Populus fremontii</i> | Fremont's cottonwood | Native | |
| <i>Portulaca oleracea</i> | purslane | Introduced | NR |
| <i>Pseudognaphalium californicum</i> | California everlasting | Native | |
| <i>Pseudognaphalium luteoalbum</i> | cudweed | Introduced | NR |
| <i>Psilocarphus tenellus</i> | slender woolly heads | Native | |
| <i>Rubus ursinus</i> | California blackberry | Native | |
| <i>Rumex acetosella</i> | sheep sorrel | Introduced | Moderate |
| <i>Rumex crispus</i> | curly dock | Introduced | Limited |
| <i>Salix gooddingii</i> | Gooding's willow | Native | |
| <i>Salsola tragus</i> | Russian thistle | Introduced | Limited |
| <i>Schoenoplectus acutus</i> var. <i>occidentalis</i> | common tule | Native | |
| <i>Senecio vulgaris</i> | groundsel | Introduced | NR |
| <i>Silybum marianum</i> | milk thistle | Introduced | Limited |
| <i>Sisymbrium irio</i> | London rocket | Introduced | Limited |
| <i>Solanum americanum</i> | American nightshade | Native | |
| <i>Sonchus asper</i> | prickly sow thistle | Introduced | NR |
| <i>Sonchus oleraceus</i> | common sow thistle | Introduced | NR |
| <i>Sorghum bicolor</i> | sorghum | Introduced | NR |
| <i>Spergularia rubra</i> | spurrey | Introduced | NR |
| <i>Tamarix parviflora</i> | small-flower salt-cedar | Introduced | High |

| Scientific Name | Common Name | Origin | Cal-IPC Inventory ¹ Listing |
|---|-----------------|------------|--|
| <i>Tribulus terrestris</i> | puncture vine | Introduced | Limited |
| <i>Uropappus lindleyi</i> | silverpuffs | Native | |
| <i>Urtica dioica</i> | stinging nettle | Native | |
| ¹ Cal-IPC Inventory Listing refers to the California Invasive Plant Council's Online Inventory's evaluation of the risk introduced species pose to natural areas. Rankings are "Watch List", "Limited", "Moderate" and "High". Introduced species not currently ranked in the inventory are denoted here as "NR" = Not Ranked. | | | |

Limitations

Botanical field surveys were based on current industry practices, which change over time and may not be applicable in the future. No other guarantees or warranties, expressed or implied, are provided. The findings and opinions conveyed in this report are based on findings derived from review of specified databases and literature resources and four site visits. Standard data sources relied upon during the completion of this report, such as the CNDDDB, may vary with regard to accuracy and completeness. In particular, the CNDDDB is compiled from research and observations reported to CDFW that may or may not have been the result of comprehensive or site-specific field surveys. Although Rincon considers the data sources are reasonably reliable, Rincon cannot and does not guarantee the authenticity or reliability of the data sources it had used. Furthermore, not all annual plant species germinate each year. Based on survey efforts in other areas, coupled with generally below average rainfall levels, certain Central Valley species were observed to be small in size and stature in 2018.

Attachments

Attachment A – Site Photos

Figure 1. Regional Location



★ Project Location



Figure 2. Survey Area



Attachment A – Site Photos

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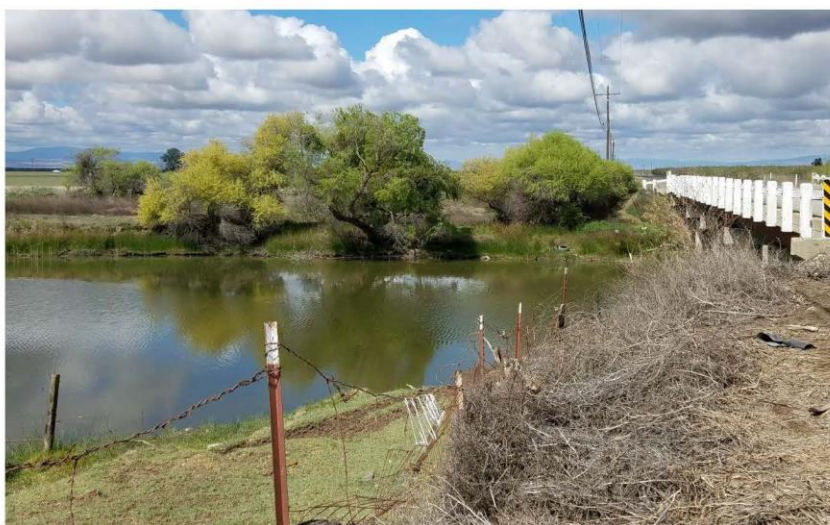
April 11, 2018. View of the SR 41 Kings River Bridge, looking north.



April 11, 2018. View of Laurel Avenue looking east towards SR 41 from near the Kings River.



April 11, 2018. View of 22nd Avenue looking north.



April 17, 2018. View of Kings River at the Laurel Avenue bridge, looking west.



April 17, 2018. View of riparian corridor along Kings River looking west from SR 41.



March 12, 2018. View of barren/disturbed areas next to the Kings River on the east side of SR 41.

Date: August 7, 2018
Consultant Name: Rincon Consultants, Inc. (Rincon Project No. 14-00833)/ HDR Engineering, Inc.
Contract #: 06A2126
Task Order #: 77
District-Project ID # (EA) & Project Name: 06-1600-0208-0 (06-0V110); Stratford Kings River Bridge Replacement
Fiscal Year(s): 17/18 and 18/19
Fund Source: 232
Department Contract Manager: Stephanie Rodriguez **Phone:** (559) 243-3472
Department Task Order Manager: Javier Almaguer **Phone:** (559) 445-6465
Consultant Project Manager: Cindy Adams **Phone:** (916) 679-8331

This report documents the results of bat surveys performed by Rincon Consultants, Inc. (Rincon), sub consultant to HDR Engineering, Inc., for the on-call contract to provide environmental services to Caltrans for Districts 6 and 10. The purpose of this survey was to identify the species and abundance of bats by species that may be present within the vicinity of the Stratford River Bridge (bridge No. 45-0007).

I. Project Location and Description

The project is located in central Kings County (County), California approximately 7.0 miles southwest of Lemoore on State Route 41 from post mile 32.5 to post mile 33.1 and along Laurel Avenue (post mile 33.0) and 22nd Avenue (post mile 30.6) for approximately 3.3 miles (Figures 1 and 2). Caltrans proposes to replace bridge No. 45-0007 at post mile 32.3 on State Route 41 in the County. The purpose of this project is to address deteriorated bridge columns and outstanding seismic deficiencies. The bridge is in need of a complete seismic retrofitting which includes abutments and pier retrofit, and column replacement. The project will also require pavement repairs from Laurel Avenue west to 22nd Avenue and from 22nd Avenue south to State Route 41 to accommodate detoured traffic. The survey area or biological study area (BSA) encompasses the bridge No. 45-0007 to be replaced (Figure 3).

Environmental Setting

General habitat near bridge No. 45-0007 included riparian trees such as red willow (*Salix laevigata*) and cottonwood (*Populus fremontii*). However, the BSA is heavily disturbed and lacking in vegetation along the southeastern side of the bridge. Disturbance in this area is related to public access/use, Kings River Conservation District maintenance activity, and agricultural activity.

II. Methodology

Rincon Senior Biologist Ms. Wendy Knight and Associate Biologists Ms. Alana Garza and Ms. Kirsten Bates, conducted bat surveys according to the methodology outlined in the Caltrans Task Order. Rincon conducted surveys on four non-consecutive days. Surveys included visual inspections of the bridge structure and emergence surveys to watch for bats that may have been emerging from the structure to forage. Surveyors used binoculars and high-powered flashlights to inspect the bridge for roosting bats, potential

roosting locations, and bat sign (e.g., guano). Dusk and night emergence surveys were conducted from one hour before sunset (dusk) to approximately three hours after sunset (night) and utilized bat detectors (Pettersson Elektronik D240X bat detector and SM2BAT [Sonobat] detector) to record echolocation calls. Echolocation analysis was performed using the Sonobat program. Table 1 presents the methodology and type of equipment used for each survey effort. Table 2 presents the dates, times, and weather conditions for each survey day

Table 1. Methodology and Equipment Used

| Date (2018) | Survey Type | Survey Equipment | Surveyors |
|-------------|-------------------------|---|-------------------------------|
| May 24 | Daytime Visual Survey | Binoculars, flashlights | Wendy Knight Alana Garza |
| May 24 | First Emergence Survey | Binoculars, flashlights | Wendy Knight Alana Garza |
| June 11 | Second Emergence Survey | Binoculars, flashlights, Pettersson bat detector, SM2BAT detector | Wendy Knight Kirsten Bates |
| July 16 | Third Emergence Survey | Binoculars, flashlights, Pettersson bat detector | Wendy Knight Kirsten Bates |
| July 19 | Fourth Emergence Survey | Binoculars, flashlights, Pettersson bat detector, SM2BAT detector | Wendy Knight Kirsten Bates |

Table 2. Conditions during each Survey Effort

| Date (2018) | Time (24hr) | | Temp (°F) | | Wind (mph) | Cloud Cover | Sunset | Moon Phase and Visibility |
|-------------|-------------|-------|-----------|-----|------------|---------------|--------|--|
| | Begin | End | Begin | End | | | | |
| May 24 | 17:00 | 18:00 | 82 | 82 | 4-10 | Partly cloudy | 20:06 | N/A |
| May 24 | 19:45 | 19:35 | 69 | 64 | 8-15 | Mostly cloudy | 20:06 | Waxing gibbous; visible during survey |
| June 11 | 20:00 | 20:16 | 86 | 74 | 0-1 | Clear | 20:18 | Waning crescent; not visible during survey |
| July 16 | 19:40 | 23:05 | 99 | 86 | 4-10 | Clear | 20:18 | Waxing crescent; visible during survey |
| July 19 | 19:45 | 23:05 | 100 | 85 | 0-4 | Clear | 20:16 | Waxing gibbous; visible during survey |

Daytime Visual Survey

Bridge abutments in four locations were visually inspected for roosting bats, bat guano, and for potential bat roosting locations during daytime hours.

First Emergence Survey

Per the Caltrans Task Order, no bat detection equipment was used to conduct the first emergence survey. A visual emergence survey was conducted from seated positions at opposite ends of the bank and bridge. Seated position locations were selected to maximize visual coverage of the bridge and to increase the likelihood of observing bat activity in, upon, or near the bridge. The survey commenced at dusk and ended when the bridge was no longer visible.

Second, Third, and Fourth Emergence Surveys

If bat presence was detected during the first emergence survey, then additional evening surveys would be conducted using bat detection equipment. Bat species present would be identified and an estimated abundance of each species present would be determined. Bat detection equipment was set up on opposite banks and on opposite sides of the bridge. Data collection began at dusk and proceeded for approximately three hours.

III. Results

Daytime Visual Survey

No bats or bat sign were observed during the daytime visual survey. Bridge No. 45-0007 is constructed of a solid slab of concrete with no visibly apparent interior where bats may potentially roost. However, a gap measuring about 1.5 to 2 inches in diameter was observed along the underside and center of the bridge. This gap may have the potential to provide a suitable roosting location. In addition, many intact cliff swallow (*Petrochelidon pyrrhonota*) nests were observed along the underside and eaves of the bridge and may have the potential to provide suitable roosting locations.

First Emergence Survey

Bats were visibly observed flying above the bridge at three separate times during the first survey: 21:10, 21:19, and 21:26. However, bats were not observed emerging from the bridge, and the observed bats had likely arrived from other roosting locations to forage in the area.

Second Emergence Survey

No bats were visibly observed; however, bat presence was captured on the bat detection equipment (Table 3).

Third Emergence Survey

Equipment failure during the third survey resulted in no usable bat-call data. Bats were visibly observed at three separate times during the third survey: 20:55, 20:57 and 21:03. However, as during the first survey, bats were not observed emerging from the bridge, and the observed bats had likely arrived from other roosting locations to forage in the area.

Fourth Emergence Survey

Bat presence was captured on the bat detection equipment (Table 3) and bats were visually observed at four separate times: 20:56, 20:57, 21:03, and 21:35. However, as during the first and third surveys bats were not observed emerging from the bridge, and the observed bats had likely arrived from other roosting locations to forage in the area.

Echolocation data collected during the second and fourth emergence surveys was analyzed to species level. Table 3 presents the results from the analysis. Of the bats detected during the surveys, only the western red bat (*Lasiurus blossevillei*) is a CDFW

species of special concern; the remaining six bat species are not considered special-status or sensitive by CDFW. The western red bat was detected once during each of the second and fourth emergence surveys. Preferred roosting locations for this species include trees associated with riparian corridors, and the species is not known for roosting in man-made structures such as bridges. This is consistent with the lack of observations of bats emerging from the bridge during each survey effort, as this species would be expected to travel from tree roosts to foraging areas near the bridge. While western red bat would be expected to forage in the area, it is unlikely this species would use bridge No. 45-0007 as a roosting location.

Estimate of Abundance

A low number of bats were visibly observed during each survey, and no bats were observed to emerge from the bridge. Those bats that were observed were probably all foraging in the area, and arriving from other roost locations. Based on the results of these surveys, it is considered unlikely that the bridge is currently being used as a roosting location for any of the observed bat species. Rather, bats detected may have been a result of solitary bats exhibiting foraging behavior.

Table 3. Echolocation Data Results

| Species (Scientific name) | Species (Common name) | Status | Number of calls detected | |
|----------------------------------|--------------------------|--|--------------------------|---------|
| | | | June 11 | July 19 |
| <i>Tadarida brasiliensis</i> | Mexican free-tailed bat | None | 132 | 56 |
| <i>Lasionycteris noctivagans</i> | silver-haired bat | IUCN: LC WBWG: Medium | 8 | 1 |
| <i>Lasiurus cinereus</i> | hoary bat | IUCN: LC WBWG: Medium | 2 | 0 |
| <i>Eptesicus fuscus</i> | big brown bat | None | 6 | 13 |
| <i>Myotis yumanensis</i> | Yuma myotis | BLM: Sensitive IUCN: LC WBWG: Low-Medium | 2 | 1 |
| <i>Lasiurus blossevillii</i> | western red bat | CDFW: SSC IUCN: LC WBWG: High | 1 | 1 |
| <i>Myotis lucifugus</i> | little brown bat | IUCN: LC WBWG: Medium | 1 | 0 |

IUCN = International Union for Conservation of Nature. LC = Least Concern. WBWG = Western Bat Working Group. BLM = Bureau of Land Management. CDFW = California Department of Fish and Wildlife. SSC = Species of Special Concern.

Limitations

Fluctuating water levels within the Kings River proved to be a safety concern and prevented access and decreased visibility to the direct center of the underside of the bridge. The presence of numerous cliff swallow nests under and along the eaves of the bridge also decreased visibility.

Attachments

Attachment A – Site Photos

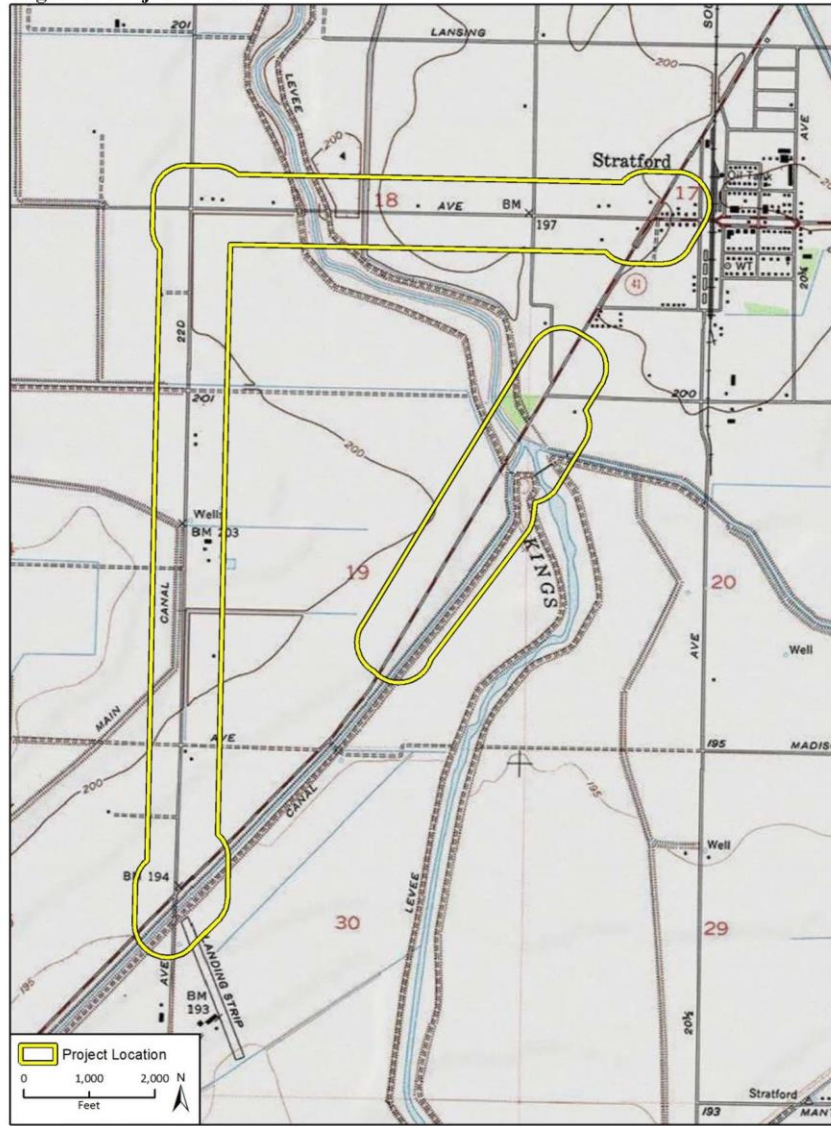
Figure 1. Regional Location



★ Project Location



Figure 2. Project Location



Imagery provided by ESRI, National Geographic and its licensors © 2018.

Figure 3. Biological Study Area



Attachment A – Site Photos



April 11, 2018. View of the SR 41 Kings River Bridge, looking north.



May 24, 2018. View of the underside of the bridge looking northwest from the eastern side of the bridge.



May 24, 2018. View of the eastern bridge abutment.



May 24, 2018. Weep hole extending through the deck of the bridge.



May 24, 2018. Groove extending the length of the underside of the bridge.



May 24, 2018. View of bridge looking to the northeast.



May 24, 2018. View of underside of bridge from western abutment.



May 24, 2018. View of joint from the top of the bridge. The joint extends through the bridge from the top of the bridge and creates a 1.5" to 2" gap across the underside of the bridge.



Stratford Kings River Bridge Replacement Project

Aquatic Resources Delineation

prepared with the assistance of
Rincon Consultants, Inc.
7080 North Whitney Avenue
Fresno, California 93720

May 2018



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Executive Summary

Rincon Consultants, Inc. conducted a jurisdictional waters and wetlands delineation for the Stratford Kings River Bridge Replacement Project (Bridge No. 47-0007) in Kings County, California. The delineation was conducted to determine the location and extent of waters and wetlands within the project site that are potentially subject to the jurisdictions of the United States Army Corps of Engineers, Regional Water Quality Control Board, and California Department of Fish and Wildlife.

The California Department of Transportation proposes to replace the existing bridge on State Route 41 over the Kings River-South Fork and will require roadway detouring along Laurel Avenue West, west of State Route 41 including the crossing over the Kings River-South Fork. The approximately 658-acre Study Area is located in the San Joaquin Valley, approximately 0.71 mile south and one mile west of the town of Stratford, California.

In addition to the Kings River-South Fork (9.54 acres; 2,773 linear feet), the jurisdictional delineation identified two canals (10.30 acres; 7,038 linear feet) and two wetlands (0.54 acre) potentially subject to United States Army Corps of Engineers and Regional Water Quality Control Board jurisdictions under Sections 404 and 401, respectively, of the Clean Water Act. Additionally, the jurisdictional delineation identified areas potentially subject to the California Department of Fish and Wildlife pursuant to Section 1600 et seq. of the California Fish and Game Code between tops of banks, or to the edge of riparian canopy. These include areas along the Kings River-South Fork (22.53 acres; 2,773 linear feet), the canals (11.07 acres; 7,038 linear feet), and irrigation and roadway ditches (5.50 acres; 16,185 linear feet). Additionally, the irrigation and roadway ditches are also potentially subject to Regional Water Quality Control Board jurisdiction under the Porter-Cologne Water Quality Control Act. Note that the final jurisdictional determinations of the boundaries of wetlands, waters, and riparian habitat are made by each agency, typically at the time that authorizations to impact such features are requested.

1 Introduction

Rincon Consultants, Inc. (Rincon) conducted an aquatic resources delineation for the Stratford Kings River Bridge Replacement Project (Bridge No. 47-0007) located in Kings County, California. This report is prepared for:

California Department of Transportation (Caltrans)
District 6 - Environmental Planning Biology Branch
855 M Street, Suite 200
Fresno, California 93721
Contact: Javier Almaquer

The delineation was conducted to determine the location and extent of waters and wetlands within the project site that are potentially subject to the jurisdictions of the United States Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Game (CDFW).

Any proposed development in areas identified as jurisdictional waters and/or wetlands may be subject to the permit requirements of the USACE under Section 404 of the Clean Water Act (CWA), RWQCB under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), and CDFW pursuant to Section 1600 et seq. of the California Fish and Game Code.

1.1 Project Location

The project site is located where State Route 41 (SR 41) crosses the Kings River within the San Joaquin Valley, approximately 0.71 mile south and one mile west of the town of Stratford, California (Appendix A, Figure 1). The site is within Township 20 South, Range 20 East, Sections 19 and 20 (Mount Diablo Baseline and Meridian), and is depicted on the U.S. Geological Survey (USGS) *Stratford, California* 7.5-minute topographic quadrangle map (Appendix A, Figure 2). The Study Area for this aquatic resources delineation contains the Laurel Avenue West crossing of the Kings River and the SR 41 crossing of the Kings River. The two areas in the Study Area total approximately 658 acres and encompasses all elements of the currently proposed project that have the potential to impact wetlands, streams and riparian habitats, as well as a 100-foot buffer around the project footprint. The project site center at the Laurel Avenue West crossing is at approximately 36.189450°N, 119.845566°W (WGS84) and the SR 41 crossing is at approximately 36.180326°N, 119.834463°W (WGS84).

1.2 Project Description

Caltrans proposes to replace the bridge on SR 41 in Kings County (Bridge No. 45-0007, Post Mile [PM] 32.3). The existing bridge at the Kings River-South Fork crossing would be replaced, which will involve a temporary water diversion system to allow for work in the river channel. The water diversion system would be designed by the contractor under the guidance of Caltrans best management practices (BMPs) on water diversion. Water diversion typically involves temporary

rerouting of water around the bridge using pipes and soil berms within the channel bed. During construction, traffic will be re-routed along 22nd Avenue and Laurel Avenue West. The project will also require pavement repairs at the intersection of Laurel Avenue West and 22nd Avenue to accommodate detoured truck traffic. The roadbed and side-road intersections from Laurel Avenue West to 22nd Avenue and from 22nd Avenue to SR 41 will also be reconstructed. No new right-of-way would be required, but there will be temporary construction easements. Off-pavement work, ground disturbance, vegetation removal, access road construction, and channel work are anticipated. No culvert work is anticipated for this project, but the culvert headwalls may require crash cushion shielding due to the close proximity to the roadway. Work will include the demolition of the existing bridge and temporary falsework will be set up at the existing bents during demolition. The number and size of the supporting columns for the replacement bridge will differ from the existing bridge. Two bents will be located in the Kings River-South Fork river bed and each of these bents will have two supporting columns. Each of these columns/piers will be 48 inches in diameter and will be about 100 feet deep. An abutment seat will be built at each end of the bridge and each of these seats will have six supporting columns, which are 24 inches in diameter and 50 feet deep. Four new wing walls will also be built and rock slope protection (RSP) is anticipated to be installed for the side drains and possibly the bridge deck drainage pipe. RSP is not anticipated to be needed under the bridge or along the river bed. The project is expected to take 230 working days.

This project is associated with the seismic retrofit project (EA 06-0K800), which was completed January 15, 2018. This bridge is considered to be outdated and the supporting columns have deteriorated to such a point as to warrant total replacement. A total of 77 columns/piers and two abutments would be removed.

2 Methodology

The delineation study began with a literature review of maps and other publications. After completion of the literature review, a field delineation was completed to identify, describe, and map all potential jurisdictional waters/wetlands and riparian habitats within the Study Area (Appendix A, Figure 2).

2.1 Literature Review

Prior to the field survey, Rincon reviewed aerial imagery depicting the Study Area (Google Earth 2018), the *Stratford, California* USGS 7.5-minute topographic quadrangle (USGS 2015), the Web Soil Survey (United States Department of Agriculture, Natural Resources Conservation Service [USDA, NRCS] 2018a) and other publications to better characterize the nature and extent of jurisdictional waters/wetlands and riparian habitats potentially occurring on the subject site.

Furthermore, the *National Wetlands Inventory* (NWI) (United States Fish and Wildlife Service [USFWS] 2018) and the *National Hydrography Dataset* (USGS 2018) were reviewed to determine if any wetland and/or other waters had been previously documented and mapped on or in the vicinity of the proposed project site. The *National Hydric Soils List by State: California* (USDA, NRCS 2018b) was also reviewed to determine if any soil map unit mapped on in the Study Area were classified as hydric. Other available background information, including the *The Kings River Handbook* (KRCD, KRWA 2009) was reviewed.

2.2 Field Delineation

Fieldwork for this evaluation was conducted by Rincon Associate BiologistCarolynn Daman assisted by Rincon Associate Biologist Sophia Murrell on March 12, 2018. Where direct access was permitted, the Study Area was surveyed on foot for jurisdictional aquatic resources, including potential wetlands and non-wetland jurisdictional areas including streams that might exhibit an ordinary high water mark (OHWM) and which might constitute waters of the U.S., waters of the state, and/or riparian resources. Where access was not permitted, the Study Area was surveyed from public roads and right-of-ways, supplemented by a review of aerial photographs and published datasets. General site characteristics and vegetation were noted. Current federal and state methods and guidelines were used to identify and delineate potential jurisdictional areas, as described in detail below.

2.2.1 USACE Jurisdiction - Wetland Waters of the United States

Potential wetland features were evaluated for presence of wetland indicators; specifically, hydrophytic vegetation, hydric soils and wetland hydrology, according to routine delineation procedure outlined in *Wetlands Delineation Manual* (USACE 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008a). The *USACE Arid West 2016 Regional Wetland Plant List* (USACE 2016) was used to determine the wetland status of the examined vegetation by the following indicator status categories: Upland (UPL), Facultative Upland (FACU), Facultative (FAC), Facultative Wetland (FACW), and Obligate Wetland (OBL) (Lichvar

et al. 2016; USACE 2016). Sample wetland points were selected in areas that contain potential wetland vegetation, and in areas that may be impacted by the project. Six sample soil points were selected to evaluate observed changes in hydrology, soil, and vegetation to assist in defining boundaries of wetlands. A full description of federal wetlands indicators can be found in Appendix B, USACE Jurisdiction.

2.2.2 USACE Jurisdiction - Non-Wetland Waters of the United States

The lateral limits of USACE jurisdiction (i.e., width) for non-wetland waters or “other waters” was determined by the presence of physical characteristics indicative of the OHWM. The OHWM was identified in accordance with the applicable Code of Federal Regulations (CFR) sections (33 CFR 328.3 and 33 CFR 328.4) and Regulatory Guidance Letter (USACE 2005), as well as in reference to various relevant technical publications including but not limited to *Review of Ordinary High Water Mark Indicators for Delineating Arid Streams in the Southwestern United States* (USACE 2004), *Distribution of Ordinary High Water Mark (OHWM) Indicators and Their Reliability in Identifying the Limits of “Waters of the United States” in Arid Southwestern Channels* (USACE 2006), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008b), and *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2010). Additionally, sources of water and connections to downstream Relatively Permanent Waters (RPWs) and Traditional Navigable Waters (TNWs) were also evaluated. A full regulatory definition of non-wetland waters can be found in Appendix B, USACE Jurisdiction.

2.2.3 CDFW Jurisdiction

Section 1602 of the California Fish and Game Code (CFG) requires an entity to notify the CDFW before conducting any activity that would divert obstruct, or substantially alter a streambed. Once notified, the CDFW may require that a Streambed Alteration Agreement (SAA) be executed before the activity may proceed. The CDFW has not defined the term “stream” for the purposes of implementing its regulatory program under Section 1602, and the agency has not promulgated regulations directing how jurisdictional streambeds may be identified, or how their limits should be delineated. Considering this, Section 1602 of the CFG, *Rutherford v. State of California* (188 Cal App. 3d 1276 (1987), which interpreted Section 1602’s use of “stream” to be as defined in common law, CDFW regulations defining “stream” for other purposes, including sport fishing (14 California Code of Regulations [CCR] 1.72) and streambed alterations associated with cannabis production (14 CCR 722(c)(21), and *A Field Guide to Lake and Streambed Alteration Agreements* (CDFG 1994) were reviewed and considered in determining the appropriate limits of CDFW jurisdiction within the site. The principles presented in these materials were used to guide the delineation of on-site streams and riparian habitats, with consideration given to the relevance (i.e., jurisdiction, applicability) of each source to the project and resources at hand. A full regulatory definition of CDFW Jurisdiction can be found in Appendix B.

2.2.4 RWQCB Jurisdiction

RWQCB jurisdiction under Section 401 of the CWA was determined in accordance with the previously listed methodologies to identify waters of the U.S. and thus, mirrors the jurisdictional limits of federal jurisdiction. The limits of “waters of the State,” as defined under Section 13050(e) of the California Water Code and pursuant to the Porter-Cologne Act, were determined to be coterminous with the CDFW jurisdictional streambeds and riparian habitats described above. The

Stratford Kings River Bridge Replacement Project

delineated boundaries include all flow channels and riparian vegetation within the Study Area and the Study Area does not contain any apparent aquatic resources beyond those limits. The determination of RWQCB jurisdiction will follow such methods until the State Water Resources Control Board's Wetland and Riparian Area Protection Policy is fully developed and officially implemented.

2.2.5 Data Collection and Processing

Extents of potential jurisdictional features, sample points and photo locations were mapped using a Trimble Geo 7X Global Positioning System (GPS) unit with sub-meter accuracy, and were also plotted on aerial photographs. Recent, high-resolution aerial photos were utilized to assist with delineation in portions of the Study Area where access was limited. The data were subsequently transferred to Rincon's geographic information system (GIS) software package to produce Figures 1 through 7 (Appendix A). Representative photographs of the Kings River-South Fork and its associated wetland and riparian vegetation, and the surrounding conditions are presented in Appendix C. OHWM forms, Wetland Determination Data forms, and other observations regarding type and extent of features are presented in Appendix D.

3 Existing Setting

3.1 Topography, Climate, and Land Use

The topography within and surrounding the Study Area is relatively flat, with the only significant slopes along the banks of the Kings River-South Fork, the Blakeley Canal, and irrigation and roadway ditches that cross the Study Area. The Study Area is located within the San Joaquin Valley, north of the Tulare Lake dry lake bed and northeast of the Kettleman Hills. The elevation within the Study Area is approximately 190 feet above mean sea level. The San Joaquin Valley has a Mediterranean climate characterized by hot, dry summers and short foggy winters. The Kettleman Station located approximately 14 miles southwest averages a high temperature of 99 degrees Fahrenheit in July and averages a low temperature of 38.4 degrees Fahrenheit in December with an average total annual precipitation of 6.71 inches (Western Regional Climate Center 2018). Hours prior to the jurisdictional delineation survey, late season precipitation occurred following a drier winter than normal for the region.

The Study Area is a highly managed landscape with limited natural vegetation. The majority of the land use within and surrounding the Study Area consists of cropland, structures associated with agricultural uses, irrigation canals, and rural residences. The areas adjacent to the Study Area are highly modified due to irrigation systems and levee access roadways.

3.2 Hydrology

The project is located within the South Valley Floor Hydrologic Unit Code (HUC) and the Town of Lemoore-Kings River sub-watershed (HUC-12 180300120704). The *National Hydrography Dataset* and *National Wetlands Inventory* depict riverine features, including artificial features such as canals and ditches, and freshwater emergent and freshwater forested/shrub wetlands within the Study Area. The project is also located just north of the Tulare Lake. The Tulare Lake basin has sustained a past of hydromodification.

The Kings River-South Fork is a highly regulated perennial stream (riverine) that is fed by the runoff in the Sierra Foothills and Pine Flat Lake, approximately 70 miles to the northeast, and San Joaquin Valley irrigation canals. Surface water was documented within the Kings River during the survey. The Kings River-South Fork meanders through the Study Area before its diversion at Empire Weir No. 2 into the channelized Blakeley Canal, Kings River-South Fork, and the Tulare Lake Canal. Empire Weir No. 2 is approximately 200 feet south of the SR 41 crossing. The channelized Kings River-South Fork Canal south of the Study Area continues approximately 10 miles southward. It ends at the confluence with the Tule River and the water is dispersed into numerous irrigation canals within the Tulare Lake Bed (USGS 2018, Google Earth 2018).

Multiple sources agree that Tulare Lake was once one of the largest freshwater lakes in California, but by the 1870s, diversion for irrigation, constructed canals and ditches, and flood control projects had begun to alter hydrology patterns (ECORP 2007; Menefee and Dodge 1913). The southern portion of the former Tulare Lake watershed historically filled with water delivered by the Kings, Kaweah, and Tule rivers, which drain from the Sierra Nevada east of the Study Area. The hydrology

of the region was highly modified in the late 1800s and early 1900s for irrigation and flood management purposes and through reclamation activities to convert marshy areas to farmland. By 1872, numerous canals and ditches had been constructed to divert water from the major tributaries to Tulare Lake (ECORP 2007). By 1882, Tulare Lake no longer spilled over county lines, and by May of 1895, the former lake had been reclaimed as farmland, though snowmelt eventually flooded the fields that year, reaching the approximate extent of inundation observed two years prior in 1893 (Menefee and Dodge 1913). By 1935 the historical lakebed was fully altered (ECORP 2007).

Many of the rivers and streams providing runoff to the historical Tulare Lake are now channelized or otherwise redirected along north-south or east-west pathways. A network of canals and ditches is now present in bottom of the present-day dry lakebed. In the mid-20th Century, channelization of rivers, dams and reservoirs for flood control, and construction of levees and groundwater recharge percolation ponds have further altered hydrology of the Tulare Lake Watershed (ECORP 2007). East of the channelized Kings River-South Fork, several lake-bottom storage cells were constructed near the low point of the former lake to store floodwaters (ECORP 2007).

The Kings River-South Fork, canals and irrigation ditches are managed by an irrigation district and contain water a majority of the year; however, water flow direction in the canals is dependent on demand within the region. During certain flood events, water has been pumped north up the South Fork Canal and river and ultimately reached the San Joaquin River (USACE 2015).

3.3 Soils

The USDA, NRCS Web Soil Survey depicts eight soil map units within the Study Area (USDA, NRCS 2018a). These soil map units are described in detail below and depicted on Figure 3 (Appendix A).

Armona loam, partially drained. Armona loam soils consist of deep, poorly drained, saline-alkali soils on basin rims and flood plains. These soils are formed in alluvium derived from igneous and sedimentary rock with slopes ranging from 0 to 1 percent. A typical soil profile for Armona loam consists of dark gray and gray loam to 14 inches deep, a gray loam and sandy loam to gray clay loam to 30 inches deep, olive gray loam to olive gray silt loam to 60 inches depth, and light gray sand greater than 60 inches deep (USDA, NRCS 1986). Multiple components of this soil map unit are listed as hydric on the *National Hydric Soils List* (USDA, NRCS 2018), on alluvial flats, flood plains and basin floors (criterion 2).

Boggs sandy loam, partially drained. Boggs sandy loam soils consist of very deep, somewhat poorly drained, saline-alkali soils on alluvial plains. These soils are formed in alluvium derived dominantly from igneous and sedimentary rock with slopes ranging from 0-1 percent and are strongly saline. These soils are primarily massive, soft, and friable, non-sticky and non-plastic with few fine roots with occasional striations of strong, hard, firm, sticky and plastic clay loam around a depth of 40 inches. A typical soil profile of Boggs sandy loam consists of a dark greyish brown sandy loam (moist) to 15 inches deep, a light olive gray sandy loam to 30 inches deep, a light brownish gray fine sandy loam to 38 inches deep, a dark gray stratified sand to clay loam to 46 inches deep, and a grayish brown to olive massive, hard, and friable, non-sticky and non-plastic sandy loam to 60 inches deep (USDA, NRCS 1986). Multiple components of this soil map unit are listed as hydric on the *National Hydric Soils List* (USDA, NRCS 2018), on alluvial flats, alluvial fans, and basin floors (criterion 2).

Grangeville sandy loam, saline-alkali, 0 to 2 percent slope. Grangeville sandy loam, saline-alkali soils consist of very deep, somewhat poorly drained sandy loam soils derived from alluvial fans and flood plains. These soils are formed in alluvium derived from igneous rock with slopes ranging from

0-2 percent. These soils vary between a slightly saline to a strongly saline profile and slightly alkaline. Grangeville soils are coarse and loamy. A typical soil profile of Grangeville sandy loam consists of a very dark grey hard, friable, sticky and plastic strong coarse subangular blocky sandy loam (moist) to 14 inches deep, an olive gray massive, hard, friable, slightly sticky, non-plastic sandy loam to 35 inches deep, and a yellow brown very fine sandy loam to 63 inches deep (USDA, NRCS 1986). This soil map unit is listed as hydric on the *National Hydric Soils List* (USDA, NRCS 2018), on alluvial flats, alluvial fans, basin floors, and floodplains.

Houser clay, partially drained. Houser clay soils consist of very deep, saline-alkali soils on basin rims with slopes between 0-1. These soils are derived from alluvium dominantly from igneous and sedimentary rock and vary between a moderately saline to a strongly saline profile. A typical soil profile consists of light gray fine sandy loam to 4 inches deep, light gray clay to 10 inches deep, and light gray and light brownish gray silty clay to 60 inches deep or more. The soil is calcareous throughout and is mottled and saline-alkali at depths greater than 4 inches (USDA, NRCS 1986). Multiple components of this soil map unit are listed as hydric on the *National Hydric Soils List* (USDA, NRCS 2018), on basin floors and alluvial flats (criterion 2).

Pitco clay, partially drained. Pitco clay soils consists of very deep, somewhat poorly drained, saline-alkali soils on basin rims and flood plains with slopes between 0 and 1 percent. These soils are formed in alluvium derived from sedimentary rock and saline-alkali throughout. A typical soil profile consists of dark gray and gray clay for about 23 inches deep with mottles deeper than 16 inches, and stratified, dark gray and olive gray clay loam and clay at a depth of 60 inches or more (USDA, NRCS 1986). Multiple components of this soil map unit are listed as hydric on the *National Hydric Soils List* (USDA, NRCS 2018), on basin floors and rims, and flood plains (criterion 2).

Tulare clay, partially drained, 0 to 1 percent slope. Tulare clay is a very deep, somewhat poorly drained, saline alkali soil in basins with a slope on 0 to 1 percent. It is formed in alluvium derived dominantly from igneous and sedimentary rock and varies between a slightly saline to moderately saline profile. These soils are also moderately alkaline. The typical soil profile of Tulare clay consists of a surface layer of gray clay about 16 inches thick and light gray, light olive gray, and grayish brown clay to depths of 60 inches or more. Mottles are in most layers below the depth of 1 inch, and in some areas the surface layer is silty clay. Tulare clay has areas of that are saline-alkali. This soil is calcareous throughout (USDA, NRCS 1986). This soil map unit is listed as hydric on the *National Hydric Soils List* (USDA, NRCS 2018), on basin floors (criterion 2).

Urban Land. This soil type consists of land covered by streets, parking lots, buildings, and other structures that alter the soils so that identification is not feasible. Some components of this soil map unit, are hydric on the *National Hydric Soils List* (USDA, NRCS 2018), on alluvial fans, basin floors, and in sloughs (criteria 2 and 4).

Westcamp loam, partially drained. Westcamp loam is a very deep, somewhat poorly drained, saline-alkali soil on basin rims and flood plains with slopes of 0 to 2 percent. This soil is formed in alluvium derived dominantly from sedimentary and igneous rock and varies between a slightly saline to a strongly saline profile. The typical soil profile of Westcamp loam consists of light brownish gray loam and silt loam to depths of 10 inches, stratified, light yellowish brown, pale yellow, light gray and very pale brown silt loam, silty clay, and clay occur to depths of 72 inches. Mottles are present in most layers below 10 inches in depth and some areas of the surface layer are sandy loam (USDA, NRCS 1986). Multiple components of this soil map unit are listed as hydric on the *National Hydric Soils List* (USDA, NRCS 2018), on alluvial flats, alluvial fans, and basin floors (criteria 2 and 4).

3.4 Vegetation

Vegetation communities and land cover types within the Study Area include emergent soft rush marshes and black willow (*Salix gooddingii*) thickets and the remaining habitats are dominated by crops, upland vegetation, or developed areas. A large acreage of the Study Area has been graded and is unvegetated (disturbed/developed), and is used for irrigation canal management and river access. Upland vegetation adjacent to the Kings River-South Fork Canal at the Laurel Avenue West crossing within the river's floodplain is heavily grazed. A complete list of plant species observed can be found in Table D-1, Appendix D.

3.4.1 Emergent Soft Rush

Portions of the Kings River-South Fork and the Blakeley Canal contain an emergent soft rush community with varying degrees of disturbance. Soft rush marshes are defined in *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) as having soft rush (*Juncus effusus*) as a primary dominant species. Soft rush marshes typically occur along seasonally flooded areas including natural or man-made stock ponds, wetlands and wet meadows at elevation between sea level to 4,265 feet.

Within the Study Area, much of the emergent soft rush is located within the Kings River-South Fork and Blakeley Canal and along their banks. The community is dense but not diverse, with soft rush (FACW) accounting for the vast majority of the vegetation within three feet from the edge of the river and canals banks. Small patches of cattail (*Typha latifolia*, OBL), stinging nettle (*Urtica dioica*, FAC), bull thistle (*Cirsium vulgare*, FACU), and Himalayan blackberry (*Rubus armeniacus*, FAC) were also observed within the Kings River-South Fork Canal north of the Laurel Avenue West crossing. Dispersed, well-established black willow (FACW), Fremont cottonwood (*Populus fremontii*/*Populus deltoides*, FAC), and red willow (*Salix laevigata*, FACW) trees are also present along the river and canals banks.

3.4.2 Black Willow Thicket

Areas adjacent to the Kings River-South Fork Canal and Blakeley Canal contain disturbed and fragmented black willow thicket. Black willow thickets defined in *A Manual of California Vegetation, Second Edition* as a black willow-dominant tree canopy inhabiting terraces along large rivers and intermittent streams at elevations between sea level and 1,640 feet (Sawyer et al. 2009).

Within the Study Area the black willow thickets are concentrated on terraces (i.e. banks of the Kings River-South Fork Canal and Blakeley Canal). The largest concentrations of intact thickets are located between SR 41 and Blakeley Canal and between Blakeley Canal and Kings River-South Fork Canal. Additional black willow thicket habitat is located adjacent to the western side of the existing Stratford Kings River Bridge. The canopy contains co-dominate black willow, Fremont cottonwood, and red willow. Understory observed within this community included Himalayan blackberry (FAC), bur chervil (*Anthriscus caucalis*), spiny sowthistle (*Sonchus asper*), rocket (*Sisymbrium irio*), lambs' quarters (*Chenopodium album*), puncture vine (*Tribulus terrestris*) and pepper grass (*Lepidium nitidum*).

4 Field Results

As previously noted, the Study Area is highly modified, and contains several artificial aquatic resources, as well as a highly managed section of the Kings River within the South Fork Canal.

Based upon the findings of Rincon's field delineation, the Study Area contains several aquatic resources, including Kings River-South Fork, Blakeley Canal, Tulare Lake Canal, emergent wetlands, and irrigation and drainage ditches. These features are described below, and are illustrated graphically on Figure 4 (Appendix A) and representative photographs of each figure can be found in Appendix C (Figure 7).

4.1 Rivers and Canals

4.1.1 Kings River-South Fork and Canal

The Kings River-South Fork flows through the Study Area under SR 41 and Laurel Avenue West, and this section of the river is highly managed but retains some natural riparian and wetland features. At the eastern edge of the Study Area, the Kings River-South Fork is diverted into multiple channels at the Empire Weir No. 2, including the Kings River-South Fork Canal. Infrastructure for water management, including gates, weirs, and pump systems, are present in the Kings River-South Fork Canal, and allow for movement of water in different directions and between different systems when conditions are appropriate. During the survey, water was present within the Kings River-South Fork and was also present in the Canal; however, no directional flow was observed. Ordinary High Water Mark Delineation Datasheets are provided in Appendix D.

Kings River-South Fork at SR 41 (KR-2)

An OHWM was observed within the Study Area at the SR 41 roadway crossings with indicators including a wrack line, in-channel emergent vegetation, and sediment change from silt to sand. Excessive scour has caused shelving with exposed roots of black willows, creating a sharp break in slope, greater than 60 degrees. A large percentage of bare ground was observed below the OHWM, and the channel condition drastically transitions to emergent vegetation dominated by soft rush with occasional flat sedge (*Cyperus eragrostis*, FACW) and common tule (*Schoenoplectus acutus*, OBL) within three feet of the water's edge. (Wetlands are discussed in more detail below in section 4.2.) The OHWM spans approximately 185 feet width from bank to bank. In-channel emergent vegetation was observed north of Stratford Kings River Bridge along the eastern bank of the canal. Overhanging fragmented black willow thicket riparian vegetation was also observed on the banks of the canal north of Stratford Kings River Bridge.

Kings River-South Fork at Laurel Avenue West (KR-1)

Due to access restrictions, only the western bank of the Kings River-South Fork at this road crossing was field-delineated with on-the-ground survey. The OHWM was identified at the change in vegetation composition, break in slope, and change in sediment. Below the OHWM, broken concrete of varied size was observed along with a patch of cattail in-channel northwest of the Laurel Avenue West Bridge. A steep break in slope was observed on the western bank, greater than 60 degrees. At the top of the slope, above the OHWM, fragmented black willow thicket was

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concentrated on the west bank, south of the Laurel Avenue West Bridge, along with dense soft rush within two feet of the water. Using heads up digitization on recent aerial photos (Google Earth 2018), the eastern bank was delineated based on aerial interpretation and observations made from the opposite bank, due to access restrictions. The eastern bank contains a moderate slope between 15 and 20 degrees to the artificial berm, with upland grasses and dispersed black willows. Banks on the eastern side have been heavily grazed, decreasing the density of soft rush along the water. The OHWM spans approximately 120 feet width from bank to bank.

The Kings River-South Fork is a riverine feature in the lower perennial subsystem with an unconsolidated bottom and permanently flooded. This river meets the USACE definition of a RPW. The feature has a traceable hydrologic connection to the Tulare Lake dry lake bed. The river includes non-wetland and wetland segments (discussed further below) and is likely to fall under CWA Sections 404 and 401 jurisdictions, and thus likely to be regulated by the USACE and RWQCB. The feature may also be regulated by the RWQCB under the Porter-Cologne Act. In addition, this river meets the definition of a CDFW streambed jurisdictional feature and likely falls under CDFW jurisdiction under CFGC Section 1600 et seq. See Section 5.1 for a discussion of jurisdictional status.

Kings River-South Fork Canal below Empire Weir No. 2 (KR-3)

The Kings River-South Fork Canal below the Empire Weir No. 2 is channelized and devoid of vegetation. Due to management by the Empire West Side Irrigation District (KRCID KRWA 2009) water is present in the canal all year. The eastern and western banks of the canal contain broken concrete (rip-rap) for scour protection. The OHWM was indicated with water staining on the rip-rap. A sharp break in slope, greater than 60 degrees was identified at the OHWM. The OHWM is approximately 85 feet in width from bank to bank.

The Kings River-South Fork Canal is an excavated riverine feature in the lower perennial subsystem with an unconsolidated bottom and permanently flooded. This canal meets the USACE definition of a RPW. The feature has a traceable hydrologic connection to the Tulare Lake dry lake bed. This canal is a non-wetland water that is likely to fall under CWA Sections 404 and 401 jurisdictions, and is thus likely to be regulated by the USACE and RWQCB. In addition, this canal has bed and bank features and likely falls under CDFW jurisdiction under CFGC Section 1600 et seq. See Section 5.1 for a discussion of jurisdictional status.

4.1.2 Tulare Lake Canal

The western extent of the Tulare Lake Canal (TLC-1) is located at the eastern edge of the Study Area. The deepwater canal is a branch of the Kings River-South Fork Canal and is under the management of Empire West Side Irrigation District. Due to its management, water occurs in the canal all year. The Tulare Lake Canal weir is located just east of the Study Area, and water in this system is heavily controlled. The south bank of the canal contains broken concrete (rip-rap) for scour protection and the majority of the north bank is bare ground with sparse herb vegetation. The OHWM was indicated with the presence of a wrack line, natural line impressed in bank, and the presence of water staining. A sharp break in slope, greater than 60 degrees, was also identified at the OHWM. The OHWM spans approximately 80 feet width from bank to bank. Ordinary High Water Mark Delineation Datasheets are provided in Appendix D.

The Tulare Lake Canal is classified as an excavated riverine feature in the lower perennial subsystem with an unconsolidated bottom and permanently flooded. This canal meets the USACE definition of a RPW. The feature has a traceable hydrologic connection to the Tulare Lake dry lakebed. This canal is a non-wetland water that is likely to fall under CWA Sections 404 and 401 jurisdictions, and is thus

likely to be regulated by the USACE and RWQCB. The feature may also be regulated by the RWQCB under the Porter-Cologne Act. In addition, this canal meets the definition of a CDFW streambed jurisdictional feature and likely falls under CDFW jurisdiction under CFGC Section 1600 et seq. See Section 5.1 for a discussion of jurisdictional status.

4.1.3 Blakeley Canal

The Blakeley Canal (BC-1 and BC-2) is diverted from the Kings River-South Fork at Empire Weir No. 2. Similar to the Kings River-South Fork Canal and the Tulare Lake Canal, the Blakeley Canal is a highly modified deep water canal under the management of Empire West Side Irrigation District. During high water levels, a backwater channel off of Blakeley Canal occurs in lower topographic areas. During the time of the survey, no water was present in the backwater area; however, an adjacent wetland was observed and will be discussed below. The western side of the canal, similar to Kings River-South Fork upstream, contains an approximately three foot wide band of emergent soft rush directly adjacent to the water. The western side prior to the Blakeley Canal weir is devoid of vegetation and contains steep slopes in proximity to the canal weirs at the east edge of the Study Area. The eastern side of the canal contains overhanging black willow and cottonwood riparian vegetation along with emergent soft rush-lined banks. The OHWM spans approximately 92 feet width from bank to bank.

Blakeley Canal is classified as an excavated riverine feature in the lower perennial subsystem with an unconsolidated bottom and permanently flooded. This canal meets the USACE definition of a RPW. The feature has a traceable hydrologic connection to the Tulare Lake. The section of the canal within the Study Area generally lacks wetland vegetation, except as discussed in Section 4.2, and is a non-wetland water that is likely to fall under CWA Sections 404 and 401 jurisdictions, and is thus likely to be regulated by the USACE and RWQCB. The feature may also be regulated by the RWQCB under the Porter-Cologne Act. In addition, this canal has a bed and a bank, and likely falls under CDFW jurisdiction under CFGC Section 1600 et seq. See Section 5.1 for a discussion of jurisdictional status.

4.2 Wetlands

In addition to riverine non-wetland features, freshwater emergent wetlands were observed during the survey adjacent to Blakeley Canal and Kings River-South Fork Canal.

4.2.1 Emergent Wetland 1

A total of six wetland determination data points (Sample Points) were evaluated, including excavation and description of soil pits, within the Study Area (Appendix A, Figure 4). Wetland Determination Forms are provided as Appendix D.

Investigations started in the proximity of the Blakeley Canal backwater inlet. The backwater inlet contains a depressional area surrounded by steep banks up to SR 41 and a compacted un-vegetated area to the south. Four sample points were evaluated to assist in determining if a wetland is present along the canal and within the backwater channel and to determine wetland boundaries.

Wetland 1 was observed adjacent to Blakeley Canal. Sample Point 1 was evaluated in the lowest elevation area with wetland vegetation, and confirmed the feature is a wetland with all three USACE-defined wetland parameters. These parameters included vegetation dominated by a soft rush and bulrush understory and black willow canopy, and saturated soil with visible inundation on

aerial imagery. Sample Point 2 was taken where vegetation lacked dominant hydrophytic vegetation. No USACE wetland indicators were observed at this point.

Recent disturbances from vehicles were observed throughout the wetland. Sample Points 3 and 4 were evaluated and confirmed Wetland 1 limits are bound in the lower depression area and along the edge of the canal. Although Sample Point 3 contained some non-hydrophytic vegetation, the dominant species was soft rush. Hydric soils were present, and hydrology indicators included drainage patterns and saturation visible on aerial imagery. Trash and modification of the soil on the bank adjacent to SR 41 was observed at higher elevation above the wetland boundary, along with vegetation dominated by non-native upland species.

The wetland is classified in the Cowardin system as a freshwater forested/shrub wetland that is temporarily flooded. This feature meets the federal definition of a wetland, and is adjacent to a RPW that has hydrologic connectivity to the Tulare Lake dry lake bed. Thus, it is expected to fall under CWA Sections 404 and 401 jurisdictions, and is likely to be regulated by the USACE and RWQCB. The feature may also be regulated by the RWQCB under the Porter-Cologne Act. Additionally, the wetland is along a channel and forms the understory to the associated riparian canopy, and thus likely also falls under CDFW's jurisdiction. See Section 5.1 for a discussion of jurisdictional status.

4.2.2 Emergent Wetland 2

Wetland 2 was observed between Blakeley Canal and Kings River-South Fork just upstream of the channelized segment of the river. Wetland 2 is similar to Wetland 1, with dense hydrophytic vegetation observed directly adjacent to the water, spanning a band approximately three feet wide. At this location, Himalayan blackberry directly abuts the soft rush, with a canopy of cottonwoods and willows forming the overstory. Hydrology indicators observed include saturation and inundation visible on aerial imagery. Full wetland determination forms were completed at Wetland 1, and once a pattern was established, data on indicators present at Wetland 2 were collected in abbreviated form (see Table D-2, Appendix D).

The wetland is classified in the Cowardin system as a freshwater emergent wetland that is temporarily flooded. This feature meets the federal definition of a wetland, and is adjacent to a RPW that has hydrologic connectivity to the Tulare Lake dry lake bed. Thus, it is expected to fall under CWA Sections 404 and 401 jurisdictions, and is likely to be regulated by the USACE and RWQCB. The feature may also be regulated by the RWQCB under the Porter-Cologne Act. Additionally, the wetland is along a channel and forms the understory to the associated riparian canopy, and thus likely also falls under CDFW's jurisdiction. See Section 5.1 for a discussion of jurisdictional status.

4.3 Irrigation and Roadway Ditches

Other aquatic features identified in the Study Area include numerous irrigation ditches that traverse field margins, and a roadway ditch along SR 41. Irrigation ditches supports the extensive irrigated agricultural operations in this section of the Central Valley. These 13 features vary in size, and according to the *National Hydrography Dataset* (USGS 2018b), are connected to one or more of the canals or other conveyance ditches through structures such as gates or through pump facilities (Appendix A, Figure 8). These features exhibit indicators of an OHWM and a clear top of bank, though they are artificial in origin and are routinely maintained. A majority of the ditches are devoid of vegetation and contain regulated relatively permanent flow of water.

Based on field observations, in the absence of vegetation management activities and with presence of water, we expect that all these ditches would recruit a fringe of hydrophytic vegetation below the OHWM, and in the absence of water, the vegetation would die, indicating vegetation is management-dependent.

In addition to the irrigation ditches, a roadway ditch is located approximately 30 feet west of SR 41 approximately 300 feet south of the crossing over the Kings River-South Fork Canal. The ditch is joined by a two foot corrugated pipe culvert west of SR 41 approximately 180 feet to the north (Appendix A, Figure 4). The drainage is approximately two feet wide with an average depth of one foot. The ditch flows north towards the Kings River-South Fork Canal. Emergent vegetation was observed at a small depression along SR 41 south of the Kings River-South Fork, therefore, paired sample points were excavated. Sample Point 5 was excavated within the small depression and lacked hydric soils and hydrology. To further confirm no wetland presence within the roadside drainage, Sample Point 6 was excavated at the upslope under a patch of willows approximately 25 feet north of Sample Point 5. No outlet directly to the river was observed. The feature may contain water from roadway runoff during storm events. The feature did contain a small amount of water during the survey due to a precipitation event prior to the survey.

Under some circumstances, irrigation and roadway ditches constructed in uplands are not jurisdictional under the CWA. See Section 5.1 for a discussion of jurisdictional status.

5 Summary of Jurisdictional Waters and Wetlands

Based upon the analysis of Rincon's jurisdictional delineation, there are aquatic resources, including wetlands and other waters, that are potentially subject to USACE and RWQCB jurisdictions in the Study Area. In addition, many of these aquatic resources have defined beds, banks, and/or riparian habitats and are potentially under CDFW jurisdiction. Note the final jurisdictional determinations of the boundaries of wetlands, waters, and riparian habitat are made by each agency, typically at the time that authorizations to impact such features are requested. Potentially jurisdictional areas within the Study Area are summarized below in Table 1 and shown on Figures 4, 5, and 6 (Appendix A). A table with full details for each delineated feature is included as Table D-2 in Appendix D.

5.1 USACE Jurisdiction

The Kings River-South Fork and Canal, Blakeley Canal and Tulare Lake Canal, and wetlands in the Study Area may be jurisdictional waters of the U.S. regulated under CWA Section 404, subject to USACE. OHWM indicators documented include a break in slope, change in vegetation cover, shelving, wrack line, and the presence of a bed and bank. Portions of these canals banks also contain wetland vegetation, hydric soils and wetland hydrology. Also, these canals convey water into the Tulare Lake dry lake bed outside the Study Area, or on occasion can flow north to the San Joaquin River. As depicted in Table 1 below, a total of approximately 19.84 acres (9,811 linear feet) of non-wetland waters (rivers and canals), and approximately 0.70 acre of wetland waters were observed within the Study Area.

Irrigation and roadway ditches located within the Study Area may not be jurisdictional waters of the U.S. These ditches do not flow back into a TNW or RPW like the Kings River-South Fork and Canal, Blakeley Canal or Tulare Lake Canal. See Significant Nexus Evaluation discussion below.

5.1.1 Previous Jurisdictional Determinations and Significant Nexus Evaluation

In a determination issued March 15, 2012 for file number SPK-2007-01984, the USACE stated that both the Tule River and the Tulare Lake are traditionally navigable waters that were used historically in interstate or foreign commerce. This determination confirms that the Kings River-South Fork Canal, a tributary to Tulare Lake, was previously determined by the U.S. Environmental Protection Agency (EPA) to be a traditionally navigable water, and documents an incident in 1983 during which floodwaters from the Tulare Lake Basin were pumped northward up the Kings River-South Fork Canal, entering the San Joaquin River at Mendota Pool (USACE 2015).

Multiple sources document that Tulare Lake was historically navigable. The Tulare Historical Museum describes the uses of boats used to transport livestock, for fishing, and other uses in the 1870s (Tulare Historical Museum 2014), and the City of Corcoran's webpage notes the steamboat that once operated between Stockton and Tulare Lake as notable element of the local history (City of Corcoran 2018). Menefee and Dodge (1913) also document steamboats and sailboats using the lake in the 1870s and document fishing and hunting activities.

Based on previous USACE determinations that Tulare Lake is a TNW, it is likely the USACE will assert jurisdiction over rivers, canals and wetlands in the Study Area with traceable direct hydrologic connections to the Tulare Lake dry lake bed. All irrigation and roadway ditches within the Study Area that USACE will not assert jurisdiction over are, however, likely under the jurisdiction(s) of RWQCB and/or CDFW. See discussion on RWQCB and CDFW jurisdictions below.

Under CFR sections (33 CFR 328.3 and 33 CFR 328.4), irrigation and drainage ditches that drain upland areas, do not naturally carry a relatively permanent water flow, or do not flow back into a TNW or RPW are not under the jurisdiction of USACE (Appendix A, Figure 8). Irrigation and drainage ditches within the Study Area are man-made, and water is maintained within the ditches during irrigation demand. Without active management directing water into these features to support irrigation, these ditches would not contain a water flow.

5.2 RWQCB Jurisdiction

Streambanks of rivers and canals, wetlands, as well as the channels of irrigation and roadway ditches between tops of banks, may also be jurisdictional waters of the state under the Porter-Cologne Act in addition to those features under CWA jurisdiction as previously described under USACE Jurisdiction, subject to the Central Valley RWQCB. As depicted in Table 1 below, a total of approximately 39.80 acres (25,996 linear feet) of Central Valley RWQCB jurisdictional rivers, canals, wetlands, and tops of banks of irrigation and roadway ditches within the Study Area.

5.3 CDFW Jurisdiction

Fragmented black willow thicket was mapped within the Study Area adjacent to Kings River-South Fork Canal. Additionally, rivers, canals, irrigation and drainage ditches within the Study Area may be jurisdictional under Section 1600 et seq. of the CFGC, as these features contain water under some circumstances, have defined bed and bank features, and potential wildlife habitat. However, many of these aquatic features are artificial features supporting agriculture activities, rather than natural channels, lakes or ponds. As depicted in Table 1 below, approximately 33.6 acres (9,811 linear feet) of CDFW streambed, including edge of riparian or top of bank, whichever is greatest, was observed in relation to the rivers and canals and approximately 5.50 acres (16,185 linear feet) of CDFW streambed to top of bank for irrigation and roadway ditches were identified and mapped within the Study Area.

5.4 Jurisdiction Summary

Table 1 USACE, RWQCB, and CDFW Jurisdictional Areas

| Feature | Waters of the U.S. ¹ | | Waters of the State ¹ (acres/linear feet) | CDFW Jurisdictional Streambed ² (acres/linear feet) |
|--------------------------------|--|---|---|--|
| | Non-wetland Waters of the U.S. (acres/linear feet) | Wetland Waters of the U.S. (acres, linear feet) | | |
| Kings River-South Fork | 9.54/2,773 | 0.16/-- | 22.69/2,773 | 22.53/2,773 |
| Canals | 10.30/7,038 | --/-- | 11.07/7,038 | 11.07/7,038 |
| Wetlands | --/-- | 0.54/-- | 0.54/-- | --/-- |
| Irrigation and Roadway Ditches | --/-- | --/-- | 5.50/16,185 | 5.50/16,185 |
| Total | 19.84/9,811 | 0.70/-- | 39.80/25,996 | 39.1/8,207 |

¹Calculated to OHWM or edge of wetland

²Calculated to top of bank or edge of riparian

The findings and conclusions presented in this report, including the location and extent of areas subject to regulatory jurisdiction, represent the professional opinion of the consultant biologists. These findings and conclusions should be considered preliminary and at final discretion of the applicable resource agency.

6 Recommendations

Jurisdictional waters should be considered and avoided during project design, and that if avoidance is not feasible, coordination and permitting from USACE, Central Valley RWQCB, and CDFW should be sought prior to impacting waters. Although some features may be non-jurisdictional, Caltrans would have to obtain an Approved Jurisdictional Determination to gain USACE concurrence on jurisdictional status of all features delineated and presented herein. Caltrans may wish to proceed with permitting without pursuing a formal determination by assuming the USACE has jurisdiction of all features delineated and presented herein through a Preliminary Jurisdictional Determination.

Depending on project design, discharge of dredge and fill materials within the delineated canals and wetlands for construction of the new Stratford Kings River Bridge will likely require a Section 404 Nationwide Permit or Individual Permit from the USACE, along with a Section 401 Water Quality Certification from the Central Valley RWQCB. Diversion or obstruction of the natural flow of the canals or irrigation ditches; a change or use of any material from the canals or irrigation ditches; deposit or dispose debris into canals or irrigation ditches; or removal or disturbance of streambanks and riparian habitats typically requires a Lake or Streambed Alteration Agreement from the CDFW.

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Appendix A

Figures

Stratford Kings River Bridge Replacement Project

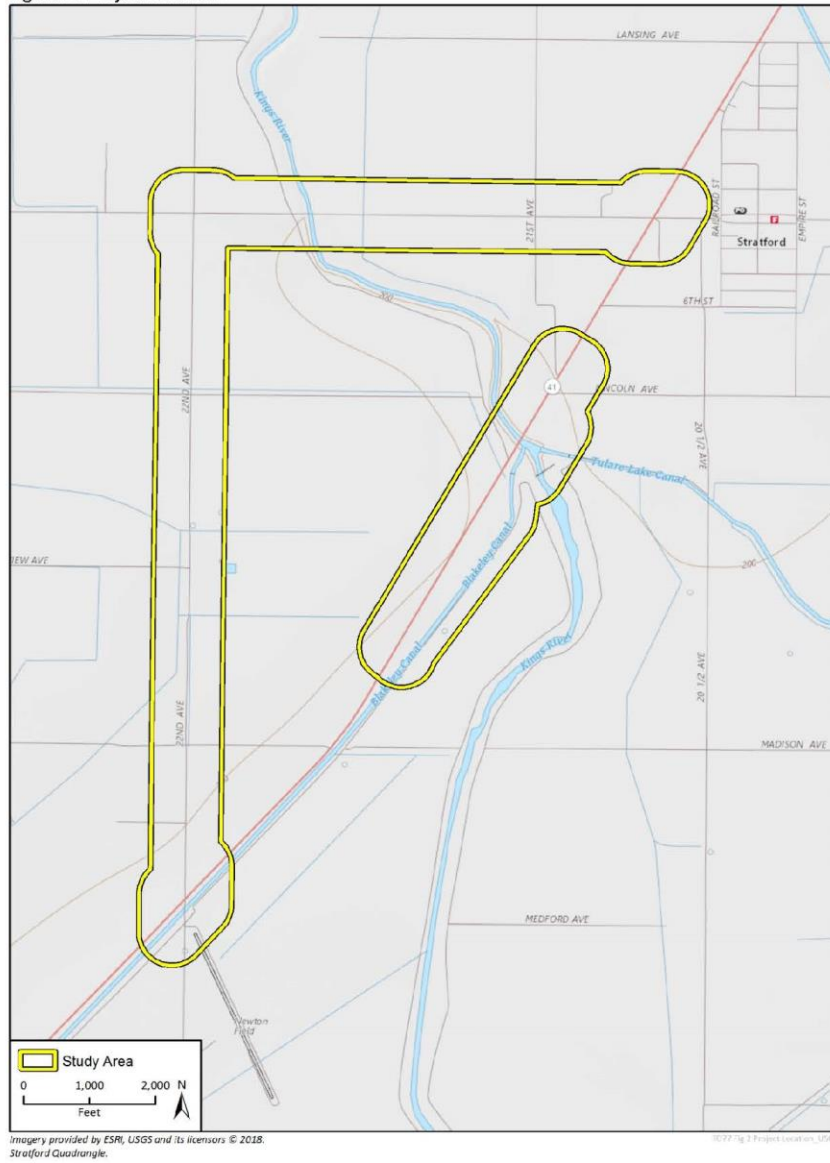
Figure 1: Regional Location



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Figure 2: Project Location



Stratford Kings River Bridge Replacement Project

Figure 3: Soil Map

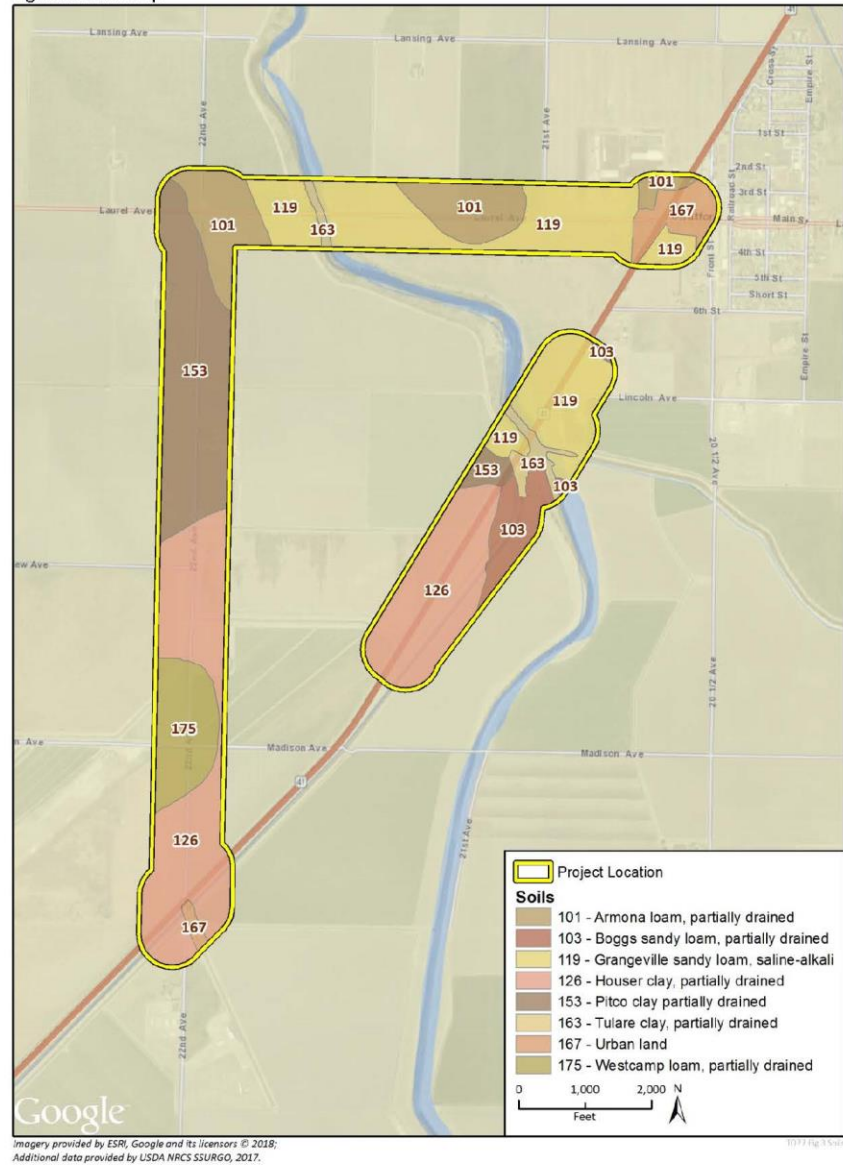
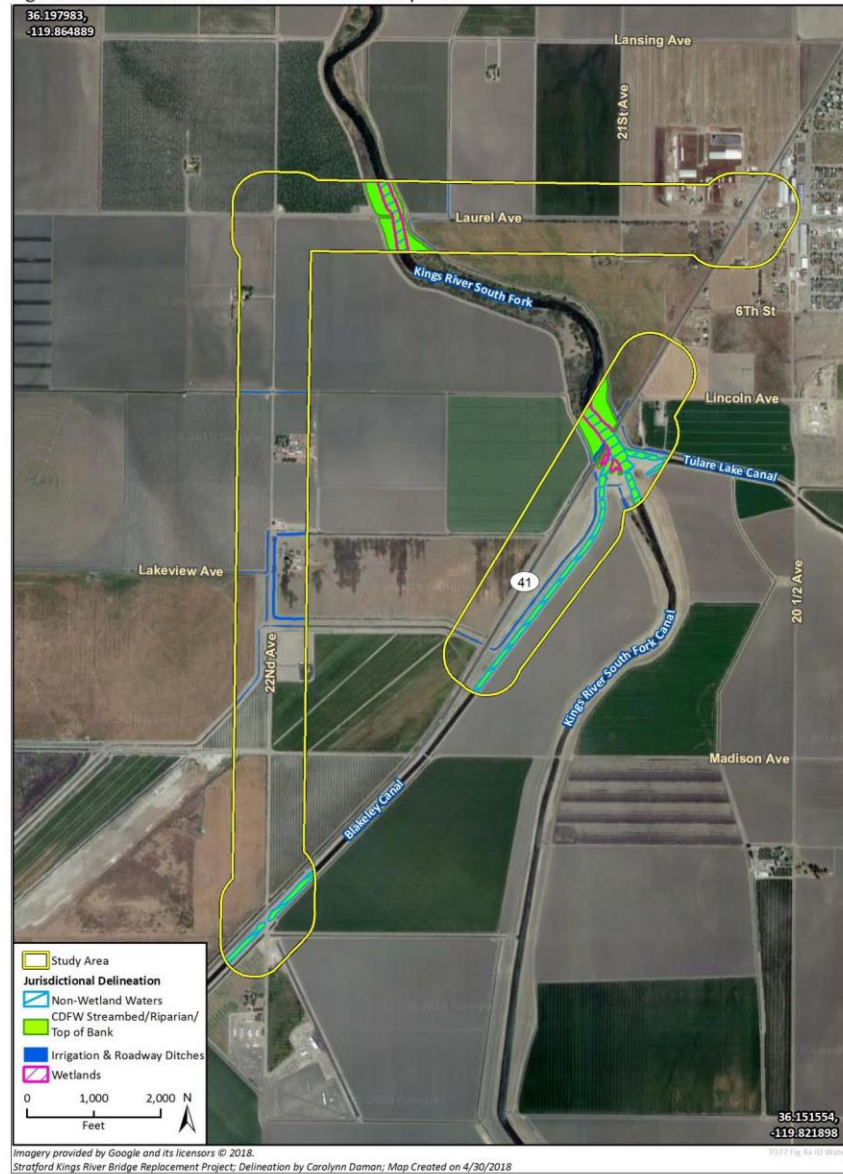


Figure 4a: Jurisdictional Waters within the Study Area



Stratford Kings River Bridge Replacement Project

Figure 4b: Jurisdictional Waters within the Study Area

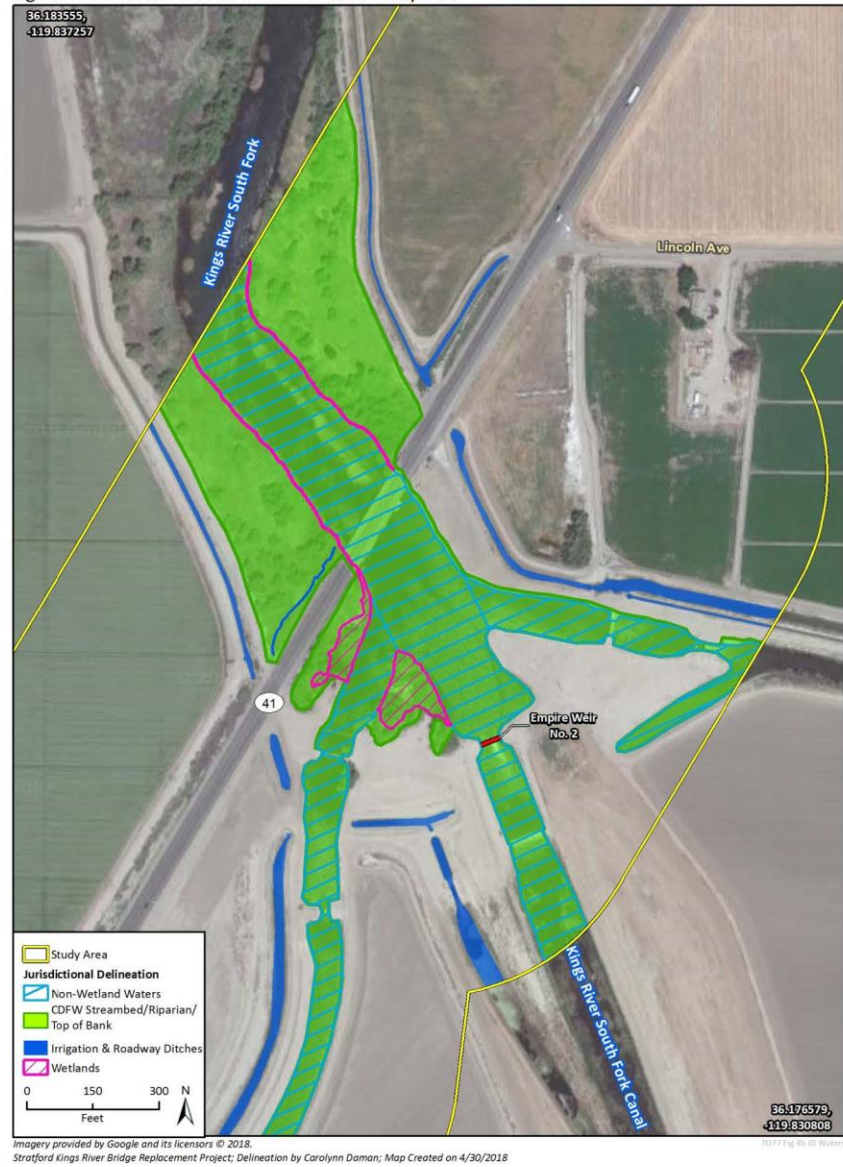


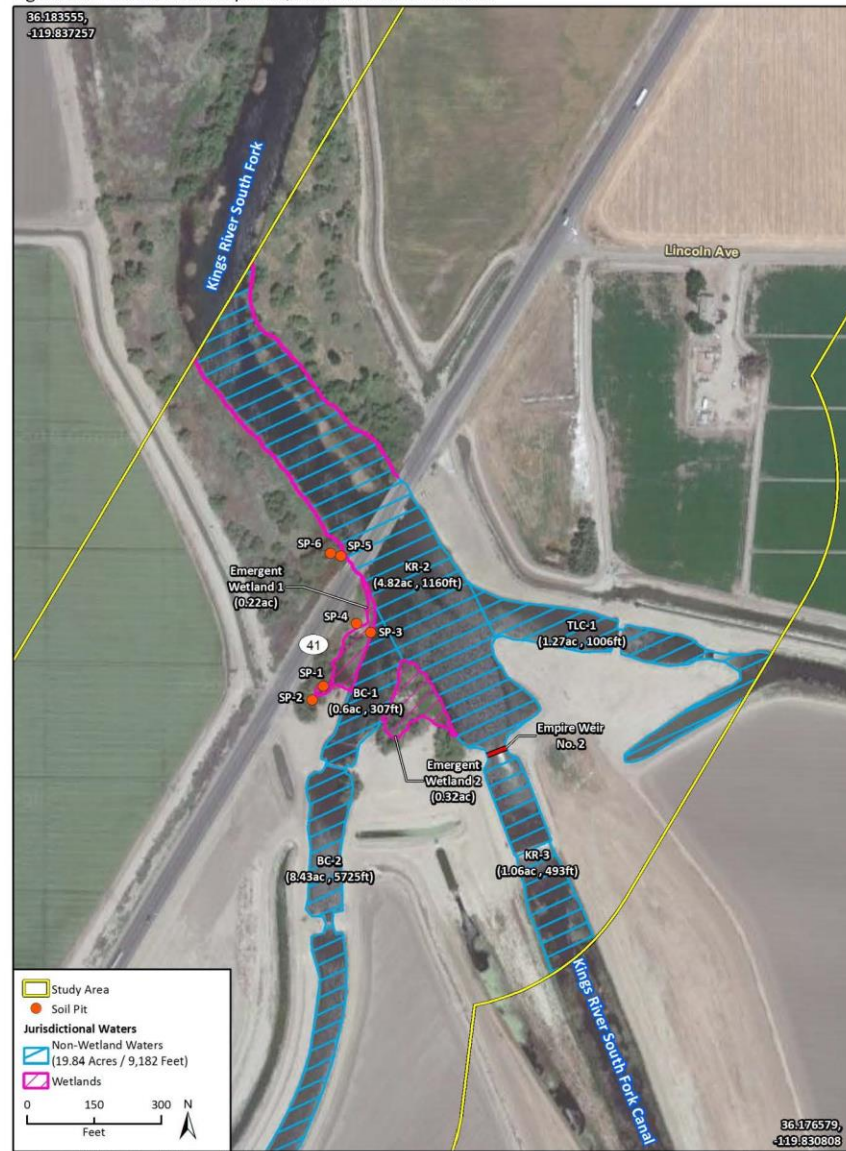
Figure 4c: Jurisdictional Waters within the Study Area



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Stratford Kings River Bridge Replacement Project; Delineation by Carolyn Daman; Map Created on 4/30/2018

Stratford Kings River Bridge Replacement Project

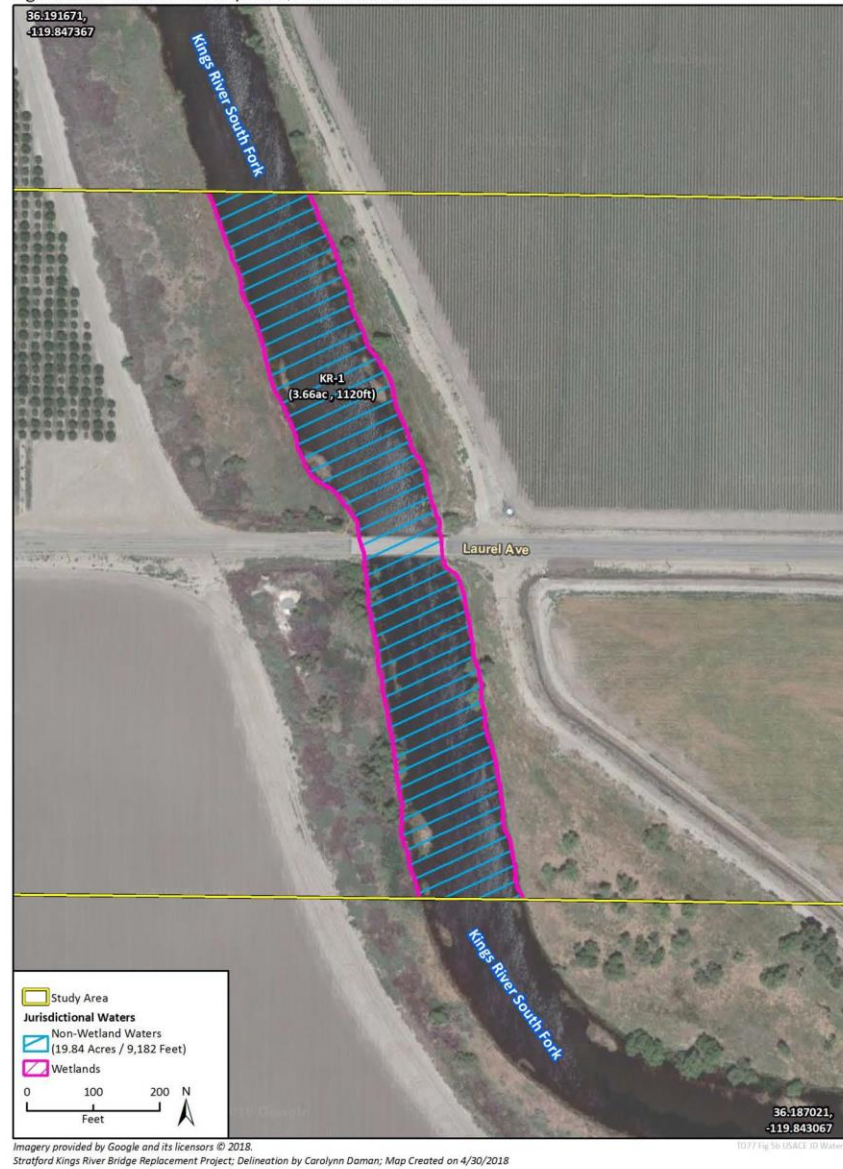
Figure 5a: Potential USACE/RWQCB Jurisdictional Waters



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Stratford Kings River Bridge Replacement Project; Delineation by Carolyn Daman; Map Created on 4/30/2018

1077 Fig 5a USACE ID Waters

Figure 5b: Potential USACE/RWQCB Jurisdictional Waters



Stratford Kings River Bridge Replacement Project

Figure 6a: CDFW/RWQCB Jurisdictional Waters



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Cal Trans Project; Delineation by Carolyn Daman; Map Created on 4/30/2018

Figure 6b: CDFW/RWQCB Jurisdictional Waters



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Stratford Kings River Bridge Replacement Project; Delineation by Carolyn Daman; Map Created on 4/30/2018

10777 Fig. 6b CDFW ID Waters

Stratford Kings River Bridge Replacement Project

Figure 6c: CDFW/RWQCB Jurisdictional Waters

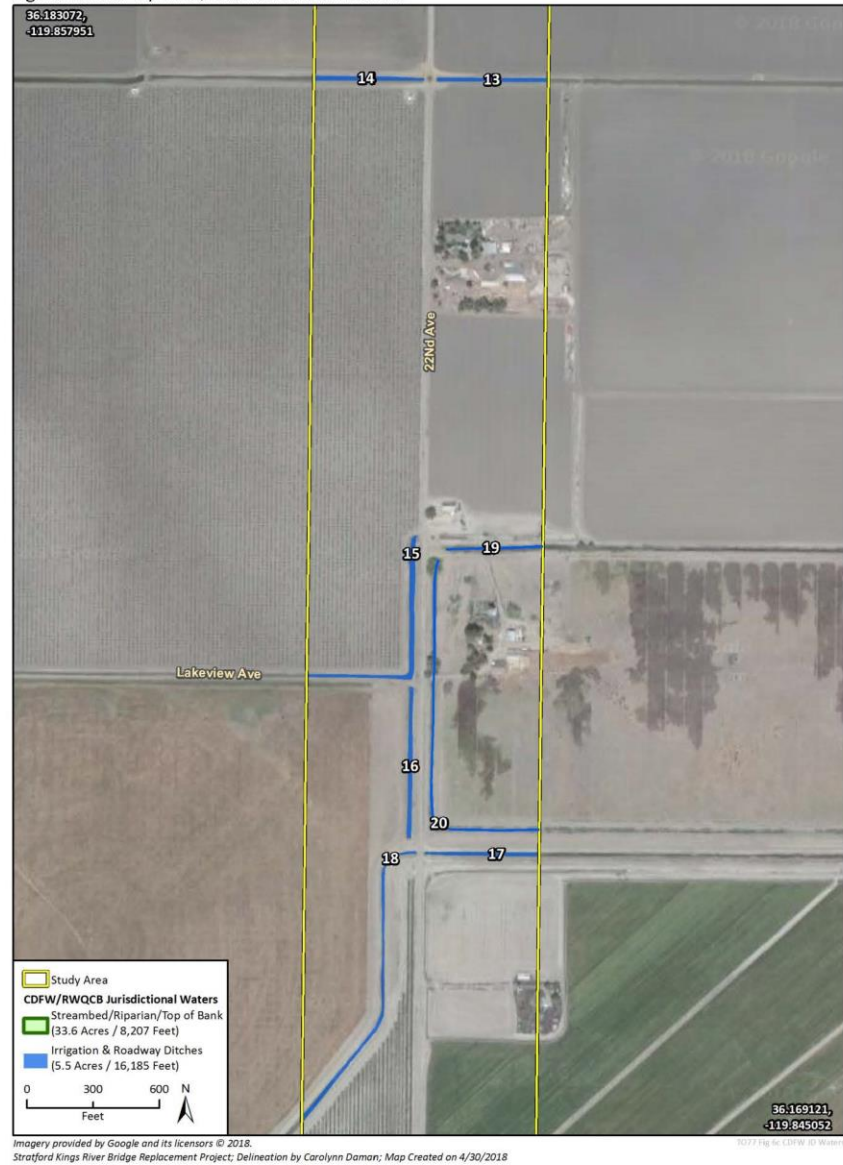


Figure 7: Representative Photograph Locations

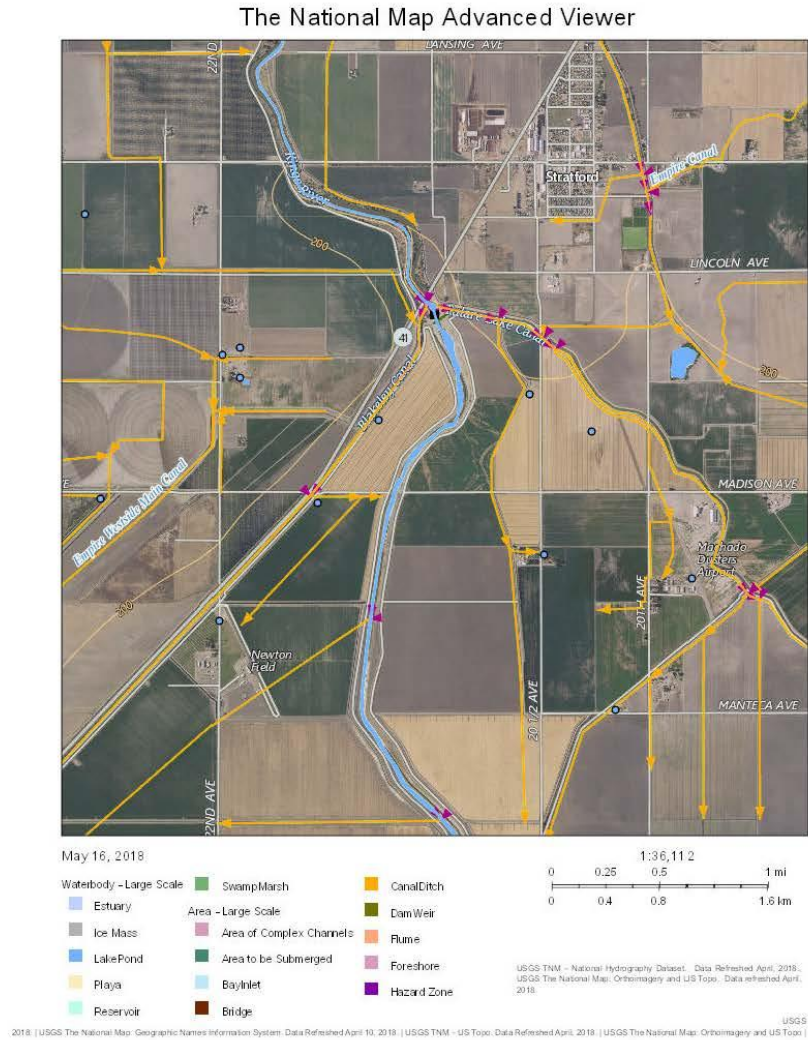


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2017 Fig. 7-10 Photo Locations

Stratford Kings River Bridge Replacement Project

Figure 8: The National Hydrography Dataset



Appendix B

Regulatory Overview and Definitions

USACE Jurisdiction

The USACE, under provisions of Section 404 of the Clean Water Act and USACE implementing regulations, has jurisdiction over the “waters of the United States.” “Waters” include all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, seasonal drainage channels, etc.), all impoundments of waters otherwise defined as waters of the U.S., tributaries of waters otherwise defined as waters of the U.S., territorial seas, and wetlands adjacent to waters of the U.S. USACE jurisdictional limits are typically identified by the presence of an Ordinary High Water Mark (OHWM). The OHWM is the line on the shore or banks of a water course established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area. The USACE defines wetlands as containing three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology.

Areas not considered to be jurisdictional waters include non-tidal drainage and irrigation ditches excavated on dry land, artificially irrigated areas, artificial lakes or ponds excavated on dry land used for irrigation or stock watering, small artificial water bodies such as swimming pools, and water-filled depressions (51 Fed. Reg. 41, 217 1986). In addition, a Supreme Court ruling (Solid Waste Agency of Northern Cook Counties [SWANCC] vs. USACE, January 9, 2001) determined that the USACE exceeded its statutory authority by asserting Clean Water Act jurisdiction over “an abandoned sand and gravel pit in northern Illinois, which provides habitat for migratory birds.” Based solely on the use of such waters by migratory birds, the Supreme Court’s holding was strictly limited to waters that are “non-navigable, isolated, and intrastate.”

The Supreme Court further addressed the extent of the USACE jurisdiction in *Rapanos v. U.S.* (June 19, 2006). There, a sharply divided Court issued multiple opinions, none of which garnered the support of a majority of Justices. This created substantial uncertainty as to which jurisdictional test should be used. The Ninth Circuit Court of Appeal, which encompasses California, answered this in *Northern California River Watch v. City of Healdsburg* (August 11, 2006). There, the Court held that Justice Kennedy’s opinion in *Rapanos* provides the controlling rule of law. Under that rule, wetlands or other waters which are not navigable in fact are subject to USACE jurisdiction if they have a “significant nexus” to a navigable-in-fact waterway. As Justice Kennedy explained, whether a significant nexus exists in any given situation will have to be decided on a case-by-case basis, depending on site-specific circumstances.

USACE Headquarters in Washington, D.C. issued substantive guidance on June 5, 2007, to its District Offices as to how to apply these rulings. Based on this guidance, additional quantitative, qualitative, and other physical data is required for the USACE to make a determination of jurisdictional authority. This determination is reviewed by the United States Environmental Protection Agency (EPA).

In accordance with the *Rapanos* guidance, the USACE will assert jurisdiction over traditional navigable waters (TNWs), non-navigable tributaries of TNWs that are relatively permanent waters (RPWs), and wetlands that directly abut such tributaries. TNWs include all of the “navigable waters

of the U.S.," defined in 33 CFR Part 329 and by pertinent federal court decisions. RPWs convey water flow seasonally, typically for at least 3 months. In addition, non-navigable tributaries that are not relatively permanent (non-RPWs), wetlands adjacent to non-RPWs, and wetlands adjacent to but that do not directly abut a TNW will be found jurisdictional based on a fact-specific analysis that they have a significant nexus with a TNW. The significant nexus evaluation considers the volume, duration, and frequency of water flow in the tributary and the proximity of the tributary to a TNW, as well as the hydrologic, ecologic, and other functions performed by the tributary and all of its adjacent wetlands.

Wetlands

The USACE defines wetlands as containing three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. The following is a discussion of each of these parameters.

Hydrophytic Vegetation

Hydrophytic vegetation dominates areas where frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned wetland indicator status according to the probability of their occurring in wetlands. More than fifty percent of the dominant plant species must have a wetland indicator status to meet the hydrophytic vegetation criterion. The USFWS published the National List of Plant Species That Occur in Wetlands (Lichvar, 2016), which separates vascular plants into the following five basic categories based on plant species frequency of occurrence in wetlands:

- **Obligate Wetland (OBL).** Occur almost always under natural conditions in wetlands.
- **Facultative Wetland (FACW).** Usually occur in wetlands but occasionally found in non-wetlands.
- **Facultative (FAC).** Equally likely to occur in wetlands or non-wetlands.
- **Facultative Upland (FACU).** Usually occur in non-wetlands, but occasionally found in wetlands.
- **Obligate Upland (UPL).** Rarely occur in water or saturated soils or species that are not listed are assumed to be UPL

The USACE considers OBL, FACW and FAC species to be indicators of wetlands. An area is considered to have hydrophytic vegetation when greater than 50 percent of the dominant species in each vegetative stratum (tree, shrub, and herb) fall within these categories. Should 50 percent of the dominate species not fall into USACE indicator status, hydrophytic vegetation may be present with 80 percent of the total vegetation cover assigned wetland indicator status. Any species not appearing on the current National Wetland Plant List is assumed to be an upland species, almost never occurring in wetlands in accordance with Lichvar et al. 2016. In addition, an area needs to contain at least 5% vegetative cover to be considered a vegetated wetland.

Hydric Soils

Hydric soils are saturated or inundated for a sufficient duration during the growing season to develop anaerobic or reducing conditions that favor the growth and regeneration of hydrophytic vegetation. Field indicators of wetland soils include observations of ponding, inundation, or saturation, dark (low chroma) soil colors, bright mottles (concentrations of oxidized minerals such as iron), gleying, which indicates reducing conditions by a blue-grey color, or accumulation of organic

material. Additional supporting information includes documentation of soil as hydric or reference to wet conditions in the local soils survey, both of which must be verified in the field.

Wetland Hydrology

Wetland hydrology is inundation or soil saturation with a frequency and duration long enough to cause the development of hydric soils and plant communities dominated by hydrophytic vegetation. If direct observation of wetland hydrology is not possible (as in seasonal wetlands), or records of wetland hydrology are not available (such as stream gauges), assessment of wetland hydrology is frequently supported by field indicators, such as water marks, drift lines, sediment deposits, or drainage patterns in wetlands.

RWQCB Jurisdiction

The State Water Resources Control Board (SWRCB) and local RWQCB have jurisdiction over “waters of the State,” which are defined as any surface water or groundwater, including saline waters, within the boundaries of the state. The SWRCB has issued general Waste Discharge Requirements (WDRs) regarding discharges to “isolated” waters of the State (Water Quality Order No. 2004-0004-DWQ, Statewide General Waste Discharge Requirements for Dredged or Fill Discharges to Waters Deemed by the USACE to be Outside of Federal Jurisdiction). The local RWQCB enforces actions under this general order, and is also responsible for Clean Water Act Section 401 certification determinations over USACE defined jurisdictional waters. Under Clean Water Act Section 401, the RWQCB shares USACE jurisdiction.

The Porter-Cologne Act provides the State with very broad authority to regulate “waters of the State” (which are defined as any surface water or groundwater, including saline waters). The Porter-Cologne Act has become an important tool in the post-SWANCC and Rapanos era with respect to the State’s authority over isolated waters. Generally, any person proposing to discharge waste into a water body that could affect its water quality must file a “Report of Waste Discharge” (ROWD) when there is no federal nexus, such as under Section 401 of the CWA. Although “waste” is partially defined as any waste substance associated with human habitation, the RWQCB interprets this to include fill discharge into water bodies.

CDFW Jurisdiction

The CDFW has regulatory authority over any work within rivers, streams, and lakes of the State of California (California Fish and Game Code Section 1600 *et. seq.*) on public, private, and agricultural lands. Water features that are regulated by CDFW include all rivers, streams, or lakes, including man-made watercourses with or without wetlands, if they contain a definable bed and bank and support a fish or wildlife resource.

- The plain language of Section 1602 of the California Fish and Game Code establishes the following general concepts:
 - References “river,” “stream,” and “lake”
 - References “natural flow”
 - References “bed,” “bank,” and “channel”
- Applicable court decisions, in particular *Rutherford v. State of California* (188 Cal App. 3d 1276 (1987), which interpreted Section 1602’s use of “stream” to be as defined in common law. The Court indicated that a “stream” is commonly understood to:
 - Have a source and a terminus
 - Have banks and a channel
 - Convey flow at least periodically, but need not flow continuously and may at times appear outwardly dry
 - Represent the depression between the banks worn by the regular and usual flow of the water
 - Include the area between the opposing banks measured from the foot of the banks from the top of the water at its ordinary stage, including intervening sand bars
 - Include the land that is covered by the water in its ordinary low stage
 - Include lands below the OHWM
- CDFW regulations defining “stream” for other purposes, including sport fishing (14 CCR 1.72) and streambed alterations associated with cannabis production (14 CCR 722(c)(21)), which indicate that a stream:
 - Flows at least periodically or intermittently
 - Flows through a bed or channel having banks
 - Supports fish or aquatic life
 - Can be dry for a period of time
 - Includes watercourses where surface or subsurface flow supports or has supported riparian vegetation
- Guidance documents, including *A Field Guide to Lake and Streambed Alteration Agreements* (CDFG 1994) and *Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants* (Brady and Vyverberg 2013), which suggest the following:
 - A stream may flow perennially or episodically

- A stream is defined by the course in which water currently flows, or has flowed during the historic hydrologic course regime (approximately the last 200 years)
- Width of a stream course can reasonably be identified by physical or biological indicators
- A stream may have one or more channels (single-thread vs. compound form)
- Features such as braided channels, low-flow channels, active channels, banks associated with secondary channels, floodplains, islands, and stream-associated vegetation, are interconnected parts of the watercourse
- Canals, aqueducts, irrigation ditches, and other means of water conveyance can be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife
- Biologic components of a stream may include aquatic and riparian vegetation, all aquatic animals including fish, amphibians, reptiles, invertebrates, and terrestrial species which derive benefits from the stream system
- The lateral extent of a stream can be measured in different ways depending on the particular situation and the type of fish or wildlife resource at risk

Appendix C

Representative Site Photographs



Representative Photo 1: Kings River-South Fork, south bank, east of SR 41, facing north.



Representative Photo 2: Kings River Bridge with water-stained columns and wrackline of debris, facing north.



Representative Photo 3: Blakeley Canal with Wetland 1 and Wetland 2 in the background, facing north



Representative Photo 4: Tulare Lake Canal confluence with Kings River-South Fork Canal, facing east.



Representative Photo 5: Kings River-South Fork northbank, west of Kings River Bridge, facing northwest.



Representative Photo 6: Kings River-South Fork north bank, east of Kings River Bridge, facing northwest.



Representative Photo 7: Kings River-South Fork west bank with common tule in background, north of Laurel Avenue West crossing, facing north.



Representative Photo 8: Kings River-South Fork west bank, south of Laurel Avenue West crossing, facing north.



Representative Photo 9: Kings River-South Fork, south of Laurel Avenue West crossing, facing south.



Representative Photo 10: Kings River-South Fork, north of Laurel Avenue West crossing, facing north.



Representative Photo 11: Southern extreme of Wetland 1 near SP-2, facing west.

Representative Photo 12: Heavy disturbance in Wetland 1, facing north.



Representative Photo 13: Southern extreme of Wetland 2, facing north.



Representative Photo 14: Wetland 2 and Wetland 1 with Blakeley Canal between, facing south.



Representative Photo 15: Irrigation ditch excavated adjacent to agricultural field, facing south.



Representative Photo 16: Black willow thicket, north of Kings River-South Fork west of SR 41, facing south.



Representative Photo 17: Sample Point 1 taken within hydrophytic vegetation in the foreground and Sample Point 2 taken in the background beyond the hydrophytic vegetation, facing south.



Representative Photo 18: Sample Point 3 taken along Blakeley Canal in the background, facing east.



Representative Photo 19: Sample Point 4 taken where vegetation changed to upland habitat in well disturbed area, facing northwest.



Representative Photo 20: Sample Point 5 in background within hydrophytic vegetation and Sample Point 6 in foreground, facing southeast.

Appendix D

Data Forms and Summary

Table D-1 Observed Plant Species

| Scientific Name | Common Name | Wetland Indicator Status (AW)* |
|--|---|--------------------------------|
| <i>Amaranthus blitoides</i> | Procumbent pigweed | FACU |
| <i>Amsinckia menziesii</i> | Small-flowered fiddleneck | UPL |
| <i>Anthriscus caucalis</i> | bur chervil | UPL |
| <i>Chenopodium album</i> | Lambs' quarters | FACU |
| <i>Cirsium vulgare</i> | Bull thistle | FACU |
| <i>Cynodon dactylon</i> | Bermuda grass | FACU |
| <i>Cyperus eragrostis</i> | Flat sedge | FACW |
| <i>Juncus effusus</i> | Soft rush | FACW |
| <i>Laennecia coulteri</i> | Coulter's woolwort | FAC |
| <i>Lactuca serriola</i> | Prickly lettuce | FACU |
| <i>Lepidium nitidum</i> | Peppergrass | FAC |
| <i>Malva parviflora</i> | cheeseweed | UPL |
| <i>Populus fremontii</i> / <i>Populus deltoides</i> (NWPL) | Fremont cottonwood, eastern cottonwood (NWPL) | FAC |
| <i>Rubus armeniacus</i> | Himalayan blackberry | FAC |
| <i>Salix gooddingii</i> | Black willow | FACW |
| <i>Salix laevigata</i> | Red willow | FACW |
| <i>Salsola tragus</i> | Russian thistle | FACU |
| <i>Schoenoplectus acutus</i> | Common tule | OBL |
| <i>Sonchus asper</i> | sowthistle | FAC |
| <i>Tribulus terrestris</i> | Puncture vine | UPL |
| <i>Typha latifolia</i> | Common cattail | OBL |
| <i>Urtica dioica</i> | Stinging nettle | FAC |

*Wetland Indicator Status:

OBL Plants that always occur in standing water or in saturated soils

FACW Plants that nearly always occur in areas of prolonged flooding or require standing water or saturated soils but may, on rare occasions, occur in non-wetlands

FAC Plants that occur in a variety of habitats, including wetland and mesic to xeric non-wetland habitats, but commonly occur in standing water or saturated soils

FACU Plants that typically occur in xeric or mesic non-wetland habitats but may frequently occur in standing water or saturated soils

UPL Plants that rarely occur in water or saturated soils or species that are not listed are assumed to be UPL in accordance with Lichvar et al. 2016

Table D-2 Jurisdictional Features

| Aquatic Resource | Area/linear feet | Cowardin Class | Wetland Indicator Summary/Comments | Latitude | Longitude |
|--------------------------------------|------------------|-----------------------------------|--|------------|-------------|
| KR-1 (Kings River-South Fork) | 3.66 acres | Riverine (R3RB) | Non-wetland. This feature was mapped based on indicators of the OHWM. | 36.189971° | -119.84569° |
| KR-2 (Kings River-South Fork) | 4.82 acres | Riverine (R3RB) | Non-wetland. This feature was mapped based on indicators of the OHWM. | 36.179939° | -119.83415° |
| KR-3 ((Kings River-South Fork Canal) | 1.06 acres | Riverine (R5) | Non-wetland channelized. This feature was mapped based on indicators of the OHWM. | 36.178511° | -119.83333° |
| BC-1 (Blakeley Canal) | 0.60 acres | Riverine (R5) | Non-wetland channelized. This feature was mapped based on indicators of the OHWM. | 36.179257° | -119.83460° |
| BC-2 (Blakeley Canal) | 8.43 acres | Riverine (R5) | Non-wetland channelized. This feature was mapped based on indicators of the OHWM. | 36.178616° | -119.83482° |
| TLC-1 (Tulare Lake Canal) | 1.27 acres | Riverine (R5) | Non-wetland. This feature was mapped based on indicators of the OHWM. | 36.179736° | -119.83285° |
| Emergent Wetland 1 | 0.22 acres | Palustrine Forested Wetland (PFO) | <ul style="list-style-type: none"> Hydrophytic vegetation, primarily soft rush, bulrush, and black willow. Hydric Soils (F8) Hydrology (B7; B2; B3) | 36.179523° | -119.83471° |
| Emergent Wetland 2 | 0.32 acres | Palustrine Emergent Wetland (PEM) | <ul style="list-style-type: none"> Hydrophytic vegetation, primarily soft rush, Himalayan blackberry, Fremont cottonwood, and black willow. Hydrology (A3; B7) | 36.179372° | -119.83419° |
| Irrigation Ditch 1 | 0.20 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced. | 36.182276° | -119.83453° |
| Irrigation Ditch 2 | 0.20 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.181608° | -119.83382° |
| Irrigation Ditch 3 | 0.40 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.179973° | -119.83237° |
| Irrigation Ditch 4 | 0.04 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.179862° | -119.83216° |
| Irrigation Ditch 5 | 0.14 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.197875° | -119.83555° |
| Irrigation Ditch 6 | 0.06 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.178855° | -119.83518° |
| Irrigation Ditch 7 | 0.08 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.178502° | -119.83415° |


D-2

| Aquatic Resource | Area/linear feet | Cowardin Class | Wetland Indicator Summary/Comments | Latitude | Longitude |
|---------------------|------------------|----------------|---|------------|-------------|
| Irrigation Ditch 8 | 0.24 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.178206° | -119.83391° |
| Irrigation Ditch 9 | 1.56 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.177835° | -119.83515° |
| Irrigation Ditch 10 | 0.20 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.172166° | -119.84158° |
| Irrigation Ditch 11 | 0.14 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.190145° | -119.84274° |
| Irrigation Ditch 12 | 0.23 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.188632° | -119.84431° |
| Irrigation Ditch 13 | 0.20 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.182169° | -119.85068° |
| Irrigation Ditch 14 | 0.21 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.182194° | -119.85231° |
| Irrigation Ditch 15 | 0.48 acres | Upland (U) | Excavated vegetated irrigation ditch heavily monitored and artificially sourced | 36.175311° | -119.85176° |
| Irrigation Ditch 16 | 0.29 acres | Upland (U) | Excavated vegetated irrigation ditch heavily monitored and artificially sourced | 36.173948° | -119.85175° |
| Irrigation Ditch 17 | 0.19 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.172557° | -119.85054° |
| Irrigation Ditch 18 | 0.44 acres | Upland (U) | Excavated irrigation ditch heavily monitored and artificially sourced | 36.171579° | -119.85217° |
| Irrigation Ditch 19 | 0.20 acres | Upland (U) | Excavated vegetated irrigation ditch heavily monitored and artificially sourced | 36.176350° | -119.85040° |
| Irrigation Ditch 20 | 0.45 acres | Upland (U) | Excavated vegetated irrigation ditch heavily monitored and artificially sourced | 36.172878° | -119.85073° |
| Roadway Drainage | 0.02 acres | Upland (U) | Roadway drainage with input from culverts from SR 41 that does not connect to KR-2. | 36.180033° | -119.83488° |

| OHWM Delineation Cover Sheet | | Page <u>1</u> of <u>6</u> |
|--|----------------------|---------------------------|
| Project: <u>Stratford Bridge Replacement</u> | Date: <u>3/12/18</u> | |
| Location: <u>State Route 41 Crossing over Kings River</u> Investigator(s): <u>Carolynn Daman</u> | | |
| Project Description: Full bridge replacement on State Route 41 over the Kings River. Caltrans plans to replace the bridge and remove the 77 columns & 2 abutments and replace with 16 columns and 2 abutments. A dewatering plan will be in place for the duration of construction. | | |
| Describe the river or stream's condition (disturbances, in-stream structures, etc.): West South of the bridge is the Kings River. Contains in-stream emergent vegetation along water edge w/in OHWM. The Kings River has active flow during survey. 77 columns were observed in channel. East of bridge 3 channels observed with weirs. Water being pumped into Blakeley Canal north was observed during survey. | | |
| Off-site Information Remotely sensed image(s) acquired? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description: | | |
| Hydrologic/hydraulic information acquired? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No [If yes, attach information to datasheet(s) and describe below.] Description: During survey water observed no real flow through the study area. water was observed pumped north into from Blakeley Canal to channels weir and to confluence w/ Kings River. | | |
| List and describe any other supporting information received/acquired: | | |
| Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet. | | |

Datasheet # Kings River - South Fork OHWM Delineation Datasheet Page 2 of 6

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Looking North (North of Bridge)

Break in Slope at OHWM: ☒ Sharp ($> 60^\circ$) | ☐ Moderate ($30-60^\circ$) | ☐ Gentle ($< 30^\circ$) | ☐ None

Notes/Description: Sharp slope from water to top of slope with a change in vegetation.

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

| | Clay/Silt <0.05mm | Sand 0.05 - 2mm | Gravel 2mm - 1cm | Cobbles 1 - 10cm | Boulders >10cm | Developed Soil Horizons (Y/N) |
|------------|----------------------|--------------------|---------------------|---------------------|-------------------|----------------------------------|
| Above OHWM | 20 | 80 | | | | |
| Below OHWM | 50 | 50 | | | | |

Notes/Description: Sediment texture changes above OHWM. Below OHWM soil was saturated and contained a lot of debris and sediment buildup.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

| | Tree (%) | Shrub (%) | Herb (%) | Bare (%) |
|------------|----------|-----------|----------|----------|
| Above OHWM | 20 | | 80 | |
| Below OHWM | | | 10 | 90 |

Notes/Description: Emergent vegetation observed below OHWM and w/in water, while above OHWM on terrace at top of bank large willows were observed. Also below OHWM it was mostly bare due to active water.

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Wreckline was observed under bridge on south side, along with water staining on the bridge columns, exposed roots of willows on eroded banks, and litter and drift deposits.

Datasheet # Blakely Canal OHWM Delineation Datasheet Page 3 of 6

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

East

Looking South

Break in Slope at OHWM: ☒ Sharp ($> 60^\circ$) | ☐ Moderate ($30-60^\circ$) | ☐ Gentle ($< 30^\circ$) | ☐ None

Notes/Description:
Excised banks with scour approximately 3 ft. in height from water to top of bank.

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

| | Clay/Silt <0.05mm | Sand 0.05 - 2mm | Gravel 2mm - 1cm | Cobbles 1 - 10cm | Boulders >10cm | Developed Soil Horizons (Y/N) |
|------------|----------------------|--------------------|---------------------|---------------------|-------------------|----------------------------------|
| Above OHWM | 15 | 85 | | | | |
| Below OHWM | 100 | | | | | |

Notes/Description:
Below OHWM was underwater. Above OHWM was above top of bank which predominantly was sand with little debris on top soil.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

| | Tree (%) | Shrub (%) | Herb (%) | Bare (%) |
|------------|----------|-----------|----------|----------|
| Above OHWM | 8 | 2 | 80 | 10 |
| Below OHWM | | | 2 | 98 |

Notes/Description:
Small patches of emergent vegetation within channel below OHWM. Above OHWM on terrace contained areas of bare ground from vehicle use and parking, dense herbs with bank edge and in lower areas of terrace w/ canopy of willows and shrubs (blackberry).

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation
Litter and drift deposits observed on vegetation and lower limbs of willows, exposed roots of willow along banks observed.

Datasheet # King River South Fork OHWM Delineation Datasheet Page 4 of 6

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

East

Looking South West

Break in Slope at OHWM: ☒ Sharp ($> 60^\circ$) | ☐ Moderate ($30-60^\circ$) | ☐ Gentle ($< 30^\circ$) | ☐ None

Notes/Description:
Sharp slope

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

| | Clay/Silt <0.05mm | Sand 0.05 - 2mm | Gravel 2mm - 1cm | Cobbles 1 - 10cm | Boulders >10cm | Developed Soil Horizons (Y/N) |
|------------|----------------------|--------------------|---------------------|---------------------|-------------------|----------------------------------|
| Above OHWM | 20 | 60 | | | 20 | |
| Below OHWM | 20 | 60 | | | 20 | |

Notes/Description:
Boulder/large boulder - granite slabs used as riprap on the bank near stream channel to top of bank; on the other side majority sand substrate.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

| | Tree (%) | Shrub (%) | Herb (%) | Bare (%) |
|------------|----------|-----------|----------|----------|
| Above OHWM | 10 | 2 | 83 | 5 |
| Below OHWM | | | 2 | 98 |

Notes/Description:
Dispersed shrubs/forbes along at foot of the southwest bank. No vegetation observed on eastern bank. Emergent vegetation observed (blackberry, juncos) above OHWM.

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

| Datasheet # Tulare Lake Canal | | OHWM Delineation Datasheet | | Page 5 of 10 | |
|---|----------------------|----------------------------|---------------------|---------------------|-------------------|
| Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length) | | | | | |
| | | | | | |
| Break in Slope at OHWM: <input checked="" type="checkbox"/> Sharp ($> 60^\circ$) <input type="checkbox"/> Moderate ($30-60^\circ$) <input type="checkbox"/> Gentle ($< 30^\circ$) <input type="checkbox"/> None | | | | | |
| Notes/Description: Gradual slope on north side to steep at top. | | | | | |
| Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM | | | | | |
| | Clay/Silt <0.05mm | Sand 0.05 – 2mm | Gravel 2mm – 1cm | Cobbles 1 – 10cm | Boulders >10cm |
| Above OHWM | | 80 | | | 20 |
| Below OHWM | 5 | 75 | | | 20 |
| Notes/Description: South bank above & below OHWM contains broken concrete (rip-rap) while north bank just contains sand/gravel. | | | | | |
| Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM | | | | | |
| | Tree (%) | Shrub (%) | Herb (%) | Bare (%) | |
| Above OHWM | | | 2 | 98 | |
| Below OHWM | | | | 100 | |
| Notes/Description: majority of bare ground. sparse herbs observed on north bank above OHWM. | | | | | |
| Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation | | | | | |
| Highly disturbed land. Wreckline observed of small litter of leaves, water staining, | | | | | |

Laurel Ave

Datasheet # Kings River - South Fork OHWM Delineation Datasheet Page 6 of 6

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Break in Slope at OHWM: ☒ Sharp ($> 60^\circ$) | ☒ Moderate ($30-60^\circ$) | ☒ Gentle ($< 30^\circ$) | ☐ None

Notes/Description:
Sharp slope on westbank due to erosion. Eastern side ~~steeply~~ moderate slope to edge of artificial berm.

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

| | Clay/Silt <0.05mm | Sand 0.05 - 2mm | Gravel 2mm - 1cm | Cobbles 1 - 10cm | Boulders >10cm | Developed Soil Horizons (Y/N) |
|------------|----------------------|--------------------|---------------------|---------------------|-------------------|----------------------------------|
| Above OHWM | 100 | | | | | |
| Below OHWM | 95 | | | 5 | | |

Notes/Description:
Cobbles observed below OHWM are artificial (imported concrete) varying in size.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

| | Tree (%) | Shrub (%) | Herb (%) | Bare (%) |
|------------|----------|-----------|------------------|----------|
| Above OHWM | 1 | | 25 99 | |
| Below OHWM | | | 25 | 75 |

Notes/Description:
Majority of vegetation w/in channel is emergent (cattail & rush sp.). lots of bareground observed. Above OHWM is completely vegetated w/ rush sp. and grass species w/ occasional willow.

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Stratford Bridge Replacement City/County: Kings County Sampling Date: 3/12/2018
 Applicant/Owner: Caltrans State: CA Sampling Point: SP-1
 Investigator(s): Carolynn Daman and Sophia Murrell Section, Township, Range: S19, T20S, R20E
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR): C Lat: 36.179408 Long: -119.834878 Datum: WGS 84
 Soil Map Unit Name: Tulare clay, partially drained NWI classification: PSSA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Remarks: Emergent vegetation observed west of Blakeley Canal. Appears that overflow water from canal enters low area and ponds for a period of time. Disturbance made by vehicles in low area. Rain occurred 2 days prior to survey. | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>10 ft radius</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|---|------------------|-------------------|------------------|--|
| 1. <u>Salix gooddingii</u> | <u>5</u> | <u>Y</u> | <u>FACW</u> | Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>2</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>2/2</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | <u>5</u> | | | |
| = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | Prevalence Index worksheet: |
| 2. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 3. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 4. _____ | _____ | _____ | _____ | FACW species _____ x 2 = _____ |
| 5. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| = Total Cover | | | | FACU species _____ x 4 = _____ |
| Herb Stratum (Plot size: <u>5 ft radius</u>) | | | | UPL species _____ x 5 = _____ |
| 1. <u>Schoenoplectus acutus</u> | <u>7</u> | _____ | <u>OBL</u> | Column Totals: _____ (A) _____ (B) |
| 2. <u>Juncus effusus</u> | <u>80</u> | <u>Y</u> | <u>FACW</u> | |
| 3. <u>Anthriscus caucalis</u> | <u>3</u> | _____ | _____ | Prevalence Index = B/A = _____ |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | Hydrophytic Vegetation Indicators: |
| 6. _____ | _____ | _____ | _____ | <input checked="" type="checkbox"/> Dominance Test is >50% |
| 7. _____ | _____ | _____ | _____ | Prevalence Index is ≤3.0 ¹ |
| 8. _____ | _____ | _____ | _____ | Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 9. _____ | _____ | _____ | _____ | Problematic Hydrophytic Vegetation ¹ (Explain) |
| 10. _____ | <u>90</u> | | | |
| = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 2. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| % Bare Ground in Herb Stratum <u>5</u> % Cover of Biotic Crust _____ | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: Vegetation dominated by juncus and schoenoplectus. Bare ground also observed. Large willows were observed on western side of emergent vegetation. | | | | |

US Army Corps of Engineers

Arid West – Version 2.0

[illegible]

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Stratford Bridge Replacement City/County: Kings County Sampling Date: 3/12/2018
 Applicant/Owner: Caltrans State: CA Sampling Point: SP-2
 Investigator(s): Carolynn Daman and Sophia Murrell Section, Township, Range: S19, T20S, R20E
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): C Lat: 36.179320 Long: -119.834962 Datum: WGS 84
 Soil Map Unit Name: Tulare clay, partially drained NWI classification: PSSA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|---|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Remarks: Point was collect where vegetation changed and elevation began to increase. No inlet or outlet observed. | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>10 ft radius</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--|------------------------|-------------------|------------------|--|
| 1. <u>Salix gooddingii</u> | <u>2</u> | <u>Y</u> | <u>FACW</u> | Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>2</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>1/2</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | <u>2</u> = Total Cover | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | Prevalence Index worksheet: |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: |
| 2. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species _____ x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| 6. _____ | _____ | _____ | _____ | UPL species _____ x 5 = _____ |
| 7. _____ | _____ | _____ | _____ | Column Totals: _____ (A) _____ (B) |
| 8. _____ | _____ | _____ | _____ | Prevalence Index = B/A = _____ |
| 9. _____ | _____ | _____ | _____ | |
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| 98. _____ | _____ | _____ | _____ | |
| 99. _____ | _____ | _____ | _____ | |
| 100. _____ | _____ | _____ | _____ | |
| Woody Vine Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Indicators: |
| 1. _____ | _____ | _____ | _____ | ___ Dominance Test is >50% |
| 2. _____ | _____ | _____ | _____ | ___ Prevalence Index is ≤3.0 ¹ |
| 3. _____ | _____ | _____ | _____ | ___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 4. _____ | _____ | _____ | _____ | ___ Problematic Hydrophytic Vegetation ¹ (Explain) |
| 5. _____ | _____ | _____ | _____ | |
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| 100. _____ | _____ | _____ | _____ | |
| Herb Stratum (Plot size: <u>5 ft radius</u>) | | | | |
| 1. <u>Anthriscus caucalis</u> | <u>50</u> | <u>Y</u> | | |
| 2. _____ | _____ | _____ | | |
| 3. _____ | _____ | _____ | | |
| 4. _____ | _____ | _____ | | |
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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Stratford Bridge Replacement City/County: Kings County Sampling Date: 3/12/2018
 Applicant/Owner: Caltrans State: CA Sampling Point: SP-3
 Investigator(s): Carolynn Daman and Sophia Murrell Section, Township, Range: S19, T20S, R20E
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): C Lat: 36.179740 Long: -119.834520 Datum: WGS 84
 Soil Map Unit Name: Grangeville sandy loam, saline-alkali NWI classification: PSSA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Remarks: Point was collect adjacent to riverine system on top of terrace above OHWM where emergent vegetation was apparent. | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--|-------------------------------|-------------------|------------------|--|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: _____ (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | _____ | _____ | _____ | Prevalence Index worksheet: |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species <u>80</u> x 2 = <u>160</u> |
| 4. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| _____ = Total Cover | | | | UPL species <u>14</u> x 5 = <u>70</u> |
| | | | | Column Totals: <u>94</u> (A) <u>230</u> (B) |
| | | | | Prevalence Index = B/A = <u>2.44</u> |
| Herb Stratum (Plot size: <u>5 ft radius</u>) | _____ | _____ | _____ | Hydrophytic Vegetation Indicators: |
| 1. <u>Juncus effusus</u> | <u>80</u> | <u>Y</u> | <u>FACW</u> | _____ Dominance Test is >50% |
| 2. <u>Anthriscus caucalis</u> | <u>7</u> | _____ | <u>UPL</u> | <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ |
| 3. <u>Sonchus asper</u> | <u>5</u> | _____ | <u>UPL</u> | _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 4. <u>Stilbum marianum</u> | <u>2</u> | _____ | <u>UPL</u> | _____ Problematic Hydrophytic Vegetation ¹ (Explain) |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| Woody Vine Stratum (Plot size: _____) | _____ | _____ | _____ | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| % Bare Ground in Herb Stratum <u>6</u> | % Cover of Biotic Crust _____ | | | |
| Remarks: The juncus was dense and approximately 2.5 feet tall. Bare ground was observed due to a wildlife migration path to the waterfront. | | | | |

US Army Corps of Engineers

Arid West – Version 2.0

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Stratford Bridge Replacement City/County: Kings County Sampling Date: 3/12/2018
 Applicant/Owner: Caltrans State: CA Sampling Point: SP-4
 Investigator(s): Carolynn Daman and Sophia Murrell Section, Township, Range: S19, T20S, R20E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): C Lat: 36.179792 Long: -119.834631 Datum: WGS 84
 Soil Map Unit Name: Grangeville sandy loam, saline-alkali NWI classification: PSSA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|---|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Remarks: Point was collect adjacent to riverine system on top of terrace above OHWM where emergent vegetation was apparent. | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B) |
|---|------------------|-------------------|------------------|--|
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>5</u> x 3 = <u>15</u> FACU species <u>5</u> x 4 = <u>20</u> UPL species <u>78</u> x 5 = <u>390</u> Column Totals: <u>88</u> (A) <u>425</u> (B) Prevalence Index = B/A = <u>4.8</u> |
| Sapling/Shrub Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| Herb Stratum (Plot size: <u>5 ft radius</u>) | | | | Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) |
| 1. <u>Anthriscus caucalis</u> | <u>50</u> | <u>Y</u> | <u>UPL</u> | |
| 2. <u>Amsinckia menziesii</u> | <u>3</u> | | <u>UPL</u> | |
| 3. <u>Sonchus asper</u> | <u>10</u> | | <u>UPL</u> | |
| 4. <u>Laennecia coulteri</u> | <u>5</u> | | <u>FAC</u> | |
| 5. <u>Cirsium vulgare</u> | <u>5</u> | | <u>FACU</u> | |
| 6. <u>unkn</u> | <u>15</u> | | <u>UPL</u> | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| % Bare Ground in Herb Stratum <u>13</u> % Cover of Biotic Crust _____ | | | | |
| Remarks: Due to season, some plants were not identified due to a lack of identifiable characteristics to key species. Unknown species non hydrophytic. | | | | |

US Army Corps of Engineers

Arid West – Version 2.0

[illegible]

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Stratford Bridge Replacement City/County: Kings County Sampling Date: 3/12/2018
 Applicant/Owner: Caltrans State: CA Sampling Point: SP-5
 Investigator(s): Carolynn Daman and Sophia Murrell Section, Township, Range: S19, T20S, R20E
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR): C Lat: 36.180207 Long: -119.834752 Datum: WGS 84
 Soil Map Unit Name: Grangeville sandy loam, saline-alkali NWI classification: PSSA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Remarks: Point collected where emergent vegetation observed at the end of a roadway drainage from a culvert under SR-41. Appears water pools before entering Kings River during storm events. | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species | Indicator Status | Dominance Test worksheet: |
|---|------------------|------------------|------------------|--|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: _____ (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | Absolute % Cover | Dominant Species | Indicator Status | Prevalence Index worksheet: |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species <u>95</u> x 2 = <u>190</u> |
| 4. _____ | _____ | _____ | _____ | FAC species <u>2</u> x 3 = <u>6</u> |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| _____ = Total Cover | | | | UPL species <u>5</u> x 5 = <u>25</u> |
| | | | | Column Totals: <u>102</u> (A) <u>221</u> (B) |
| | | | | Prevalence Index = B/A = <u>2.16</u> |
| Herb Stratum (Plot size: <u>5 ft radius</u>) | Absolute % Cover | Dominant Species | Indicator Status | Hydrophytic Vegetation Indicators: |
| 1. <u>Juncus effusus</u> | <u>95</u> | <u>Y</u> | <u>FACW</u> | _____ Dominance Test is >50% |
| 2. <u>Anthriscus caucalis</u> | <u>5</u> | <u>UPL</u> | <u>FAC</u> | <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ |
| 3. <u>Urtica dioica</u> | <u>2</u> | <u>FAC</u> | <u>FAC</u> | _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 4. _____ | _____ | _____ | _____ | _____ Problematic Hydrophytic Vegetation ¹ (Explain) |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | Absolute % Cover | Dominant Species | Indicator Status | Hydrophytic Vegetation Indicators: |
| 1. _____ | _____ | _____ | _____ | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 2. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____ | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: One plant dominate. Dense vegetation | | | | |

US Army Corps of Engineers

Arid West – Version 2.0

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Stratford Bridge Replacement City/County: Kings County Sampling Date: 3/12/2018
 Applicant/Owner: Caltrans State: CA Sampling Point: SP-6
 Investigator(s): Carolynn Daman and Sophia Murrell Section, Township, Range: S19, T20S, R20E
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0
 Subregion (LRR): C Lat: 36.180224 Long: -119.834830 Datum: WGS 84
 Soil Map Unit Name: Grangeville sandy loam, saline-alkali NWI classification: PSSA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Remarks: Point collected where vegetation dominant species change as well as elevation change. | |

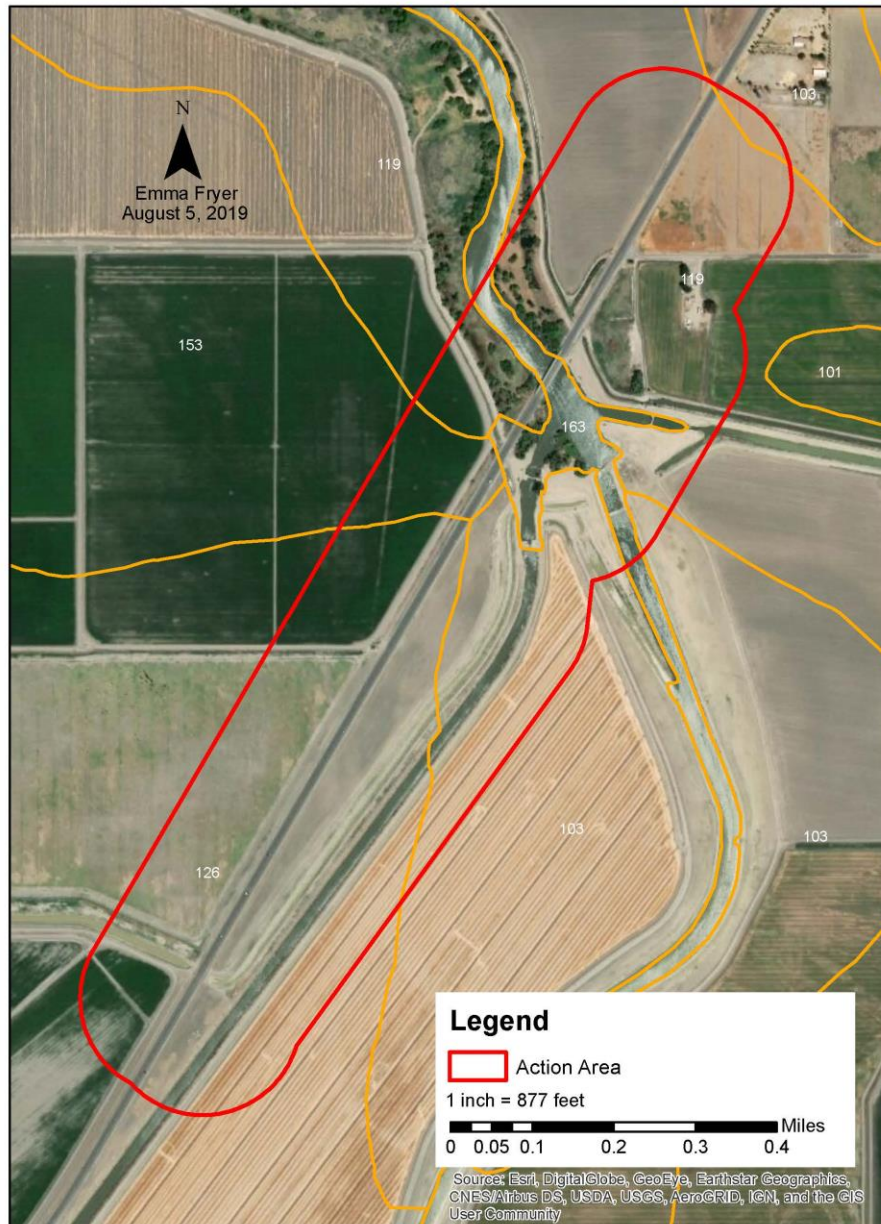
VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>10 ft radius</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--|------------------------|-------------------|------------------|--|
| 1. <u>Salix gooddingii</u> | <u>5</u> | <u>Y</u> | <u>FACW</u> | Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>2</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>1/2</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | <u>5</u> = Total Cover | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | Prevalence Index worksheet: |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species _____ x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| 6. _____ | _____ | _____ | _____ | UPL species _____ x 5 = _____ |
| 7. _____ | _____ | _____ | _____ | Column Totals: _____ (A) _____ (B) |
| 8. _____ | _____ | _____ | _____ | Prevalence Index = B/A = _____ |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
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Appendix D Soils Descriptions

Soils Present in Action Area



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Map Unit Description: Pitco clay partially drained---Kings County, California

Kings County, California

153—Pitco clay partially drained

Map Unit Setting

National map unit symbol: hhk7
Elevation: 190 to 210 feet
Mean annual precipitation: 7 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 260 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Pitco and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pitco

Setting

Landform: Rims on basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 23 inches: clay
2Cyzg - 23 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w



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Map Unit Description: Pitco clay partially drained---Kings County, California

Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Armona

Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Gepford

Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Tulare

Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Vanguard

Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Kings County, California
Survey Area Data: Version 14, Sep 12, 2018



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Map Unit Description: Tulare clay, partially drained, MLRA 17---Kings County, California

Kings County, California

163—Tulare clay, partially drained, MLRA 17

Map Unit Setting

National map unit symbol: 2xld3
Elevation: 180 to 190 feet
Mean annual precipitation: 8 to 8 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 311 to 319 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tulare and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tulare

Setting

Landform: Lakebeds
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Lacustrine deposits derived from igneous and sedimentary rock

Typical profile

Ap1 - 0 to 4 inches: clay
Ap2 - 4 to 12 inches: clay
Ap3 - 12 to 17 inches: clay
BAp - 17 to 22 inches: clay
Bkng1 - 22 to 29 inches: clay
Bkng2 - 29 to 39 inches: clay
Bkng3 - 39 to 52 inches: clay
Bkkng - 52 to 58 inches: clay
B'kng4 - 58 to 74 inches: silty clay
Bknyg - 74 to 87 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat):
Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 0 to 60 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Gypsum, maximum in profile: 10 percent



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Map Unit Description: Tulare clay, partially drained, MLRA 17---Kings County, California

Salinity, maximum in profile: Slightly saline to moderately saline
(6.0 to 10.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C
Hydric soil rating: Yes

Minor Components

Gepford, sandy substratum

Percent of map unit: 3 percent
Landform: Rims on basin floors
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Houser

Percent of map unit: 2 percent
Landform: Rims on basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Gepford

Percent of map unit: 2 percent
Landform: Rims on basin floors
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Homeland

Percent of map unit: 1 percent
Landform: Rims on basin floors
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Pitco

Percent of map unit: 1 percent
Landform: Basin floors on rims
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Tulare, rare flooding

Percent of map unit: 1 percent



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Map Unit Description: Tulare clay, partially drained, MLRA 17---Kings County, California

Landform: Lakebeds
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Data Source Information

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Map Unit Description: Grangeville sandy loam, saline-alkali--Kings County, California

Kings County, California

119—Grangeville sandy loam, saline-alkali

Map Unit Setting

National map unit symbol: hhj4
Elevation: 10 to 1,800 feet
Mean annual precipitation: 8 to 16 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Grangeville and similar soils: 85 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile

Ap - 0 to 6 inches: sandy loam
C1 - 6 to 21 inches: sandy loam
C2 - 21 to 63 inches: stratified loamy sand to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat):
Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B/D



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Map Unit Description: Grangeville sandy loam, saline-alkali--Kings County, California

Hydric soil rating: Yes

Minor Components

Armona

Percent of map unit: 2 percent

Landform: Basin floors

Hydric soil rating: Yes

Boggs

Percent of map unit: 2 percent

Landform: Alluvial flats

Hydric soil rating: Yes

Gepford

Percent of map unit: 2 percent

Landform: Basin floors

Hydric soil rating: Yes

Lakeside

Percent of map unit: 2 percent

Landform: Basin floors

Hydric soil rating: Yes

Lemoore

Percent of map unit: 2 percent

Landform: Basin floors

Hydric soil rating: Yes

Vanguard

Percent of map unit: 2 percent

Landform: Flood plains

Hydric soil rating: Yes

Nord

Percent of map unit: 1 percent

Hydric soil rating: No

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Map Unit Description: Houser clay, partially drained---Kings County, California

Kings County, California

126—Houser clay, partially drained

Map Unit Setting

National map unit symbol: hhjc
Elevation: 180 to 210 feet
Mean annual precipitation: 6 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 260 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Houser and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houser

Setting

Landform: Rims on basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Ap - 0 to 20 inches: clay
Cky - 20 to 60 inches: stratified silt loam to clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 3 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 45.0
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): 3w



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Map Unit Description: Houser clay, partially drained---Kings County, California

Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Houser, sandy loam

Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Rambla

Percent of map unit: 3 percent
Hydric soil rating: No

Lethent

Percent of map unit: 3 percent
Hydric soil rating: No

Boggs

Percent of map unit: 2 percent
Landform: Alluvial flats
Hydric soil rating: Yes

Gepford

Percent of map unit: 1 percent
Landform: Basin floors
Hydric soil rating: Yes

Tulare

Percent of map unit: 1 percent
Landform: Basin floors
Hydric soil rating: Yes

Westcamp

Percent of map unit: 1 percent
Landform: Basin floors
Hydric soil rating: Yes

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Map Unit Description: Boggs sandy loam, partially drained--Kings County, California

Kings County, California

103—Boggs sandy loam, partially drained

Map Unit Setting

National map unit symbol: hhhm
Elevation: 190 to 250 feet
Mean annual precipitation: 7 inches
Mean annual air temperature: 64 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Boggs and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boggs

Setting

Landform: Alluvial flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

Akz - 0 to 15 inches: sandy loam
Ckz - 15 to 38 inches: sandy loam
2AzB - 38 to 46 inches: stratified sand to clay loam
2Ckz - 46 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat):
Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Strongly saline (16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 65.0
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): 3w



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Map Unit Description: Boggs sandy loam, partially drained--Kings County, California

Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Armona

Percent of map unit: 5 percent
Landform: Basin floors
Hydric soil rating: Yes

Houser

Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Lemoore

Percent of map unit: 3 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Westcamp

Percent of map unit: 3 percent
Landform: Basin floors
Hydric soil rating: Yes

Data Source Information

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Appendix E Best Management Practices

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