Environmental Constraints Analysis

Department of Water Resources

Yolo Flood Risk Reduction Feasibility Study

Yolo, Yolo County, California
April 29, 2019

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Acronyms and Abbreviations

APE	Area of Potential Effects
BMP	Best Management Practice
Cal Fire	California Department of Forestry and Fire Protection
CCAP	Cache Creek Area Plan
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
County	Yolo County
CVFPP	Central Valley Flood Protection Plan
CWA	Clean Water Act
DWR	California Department of Water Resources
EIR	Environmental Impact Report
ESA	Endangered Species Act
Feasibility Study	Yolo Flood Risk Reduction Feasibility Study
FEMA	Federal Emergency Management Agency
GHG	Greenhouse Gas
HCP	Habitat Conservation Plan
iPaC	Information Planning and Consultation
MND	Mitigated Negative Declaration
NAHC	California Native American Heritage Commission
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NULE	Non-Urban Levee Evaluation
proposed project	Yolo Flood Risk Reduction Project
quad	quadrangle
RCD	Resource Conservation District
RWQCB	Regional Water Quality Control Board
SAGBI	Soil Agricultural Groundwater Banking Index
SHPO	State Historic Preservation Officer
SPFC	California State Plan of Flood Control
USACE	U.S. Army Corps of Engineers

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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1 Introduction

Yolo County (County), as lead agency, is initiating the Community of Yolo (Yolo) Flood Risk Reduction Feasibility Study (Feasibility Study). The County is studying the feasibility of providing flood damage reduction for the unincorporated and census-designated community of Yolo (proposed project).

Generally, a feasibility study is conducted by a lead agency to identify preferred structural and non-structural elements, multi-benefits, and constraints. The Feasibility Study to assess alternatives for reducing flood risk at Yolo also compares implementation costs and schedules, and identifies local funding requirements to assess options which will reduce the flood risk to Yolo. The alternative chosen is also intended to sustain agriculture and the regional economy, provide safe public access to the river, and improve the riverine habitat viability and regional levee maintenance governance.

1.1 Purpose and Scope of a Feasibility Study

During the planning phase of a proposed project, a feasibility study is often prepared to provide a description of the existing conditions and associated deficiencies, as well as an evaluation of alternative solutions to correct identified problems. A feasibility study typically includes a framing of the feasibility study objectives, a discussion of the project area and background, an identification of problems and opportunities, and definition of potential environmental constraints. Environmental constraints are restrictions that limit the planning process, such as resource constraints (i.e. biological, cultural, etc.); legal and policy constraints (i.e. laws, applicable policies, regulations, etc.); and permit requirements. The purpose of including an environmental constraints analysis within the feasibility study is to assist with the identification of key environmental issues that should be given due consideration during the planning and design phase of the project.

The analysis of environmental constraints is intended to facilitate the project planning process, assist with the evaluation of various alternatives, support definition of a preferred project, and identify potential permitting and mitigation requirements. This environmental constraints analysis focuses on one preferred structural alternative, described in Section 1.5, since this alternative has been developed to the point that a useful evaluation of environmental constraints is viable and can be informative for planning purposes. Specifically, this environmental constraints analysis identifies potential constraints based on the anticipated presence or absence of environmental resources; describes the consistency and/or compliance with existing policies; and identifies potential environmental mitigation costs that could be attributable to this alternative. Finally, this report also provides basic permit information. For comparison, other non-structural alternatives are also described in Section 1.6 of this document; however, these concepts have not been developed to the point to allow for a useful evaluation of environmental constraints, thus this report does not describe the potential environmental constraints related to the ecosystem and multi-benefit concepts.

The California Environmental Quality Act (CEQA) Guidelines Section 15262 states that “a project involving only feasibility or planning studies for possible future actions which an agency, board, or commission has not approved, adopted, or funded does not require

the preparation of an Environmental Impact Report or a Negative Declaration". Section 15262 of the CEQA Guidelines further defines that it does not apply to the adoption of a plan that will have a legally binding effect on later activities. Since the Feasibility Study is not legally binding to future activities, no documentation under CEQA has been prepared for the Feasibility Study. In addition, the ecosystem concepts and multi-benefit concepts identified in the Feasibility Study and summarized in this report are presented solely for planning purposes at this time. Their inclusion herein does not commit the County to any specific future actions and has no legally binding effect.

1.2 Project Area Location and Information

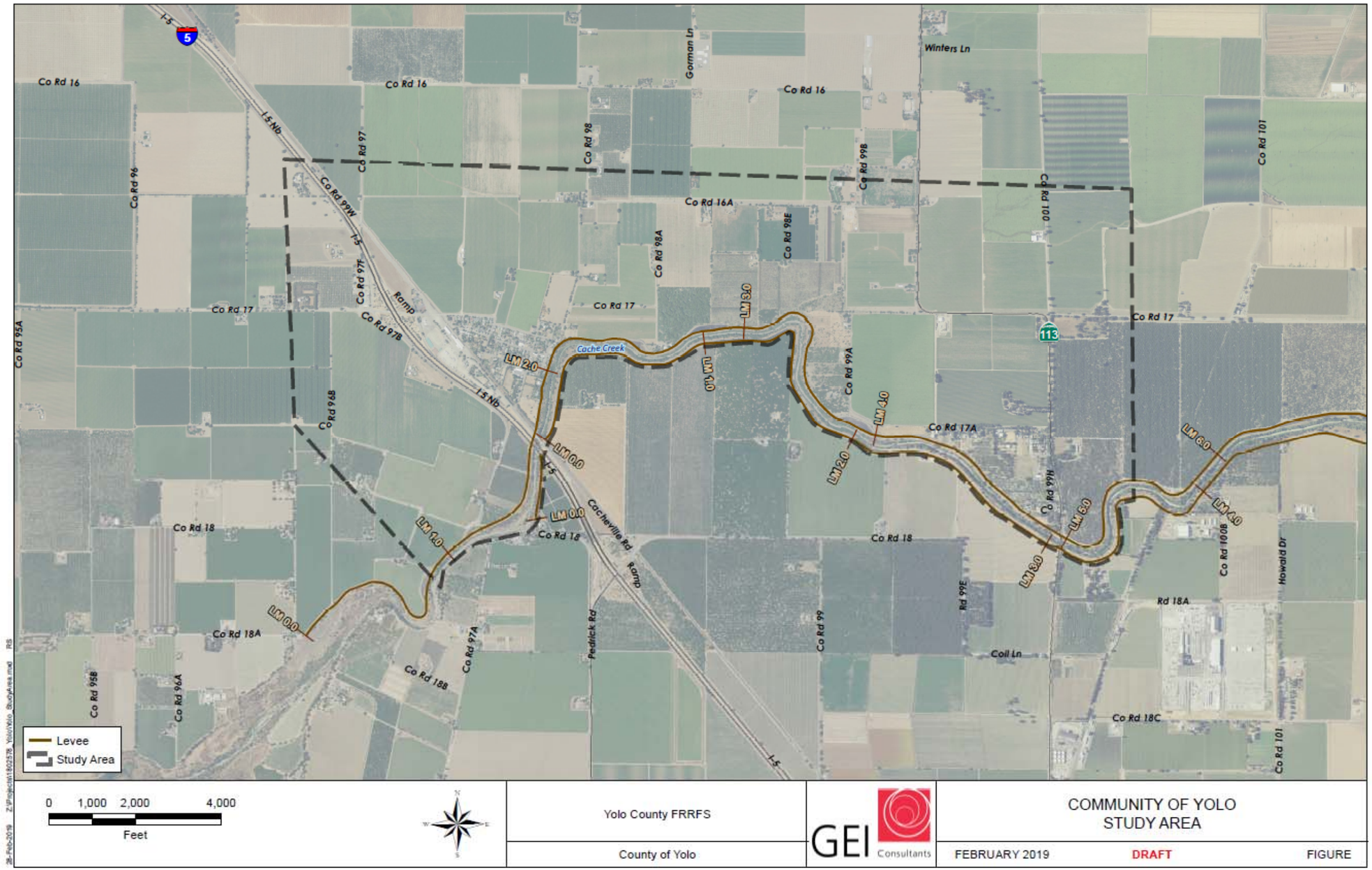
The proposed project is located in the community of Yolo, a census-designated place in Yolo County, California. **Figure 1-1** below provides an overview of the project area. Yolo is approximately 5 miles northwest of Woodland, California along Interstate 5, on the left bank of Cache Creek. Specifically, the community of Yolo is adjacent to the Cache Creek levee directly downstream of where Interstate 5 crosses Cache Creek. Cache Creek drains from west to east, starting near Clear Lake and terminating at the Cache Creek Settling Basin. The Cache Creek Setting Basin is bounded by levees on all sides and flows into the Yolo Bypass by means of an outlet weir. Yolo occupies approximately 1.4 square miles of land (**Figure 1-1**; community of Yolo designated within dotted line). The community is at an elevation between 75 and 82 feet and receives an average annual precipitation of 21 inches (WorldClimate 2019).

The project area for this flood risk reduction feasibility study includes the levee segment (Non-Urban Levee Evaluation (NULE) segment #41) along the north bank of Cache Creek, and the community of Yolo which it protects. This is also referred to as National Levee Database (NLD) segment 5204000412, Cache Creek – Unit 2, Right Bank CCK2, and described as the right (south) bank Cache Creek, right (west) bank CCSB, and right (south) bank CCSB between Interstate 5 and Yolo Bypass. This segment of levee is maintained by California Department of Water Resources.

There are approximately 161 housing units in Yolo, no hospitals and one school. According to a 2010 census, the population of Yolo is approximately 450 residents, which has remained fairly steady, with an estimated 453 residents in 2000, constituting a 0.66% decrease from 2000 to 2010 (Census Viewer 2012). In 2010 the median household income in Yolo was less than $46,166 (Yolo County 2019a). As this level of income is equal to or less than 80% of the statewide median household income of California, Yolo is designated as a "disadvantaged community" (DAC) (Yolo County 2019a).

According to the Yolo County General Plan Land Use Map, predominant land uses in Yolo include agriculture, commercial general, commercial local, residential low, residential medium, industrial, public and quasi-public, and open space (Yolo County 2019c). Lands immediately adjacent to the community of Yolo to the north, west, south and east are all designated for agricultural purposes (Yolo County 2019c).

Figure 1-1. Community of Yolo Project Area



1.3 Objectives of the Proposed Project

The objectives of the proposed project are to:

- Reduce the risks of flooding to life, property, and critical infrastructure
- Improve flood system resiliency and facilitate adaptation to future climate variability
- If feasible, attain a 100-year level of flood protection for the community of Yolo in accordance with Federal Emergency Management Agency's (FEMA) guidelines pursuant to Code of Federal Regulations (CFR) Section 65.10.
- Increase and improve the quantity, diversity, quality, and connectivity of riverine aquatic and floodplain habitats
- Contribute to the recovery and sustainability of native species populations and overall biotic community diversity
- Promote multi-benefit projects/provide recreational benefits
- Improve operations and maintenance
- Improve Institutional support

1.4 Need for the Proposed Project

The proposed project is located in the Central Valley of California which faces significant flood risk. According to the Department of Water Resources (DWR), "approximately 1 million Californians live and work in the floodplains of the valley, which contain approximately $80 billion worth of infrastructure, buildings, homes, and prime agricultural land" (DWR 2018). As a result, a major flood in the Central Valley could result in devastating loses, both financially and otherwise (DWR 2018). According to DWR, the Central Valley is home to more than 1,600 miles of State-Federal levees, and since 1983 these project levees have been breached or overtopped more than 70 times (DWR 2019). The Central Valley Flood Protection Plan (CVFPP) 2017 Update indicates that future floods are expected to result in greater damage due to such factors as climate change, subsistence, sea-level rise, and future population growth and development within floodplains (DWR 2017). Therefore, the proposed project is being studied to address the need for flood protection in this high flood risk community of California.

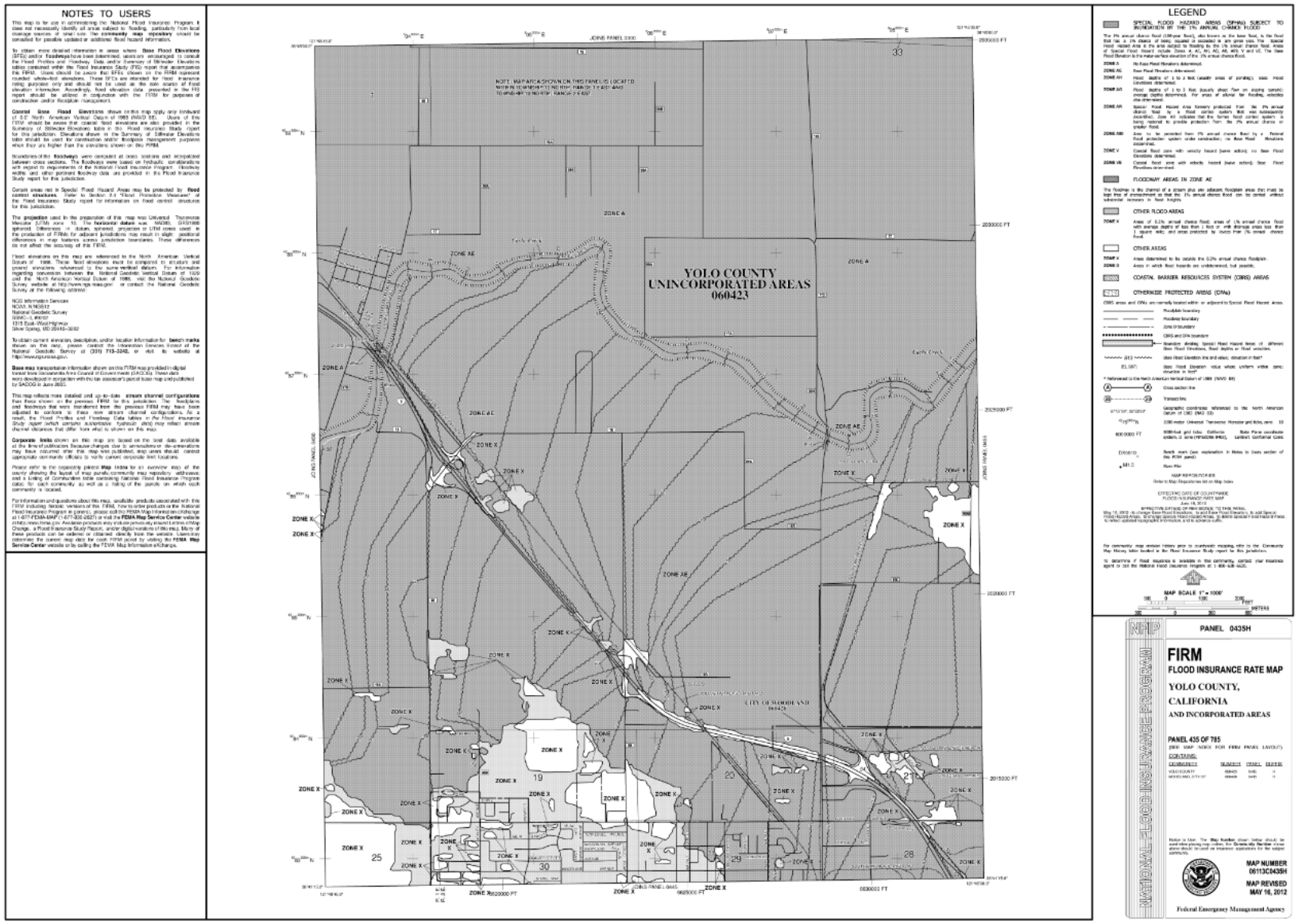
Yolo is located in the northwest portion of the Lower Sacramento/Delta North (LSDN) Regional Flood Management Plan (RFMP) area. Many Levee Maintaining Agencies (LMAs) in the noted RFMP area face infrastructural, funding, operations and maintenance, institutional, emergency response, and climate change issues that threaten the success of the existing flood management systems (Yolo County 2019a). Furthermore, perimeter levee conditions have rendered the levees insufficient to ensure future protection of the community and fall short of the target 100-year level of flood protection (Yolo County 2019a).

In 2012, Yolo was remapped by FEMA as Zone A and Zone AE on a Flood Insurance Rate Map (FIRM), meaning they are in the identified 100-year floodplain and those living within the zone must have flood insurance (see **Figure 1-2**). According to the FEMA

Flood Insurance Study for Yolo County, the existing Cache Creek levees are not in compliance with the requirements set forth in the National Flood Insurance Program (NFIP), and would likely fail in a larger event. Therefore, the proposed project is needed to provide increased flood protection for Yolo and would help meet DWR's Central Valley Flood Protection Plan (CVFPP) Conservation Strategy goals. The goals of the CVFPP Conservation Strategy include: improved flood risk management, the promotion of multi-benefit projects, increased operational and regulatory efficiency, and the promotion and restoration of ecosystem function in the Central Valley (DWR 2016). Specifically, the proposed project is needed because:

1. Yolo is threatened from flooding from Cache Creek to the east.
2. Previous investigations by DWR, through the Non-Urban Levee Evaluation (NULE) program, showed that levees protecting Yolo suffer from underseepage, through seepage, and stability issues (DWR 2015).

Figure 1-2. Yolo Project Area County Flood Insurance Rate Map



1.5 Preferred Structural Alternative

Based on the goals and objectives of the proposed project to improve flood risk management, enhance habitat restoration, provide recreational benefits, and support agricultural sustainability in Yolo, a wide array of preliminary flood risk reduction alternatives were scoped for the community of Yolo through the Small Communities Flood Risk Reduction grant program administered by DWR. Structural, nonstructural, and ecosystem alternatives were formulated and screened during the Feasibility Study scoping process and in the Yolo Multi-Benefits Opportunities Technical Memo (Yolo County 2019b). Non-structural and ecosystem alternatives are described in Section 1.6. The following six structural alternatives were formulated and evaluated during the Feasibility Study scoping process:

1. Vegetation clearing/sediment removal/dredging
2. Construction of additional setback levees
3. Construction of upstream flood control storage reservoir(s)
4. Restore/repair left (north) bank of Cache Creek levee to USACE 1957 Design Profile, including elimination of freeboard deficiencies and remediation of erosion concerns
5. Levee improvements for left (north) bank of Cache Creek to convey a 100-year flood event
6. Restore left (north) bank of Cache Creek levee to USACE 1957 Design Profile and levee improvements to convey a 100-year flood event (combination of #4 and #5 above)

Alternative 6 was selected as the preferred alternative. Alternative 6 generally met the criteria established in the Feasibility Study and is the only alternative evaluated further in this analysis. This alternative is summarized below (see **Figure 1-3**)

For the preferred alternative, the regulatory setting and regulatory consistency analysis are provided for each resource area (**Appendix A**). An analysis of environmental resources, which includes the existing conditions, such as the anticipated presence or absence of environmental resources, and the key environmental constraints, is provided in **Appendix B**.

Alternative 6: Restore Left (north) Bank of Cache Creek Levees to USACE 1957 Design Profile and Levee Improvement to Convey a 100-Year Flood Event

This alternative includes the following elements:

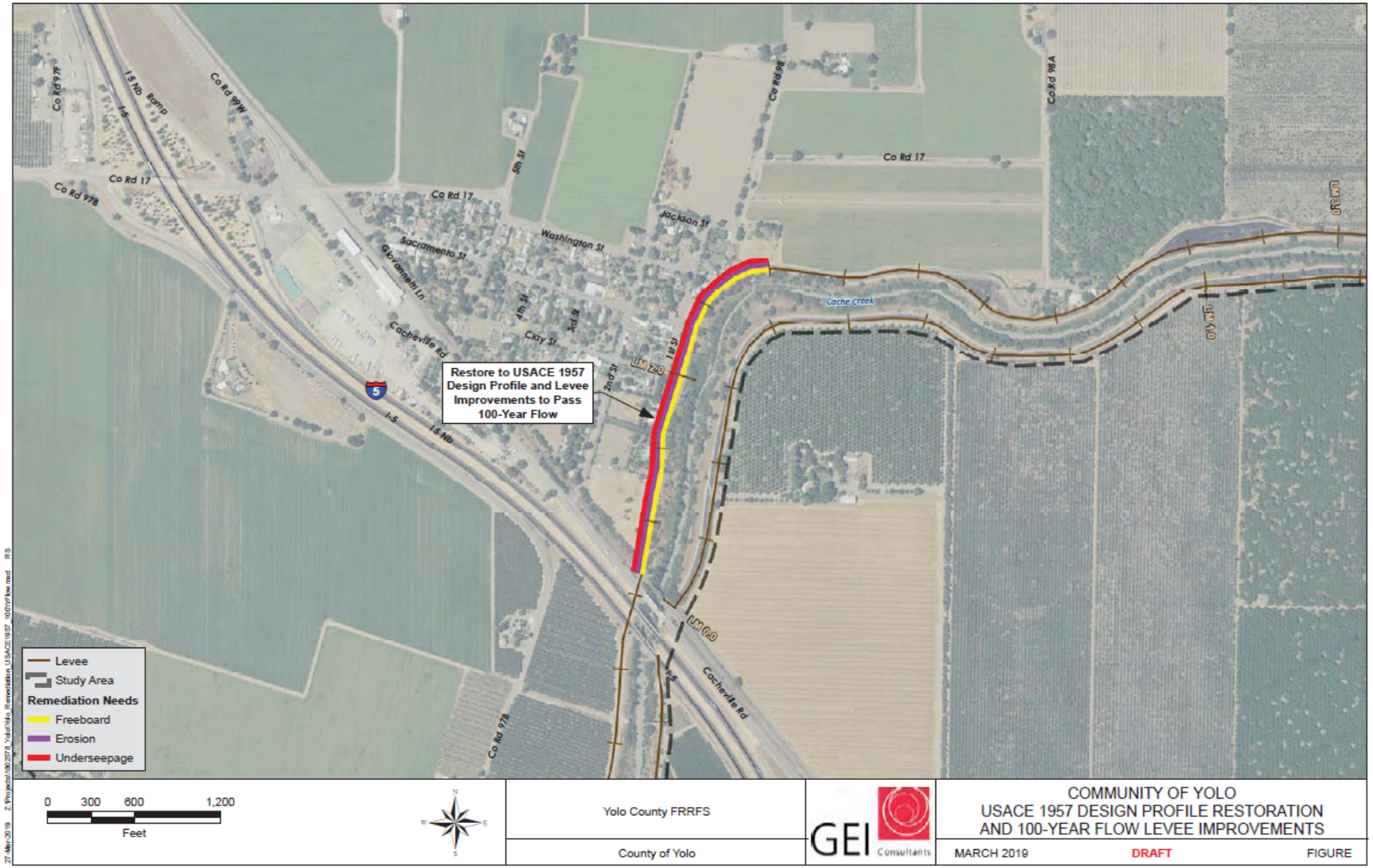
- Raise the north bank of the Cache Creek levee up to 4 feet above its current height along the segment adjoining the community of Yolo.
- Widen the Cache Creek north bank levee at its base by as much as 10 to 15 feet in certain locations, particularly along the downstream, easterly portion of the levee system.

- Improve the half-mile north bank levee segment directly adjacent to the community of Yolo with an appropriate soil-bentonite cut-off wall, utilizing standard open trenching techniques to address underseepage.
- Improve the levee prism to pass the 55/57 profile (USACE 1957 Design Profile requirements) with 3 feet of freeboard.
- Install rock slope protection along the waterside slope of the north bank levee segment to address erosion.

Alternative 6 Construction Methods

It is assumed that all activities would occur during a single construction season. Due to the physical space requirements for construction of the proposed cut-off walls and the relatively low height of the existing levee, it would be necessary to degrade the existing levee to ground elevation to provide at least a 35-foot-wide working surface for the equipment. After the cut-off wall is constructed, suitable levee fill material would be brought on site to construct the levee to the required elevation. Rock slope protection would then be added to the waterside slope.

Figure 1-3. Yolo Proposed Alternative 6 (Preferred Structural Alternative)



1.6 Non-Structural Alternatives, Ecosystem and Multi-Benefit Concepts

As discussed in Section 1.1, the non-structural alternatives, ecosystem and multi-benefit concepts identified in the Feasibility Study and Yolo Multi-Benefit Opportunities Technical Memo (Yolo County 2019) have been developed to a conceptual level only; therefore, they do not meet the definition of a "project" as defined by CEQA (PRC, Division 13, Section 21000 et seq.). The CEQA Guidelines define a project as the whole of an action, which has a potential for resulting in either the direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment (California Code of Regulations [CCR], Chapter 14, Section 15378). Further, as described in Section 1.1, the CEQA Guidelines Section 15262 states that a project involving only feasibility or planning studies for possible future actions which an agency, board, or commission has not approved, adopted, or funded does not required the preparation of an Environmental Impact Report or a Negative Declaration. Section 15262 does not apply to the adoption of a plan that will have a legally binding effect on later activities. Therefore, the non-structural alternatives, ecosystem and multi-benefit concepts are presented solely for planning purposes. These concepts have not been developed to the point to allow for a useful evaluation of environmental constraints, thus this report does not describe the potential environmental constraints related to the ecosystem and multi-benefit concepts.

1.6.1 Non-Structural Alternatives

In addition to the preferred structural alternative, three non-structural alternatives have been developed to a conceptual level and identified for their potential to reduce residual flood risk. The three non-structural alternatives include 1) changes to the NFIP; 2) voluntary flood proofing of existing structures behind the levee; and 3) voluntary structure raising of existing structures behind the levee, as described in further detail below. Non-structural alternatives can be implemented independent of or in combination with the preferred structural improvements described in Section 1.5.

Changes to the National Flood Insurance Program

The most significant non-structural flood risk reduction program is the NFIP which is administered by the FEMA. The NFIP focuses on mapping flood hazard areas nationwide, and requires that homes and other structures, with Federally backed mortgages, must carry flood insurance if the mapped area has less than 100-year flood protection. The Agricultural Floodplain Ordinance Task Force (AFOTF) recommended nine actions that address how rules and practices could be modified to: (1) reduce or remove elevation and floodproofing requirements for new and substantially improved agricultural structures, and (2) reduce the cost of flood insurance for agricultural structures with a federally backed mortgage to a more appropriate portion of the financial risk in the NFIP.

FEMA's insurance rates for structures behind a non-accredited levee are the same as if there was no levee at all. Yet many non-accredited levees provide protection from frequent floods and significantly reduce flood risk (Yolo County 2019a). The AFOTF recommends that FEMA use sound actuarial science to amend its insurance rates to

reflect the flood protection provided by a non-accredited levee as documented by a civil engineer, following a specific methodology and meeting specific criteria recommended by the Task Force.

Voluntary Flood Proofing

Damages to structures behind levees can be greatly reduced through effective flood proofing. This can be achieved through a combination of adjustments and/or additions of features that eliminate or reduce the potential for flood damage. Based on FEMA definition, examples of flood proofing could include, but would not be limited to, the following (Yolo County 2019a):

- Installation of watertight closures for doors and windows;
- Reinforcement of walls to withstand floodwater pressures and impact forces generated by floating debris;
- Use of membranes and other sealants to reduce seepage of floodwater through walls and wall penetrations;
- Installation of pumps to control interior water levels;
- Installation of check valves to prevent the entrance of floodwater or sewage flows through utilities; and
- Relocation of electrical, mechanical, utility, and other valuable damageable equipment and contents to above the expected flood level.

Voluntary Structure Raising

This non-structural alternative would lift existing structures behind the levee to an elevation which is at least equal to or greater than 1% annual chance flood elevation (100-year flood). Structures can be elevated using various methods such as extended foundation walls, on piers, post, piles and columns. This non-structural measure would be sustainable over the long term with minimal costs for operation, maintenance, repair, rehabilitation, and replacement.

1.6.2 Ecosystem and Multi-Benefit Concepts

Four ecosystem concepts would be implementable in connection with the preferred flood risk reduction alternative, including: the Cache Creek Non-Native Species Control Concept, the Working Waterways Projects Implementation Concept, the Cache Creek Gravel Pit Restoration Concept, and the Cache Creek Gravel Pit Recharge Basin Concept. These four ecosystem concepts are described below. In addition, recreational opportunities that are implementable in connection with any of the flood risk reduction alternatives are also described below.

Cache Creek Non-native Species Control Concept

This concept includes implementing a non-native species control effort within the Cache Creek watershed to control the spread of arundo (*Arundo donax*) and other invasive species. Healthy riparian systems in California are biologically diverse, supporting many terrestrial and aquatic species of plants, animals and insects. Arundo out-competes

native plants within riparian habitats due to its ability to monopolize soil moisture, light and space. Within the Cache Creek riparian corridor, arundo has successfully infested large areas of the stream bank. The California Invasive Plant Council (Cal-IPC) has mapped 85.7 acres of arundo infestation in Cache Creek (Yolo RCD 2018). However, ongoing eradication efforts by the Cache Creek Conservancy through their Invasive Weed Control Program have improved conditions along the lower Cache Creek over the last several years (Cache Creek Technical Advisory Committee 2017). The Yolo Resource Conservation District (RCD) is pursuing an arundo removal program along 52.8 miles of Cache Creek extending from the Yolo County line to the Sacramento River.

Arundo is known to have evapotranspiration rates six times higher than the replacement riparian vegetation (24 acre-feet/acre/year versus 4 acre-feet/acre/year). Based on this rate difference, eradication of arundo from waterways in the Cache Creek watershed would also lead to an average net annual increase in creek flow of approximately 20 acre-feet of water per acre of arundo removed per year. This conserved water would be available for native fish and other wildlife species living at the riparian edges, and for native riparian plants that support this wildlife. Water conserved would also increase baseline flows and may extend occurrence of water in the creeks later into the dry season (Yolo RCD 2018). Due to its rapid growth rate, arundo can also reduce flood conveyance capacity, reducing the creek's ability to pass large flood events.

Arundo removal and subsequent replanting with native species would restore the riparian ecosystem along Cache Creek that has been degraded by non-native species infestations. This would result in improving riparian function and enhancing natural plant species recruitment. In addition, dense monocultures restrict movement of native wildlife through and across the riparian corridor. Riparian zones are critical migratory corridors across the landscape and enhancing their function would benefit both wetlands and adjacent uplands. Replanting the riparian habitat with native vegetation following arundo removal would also contribute to listed plant species recovery and would support native wildlife species. Finally, land would be opened up for elderberry shrub recruitment, which supports the Valley elderberry longhorn beetle, and for bank improvements and riparian planting, which supports giant garter snakes, Western yellow-billed cuckoo, and least Bell's vireo (Yolo RCD 2018).

The Yolo Resource Conservation District (Yolo RCD) has experience with arundo control programs and is pursuing funding to conduct more extensive control. Therefore, the ability to integrate these efforts into flood system improvements within Yolo substantially enhances the feasibility of this concept.

Working Waterways Projects Implementation Concept

Yolo RCD has teamed with the Audubon Landowner Stewardship Program, the Solano Resource Conservation District, and the Solano Land Trust to pursue implementation of Working Waterways Projects (https://www.solanorcd.org/projects-and-programs/restoration/working-waterways-program.html) .Working Waterways Projects effort is focused on developing, installing and maintaining ecosystem function improvements on working landscapes in Yolo, Solano, and Colusa Counties. The Working Waterways Projects partners implemented a range of environmental projects on farm properties along working waterways using conservation funds from state and federal agencies.

Working Waterways Projects include three types of conservation projects: 1) Vegetating levees, ditches, and canals to slow water flow, filter out pesticides and sediments, and provide species habitat; 2) Restoring riparian habitat to stabilize stream banks and support species that provide pollination, biological control, and food; and 3) Constructing habitat or sediment ponds to control sediment and floods, to enable water reuse, and to create habitat (Solano Land Trust 2014).

The objective of this restoration concept is to identify how working waterways can be used to offset ecosystem impacts associated with flood system improvements and land use. As a representative project, the Yolo RCD and their partners implemented habitat restoration along Cottonwood Slough as part of this Working Waterways effort. Cottonwood Slough is located east of County Road 89 and south of Madison in Yolo County. The restoration effort included enhancing the north and south banks of the slough by planting with native riparian vegetation. The north bank was also sloped back approximately 30 feet into the adjacent farm field to widen flow capacity, and the banks were planted with native trees, shrubs, grasses, sedges and forbs. Post-installation plant maintenance included irrigation and weed management for two growing seasons to ensure satisfactory plant establishment. The project took three and one-half years to implement following receipt of agreement with landowner. Within this period, environmental permitting took the first six to nine months prior to any field activity, followed by earth-moving and plant installation that required nine to twelve months. The project's ecosystem benefits include increased water carrying capacity, increased floodwater storage and peak flow attenuation, improved water quality, expansion of wildlife and fish habitat, improved aesthetics, and increased groundwater recharge and carbon storage.

This type of project could be integrated into proposed flood planning and design improvements for the community of Yolo through a collaborative partnership with the Yolo RCD. The region surrounding the community includes an abundance of streams, canals and drainage ditches located along farm edges and the Yolo RCD has developed strong relationships with farmers in the region. It is anticipated that some farmers would be interested in these types of improvements if flood system funding could be leveraged to support the necessary technical work of the Yolo RCD to get the restoration improvement permitted and implemented.

Combined Cache Creek Gravel Pit Restoration and Recharge Basin Concepts

The Combined Cache Creek Gravel Pit Restoration and Recharge Basin Concept includes rehabilitating and restoring existing gravel pits located along Cache Creek upstream of Yolo to native habitat areas and groundwater recharge basins. These combined concepts would likely be complimentary and could be implemented concurrent to other flood risk reduction efforts.

Some of the existing gravel pits would require only minor rehabilitation for habitat purposes, whereas others would involve moderate to significant grading, terracing, and planting of native vegetation, including woody riparian and emergent marsh species. Terracing would help control soil erosion and stabilize existing berms. Providing for natural inundation through existing or modified topography would be recommended over operable water diversions from Cache Creek to inundate the pits. For groundwater

recharge, the best opportunities are located along the more unconfined channel reaches and within existing gravel operations (e.g., Teichert, Vulcan, Cemex).

The analysis of these combined concepts was limited to areas near the community of Yolo that had available LiDAR survey coverage. The focus of the effort was on identifying existing gravel pits and low-lying areas that could benefit from improved connectivity to Cache Creek with minimal excavation in order to increase the frequency of inundation of these areas for both habitat and groundwater recharge benefits.

Based on the UC Davis Soil Agricultural Groundwater Banking Index (SAGBI) Deep Percolation layer, the entire Cache Creek corridor has good potential for deep percolation – one characteristic needed for groundwater recharge to occur. This makes sense as substrate in the reach is relatively coarse (sands and gravels) (Yolo County 2019b). Another characteristic needed for groundwater recharge to occur is adequate space in the soil and rocks for water to infiltrate and fill. Based on the fall 2015 and 2017 evaluations of depth to groundwater levels (following a dry and wet winter/spring respectively), ample pore space is available for water to infiltrate. Even following a record winter (2017), depth to groundwater in the reach ranged from 70 to 90 feet the following fall.

With the understanding that groundwater recharge potential in the target reach is high, a detailed evaluation of LiDAR topography and aerial photographs led to numerous proposals for restoration and rehabilitation actions that could be taken to simultaneously improve habitat and groundwater recharge in this heavily mined reach of Cache Creek. These actions primarily consist of native plantings and targeted excavations to improve connectivity between individual pits and the creek. However, constraints associated with implementing connections between the gravel pits and the creek, such as the potential to cause fish strandings, would need to be explored in more detail before these efforts could progress. Also, extensive landowner and stakeholder engagement would be necessary to further refine and develop these concepts.

Recreational Opportunities

As part of the Cache Creek planning efforts in the early 1990's, the County prepared a report entitled Technical Studies and Recommendations for the Lower Cache Creek Resources Management Plan (referred to as the "1995 Technical Studies"). This report encourages recreational opportunities as a part of long-term planning efforts that would allow for future parks, public access points, staging areas, interpretive centers, and trail heads of a comprehensive parkway along the Cache Creek. The Cache Creek Parkway Plan and Class II Bike Lane between Yolo and Woodland, described below, are two recreational opportunities identified by the County as meeting the goals outlined in the 1995 Technical Studies.

- **Cache Creek Parkway Plan** - The Cache Creek Parkway Plan identifies a number of mining properties within close proximity to the community of Yolo with opportunities to develop recreational facilities. These include the 98-acre Teichert Woodland Muller property, the Teichert Muller Bridge, the 7-acre county borrow pit, the 115-acre Granite Woodland Reiff property, the 30-acre Rodgers property, and the 38.9-acre Correll property. All of these current and former mining properties are located east of County Road 94B along Cache Creek and within a 10-minute drive

from the community of Yolo. The potential recreational opportunities for these properties include, but are not limited to, the following:

- ***Teichert Woodland Muller Property*** – This property includes an existing conveyer bridge that could provide pedestrian access over the creek. It is also adjacent to the Granite Woodland Reiff property to the east and a nature preserve to the west, which would allow it to be developed as a recreational node and trail connection location.

- ***Teichert Muller Bridge*** – This existing bridge could be converted to a pedestrian crossing to provide a future link to a trail on the south side of the creek connecting to the Rodgers and Correll properties.

- ***County Borrow Pit*** – The property is leased by Teichert, who would be responsible for reclamation at the end of the lease term.

- ***Granite Woodland Reiff property*** – This property provides excellent direct public access to Cache Creek and CR 95B, with approximately 3,800 linear feet of creek frontage. It also provides a large active recreational opportunity and habitat restoration potential.

- ***Rodgers Property*** – This property provides passive recreational opportunities and good public access including potential parking.

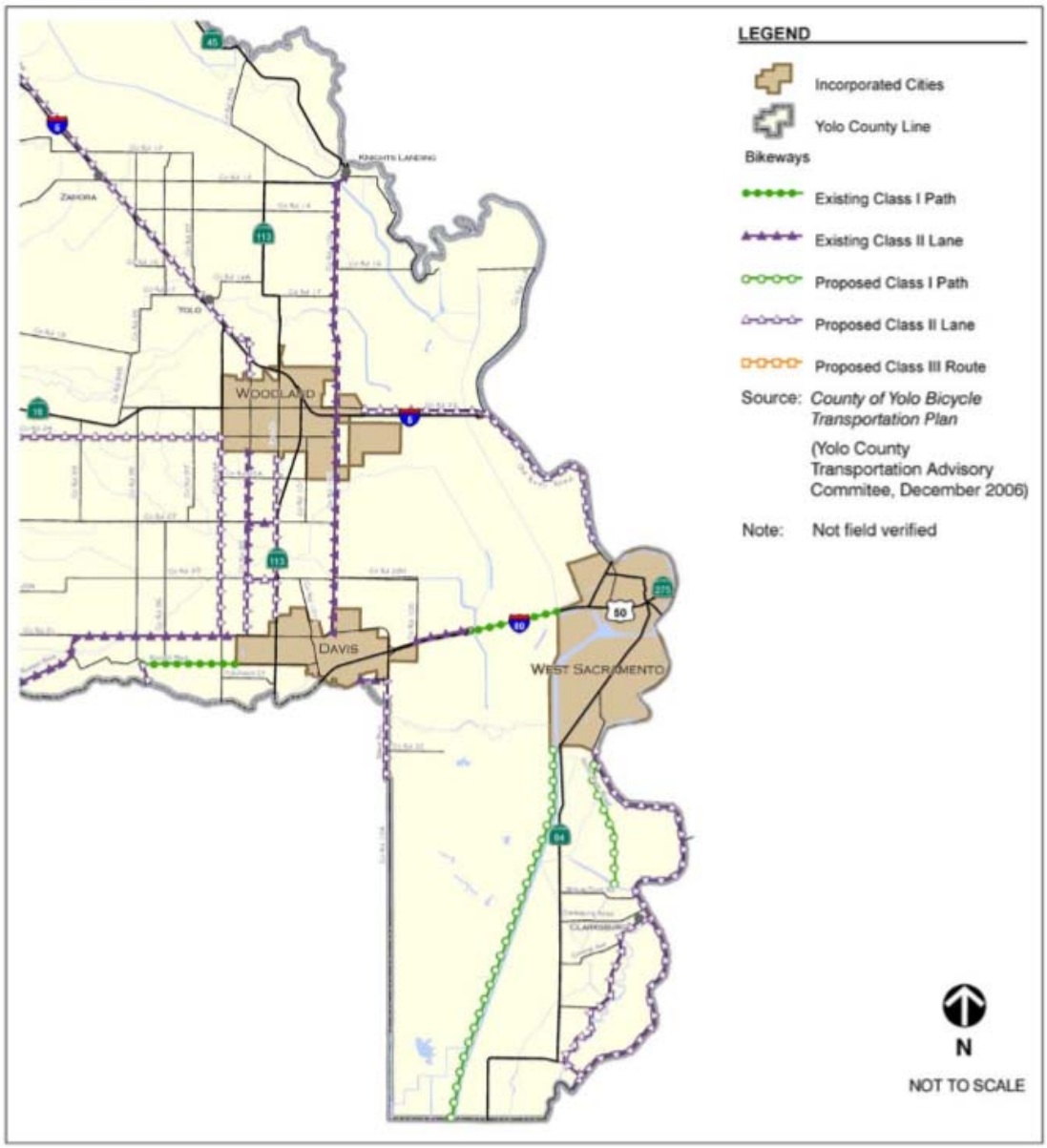
- ***Correll Property*** – This property provides passive recreational and riparian vegetation restoration opportunities. It would anchor the east end of the Parkway and could include trail connects with the Rodgers property.

The Parkway Plan also identifies trail and creek channel connections that extend through the length of the Cache Creek included in the Cache Creek Area Plan (CCAP). The Parkway Plan further identifies regional trail connections that extend east and west beyond the CCAP boundaries. For the regional trail extension to the east, it is proposed to follow the levees along the eastern length of Cache Creek extending through Yolo, continuing to the Cache Creek Settling Basin, and then extending along County Road 22 (CR 22) to South River Road and the City of West Sacramento. Two extensions are proposed to extend south from this eastern alignment following CR 99 and CR 102, respectively.

- **Class II Bike Lane between Yolo and Woodland** - The community of Yolo is located approximately 3.5 miles northeast of the City of Woodland, which represents a relatively short bicycling distance between the two communities. However, the local roads that would be used for bicycle commuting, including Cacheville Road, County Road 18 (CR 18), and CR 99, have narrow shoulders consisting of a mix of pavement and gravel, and vehicle speeds on these straight rural roadways can be quite high. These conditions discourage bicycle use on these roadways due to safety concerns. However, the Circulation Element of the 2030 Countywide General Plan (County of Yolo 2009) identifies a proposed Class II bike lane alignment that would more safely connect the community of Yolo to the City of Woodland's existing bicycle circulation system.

A Class II bike lane is a paved edge of a street or road delineated as a bike lane by white stripes and stencils. Figure CI-3B in the Circulation Element (see **Figure 1-4**) identifies the proposed bike lane alignment as extending southeast from Yolo along Cacheville Road to the intersection with CR 18.

Figure 1-4. Existing and Proposed Bikeways - East



(Source: County of Yolo 2009)

The alignment would continue east along CR 18 to the CR 18/CR 99 intersection, at which point it would extend south on CR 99 (West Street) to CR 20 (Kentucky Avenue), where it would connect to an existing Class II bike lane on CR 99 within the City of Woodland. This same Class II bike lane alignment is also identified in the County of Yolo Bicycle Transportation Plan (Yolo County Transportation Advisory Committee 2013, pg. A2-18). As identified in this plan, the project includes widening the existing 24-foot wide

roadways by four feet to accommodate Class II bike lanes on each side of the roadway alignment.

2 Research Methods

2.1 Environmental Constraints Analysis Methodology

A desktop analysis was performed in order to determine potential environmental constraints associated with the implementation of the preferred structural alternative. Criteria from Appendix G of the California Environmental Quality Act (CEQA) Guidelines was used as a framework to determine potentially significant impacts on different resource areas, and was also used as a means to determine if CEQA documentation would be required for the preferred alternative. The resource areas evaluated include the following:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality and Green House Gas (GHG) Emissions
- Biological Resources
- Cultural and Tribal Cultural Resources
- Energy
- Geology and Soils
- Mineral Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Public Services
- Recreation
- Transportation
- Utilities and Service Systems
- Wildfire

The results of that analysis are provided in **Appendix B** of this report, and a summary of potential environmental constraints is provided in **Section 3.2**. A regulatory consistency analysis was also performed for the proposed project to determine the preferred alternative's conformance to relevant federal, state, and local regulations under each of the evaluated resource areas **(Appendix A).** Primary data sources used during the desktop analysis include the following:

- Yolo County General Plan and Final Environmental Impact Report (EIR)

- California Department of Conservation Farmland Mapping and Monitoring Program
- California Department of Conservation Williamson Act Maps
- California Department of Forestry and Fire Protection (Cal Fire) Hazard Severity Zone Maps
- California Department of Transportation Scenic Highway Maps
- California State Water Resources Control Board GeoTracker Database
- Department of Toxic Substances Control (DTSC) EnviroStor Database
- Yolo-Solano Air Quality Management District
- U.S. Fish and Wildlife Service Critical Habitat Maps
- California Energy Commission
- Yolo County Climate Action Plan

In addition to the environmental constraints and regulatory consistency analyses, separate in-depth biological resources and cultural resources analyses were conducted to support the environmental constraints analysis, as described in further detail below. The Biological Resources Analysis is provided in **Appendix C** and the Cultural Resources Analysis is located in **Appendix D**.

2.2 Biological Resources Analysis Methodology

The Biological Resources Analysis is provided in **Appendix C**. The methodology is described below.

2.2.1 Desktop Review

A desktop review was undertaken to assess potential biological constraints in the Yolo project area (**Appendix C, Figure 1**), which included two steps to collect data on special-status species, vegetation communities, sensitive communities, protected lands, and federally-protected aquatic resources with the potential to occur in the project area. First, preliminary database searches were performed to identify aquatic resources and special-status species with the potential to occur in the project area. Second, a preliminary review of recent aerial imagery and land use maps was conducted to collect site-specific data regarding habitat suitability for special-status species, and to see if any protected lands overlap with the project area.

Database searches were performed on the following websites:

- U.S. Fish and Wildlife Service's (USFWS) Information Planning and Consultation (IPaC) System (2018a);
- USFWS Critical Habitat Portal (2018b);
- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) in BIOS 5 (2018);

- California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) (2018);
- USFWS National Wetland Inventory (2018c); and,
- U.S. Geological Survey (USGS) topographical map.

A search of the USFWS National Wetlands Inventory was performed for the project area to identify aquatic resources that could be affected by the proposed activities. In addition, a query of the USFWS IPaC system was performed to identify federally listed species that may occur in or adjacent to the project area. A query of the CDFW CNDDB provided a list of processed and unprocessed special-status species occurrences within the Woodland California US Geological Survey 7.5 minute quadrangle (quad), as well as all adjacent quads. Lastly, the CNPS CRPR database was queried to identify special-status plant species with the potential to occur in the aforementioned quads. The raw data returned from the database queries is provided in **Appendix C, Attachment A**. In addition to the database queries, a review of land ownership layers in CNDDB BIOS was conducted to locate protected lands, including wildlife refuges and conservation easements. The Yolo County Habitat Conservation Plan (HCP) (ICF 2018) was also reviewed for consistency regarding vegetation communities identified in the project area, as well as for relevant resources and special status species.

2.2.2 Reconnaissance Survey

A site visit was conducted on July 20, 2018, to verify the results of the desktop review. HDR biologists drove on publicly accessible roads throughout the project area to record existing vegetation communities, aquatic resources, and species observed. Most portions of the project area were able to be directly observed. However, due to accessibility issues, Cache Creek was only observable from two road crossings; therefore, a detailed survey of the creek was not conducted. A summary of the results of the site visit are included in Section 3.2.

2.3 Cultural Resources Analysis Methodology

A cultural resources records search was requested from the Northwest Information Center of the California Historical Resources Information System located at Sonoma State University. The records search included California's database of previous studies and previously recorded sensitive sites within the project area and within a one-quarter mile radius.

A desktop investigation of the project area was also conducted by qualified archaeologists. As a result of the desktop investigation, a draft Area of Potential Effects (APE) map for cultural resources in and surrounding the project area was established. The APE map and summary of the results of the records search and desktop investigation are provided in a technical memorandum attached as **Appendix D**. The technical memorandum includes the technical data review and discussion of cultural resources and their potential for sensitivity. The findings of the technical memorandum have been incorporated into **Section 3.2**.

3 Results

3.1 Regulatory Consistency Analysis

The results of the Regulatory Consistency Analysis, provided in **Appendix A**, are summarized below. Based on the results of the analysis, potential regulatory conflicts could exist for agricultural resources, biological resources, cultural resources, air quality and greenhouse gas emissions and noise. Other resources would comply with applicable federal, state and local regulations.

Agricultural Resources

The proposed project would have the potential to disturb lands designated as Prime Farmland, Unique Farmland, Farmland of Statewide Importance, or Farmland of Local Potential during construction activities (DOC 2018). This results in the potential to conflict with the Farmland Mapping and Monitoring Program and Yolo County General Plan Agriculture and Economic Development Element.

The proposed project would also potentially conflict with the Williamson Act Program. According to the Department of Conservation Yolo County Williamson Act FY 2010/11 Map, Williamson Act Prime Agricultural Land is located within the proposed project area (DOC 2012) and ground disturbing activities or work within these areas has the potential to disturb a property under a Williamson Act Contract.

Biological Resources

The proposed project could conflict with biological resource regulations. Based on a preliminary review of biological resources databases and a site reconnaissance, the project area appears to contain suitable habitat for several special-status species and includes protected aquatic resources. Proposed project activities have the potential to impact any of the biological resources listed in **Appendix C, Table 1**, should they be present in the vicinity of the proposed work area. Prior to project implementation, consultation with resource agencies and acquisition of permits would be necessary.

Cultural Resources

Based on a review of the records search results, historic map review, and the site reconnaissance provided in **Appendix D**, four prehistoric archaeological sites and eight historic archaeological sites were identified as intersecting the project area. An additional five prehistoric sites and two historic archaeological sites were identified within 0.25 mile. One site was determined not eligible for the NRHP and CRHR; the remaining sites are all unevaluated. Proposed project activities have the potential to impact these cultural resources, should they be identified within, or potentially in the vicinity of, a proposed work area. Any newly discovered archaeological site(s) which cannot be avoided by the proposed project would also require evaluation for eligibility to the CRHR and/or NRHP. If eligible, additional mitigation could be required if significant impacts/adverse effects could not be avoided.

Air Quality, GHG Emissions, and Noise

During construction, the preferred alternative would require the use of construction vehicles and equipment on a temporary basis. Significant air quality impacts could result on a short-term basis from particulate matter generated during construction activities, such as dust and equipment exhaust. The proposed project would also generate GHG emissions during the operation of construction vehicles and equipment. The proposed project would adhere to Best Management Practices to minimize air quality and GHG emissions impacts, but there remains potential that the proposed project would not conform to the Clean Air Act and relevant GHG regulations.

The proposed project would generate increased noise conditions during proposed project construction activities. With noise sensitive receptors in close proximity (schools, residents, etc.), there is a potential that the proposed project would not adhere to noise thresholds outlined in the Yolo County General Plan.

Other Resources

Based on the Regulatory Consistency Analysis provided in **Appendix A**, and following the resource categories outlined in CEQA Guidelines Appendix G, the proposed project would conform to all federal, state and local regulations under aesthetics; energy; geology and soils; hazards and hazardous materials; hydrology and water quality; land use and planning; mineral resources; public services; utilities and service systems; recreation; transportation; and wildfire. In many cases, regulatory compliance is contingent upon implementation of appropriate Best Management Practices (BMPs), such as those required to protect water quality, and proper permitting. Those permits and approvals that could be required prior to implementation of the proposed project are provided in **Table 4-1.**

3.2 Summary of Potential Environmental Constraints

Resources with No Impacts

Based on the Existing Conditions and Environmental Constraints Analysis, environmental constraints would not occur under the following resources:

- Aesthetics
- Energy
- Land Use and Planning
- Public Services
- Recreation
- Wildfire

Table 3-1 presents a summary of potential environmental constraints under the preferred structural alternative. Only those resource areas with potential constraints are included in **Table 3-1**. The full analysis is provided in **Appendix B,** Existing Conditions and Environmental Constraints.

Table 3-1. Summary of Potential Environmental Constraints under the Preferred Structural Alternative

Potential Environmental Constraints	Structural Preferred Alternative
Agriculture and Forestry Resources	
Would the project result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance?	✓
Is the project located on a Williamson Act Contract property, or would it disturb a property under the Williamson Act Contract?	✓
Air Quality and GHG Emissions	
Would project result in substantial emissions?	✓
Would the project expose sensitive receptors to substantial pollutant concentrations?	✓
Would the project generate GHG emissions either directly or indirectly?	✓
Biological Resources	
Is the Project located adjacent to terrestrial or aquatic habitat areas for state or federally listed endangered, threatened, or candidate species?	✓
Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	✓
Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	✓
Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	✓
Would the Project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	✓
Cultural and Tribal Cultural Resources	
Do known historical, archaeological, or tribal sites or resources occur in the Project Area?	✓
Does the Project require excavations or ground disturbance that could inadvertently impact known or unknown cultural, historical, or archaeological resources?	✓
Would the Project disturb human remains, including those encountered outside of dedicated cemeteries?	✓
Geology, Soils and Mineral Resources	
Would the project require excavations, grading, or other ground disturbing activities capable of causing erosion or loss of topsoil?	✓
Do known paleontological resources exist in the Project Area?	✓
Hazards and Hazardous Materials	
Does the Project require the use or routine transport of hazardous materials?	✓
Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	✓

Potential Environmental Constraints	Structural Preferred Alternative
Hydrology and Water Quality	
Would the project alter the drainage pattern of the site or area in a manner which would result in substantial erosion or siltation?	✓
Would the Project alter the drainage pattern of the site or area or result in an increase in surface runoff in a manner which would result in flooding on- or off-site?	✓
Is the Project located within a 100-year flood hazard area?	✓
Mineral Resources	
Are mineral resources present in the project area?	✓
Noise	
Would the project generate noise in excess of thresholds outlined in the county noise ordinance or general plan?	✓
Would the Project generate excessive ground borne vibration or ground borne noise levels?	✓
Transportation	
Would the Project result in disruptions to traffic or the circulatory system?	✓
Utilities and Service Systems	
Would the Project require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities or expansion of existing facilities, the construction or relocation of which could cause significant environmental effects?	✓

As shown in **Table 3-1**, the preferred structural alternative (described in Section 1.5) could result in impacts on agriculture and forestry resources; air quality and GHG emissions; biological resources; cultural and tribal cultural resources; geology and soils; mineral resources; hazards and hazardous materials; hydrology and water quality; noise, transportation, and utilities and service systems.

4 Environmental Documentation, Permits and Approvals

4.1 California Environmental Quality Act

Based on the results of the environmental constraints analysis, it is likely that the preferred alternative would result in an impact on the environment and therefore, CEQA documentation would be required. CEQA requires that all state and local government agencies consider the environmental consequences of projects they propose to carry out, or over which they have discretionary authority, before implementing or approving those projects. As specified in Section 15367 of the State CEQA Guidelines, the public agency that has the principal responsibility for carrying out or approving a project, as defined above and as described in more detail below, is the lead agency for purposes of CEQA. As specified in Section 15064(a) of the state CEQA Guidelines, if there is substantial evidence (such as the results of an Initial Study (IS)) that a project, either

individually or cumulatively, could have a significant effect on the environment that cannot effectively be mitigated to a less-than-significant level, the lead agency must prepare an EIR. The lead agency may instead prepare an IS if it determined that there is no substantial evidence that the project could cause a significant impact to the environment. The lead agency may prepare a Mitigated Negative Declaration (MND), if in the course of the IS analysis, the agency finds that the project would have no significant environmental impacts or could have a significant impact to the environment but that implementing specific mitigation measures would reduce any such impacts to a less-than-significant level (state CEQA Guidelines, Section 15064[f]). The level of CEQA documentation that would be required for the proposed project would be determined after the Feasibility Study is completed and once the project moves into the design phase.

4.2 National Environmental Policy Act

Based on the results of the Environmental Constraints Analysis (ECA), it is likely that the project would require compliance with federal regulations, such as the Clean Water Act, Section 404; National Historic Preservation Act, Section 106; and Endangered Species Act (ESA), Section 7, as described in **Section 4.3, Permits**. Because these federal permits and consultations would likely be required, compliance with the National Environmental Policy Act (NEPA) could be triggered. In addition, all of the Yolo Levee System levees are part of the California State Plan of Flood Control (SPFC) and thus are identified as state/federal facilities; therefore, any modifications to the levees could also trigger the need for NEPA compliance, as well as a Rivers and Harbors Act, Section 408 permit. The level of NEPA documentation that would be required for the proposed project would be determined during the permitting process.

4.3 Permits and Approvals

Several Federal, state, and local permits and/or authorizations are anticipated for the proposed project. **Table 4-1** summarizes the potential permits and approvals that may be associated with the proposed project. The regulations and ordinances listed below represent a preliminary assessment of permitting requirements, which would be refined through subsequent project design and preparation of a detailed project description.

The preferred alternative would directly and indirectly affect sensitive natural resources, including waters of the U.S. All potential waters of the U.S., including wetlands, identified within the project area may be regulated by the U.S. Army Corps of Engineers (USACE) through section 404 of the Clean Water Act (CWA) and by the Regional Water Quality Control Board (RWQCB) as waters of the State through Section 401. All ecological systems associated with drainages (i.e. potential waters of the U.S.), and drainage features with bed and bank topography may also be regulated by Sections 1600-1616 of the California Fish and Game Code. In conjunction with the USACE Section 404 permit, impacts on wetlands and waters would require a Section 401 Water Quality Certification or Waste Discharge Requirement from RWQCB and CDFW Section 1602 Streambed Alteration Agreement. Also, the proposed project has the potential to affect more than 1.0 acre of soil, triggering the requirement of a National Pollutant Discharge Elimination System (NPDES) General Permit from the RWQCB.

Finally, the proposed project has the potential to adversely affect special-status species. Direct and/or indirect impact to federal and state listed species and their habitat would require formal consultation with the USFWS (Biological Opinion/Take Statement for Federal-listed species) and CDFW (2081 Incidental Take Permit for State-listed species) to determine the levels of take.

Table 4-1. Potential Environmental Permits and Approvals

Agency	Type of Permit or Approval	Regulated Activity
Federal		
U.S. Army Corps of Engineers	Clean Water Act, Section 404 Permit	Discharges of dredged or fill material into waters of the U.S., including wetlands
State Historic Preservation Officer (SHPO)	National Historic Preservation Act, Section 106 Consultation	Potential effects on properties listed in, or eligible for listing in the National Register of Historic Places
U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS)	Endangered Species Act (ESA), Section 7 Consultation	Potential effects on federally-listed species
State		
California Department of Fish and Wildlife (CDFW)	California ESA Take Authorization, California Fish and Game Code, Section 2081 Consultation	Potential for take of state-listed species
CDFW	California Fish and Game Code, Section 1602 Streambed Alteration Agreement	Alteration of bed, bank, or associated riparian areas
California Native American Heritage Commission (NAHC)	Assembly Bill 52 (CEQA), NAHC Consultation	Potential effects on Native American burials or artifacts
Local		
Regional Water Quality Control Board (RWQCB)	CWA, Section 402 National Pollutant Discharge Elimination System (NPDES) Construction General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities and/or Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters	Discharge of pollutants into Waters of the U.S.
RWQCB	CWA, Section 401 Water Quality Certification	Discharge of dredged or fill material into Waters of the U.S. and State
Air Pollution Control District	Authority to Construct/ Permit to Operate	Local construction emissions. Construction emissions and equipment must comply with applicable rules and regulations and will not interfere with air quality standards.

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Appendix A. Regulatory Consistency Analysis

Regulatory Consistency Analysis

Introduction

The Regulatory Consistency Analysis provides an overview of the federal, state and local regulations, policies and plans applicable to the proposed project and includes a discussion of whether proposed project activities, at this conceptual stage of development, would be anticipated to conflict with these regulations, policies and plans. **Table A-1** includes a summary of potential consistency conflicts by regulatory area.

Table A-1. Regulatory Consistency Table

Regulatory Area	Potential Consistency Conflict? Yes/No (Y/N)
Aesthetics	N
Agricultural Resources	Y
Air Quality	Y
Biological Resources	Y
Cultural Resources	Y
Energy	N
Geology and Soils	N
Hazards and Hazardous Materials	N
Hydrology and Water Quality	N
Land Use and Planning	N
Noise	Y
Public Services and Utilities	N
Recreation	N
Transportation	N

The sections below describe the relevant regulatory setting and regulatory consistency analysis for each resource area.

Aesthetics

State

California Scenic Highway Program. California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways (Caltrans 2018). The state laws governing the Scenic Highway Program are found in the Streets and Highways Code (Section 260, et seq.).

Local

***Yolo County General Plan*.** According to the Yolo County General Plan Conservation and Open Space Element, goals and policies strive to preserve and enhance Yolo County's wide

variety of natural resources, including agricultural areas, open space, and recreational resources (Yolo County 2009).

CONSISTENCY ANALYSIS

No conflict. The preferred alternative would not conflict with the California Scenic Highway Program. There are no officially designated state or county scenic highways in Yolo County. The only eligible state scenic highway in the county is located outside of the project area.

The proposed project would conform to policies outlined in the Yolo County General Plan. The project area is located in rural Yolo County and is primarily dominated by lands under agricultural use. Proposed project activities would be consistent with the current uses and visual quality of the project area, and would not impact visual resources in Yolo County.

Agricultural Resources

State

***Farmland Mapping and Monitoring Program*.** The California Department of Conservation, Division of Land Resource Protection works with landowners, local governments, and researchers to conserve the state's farmland and open space, and maintains a statewide inventory of farmlands. These lands are mapped as part of the Farmland Mapping and Monitoring Program (FMMP), which is based on a classification system that rates agricultural land according to soil quality and irrigation status. Agricultural lands are divided and mapped into the following eight categories:

- *Prime Farmland*—Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the 4 years before the mapping date.
- *Farmland of Statewide Importance*—Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the 4 years before the mapping date.
- *Unique Farmland*—Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the 4 years before the mapping date.
- *Farmland of Local Importance*—Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.
- *Grazing Land*—Land on which the existing vegetation is suited to the grazing of livestock.
- *Urban and Built-up Land*—Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel.
- *Other Land*—Land not included in any other mapping category. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not

suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines; borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.
- *Water*—Perennial water bodies with an extent of at least 40 acres.

Williamson Act Program. The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive reduced property tax assessments. Williamson Act categories include:

- Williamson Act – Non-Prime Agricultural Land: Land which is enrolled under California Land Conservation Act contract and does not meet any of the criteria for classification as Prime Agricultural Land.
- Williamson Act – Farmland Security Zone: Enrolled parcels containing either Prime or Non-Prime agricultural land restricted by a 20 year contract pursuant to Government Code Section 51296.

Local

Yolo County General Plan. The Agriculture and Economic Development Element of the Yolo County General Plan includes goals and policies geared towards the preservation of agricultural lands during economic growth and improvement of the County's productive capabilities (Yolo County 2009).

CONSISTENCY ANALYSIS

Potential conflict. The preferred alternative would potentially conflict with the Farmland Mapping and Monitoring Program, Williamson Act Program and the Yolo County General Plan Agriculture and Economic Development Element. The project area includes Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Farmland of Local Potential, and Williamson Act Contract properties and has the potential to disturb or convert such land uses during construction and ground disturbing activities (DOC 2012; DOC 2016). To the extent possible, these areas would be avoided and BMPs would be employed to reduce impacts on agricultural lands.

Air Quality

Federal

Clean Air Act. The Clean Air Act (CAA) was first enacted in 1963 and has since been amended (1965, 1967, 1970, 1977, and 1990). Under the CAA, the U.S. Environmental Protection Agency (USEPA) developed the National Ambient Air Quality Standards (NAAQS), or numerical concentration-based standards, for six criteria pollutants that have been determined to affect human health and the environment. The NAAQS represent the maximum allowable concentrations for O3 - measured as either volatile organic compounds (VOCs) or total oxides of nitrogen (NOx), carbon monoxide (CO), nitrogen dioxide (NO2), sulfur oxides (SOx), respirable particulate matter (including PM10 and PM2.5), and lead (Pb).

USEPA classifies the air quality in an Air Quality Control Region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas within each AQCR are therefore designated as either "attainment," "nonattainment," "maintenance," or "unclassified" for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS; nonattainment indicates that criteria pollutant levels exceed NAAQS; maintenance indicates that an area was previously designated nonattainment but is now attainment; and an unclassified air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment. The CAA also mandates that each state implement a State Implementation Plan (SIP) for local areas not meeting those standards, and the SIP must include pollution control measures outlining how the standards will be met.

State

California Clean Air Act. The CAA gives the authority to states to establish air quality rules and regulations. Air quality in California is governed by the California Clean Air Act (CCAA). The State of California has adopted the NAAQS and promulgated additional California Ambient Air Quality Standards (CAAQS) for criteria pollutants. The CAAQS are more stringent than the Federal primary standards. The CCAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date.

In California, the USEPA has delegated the authority for ensuring compliance with the NAAQS to the California Air Resources Board (CARB). CARB has delegated responsibility for implementation of the CAA and CCAA to local air pollution control agencies.

Greenhouse Gas Regulation. California has adopted statewide legislation addressing various aspects of climate change and mitigation for greenhouse gas (GHG) emissions. This legislation establishes a broad framework for meeting the state's long-term GHG reduction goals. The Governor of California has also issued several orders related to the state's evolving climate change policy. Of particular importance is the Global Warming Solutions Act of 2006, also commonly referred to as Assembly Bill (AB) 32, which establishes a statewide GHG reduction goal of achieving 1990 emissions levels by 2020.

Local

Yolo-Solano Air Quality Management District (AQMD). The project area is located within the jurisdictional boundaries of the Yolo-Solano AQMD and is subject to its rules and regulations. The Yolo-Solano AQMD is responsible for implementing and enforcing State and Federal air quality regulations within Yolo County.

Yolo County General Plan. The Conservation and Open Space Element of the Yolo County General Plan includes goals and policies intended for the conservation, protection, and enhancements of the County's air quality, including the minimization of air pollutant emissions (Yolo County 2009).

CONSISTENCY ANALYSIS

Potential conflict. The proposed project would require the use of construction vehicles and equipment on a temporary basis during construction. Air quality impacts could result from

particulate matter generated during construction activities, such as dust and equipment exhaust. Operation of construction vehicles and equipment could generate GHG emissions on a short term, intermittent basis. The proposed project would implement BMPs during construction in an effort to minimize air quality and GHG impacts, but there is potential that the Project would not conform to CAA, GHG regulations and the Yolo-Solano AQMD's rules and regulations.

Biological Resources

Federal

Endangered Species Act of 1973. The U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) enforce the provisions stipulated within the Federal Endangered Species Act of 1973 (hereafter, "FESA," 16 United States Code [USC] §1531 et seq.). Threatened and Endangered species on the Federal list (50 Code of Federal Regulations [CFR] § 17.11 and 17.12) are protected from take, defined as direct or indirect harm or harassment, unless a Section 10 permit is granted to an entity other than a Federal agency, or a Biological Opinion with incidental take provisions is rendered to a Federal lead agency via a Section 7 consultation. Pursuant to the requirements of FESA, an agency reviewing a Proposed Project within its jurisdiction must determine whether any federally listed or proposed species may be present in the study area and determine whether the Proposed Project is likely to jeopardize the continued existence of the species, or result in the adverse modification or destruction of habitat for said species. Under FESA, habitat loss is considered to be an impact to a species, thus related impacts to these species or their habitats would be considered significant and would require mitigation.

Migratory Bird Treaty Act. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703–711). As interpreted in a 2018 regulation, the MBTA makes it unlawful to non incidentally take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21).

Wetlands and Other Waters of the U.S. Any person, firm, or agency planning to perform work that involves the discharge of dredged or fill material into "waters of the U.S.", must first obtain authorization from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (33 USC §1344). Permits, licenses, variances, or similar authorizations may also be required by other Federal, State, and local statutes. Waters of the U.S. are defined as: all waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters (33 CFR Part 328). With non-tidal waters, in the absence of adjacent wetlands, the extent of USACE jurisdiction extends to the ordinary high water mark (OHWM) – the line on the shore established by fluctuations of water and indicated by a clear, natural line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, or the presence of litter and debris. Wetlands are defined as: "… those areas that are inundated

or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions".

In addition, the Regional Water Quality Control Board (RWQCB) may require a State Water Quality Certification (CWA, Section 401 permit) before other permits are issued.

State

California Fish and Game Code. The California Fish and Game Code includes various statutes that protect biological resources, including the Native Plant Protection Act of 1977 (NPPA), fully protected species, and requirements for notification of lake or streambed alteration.

The NPPA (Fish and Game Code Sections 1900–1913) authorizes the Fish and Game Commission to designate plants as endangered or rare and prohibits take of any such plants, except as authorized under limited circumstances.

Fish and Game Code Sections 3503, 3513, and 3800 protect raptors and native and migratory birds, including their active or inactive nests and eggs, from all forms of take. In addition, species that are "fully protected" from all forms of take are listed in Section 3511 (birds), Section 5515 (fish), Section 4700 (mammals), and Section 5050 (amphibians). No permit is available to take these species.

CDFW regulates activities that will interfere with the natural flow of, or substantially alter, the channel, bed, or bank of a lake, river, or stream. Section 1602 of the Fish and Game Code requires that CDFW be notified of lake or streambed alteration activities. If CDFW subsequently determines that such an activity might adversely affect an existing fish and wildlife resource, the agency has the authority to issue a streambed alteration agreement, including requirements to protect biological resources and water quality.

CNPS has developed a set of lists of native plants in California according to rarity. Plants on List 1A, List 1B, and List 2 meet the definitions of Section 1901, Chapter 10 (NPPA) or Sections 2060 and 2067 (CESA) of the Fish and Game Code (Section 1900–1913) as rare or endangered species.

California Endangered Species Act (CESA). The California Endangered Species Act (CESA) is similar to the FESA in that it contains a process for listing species and regulating potential impacts to listed species. Section 2081 of the CESA authorizes the California Department of Fish and Wildlife (CDFW) to enter into a memorandum of agreement for take of listed species for scientific, educational or management purposes.

CDFW also requires notification prior to commencement, and may require a Streambed Alteration Agreement, pursuant to California Fish and Game Code (Subsections 1601-1603), if a proposed project would result in the alteration or degradation of a stream, river, or lake in California.

Local

Yolo County Habitat Conservation Plan. The Yolo County HCP is a comprehensive, county-wide plan that identifies 12 sensitive species and the natural communities and agricultural land they use as habitat, as well as providing a streamlined permitting process to address any potential effects to these sensitive species. As the entire project area is within Yolo County, the project would fall under the guidance of this document. It is anticipated that the proposed project activities would comply with the conditions set forth in the HCP.

***Yolo County General Plan*.** The Conservation and Open Space Element of the Yolo County General Plan includes goals and policies intended for the conservation and protection of the County's ecosystem, habitats, and special status species (Yolo County 2009).

CONSISTENCY ANALYSIS

Potential conflict. Based on a preliminary review of biological resources databases and a site reconnaissance, the project area appears to contain suitable habitat for several special-status species and also includes aquatic resources. Proposed project activities have the potential to impact biological resources listed in **Appendix C Table 1**, should they be present in the vicinity of the proposed work area, and may therefore conflict with such regulations as MBTA, the California Fish and Game Code and CESA. Prior to project implementation, consultation with resource agencies and acquisition of permits would likely be necessary.

Cultural and Tribal Cultural Resources

Federal

Section 106 of the National Historic Preservation Act (NHPA). Section 106 of the National Historic Preservation Act (NHPA) requires that, before beginning any undertaking, a federal agency must take into account the potential for effects on historic properties and offer the Advisory Council on Historic Preservation (ACHP) and other interested parties an opportunity to comment on the Proposed Project. Specific regulations regarding compliance with Section 106 state that, although the tasks necessary to comply with Section 106 may be delegated to others, the federal agency is ultimately responsible for ensuring that the Section 106 process is completed. Upon initiation of the Section 106 process, the lead federal agency is required to invite the appropriate State Historic Preservation Office (SHPO) or appropriate Tribal Historic Preservation Office (required only if the undertaking would occur on land owned by a federally recognized Indian tribe) to participate in the process.

Section 106 also requires federal agencies, or those they fund or permit, to consider the effects of their actions on properties that are determined eligible for listing or are listed in the National Register of Historic Places (NRHP). To determine whether an undertaking could affect NRHP-eligible properties, cultural resources (archaeological, historical, architectural, and traditional cultural properties) must be inventoried and evaluated for the NRHP. To be listed in the NRHP, a property must be at least 50 years old (or be of exceptional historic significance if less than 50 years old) and meet one or more of the NRHP criteria. To qualify for listing, a historic property must represent a significant theme or pattern in history, architecture, archaeology, engineering, or culture at the local, state, or national level, and must meet specific significance criteria.

Antiquities Act of 1906. This act provides for fines or imprisonment of any person convicted of appropriating, excavating, injuring, or destroying any historic or prehistoric ruin or monument or other object of antiquity that falls under the jurisdiction of the federal government.

Archaeological Resources Protection Act of 1979. This act amended the Antiquities Act, set a broad policy stating that archaeological resources are important to the nation and should be protected, and required special permits before the excavation or removal of archaeological resources from public or Indian lands.

State

PRC Section 5024.1: California Register of Historical Resources. The State of California implements the NHPA through its statewide comprehensive cultural resource preservation programs. The California Office of Historic Preservation (OHP), an office of the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level. The OHP also maintains the California Register of Historical Resources (CRHR). The SHPO is an appointed official who implements historic preservation programs within the State's jurisdiction.

The CRHR includes resources that are listed in or formally determined eligible for listing in the NRHP, as well as some designated California State Landmarks and Points of Historical Interest. Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR.

PRC Sections 5097.91 through 5097.98: California Native American Heritage Commission (NAHC) The California Native American Heritage Commission (NAHC) identifies and catalogs cultural resources (i.e., places of special religious or social significance to Native Americans, and known graves and cemeteries of Native Americans on private lands) in California. The NAHC is charged with preserving and ensuring accessibility of sacred sites and burials, the disposition of Native American human remains and burial items, maintain an inventory of Native American sacred sites located on public lands, and review current administrative and statutory protections related to these sacred sites.

Assembly Bill 52. Assembly Bill (AB) 52 (Chapter 532, Statutes of 2014) applies to all projects that file a Notice of Preparation (NOP) or notice of a Negative Declaration on or after July 1, 2015. The bill requires that a lead agency begin consultation with a California Native American tribe if that tribe has requested, in writing, to be kept informed of proposed projects by the lead agency, prior to the determination whether a Negative Declaration, or EIR will be prepared. The bill also specifies mitigation measures that may be considered to avoid or minimize impacts on tribal cultural resources. Section 3.10 evaluates the Proposed Project's impacts on tribal cultural resources. Please note that formal tribal consultation for this EIR was not required because the Distract filed the Proposed Project NOP on February 2, 2015.

Local

Yolo County General Plan. The Conservation and Open Space Element of the Yolo General Plan includes goals and policies intended to conserve and protect cultural and historical resources (Yolo County 2009).

CONSISTENCY ANALYSIS

Potential conflict. Based on a review of the records search results, historic map review, and the site reconnaissance provided in **Appendix D**, four prehistoric archaeological sites and eight historic archaeological sites were identified as intersecting the project area. An additional five prehistoric sites and two historic archaeological sites were identified within 0.25 mile. One site was determined not eligible for the NRHP and CRHR; the remaining sites are all unevaluated. Proposed project activities have the potential to impact these cultural resources, should they be identified within, or potentially in the vicinity of, a proposed work area, resulting in conflicts to such regulations as Archaeological Resources Protection Act of 1979 and Antiquities Act of 1906. Any newly discovered archaeological site which cannot be avoided by the proposed project must be evaluated for eligibility to the CRHR and/or NRHP. If eligible, additional mitigation may be required if significant impacts/adverse effects cannot be avoided. If tribal cultural resources are identified in the project area, the project would conform to regulations established under Assembly Bill 52.

Energy

State

Senate Bill 350. SB 350 (Chapter 547, Statutes of 2015) was signed into law in September 2015. SB 350 establishes tiered increases to the Renewables Portfolio Standard of 40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. The former target was 33 percent by 2020. SB 350 also set a new goal to double the electricity and natural gas savings for existing buildings through energy efficiency and conservation measures.

CONSISTENCY ANALYSIS

No conflict. The preferred alternative would conform to Senate Bill 350. The proposed project would use limited amounts of energy during construction during the operation of construction equipment. Regular energy usage would not be required during operation of the proposed project.

Geology and Soils

Federal

Paleontological Resources Preservation Act. The Paleontological Resources Preservation Act (PRPA; Public Law 111-11, Title VI, Subtitle D; 16 USC Sections 470aaa – 470aaa 11) was passed on March 30, 2009. The PRPA is intended to preserve, manage, and protect paleontological resources on lands administered by the Bureau of Land Management, the Bureau of Reclamation, the National Parks Service, and the U.S. Fish and Wildlife Service. The PRPA addresses the management, collection, and curation of paleontological resources from federal lands and authorizes civil and criminal penalties for illegally collecting, damaging, defacing, or selling paleontological resources.

State

Alquist-Priolo Earthquake Fault Zoning Act. California's Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) (Public Resources Code [PRC] Section 2621 et seq.) is intended to reduce risks to life and property from surface fault rupture during earthquakes. Under the Alquist-Priolo Act, faults are zoned, and construction along or across them is strictly regulated if they are "sufficiently active" and "well defined." A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for purposes of the act as referring to approximately the last 11,000 years). A fault is considered well-defined if its trace can be clearly identified by a trained geologist at the ground surface, or in the shallow subsurface using standard professional techniques, criteria, and judgment.

Seismic Hazards Mapping Act. Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (PRC Sections 2690–2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other seismic hazards, including strong ground shaking, liquefaction, and seismically induced landslides, and cities and counties are required to regulate development within mapped seismic hazard zones.

Construction General Permit. The State of California adopted the Construction General Permit, Order No. 2012-0006-DWQ amending Order No. 2009-0009-DWQ, effective on July 17, 2012. The State Water Resources Control Board (SWRCB) Water Quality Order 2012-0006-DWQ (Construction General Permit) regulates construction site storm water management. Dischargers whose projects disturb 1 or more acres of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the general permit for discharges of storm water associated with construction activity. This requirement includes linear projects that disturb 1 or more acres. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground, such as stockpiling or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

Permit applicants are required to submit a Notice of Intent to the SWRCB and to prepare a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP identifies BMPs that must be implemented to reduce construction effects on receiving water quality based on pollutants. The BMPs identified are directed at implementing both sediment and erosion control measures and other measures to control chemical contaminants. The SWPPP must also include descriptions of the BMPs to reduce pollutants in storm water discharges after all construction phases have been completed at the site (post-construction BMPs). The SWPPP must contain a visual monitoring program, a chemical monitoring program for "nonvisible" pollutants to be implemented if there is a failure of BMPs, and a sediment monitoring plan if the site discharges directly to a waterbody listed on the Clean Water Act 303(d) list for sediment.

Local

***Yolo County General Plan*.** The Yolo County General Plan Safety Element identifies goals and policies relating to Geologic and Seismic hazards in Yolo County (Yolo County 2009).

CONSISTENCY ANALYSIS

No conflict. The project area is in a region of California characterized as having relatively low seismic activity. No Alquist-Priolo Earthquake Fault Zones and no Seismic Hazard Zones are identified within the County. Therefore, the proposed project would conform to the Alquist-Priolo Earthquake Fault Zoning Act and Seismic Hazards Mapping Act. The proposed project would adhere to the Construction General Permit to manage storm water and discharges during construction, and would conform to PRPA in the event that paleontological resources are inadvertently discovered in the project area. Additionally, the proposed project would adhere to grading and erosion control measures during ground disturbing activities and would not conflict with local regulations and policies.

Hazards and Hazardous Materials

State

California Environmental Protection Agency (Cal/EPA) and the State Office of Emergency Services. The California Environmental Protection Agency (Cal/EPA) and the State Office of Emergency Services establish rules governing the use of hazardous substances. The SWRCB has primary responsibility to protect water quality and supply. The Cal/EPA was created to better coordinate state environmental programs, reduce administrative duplication, and address the greatest environmental and health risks. The agency also unifies the California's environmental authority under a single Cabinet-level agency. The Secretary for Environmental Protection oversees the following agencies: CARB, Integrated Waste Management Board, Department of Pesticide Regulation, SWRCB, Department of Toxic Substances Control (DTSC), and the Office of Environmental Health Hazard Assessment.

Hazardous Waste Control Law. California requirements and statutory responsibilities are outlined in the statute implemented by the California DTSC in Health and Safety Code, Division 20, Chapter 6.5, Hazardous Waste Control Law. Regulations adopted from the Statute are found in Title 22 of the California Code of Regulations. The Hazardous Waste Control Law is similar to RCRA in that it regulates the identification, generation, transportation, storage, and disposal of materials deemed hazardous by the State.

Local

Yolo County General Plan. The Safety Element of the Yolo County General Plan addresses a range of natural and human-caused hazards that may pose a risk to life and property, and includes goals and policies intended to protect residents and land from hazards and hazardous materials (Yolo County 2009).

CONSISTENCY ANALYSIS

No conflict. The proposed project would conform to federal, state and local hazardous waste regulations. Construction vehicles and equipment containing grease and oils would be utilized during the construction phase. Implementation of spill prevention measures to address the accidental or inadvertent release of oil, grease, or fuel into adjacent waterways would further help minimize potential construction-related water quality impacts. No hazardous materials would be used during operations and no hazardous waste would be generated. In the event that

hazardous materials are identified in fill being removed while degrading the existing levee, they would be transported to a permitted hazardous waste and materials facility

Hydrology and Water Quality

Federal

The Clean Water Act: Section 401—Water Quality Certification. Section 401 of the CWA requires that an applicant pursuing a federal permit to conduct an activity that may result in a discharge of a pollutant obtain a Water Quality Certification. A Water Quality Certification requires the evaluation of water quality considerations associated with dredging or placement of fill materials into waters of the U.S. and State. Water Quality Certifications are issued by one of the nine geographically separated Regional Water Quality Control Boards (Regional Boards) in California. Under the CWA, the relevant Regional Board must issue a Section 401 Water Quality Certification for a project to be permitted under CWA Section 404.

The Clean Water Act: Section 402—NPDES Permit Program. NPDES Permit Program: CWA Section 402 establishes the NPDES, a permitting system for the discharge of any pollutant (except for dredged or fill material) into waters of the U.S. The Central Valley Regional Water Quality Control Board (Central Valley Water Board) is delegated with the responsibility of protecting the quality of surface and ground waters of the state in Proposed Project area.

The Clean Water Act: Section 404—Dredge/Fill Permitting. The discharge of dredged or fill material into waters of the U.S. is subject to permitting specified under Title IV (Permits and Licenses) of the CWA and specifically under Section 404 (Discharges of Dredge or Fill Material) of the CWA. Section 404 of the CWA regulates placement of fill materials into the waters of the U.S. Section 404 permits are administered by the USACE.

State

Porter-Cologne Act. The Porter-Cologne Act authorizes the state to implement the provisions of the CWA and establishes a regulatory program to protect the water quality and beneficial uses of waters of the state. The act requires projects that are discharging, or proposing to discharge, wastes that could affect the quality of the state's waters to file a report of waste discharge with the appropriate Regional Board.

Local

***Yolo County General Plan*.** The Conservation Element of the Yolo County General Plan includes goals and policies intended for the protection of the County's water resources (Yolo County 2009).

CONSISTENCY ANALYSIS

No conflict. The preferred alternative would involve work along Cache Creek. However, the proposed project would conform to all federal, state and local water quality, waste discharge, and reporting requirements. Further, the proposed project would obtain all necessary permits issued under CWA, including Section 401, Section 404, and NPDES permitting, and would implement a project SWPPP and grading and erosion control BMPs, as required, to reduce water quality impacts.

Land Use and Planning

Local

***Yolo County General Plan*.** Land use designations for the County are outlined in the General Plan Land Use and Community Character Element (Yolo County 2009). Zoning classifications, allowed uses, and development standards are outlined in the Yolo County General Plan Amendment 2014-01 Zoning Code (Yolo County 2014).

CONSISTENCY ANALYSIS

No conflict. Land use zoning would not change or be impacted by the implementation of the preferred alternative. The proposed project would not require the development of new roads or structures that have the potential to divide an established community and would adhere to the land use designations in the Yolo County General Plan.

Noise

Local

***Yolo County General Plan*.** The Health and Safety Element of the Yolo County General Plan includes goals and policies that seek to reduce community exposure to excessive noise levels through the establishment of noise level standards for a variety of land uses (Yolo County 2009). Noise standards specific to construction are included in the Noise section of the Health and Safety Element (Yolo County 2009).

CONSISTENCY ANALYSIS

Potential conflict. The preferred alternative would generate altered noise conditions only during project construction activities. With noise sensitive receptors in close proximity (schools, residents, etc.), there is a potential that the proposed project would temporarily not adhere to noise constraints outlined in the Yolo County General Plan.

Public Services and Utilities

Local

Yolo County General Plan. The Yolo County General Plan Public Facilities and Services Element includes goals and policies intended to address the following public services and facilities: sewer and septic systems, stormwater and drainage, community parks, law enforcement, fire and emergency medical services, schools, library services, dependent care, solid waste and recycling, sources of energy, utilities and communication technology, and general government services (Yolo County, 2009).

CONSISTENCY ANALYSIS

No conflict. The proposed project would not result in an increase in population that could result in an increased demand on public services, levels of service or service ratios. Therefore, the preferred alternative would adhere to public service guidelines outlined in the Yolo County General Plan.

Recreation

Local

***Yolo County General Plan*.** The Conservation and Open Space and Recreation Element of the Yolo County General Plan includes goals and policies intended to govern the preservation of open space and the maintenance, expansion, and creation of recreational resources and amenities to maintain a high quality of life for the County's citizens (Yolo County 2009).

CONSISTENCY ANALYSIS

No conflict. The preferred alternative would adhere to recreation guidelines outlined in the Yolo County General Plan. The proposed project would not permanently disturb recreational facilities and the proposed project would not result in increased population growth resulting in the need for additional recreational facilities.

Transportation

Local

Yolo County General Plan. The Circulation Element of the Yolo County General Plan provides the framework for decisions concerning the countywide transportation system, and includes goals and policies intended to provide an efficient multi-modal road and highway system that meets the needs of its users (Yolo County, 2009).

CONSISTENCY ANALYSIS

No conflict. During construction, the proposed project would involve work within roadways and highways which would result in temporary disruptions to traffic and the circulation system. Prior to construction activities, a traffic management plan and a traffic safety plan would be developed in coordination with Yolo County. Upon completion of construction, vehicle traffic would return to pre-construction levels. Therefore, the preferred alternative would adhere to traffic guidelines outlined in the Yolo County General Plan.

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Appendix B. Existing Conditions and Environmental Constraints

	Alternative 6 (Preferred Structural Alternative) Impact Analysis	Potential for Environmental Constraints (Yes/No)
Impact Criteria and Existing Conditions		
Aesthetics		
Existing Conditions:		
Would the project create a substantial source of light or glare?	No. The proposed project does not include any permanent stationary sources of light. Light would be associated with the operation of construction vehicles and equipment. However, use of construction vehicles and equipment would occur on a temporary basis, primarily during daylight hours and would not substantially impact surrounding communities.	No
Is the Project located near a scenic highway?	No. There are no officially designated state or county highways in Yolo County. The only eligible state scenic highway in the county is located in western Yolo county along State Route 16, which is outside of the project area.	No
Would the project interfere with public views in the area?	No. Alternative 6 includes a 0 to 4 foot levee raise above its current height along a portion of the existing alignment. A cut-off wall would also be installed and the base of the levee would be widened as much as 10 to 15 feet in certain locations. This increase in levee height would not substantially interfere with public views and other improvements would be consistent with the visual character of the area given that the project area is predominantly agricultural. Construction equipment would be used on a temporary basis and would be staged when not in use.	No
Would the project damage scenic resources?	No. The proposed project involves levee improvement and the implementation of ancillary flood control features. These activities would be consistent with the current uses and visual quality of the project area, and would not impact visual resources in Yolo County.	No
Agriculture and Forestry Resources		
Existing Conditions:		
Would the project result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance?	Yes. According the DOC FMMP, Yolo is designated as Urban and Built-Up Land Cache Creek is designated as Other Land. Outside of these areas, the project area includes Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Farmland of Local Potential, and Grazing Land and has the potential to disturb or convert such land uses during construction and ground disturbing activities (DOC 2016).	Yes
Is the project located on a Williamson Act Contract property, or would it disturb a property under the Williamson Act Contract?	Yes. According to the Department of Conservation Yolo County Williamson Act FY 2010/2011 Map, Williamson Act Prime Agricultural Land is located within the project area (DOC 2012). Ground disturbing activities or work within these areas has the potential to disturb a property under a Williamson Act Contract.	Yes
Would the Project result in the loss of forest land or conversion of forest land to non-forest use?	No. The proposed project is not located in areas designated for forest land (Yolo County 2009). Ground disturbing activities would not extend to areas designated as forest land. As a result, no impact to forest land would occur.	No
Air Quality and GHG Emissions		
Existing Conditions:		
Would project result in substantial emissions?	Yes. The proposed project would not create emissions post construction and no new stationary emissions sources are proposed. However, during construction the project would require the use of construction vehicles and equipment on a temporary basis. Air quality impacts could result from particulate matter generated during construction activities, such as dust and equipment exhaust.	Yes
Would the project create objectionable odors?	No. The proposed project includes implementation of flood protection and remediation measures and does not include activities that involve the long term creation of objectionable odors during construction or post construction.	No

	Alternative 6 (Preferred Structural Alternative) Impact Analysis	Potential for Environmental Constraints (Yes/No)
Impact Criteria and Existing Conditions		
Would the project expose sensitive receptors to substantial pollutant concentrations?	Yes. There are approximately 161 housing units, no hospitals and one school, Cache Creek High School, in the project area. Operation of construction vehicles and equipment under Alternative 6 could result in increased emissions on a short term basis and impacts on sensitive receptors would not be substantial.	Yes
Would the project generate GHG emissions either directly or indirectly?	Yes. Operation of construction vehicles and equipment could generate GHG emissions on a short term, intermittent basis.	Yes
Biological Resources		
Existing Conditions: See Appendix C, Biological Resources Analysis, for existing conditions and detailed analysis.		
Is the Project located adjacent to terrestrial or aquatic habitat areas for state or federally listed endangered, threatened, or candidate species?	Yes. Database query results returned a large number of special-status species with a potential to occur in the vicinity of the project area (Appendix C, Attachment A). Through review of these results, many species were determined to not have the potential to occur in the project area due to absence of suitable habitat or the project area being located outside of known species ranges. Appendix C Table 1 provides a description of the special-status species that have the potential to occur in each of the delineated vegetation communities. A few of the species included in this table are associated with riparian habitat located adjacent to Cache Creek. Project work may require vegetation removal which could impact associated special-status species, should they be present, and these species should be considered when consulting with the appropriate agencies.	Yes
Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	Yes. There is no critical habitat within or adjacent to the project area. Therefore, no effect to critical habitat units is anticipated. However, Appendix C Table 1 provides a description of the special-status species that have the potential to occur in each of the delineated vegetation communities. A few of the species included in this table are associated with riparian habitat located immediately adjacent to the project area along Cache Creek. Project work may require vegetation removal which could impact associated special-status species, should they be present, and these species should be considered when consulting with the appropriate agencies. Other communities in the project area that provide suitable habitat for special-status species include irrigated agriculture, orchard, urban, open water and various aquatic resources.	Yes
Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	Yes. Cache Creek, which is delineated as open water, and its adjacent riparian corridor are the only sensitive habitats and aquatic resource that were identified within the project area. These communities would be considered sensitive communities due to their unique hydrophytic vegetation and ability to support special-status species. Project work may require removal of riparian vegetation. It is recommended that a formal delineation of aquatic resource be completed prior to any project work in order to determine the level of impact to sensitive communities. Consultation and permitting through the appropriate agencies would need to occur where appropriate.	Yes
Does the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	No. The Yolo County Habitat Conservation Plan (HCP) covers the project area, however it is anticipated that the proposed project activities would comply with the conditions set forth in the HCP.	No
Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	Yes. There are no protected lands or conservation easements in the project area. However, Cache Creek is delineated as open water and a riparian corridor is located adjacent to Cache Creek in the project area. These resources may act as movement corridors for both special-status and common species. Although substantial interference with movement is unlikely to result from project activities, the expansion of levees and installation of the soil bentonite cutoff wall may act as barriers.	Yes
Would the Project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	Yes. Cache Creek, which is delineated as open water, and its adjacent riparian corridor are the only aquatic resources that were identified within the project area. It is recommended that a formal delineation of aquatic resources be completed prior to any project work to verify the jurisdiction of these features.	Yes

	Alternative 6 (Preferred Structural Alternative) Impact Analysis	Potential for Environmental Constraints (Yes/No)
Impact Criteria and Existing Conditions		
Cultural and Tribal Cultural Resources		
Existing Conditions: Existing Conditions: See Appendix D, Cultural Resources Analysis, for existing conditions and detailed analysis.		
Do known historical, archaeological, or tribal sites or resources occur in the Project Area?	Yes. The records search identified four prehistoric archaeological sites and eight historic archaeological sites intersecting the project area. An additional five prehistoric sites and two historic archaeological sites were identified within 0.25 mile. One site was determined not eligible for the NRHP and CRHR; the remaining sites are all unevaluated.	Yes
Does the Project require excavations or ground disturbance that could inadvertently impact known or unknown cultural, historical, or archaeological resources?	Yes. Construction of the proposed project would require ground disturbance, excavations, implementation of fill, compaction, and use of heavy equipment. These activities have the potential to result in impacts to the cultural resources listed in Appendix D, should the resources be identified within, or potentially in the vicinity of, a proposed work area. Any newly discovered archaeological site which cannot be avoided by the proposed project must be evaluated for eligibility to the CRHR and/or NRHP. If eligible, additional mitigation may be required if significant impacts/adverse effects cannot be avoided.	Yes
Would the project disturb human remains, including those encountered outside of dedicated cemeteries?	Yes. No human remains, were identified by the cultural resources analysis. However, cemeteries and burial sites were identified. In the event that human remains are inadvertently discovered outside of dedicated cemeteries, work would stop immediately and the County Coroner would be contacted for consultation.	Yes
Energy		
Existing Conditions:		
Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation?	No. The proposed project would use limited amounts of energy during construction through the operation of construction equipment. Regular energy usage would not be required once construction is completed. PG&E would have the capacity to support the project's energy needs. Therefore, impacts on energy resources would not be substantial.	No
Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	No. The proposed project would comply with state and local plans for renewable energy and energy efficiency.	No
Geology, Soils and Mineral Resources		
Existing Conditions:		
Would the project require excavations, grading, or other ground disturbing activities capable of causing erosion or loss of topsoil?	Yes. The proposed project would require open trenching, ground disturbance and use of heavy construction equipment during installation of the proposed cut-off wall. The proposed project also involves the degradation of the majority of the Cache Creek levee to ground elevation. These activities would result in erosion and loss of topsoil. However, Alternative 6 also involves rock slope protection to minimize erosion. The proposed project would adhere to erosion and grading control ordinances within Yolo County and therefore, impacts would not be substantial.	Yes
Is the Project located in a seismically active area?	No. According to the Yolo County General Plan and EIR, the project area is in a region of California characterized as having relatively low seismic activity (Yolo County 2009). No Alquist-Priolo Earthquake Fault Zones and no Seismic Hazard Zones are identified within the County.	No
Are new permanent structures proposed that could expose people to seismic related hazards such as landslides, liquefaction, ground failure, strong seismic ground shaking?	No. The project area is in a region of California characterized as having relatively low seismic activity. Although the proposed project would involve the construction of levee repairs and improvements, no impacts would occur because seismic hazards are lacking in the project area (Yolo County 2009).	No

	Alternative 6 (Preferred Structural Alternative) Impact Analysis	Potential for Environmental Constraints (Yes/No)
Impact Criteria and Existing Conditions		
Is the Project located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	No. The project area is not located on a geologic unit or soil(s) that are unstable, or that would become unstable as a result of the proposed project, thereby resulting in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. According to the Yolo County General Plan and EIR, much of the County's land surface is comprised of soils that would require special design considerations due to shrink-swell potentials (Yolo County 2009), however, these considerations would be factored into the project design.	No
Are mineral resources present in the project area?	Yes. Mineral resources and several gas fields are located in the project area. Construction activities, such as installation of the cut-off wall, could disturb mineral resources in these areas.	Yes
Do known paleontological resources exist in the Project Area?	Yes. According to the University of California Museum of Paleontology at Berkeley and the 2016 PaleoDatabase, paleontological resources are known to exist in Yolo County (Bureau of Reclamation 2017). If paleontological resources were identified in the project area during construction, the proposed project would follow policies outlined in the Yolo County General Plan Conservation Element and the Society of Vertebrate Paleontology's standard procedures for the assessment and mitigation of adverse impacts on paleontological resources. With these measures in place, impacts on paleontological resources would not be substantial.	Yes
Hazards and Hazardous Materials		
Existing Conditions:		
Be located on a site which is included on a list of hazardous materials sites compiles pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	No. One closed LUST cleanup site is located in the eastern portion of the project area, outside of the proposed area of disturbance for Alternative 6. Therefore, no impact would occur.	No
Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	No. Implementation of the proposed project is anticipated to include advanced construction traffic planning and development of a traffic safety plan, which would ensure the continuation of emergency response services during construction activities.	No
Does the Project require the use or routine transport of hazardous materials?	Yes. Construction vehicles and equipment containing grease and oils would be utilized during the construction phase. Implementation of spill prevention measures to address the accidental or inadvertent release of oil, grease, or fuel into adjacent waterways would further help minimize potential construction-related water quality impacts. Impacts would not be substantial with the implementation of BMPs.	Yes
Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Yes. Cache Creek High School is located approximately 600 feet from the proposed project. Operation of construction vehicles, although temporary, could expose sensitive receptors to emissions. To the extent possible, emissions would be controlled and contained through the implementation of BMPs.	Yes
For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	No. No airports are located in the project area. Watts - Woodland Airport, located approximately 5 miles southwest of the project area, is the airport closest to the proposed project. As a result, no impact from activities near airports would occur.	No
Would the Project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	No. According to the Cal Fire Fire Hazard Severity Zone Map for Yolo County, the proposed project is located in an area designated as "Local Responsibility Area (LRA) Unzoned," outside of moderate, high and very high fire hazard severity zones. Therefore, it is unlikely that the proposed project would lead to a significant risk of loss, injury or death involving wildland fires.	No

	Alternative 6 (Preferred Structural Alternative) Impact Analysis	Potential for Environmental Constraints (Yes/No)
Impact Criteria and Existing Conditions		
Hydrology and Water Quality		
Existing Conditions:		
Would the project alter the drainage pattern of the site or area in a manner which would result in substantial erosion or siltation?	Yes. Construction activities associated with the proposed project, such as installation of the soil bentonite cut-off wall and degradation of the Cache Creek levee, could potentially cause or result in erosion and/or sedimentation. Erosion of onsite soils can lead to increased levels of suspended sediments and turbidity in receiving waters, and could potentially impact water quality and result in a violation of water quality standards during construction. Impacts would be temporary and increased erosion and sedimentation is not anticipated once construction is completed. Post construction, installation of the cutoff wall and rock slope protection proposed under Alternative 6 would improve conditions of erosion along Cache Creek.	Yes
Would the project alter the drainage pattern of the site or area or result in an increase in surface runoff in a manner which would result in flooding on- or off-site?	Yes. Degrading the levee, raising and widening the levee, installation of the cut-off wall and rock slope protection may alter the drainage pattern of the area; however the project is intended to provide flood damage reduction and would therefore result in beneficial impacts on flooding.	Yes
Would the project conform to water quality standards and waste discharge requirements?	Yes. During construction, the proposed project has the potential to result in erosion, which could lead to increased levels of suspended sediments and turbidity in receiving waters. However, the proposed project would conform to water quality standards during construction through the implementation of BMPs, such as grading and erosion control measures, as well as the implementation of a project SWPPP to reduce polluted storm water runoff.	No
Is the Project located within a 100-year flood hazard area?	Yes. According to FEMA floodplain maps, the project area is located within the 100-year flood zone and the proposed project has the potential to temporarily increase flood risk during construction. However, post construction flood risks in the project area are not considered a restraint to project implementation, as the purpose of the proposed project is to provide flood damage reduction.	Yes
Would the project require the use of groundwater or hinder groundwater recharge?	No. The proposed project would not require the use of groundwater and would not involve the implementation of impervious surfaces to the extent that groundwater recharge would be hindered. Therefore, impacts on groundwater would not be substantial.	No
Would the project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	No. Construction, ground disturbing activities and work along Cache Creek have the potential to contribute to increased runoff on a temporary basis. However, the proposed project would include a Stormwater Pollution Prevention Plan (SWPPP) and would not exceed the capacity of existing or planned storm water drainage or provide substantial additional sources of polluted runoff.	No
Land Use and Planning		
Existing Conditions:		
Is the proposed action consistent with the predominant character of the existing built or natural landscape?	Yes. Residential and agricultural zonings are predominant in the project area (Yolo County 2009). Flood improvement measures under the proposed project are consistent with these zonings and would not preclude current land uses.	No
Is the proposed action permitted under zoning regulations?	Yes. Residential and agricultural zonings are predominant in the project area (Yolo County 2009). Flood improvement measures under the proposed project are consistent with these zonings and would not preclude current land uses.	No
Would the Project physically divide an established community?	No. The proposed project would not require the development of new roads or structures that have the potential to divide an established community. Widening and raising the levee, installation of the cut-off wall and rock slope protection would occur along Cache Creek and would not divide the established community of Yolo. Therefore, no impact would occur.	No

Impact Criteria and Existing Conditions	Alternative 6 (Preferred Structural Alternative) Impact Analysis	Potential for Environmental Constraints (Yes/No)
Noise		
Existing Conditions:		
Would the project generate noise in excess of thresholds outlined in the county noise ordinance or general plan?	Yes. Sensitive receptors in Yolo include residential areas, schools (Cache Creek High School), libraries (Yolo Branch library) and churches (Kingdom Hall of Jehovah's Witnesses). The proposed project has the potential to generate noise in excess of local thresholds during the operation of construction vehicles and equipment. Construction activities, such as installation of the cut-off wall along Cache Creek and use of heavy construction equipment in particular could result in increased noise levels. Generally, construction activities would not occur in the direct vicinity of sensitive resources. Construction would occur on a temporary and intermittent basis and thus, noise levels would return to pre-construction levels once construction is completed.	Yes
Would the Project generate excessive ground borne vibration or ground borne noise levels?	Yes. Operation of construction equipment and ground disturbing activities such as trenching, degrading the existing levee and installation of the cut-off wall would result in ground borne vibration and ground borne noise. However, ground borne noise and vibration impacts would occur on a short term, intermittent basis and would not be substantial.	Yes
Public Services and Recreation		
Existing Conditions:		
Would the project result in an increase in response times for public services such as police and fire protection?	No. The proposed project would not result in an increase in population that could result in an increased demand on public services or response times. Further, the proposed project would not interfere with emergency routes and would implement a traffic safety plan. As a result there would be no impact on public services response times.	No
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: Fire protection, police protection, schools, parks, other public facilities?	No. The proposed project would not result in an increase in population that could result in an increased demand on public services, levels of service or service ratios. As it relates to emergency response times, the proposed project would not interfere with emergency routes and would implement a traffic safety plan. As a result, there would be no impact on public services.	No
Would the project damage parks or other public facilities?	No. According to the Yolo County General Plan, there are no areas of Yolo designated for parks and recreation (Yolo County 2009). Cache Creek Regional Park is located outside of the project area and would not be disturbed by proposed project activities. Therefore, no impact would occur.	No
Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	No. The proposed project does not include recreational facilities and would not require expansion of recreational facilities. Further, the proposed project would not result in increased population growth resulting in the need for additional recreational facilities. Therefore, there would be no impact.	No
Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	No. The proposed project would not result in increased population growth resulting in the increased use of parks and recreational facilities. Therefore, there would be no impact.	No

	Alternative 6 (Preferred Structural Alternative) Impact Analysis	Potential for Environmental Constraints (Yes/No)
Impact Criteria and Existing Conditions		
Traffic and Transportation		
Existing Conditions:		
Would the proposed action result in a substantial increase in traffic above present levels?	No. The proposed project has the potential to temporarily increase the volume of traffic present on local roads and highways during construction. However, upon completion of construction, traffic would return to pre-project conditions.	No
Would the project conflict with a plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle lanes and pedestrian paths?	No. The proposed project would conform to relevant plans, ordinances and policies addressing the circulation system. Construction vehicles and equipment would utilize local roads and highways on a temporary basis. Construction equipment would be staged to the extent possible when not in use. Prior to proposed project activities, a Traffic Management Plan would be developed in coordination with Yolo County and the Town of Yolo. Additionally, implementation of the proposed project is anticipated to include advanced construction traffic planning and development of a traffic safety plan, which would ensure the continuation of emergency response services during construction activities.	No
Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	No. The proposed project involves the construction of levee improvements. These activities would be consistent with the current uses and would not create traffic or transportation hazards due to a geometric design feature.	No
Would the project result in inadequate emergency access?	No. Implementation of the proposed project is anticipated to include advanced construction traffic planning and development of a traffic safety plan, which would ensure the continuation of emergency response services during construction activities. The proposed project would adhere to the traffic safety plan and would not interfere with emergency access routes.	No
Would the project result in disruptions to traffic or the circulation system?	Yes. The proposed project would involve work within roadways and highways which would result in temporary disruptions to traffic and the circulation system. Roads, highways and lanes through which the alignment passes could be blocked on a temporary basis. The alignment is located directly north of I-5. However I-5 would not be blocked during construction. Construction equipment would be staged to the extent possible when not in use. Prior to proposed project activities, a Traffic Management Plan would be developed in coordination with Yolo County and the Town of Yolo. Additionally, implementation of the proposed project is anticipated to include advanced construction traffic planning and development of a traffic safety plan, which would ensure the continuation of emergency response services during construction activities. However, temporary disruptions to traffic would still occur.	Yes

	Alternative 6 (Preferred Structural Alternative) Impact Analysis	Potential for Environmental Constraints (Yes/No)
Impact Criteria and Existing Conditions		
Utilities and Service Systems		
Existing Conditions:		
Would the proposed Project connect to an existing public/private water supply?	No. The proposed project would not require connection to an existing public or private water supply.	No
Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	No. The proposed project would not generate wastewater that would need to be treated by a local wastewater treatment provider.	No
Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	Yes. Limited amounts of water would be used during construction; however no water would be required post construction. Therefore, no impacts on water supply would result from the proposed project.	No
Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	Yes. The proposed project would generate limited amounts of solid waste during construction. No solid waste would be generated once construction is completed. The proposed project would comply with federal, state and local regulations on solid waste.	No
Generate solid waste in excess of State or local standards or in excess of the capacity of local infrastructure?	No. Limited amounts of solid waste such as construction debris, municipal waste and green waste would be generated during construction. Solid waste would not be generated once construction is completed. The proposed project would not generate waste in excess of state or local standards and could be accommodated by local infrastructure.	No
Would the Project require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities or expansion of existing facilities, the construction or relocation of which could cause significant environmental effects?	Yes. The proposed project would not increase demand for solid waste disposal, water service, wastewater treatment, electric power, natural gas or telecommunications facilities, and would not require service by local utility providers. However, overhead utility lines are present along surface streets and highways in the project area, and there is potential that unseen underground utility infrastructure exists in the project area.	Yes

Appendix C. Biological Resources Analysis

Draft Memo

Date:	Tuesday, September 18, 2018
Project:	Town of Yolo Flood Risk Reduction Feasibility Study
To:	Yolo County
From:	Summer Pardo, Senior Biologist (HDR)
Reviewed:	Jafar Faghih, Project Manager (HDR)
Subject:	Town of Yolo – Biological Constraints Analysis

Introduction

This memo presents a preliminary look at potential biological constraints for the Town of Yolo Flood Risk Reduction Feasibility Study project. Potential constraints are described below.

Methodology

Desktop Review

A desktop review was undertaken to assess potential biological constraints in the Town of Yolo project area (Figure 1), which included two steps to collect data on special-status species, vegetation communities, sensitive communities, protected lands, and federally-protected aquatic resources with the potential to occur in the project area. First, preliminary database searches were performed to identify aquatic resources and special-status species with the potential to occur in the project area. Second, a preliminary review of recent aerial imagery, land use maps, and the Yolo County Habitat Conservation Plan (HCP; ICF 2018) was conducted to collect site-specific data regarding habitat suitability for special-status species, and to view the location of any protected lands that overlap with the project area.

Database searches were performed on the following websites:

- U.S. Fish and Wildlife Service's (USFWS) Information Planning and Conservation (IPaC) System (2018a);
- USFWS Critical Habitat Portal (2018b);
- USFWS National Wetland Inventory (2018c);
- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) in BIOS 5 (2018);
- California Native Plant Society (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California (2018); and,
- U.S. Geological Survey (USGS) topographical map.

A search of the USFWS's National Wetlands Inventory was performed for the project area to identify aquatic resources that could be affected by the proposed activities. In addition, a query of the USFWS's IPaC system was performed to identify federally listed species that may occur in or

adjacent to the project area. A query of the CNDDB provided a list of processed and unprocessed special-status species occurrences within the Woodland California US Geological Survey 7.5 minute quadrangle (quad), as well as all adjacent quads. Lastly, the CNPS database was queried to identify special-status plant species with the potential to occur in the aforementioned quads. The raw data returned from the database queries is provided in Attachment A. In addition to the database queries, a review of Land Ownership layers in CNDDB BIOS was conducted to locate protected lands, including wildlife refuges and conservation easements. The Yolo County HCP (ICF 2018) was also reviewed for consistency regarding vegetation communities identified in the project area, as well as for relevant resources and special status species.

Reconnaissance Surveys

A site visit was conducted on July 20, 2018, to verify the results of the desktop review. HDR biologists drove on publically accessible roads throughout the project area in order to record existing vegetation communities, aquatic resources, and species observed. All portions of the project area were able to be directly observed. However, due to accessibility issues, Cache Creek was only observable from two road crossings and a detailed survey was not conducted. The results of the site visit are discussed below.

Results

The desktop and field reviews identified five vegetation communities occurring in the project area, including irrigated agriculture, orchard, riparian, urban, and open water. These resources are described in detail below, and shown on **Figure 1**. The review of the project area also identified special status species with a potential to occur in identified vegetation communities. Please refer to **Table 1** for a summary of these special status species and their associated vegetation communities. Several special-status species included in the database query results were ruled out due to absence of suitable habitat or the project area being located outside of known species ranges. These species are not included in **Table 1**; but can be referenced in **Attachment A**.

Vegetation Communities

IRRIGATED AGRICULTURE

Irrigated agriculture in the project area includes field and row crops. These are dryland crops that are irrigated throughout the growing season and can often have multiple harvests during the year. Crops observed during the July 20, 2018 site visit include corn (*Zea mays*), sunflowers (*Helianthus* sp.), and tomatoes (*Solanum* sp.). Irrigated agriculture is found throughout the project area and is considered the dominant cover type.

ORCHARD

Orchard crops consist of various tree grown agriculture products. All orchards observed during the July 20, 2018 field visit consisted of English walnut (*Juglans regia*) and almonds (*Prunus deulcis*). Not all orchards were directly observed during the site visit, thus, it is possible that other nut and fruit crops are also grown in the project area.

RIPARIAN

Riparian communities in the project area consists of multilayered woodlands with a tree overstory and a diverse shrub layer. During the July 20, 2018 field visit, it was observed that this vegetation community is well developed and typically consists of an overstory of cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), Northern California black walnut (*Juglands hindsii*), willow

(*Salix* sp.). The understory is composed of California grape (*Vitis californica*), Himalayan blackberry (*Rubus armeniacus*), poison oak (*Toxicodendron diversilobum*), elderberry (*Sambucus* sp.), and a variety of herbaceous species. Riparian communities are found adjacent to Cache Creek.

URBAN

Urban areas mapped in the project area are limited to the dense residential portions of Yolo, Interstate 5, and unvegetated portions of the Cache Creek levee. Urban cover is also associated with scattered paved roads and rural residences throughout the project area; however, these were not mapped in detail on **Figure 1**. Vegetation present is either planted and manicured or consists of nonnative herbaceous species growing in and around paved and developed features.

OPEN WATER

Open water consists of major waterways characterized as permanent water features that have little-to-no vegetation present. Cache Creek, which runs along the southern portion of the project area, is the only open water resource that was identified.

Wildlife Observed

Wildlife observed during the July 20, 2018 site visit included American crow (*Corvus brachyrhynchos*), California ground squirrel (*Spermophilus beecheyi*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), California quail (*Callipepla californica*), and mourning dove (*Zenaida macroura*). No special-status species were observed during the site visit; however, special-status species were determined to have the potential to occur in the project area (**Table 1**) and are discussed in more detail below.

Special Status Species

Database query results returned a large number of special status species with a potential to occur in the vicinity of the project area (**Attachment A**). Through review of these results many species were determined to not have the potential to occur in the project area due to absence of suitable habitat or the project area being located outside of known species ranges. **Table 1** provides a description of the special status species that have the potential to occur in each of the delineated vegetation communities. Any potential project related effects to these species or their habitats would require compliance with the California Environmental Quality Act as well as permits/authorizations from the appropriate State or federal agency; as a result, a site-specific biological resources assessment would need to be conducted prior to project implementation to assess impacts on special-status species and their habitats.

Critical Habitat

There is no critical habitat within or adjacent to the project area.

Sensitive Habitats and Aquatic Resources

Sensitive habitats included are those that are of special concern to resource agencies or those that are protected under various State or federal regulations. Aquatic resources provide a variety of functions for plants and wildlife. Aquatic resources provide habitat, foraging, cover, migration, and movement corridors for both special-status and common species. In addition to habitat functions, these features provide physical conveyance of surface water flows capable of handling large stormwater events.

Cache Creek, which is delineated as open water, and its adjacent riparian corridor are the only sensitive habitats and aquatic resource that were identified within the project area. These

communities would be considered sensitive communities due to their unique hydrophytic vegetation and ability to support special-status species. It is recommended that a formal delineation of aquatic resource be completed prior to any project work in order to determine the level of impact to sensitive communities. Consultation and permitting through the appropriate agencies would need to occur where appropriate.

Table 1. Special Status Species with the Potential to Occur in the Project Area

Scientific Name	Common Name	Federal Listing[1]	State Listing[2]/CRPR[3]	Vegetation Community Description
Plants				
Hibiscus lasiocarpos var. *occidentalis*	woolly rose-mallow	--	1B.2	riparian, open water
Invertebrates				
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT	--	throughout the project area wherever elderberry host plant occurs, but most likely to occur in riparian areas
Fishes				
Spirinchus thaleichthys	longfin smelt	FC	ST/SSC	open water
Reptiles				
Emys marmorata	western pond turtle	--	SSC	open water
Birds				
Athene cunicularia	burrowing owl	--	SSC	urban
Buteo swainsoni	Swainson's hawk	--	ST	foraging: orchard, irrigated agriculture

[1] FT = Federally Threatened, FE = Federally Endangered
[2] SSC = Species of Special Concern, ST = State Threatened, SE = State Endangered, FP = Fully Protected
[3] CRPR (California Rare Plant Ranking); 1B.2 = Moderately rare, threatened, or endangered in CA and elsewhere

Scientific Name	Common Name	Federal Listing[1]	State Listing[2]/CRPR[3]	Vegetation Community Description
Buteo swainsoni	Swainson's hawk	--	ST	nesting: riparian and other large trees throughout project area
Charadrius montanus	mountain plover	--	SSC	irrigated agriculture
Circus cyaneus	northern harrier	--	SSC	foraging: irrigated agriculture, orchard
Coccyzus americanus occidentalis	western yellow-billed cuckoo	FT	SE	riparian
Elanus leucurus	white-tailed kite	--	FP	foraging: orchard, irrigated agriculture, riparian, open water
Lanius ludovicianus	loggerhead shrike	--	SSC	nesting: throughout
Icteria virens	yellow breasted chat	--	SSC	riparian
Lanius ludovicianus	loggerhead shrike	--	SSC	irrigated agriculture
Melospiza melodia	song sparrow (Modesto population)	--	SSC	riparian
Progne subis	purple martin	--	SSC	irrigated agriculture
Riparia riparia	bank swallow	--	ST	riparian
Setophaga petechia	yellow warbler	--	SSC	riparian
Mammals				
Antrozous pallidus	pallid bat	--	SSC	orchard, urban
Lasiurus blossevillii	western red bat	--	SSC	riparian

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Protected Areas, Conservation Easements, and Wildlife Movement Corridors
There are no protected lands or conservation easements in the project area.

Local Ordinances
There are no county or local ordinances that affect this project area.

Yolo HCP

The Yolo County HCP (ICF 2018) is a comprehensive, county-wide plan that identifies 12 sensitive species and the natural communities and agricultural land they use as habitat, as well as providing a streamlined permitting process to address any potential effects to these sensitive species. As the entire project area is within Yolo County, the project would fall under the guidance of this document. The 12 species that are included in the HCP are:

- Valley elderberry longhorn beetle
- California tiger salamander
- Western pond turtle
- Giant garter snake
- Swainson's hawk
- White-tailed kite
- Western yellow-billed cuckoo
- Western burrowing owl
- Least Bell's vireo
- Bank swallow
- Tricolored blackbird
- And palmate-bracted bird's beak

Of these 12 species identified in the HCP, four species were determined to have no potential to occur in the project area. These included the California tiger salamander, giant garter snake, tricolored blackbird, and the palmate-bracted bird's beak. The remaining 8 species all have the potential to occur somewhere in the project area and are shown in **Table 1**.

The HCP identifies the natural communities of the Town of Yolo area as consisting field crops, grain/hay crops, and deciduous fruits and nut orchards, as well as small amounts of riparian areas and urban areas. Overall, the desktop review and site visit aligned with vegetation mapping presented in the HCP, with the exception of a few minor changes.

Conclusion

The findings in this memo represent a preliminary, high-level review of potential biological constraints in the project area and should not be considered final and all-encompassing. Based on this cursory look at biological resources, the project area appears to support suitable habitat for several special-status species, and includes various sensitive communities and aquatic resources. Proposed project activities have the potential to impact any of the aforementioned biological resources, should they be present in the vicinity of the proposed work area. Prior to project implementation, consultation with the agencies and acquisition of permits may be necessary.

Literature Cited

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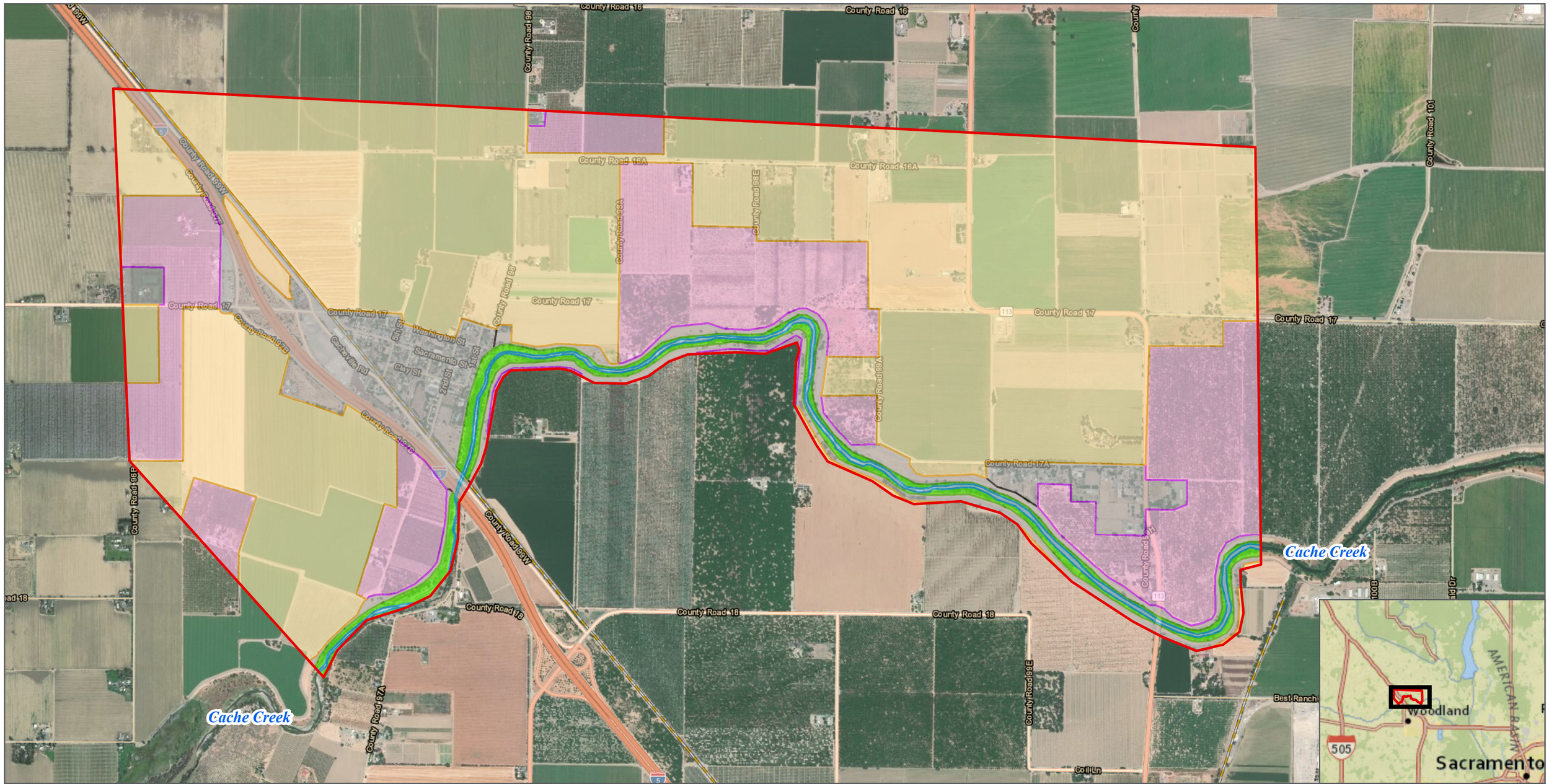

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SOURCES: Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; Chinook Salmon and Rainbow Trout: National Marine Fisheries Service; Project boundary, Potential Waters, Potential Wetlands, Habitat Types: HDR Inc. This map product was compiled from the best available sources. No warranty is made for its accuracy or completness. Projection: State Plane California Zone II 0402 US Feet.

Project Area

Vegetation Communities

- Irrigated Agriculture
- Open Water
- Orchard
- Riparian
- Urban

HDR

YOLO
FLOOD RISK REDUCTION
FEASIBILITY STUDY

FIGURE 1

PATH: H:\GIS_PROJECTS\YOLO_COUNTY_SOW\MXD\ATTACHMENT_YOLO_COUNTY_YOLO_11X17.MXD - USER: STIDBALL - DATE: 9/6/2018

Attachment A. 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:
Consultation Code: 08ESMF00-2018-SLI-3133
Event Code: 08ESMF00-2018-E-09406
Project Name: Town of Yolo

September 05, 2018

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: 08ESMF00-2018-SLI-3133

Event Code: 08ESMF00-2018-E-09406

Project Name: Town of Yolo

Project Type: Guidance

Project Description: Yolo Small Communities

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.73191299000344N121.77230965085087W

Counties: Yolo, CA

Endangered Species Act Species

There is a total of 8 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 Fisheries[1], 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.

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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.

Birds

NAME	STATUS
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Giant Garter Snake *Thamnophis gigas* 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 *Rana draytonii* 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
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* 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

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* 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 *Lepidurus packardi* 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.

CNDDB 9-Quad Species List 219 records.

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Amphibians	Ambystoma californiense	California tiger salamander	AAAAA01180	Threatened	Threatened	WL	-	3812157	Merritt	Mapped	Animals - Amphibians - Ambystomatidae - Ambystoma californiense
Animals - Amphibians	Ambystoma californiense	California tiger salamander	AAAAA01180	Threatened	Threatened	WL	-	3812178	Zamora	Mapped	Animals - Amphibians - Ambystomatidae - Ambystoma californiense
Animals - Birds	Accipiter cooperii	Cooper's hawk	ABNKC12040	None	None	WL	-	3812156	Davis	Unprocessed	Animals - Birds - Accipitridae - Accipiter cooperii
Animals - Birds	Buteo swainsoni	Swainson's hawk	ABNKC19070	None	Threatened	-	-	3812156	Davis	Mapped and Unprocessed	Animals - Birds - Accipitridae - Buteo swainsoni
Animals - Birds	Buteo swainsoni	Swainson's hawk	ABNKC19070	None	Threatened	-	-	3812157	Merritt	Mapped and Unprocessed	Animals - Birds - Accipitridae - Buteo swainsoni
Animals - Birds	Buteo swainsoni	Swainson's hawk	ABNKC19070	None	Threatened	-	-	3812158	Winters	Mapped and Unprocessed	Animals - Birds - Accipitridae - Buteo swainsoni
Animals - Birds	Buteo swainsoni	Swainson's hawk	ABNKC19070	None	Threatened	-	-	3812166	Grays Bend	Mapped and Unprocessed	Animals - Birds - Accipitridae - Buteo swainsoni
Animals - Birds	Buteo swainsoni	Swainson's hawk	ABNKC19070	None	Threatened	-	-	3812167	Woodland	Mapped and Unprocessed	Animals - Birds - Accipitridae - Buteo swainsoni
Animals - Birds	Buteo swainsoni	Swainson's hawk	ABNKC19070	None	Threatened	-	-	3812178	Zamora	Mapped	Animals - Birds - Accipitridae - Buteo swainsoni
Animals - Birds	Buteo swainsoni	Swainson's hawk	ABNKC19070	None	Threatened	-	-	3812177	Eldorado Bend	Mapped	Animals - Birds - Accipitridae - Buteo swainsoni
Animals - Birds	Buteo swainsoni	Swainson's hawk	ABNKC19070	None	Threatened	-	-	3812168	Madison	Mapped and Unprocessed	Animals - Birds - Accipitridae - Buteo swainsoni
Animals - Birds	Buteo swainsoni	Swainson's hawk	ABNKC19070	None	Threatened	-	-	3812176	Knights Landing	Mapped and Unprocessed	Animals - Birds - Accipitridae - Buteo swainsoni
Animals - Birds	Circus cyaneus	northern harrier	ABNKC11010	None	None	SSC	-	3812166	Grays Bend	Unprocessed	Animals - Birds - Accipitridae - Circus cyaneus
Animals - Birds	Circus cyaneus	northern harrier	ABNKC11010	None	None	SSC	-	3812157	Merritt	Mapped	Animals - Birds - Accipitridae - Circus cyaneus
Animals - Birds	Circus cyaneus	northern harrier	ABNKC11010	None	None	SSC	-	3812156	Davis	Unprocessed	Animals - Birds - Accipitridae - Circus cyaneus
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	3812156	Davis	Mapped and Unprocessed	Animals - Birds - Accipitridae - Elanus leucurus
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	3812157	Merritt	Mapped and Unprocessed	Animals - Birds - Accipitridae - Elanus leucurus
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	3812166	Grays Bend	Unprocessed	Animals - Birds - Accipitridae - Elanus leucurus
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	3812158	Winters	Unprocessed	Animals - Birds - Accipitridae - Elanus leucurus
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	3812167	Woodland	Unprocessed	Animals - Birds - Accipitridae - Elanus leucurus
Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	3812176	Knights Landing	Unprocessed	Animals - Birds - Accipitridae - Elanus leucurus

Animals - Birds	Elanus leucurus	white-tailed kite	ABNKC06010	None	None	FP	-	3812177	Eldorado Bend	Unprocessed	Animals - Birds - Accipitridae - Elanus leucurus
Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	3812176	Knights Landing	Unprocessed	Animals - Birds - Ardeidae - Ardea alba
Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	3812157	Merritt	Unprocessed	Animals - Birds - Ardeidae - Ardea alba
Animals - Birds	Ardea alba	great egret	ABNGA04040	None	None	-	-	3812156	Davis	Unprocessed	Animals - Birds - Ardeidae - Ardea alba
Animals - Birds	Ardea herodias	great blue heron	ABNGA04010	None	None	-	-	3812158	Winters	Unprocessed	Animals - Birds - Ardeidae - Ardea herodias
Animals - Birds	Ardea herodias	great blue heron	ABNGA04010	None	None	-	-	3812166	Grays Bend	Unprocessed	Animals - Birds - Ardeidae - Ardea herodias
Animals - Birds	Ardea herodias	great blue heron	ABNGA04010	None	None	-	-	3812176	Knights Landing	Unprocessed	Animals - Birds - Ardeidae - Ardea herodias
Animals - Birds	Egretta thula	snowy egret	ABNGA06030	None	None	-	-	3812167	Woodland	Unprocessed	Animals - Birds - Ardeidae - Egretta thula
Animals - Birds	Egretta thula	snowy egret	ABNGA06030	None	None	-	-	3812156	Davis	Unprocessed	Animals - Birds - Ardeidae - Egretta thula
Animals - Birds	Egretta thula	snowy egret	ABNGA06030	None	None	-	-	3812157	Merritt	Unprocessed	Animals - Birds - Ardeidae - Egretta thula
Animals - Birds	Ixobrychus exilis	least bittern	ABNGA02010	None	None	SSC	-	3812156	Davis	Unprocessed	Animals - Birds - Ardeidae - Ixobrychus exilis
Animals - Birds	Nycticorax nycticorax	black-crowned night heron	ABNGA11010	None	None	-	-	3812156	Davis	Unprocessed	Animals - Birds - Ardeidae - Nycticorax nycticorax
Animals - Birds	Nycticorax nycticorax	black-crowned night heron	ABNGA11010	None	None	-	-	3812157	Merritt	Unprocessed	Animals - Birds - Ardeidae - Nycticorax nycticorax
Animals - Birds	Nycticorax nycticorax	black-crowned night heron	ABNGA11010	None	None	-	-	3812167	Woodland	Unprocessed	Animals - Birds - Ardeidae - Nycticorax nycticorax
Animals - Birds	Nycticorax nycticorax	black-crowned night heron	ABNGA11010	None	None	-	-	3812168	Madison	Mapped and Unprocessed	Animals - Birds - Ardeidae - Nycticorax nycticorax
Animals - Birds	Charadrius alexandrinus nivosus	western snowy plover	ABNNB03031	Threatened	None	SSC	-	3812168	Madison	Unprocessed	Animals - Birds - Charadriidae - Charadrius alexandrinus nivosus
Animals - Birds	Charadrius alexandrinus nivosus	western snowy plover	ABNNB03031	Threatened	None	SSC	-	3812166	Grays Bend	Mapped and Unprocessed	Animals - Birds - Charadriidae - Charadrius alexandrinus nivosus
Animals - Birds	Charadrius alexandrinus nivosus	western snowy plover	ABNNB03031	Threatened	None	SSC	-	3812156	Davis	Mapped	Animals - Birds - Charadriidae - Charadrius alexandrinus nivosus
Animals - Birds	Charadrius montanus	mountain plover	ABNNB03100	None	None	SSC	-	3812156	Davis	Unprocessed	Animals - Birds - Charadriidae - Charadrius montanus
Animals - Birds	Charadrius montanus	mountain plover	ABNNB03100	None	None	SSC	-	3812157	Merritt	Unprocessed	Animals - Birds - Charadriidae - Charadrius montanus

Animals - Birds	Charadrius montanus	mountain plover	ABNNB03100	None	None	SSC	-	3812166	Grays Bend	Mapped and Unprocessed	Animals - Birds - Charadriidae - Charadrius montanus
Animals - Birds	Charadrius montanus	mountain plover	ABNNB03100	None	None	SSC	-	3812168	Madison	Mapped	Animals - Birds - Charadriidae - Charadrius montanus
Animals - Birds	Charadrius montanus	mountain plover	ABNNB03100	None	None	SSC	-	3812176	Knights Landing	Mapped	Animals - Birds - Charadriidae - Charadrius montanus
Animals - Birds	Charadrius montanus	mountain plover	ABNNB03100	None	None	SSC	-	3812177	Eldorado Bend	Mapped and Unprocessed	Animals - Birds - Charadriidae - Charadrius montanus
Animals - Birds	Charadrius montanus	mountain plover	ABNNB03100	None	None	SSC	-	3812178	Zamora	Mapped and Unprocessed	Animals - Birds - Charadriidae - Charadrius montanus
Animals - Birds	Pica nuttalli	yellow-billed magpie	ABPAV09020	None	None	-	-	3812157	Merritt	Unprocessed	Animals - Birds - Corvidae - Pica nuttalli
Animals - Birds	Pica nuttalli	yellow-billed magpie	ABPAV09020	None	None	-	-	3812156	Davis	Unprocessed	Animals - Birds - Corvidae - Pica nuttalli
Animals - Birds	Coccyzus americanus occidentalis	western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	-	-	3812157	Merritt	Mapped	Animals - Birds - Cuculidae - Coccyzus americanus occidentalis
Animals - Birds	Coccyzus americanus occidentalis	western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	-	-	3812176	Knights Landing	Mapped	Animals - Birds - Cuculidae - Coccyzus americanus occidentalis
Animals - Birds	Melospiza melodia	song sparrow (-inModesto-in population)	ABPBXA3010	None	None	SSC	-	3812166	Grays Bend	Mapped	Animals - Birds - Emberizidae - Melospiza melodia
Animals - Birds	Falco columbarius	merlin	ABNKD06030	None	None	WL	-	3812166	Grays Bend	Mapped	Animals - Birds - Falconidae - Falco columbarius
Animals - Birds	Progne subis	purple martin	ABPAU01010	None	None	SSC	-	3812156	Davis	Unprocessed	Animals - Birds - Hirundinidae - Progne subis
Animals - Birds	Riparia riparia	bank swallow	ABPAU08010	None	Threatened	-	-	3812167	Woodland	Unprocessed	Animals - Birds - Hirundinidae - Riparia riparia
Animals - Birds	Riparia riparia	bank swallow	ABPAU08010	None	Threatened	-	-	3812176	Knights Landing	Mapped and Unprocessed	Animals - Birds - Hirundinidae - Riparia riparia
Animals - Birds	Riparia riparia	bank swallow	ABPAU08010	None	Threatened	-	-	3812168	Madison	Mapped	Animals - Birds - Hirundinidae - Riparia riparia
Animals - Birds	Riparia riparia	bank swallow	ABPAU08010	None	Threatened	-	-	3812177	Eldorado Bend	Mapped and Unprocessed	Animals - Birds - Hirundinidae - Riparia riparia
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Candidate Endangered	SSC	-	3812177	Eldorado Bend	Mapped	Animals - Birds - Icteridae - Agelaius tricolor
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Candidate Endangered	SSC	-	3812178	Zamora	Mapped	Animals - Birds - Icteridae - Agelaius tricolor
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Candidate Endangered	SSC	-	3812168	Madison	Mapped and Unprocessed	Animals - Birds - Icteridae - Agelaius tricolor
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Candidate Endangered	SSC	-	3812176	Knights Landing	Mapped	Animals - Birds - Icteridae - Agelaius tricolor
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Candidate Endangered	SSC	-	3812167	Woodland	Mapped	Animals - Birds - Icteridae - Agelaius tricolor

Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Candidate Endangered	SSC	-	3812166	Grays Bend	Mapped and Unprocessed	Animals - Birds - Icteridae - Agelaius tricolor
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Candidate Endangered	SSC	-	3812158	Winters	Mapped	Animals - Birds - Icteridae - Agelaius tricolor
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Candidate Endangered	SSC	-	3812156	Davis	Mapped	Animals - Birds - Icteridae - Agelaius tricolor
Animals - Birds	Agelaius tricolor	tricolored blackbird	ABPBXB0020	None	Candidate Endangered	SSC	-	3812157	Merritt	Mapped	Animals - Birds - Icteridae - Agelaius tricolor
Animals - Birds	Xanthocephalus xanthocephalus	yellow-headed blackbird	ABPBXB3010	None	None	SSC	-	3812156	Davis	Unprocessed	Animals - Birds - Icteridae - Xanthocephalus xanthocephalus
Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	3812156	Davis	Unprocessed	Animals - Birds - Laniidae - Lanius ludovicianus
Animals - Birds	Lanius ludovicianus	loggerhead shrike	ABPBR01030	None	None	SSC	-	3812158	Winters	Unprocessed	Animals - Birds - Laniidae - Lanius ludovicianus
Animals - Birds	Larus californicus	California gull	ABNNM03110	None	None	WL	-	3812156	Davis	Unprocessed	Animals - Birds - Laridae - Larus californicus
Animals - Birds	Icteria virens	yellow-breasted chat	ABPBX24010	None	None	SSC	-	3812157	Merritt	Unprocessed	Animals - Birds - Parulidae - Icteria virens
Animals - Birds	Icteria virens	yellow-breasted chat	ABPBX24010	None	None	SSC	-	3812158	Winters	Unprocessed	Animals - Birds - Parulidae - Icteria virens
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	3812158	Winters	Unprocessed	Animals - Birds - Parulidae - Setophaga petechia
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	3812166	Grays Bend	Unprocessed	Animals - Birds - Parulidae - Setophaga petechia
Animals - Birds	Setophaga petechia	yellow warbler	ABPBX03010	None	None	SSC	-	3812157	Merritt	Unprocessed	Animals - Birds - Parulidae - Setophaga petechia
Animals - Birds	Phalacrocorax auritus	double-crested cormorant	ABNFD01020	None	None	WL	-	3812176	Knights Landing	Unprocessed	Animals - Birds - Phalacrocoracidae - Phalacrocorax auritus
Animals - Birds	Numenius americanus	long-billed curlew	ABNNF07070	None	None	WL	-	3812166	Grays Bend	Unprocessed	Animals - Birds - Scolopacidae - Numenius americanus
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	3812166	Grays Bend	Unprocessed	Animals - Birds - Strigidae - Athene cunicularia
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	3812158	Winters	Mapped	Animals - Birds - Strigidae - Athene cunicularia
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	3812167	Woodland	Unprocessed	Animals - Birds - Strigidae - Athene cunicularia
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	3812157	Merritt	Mapped and Unprocessed	Animals - Birds - Strigidae - Athene cunicularia
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	3812156	Davis	Mapped and Unprocessed	Animals - Birds - Strigidae - Athene cunicularia
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	3812168	Madison	Mapped and Unprocessed	Animals - Birds - Strigidae - Athene cunicularia
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	3812178	Zamora	Mapped and Unprocessed	Animals - Birds - Strigidae - Athene cunicularia

Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	3812177	Eldorado Bend	Unprocessed	Animals - Birds - Strigidae - Athene cunicularia
Animals - Birds	Plegadis chihi	white-faced ibis	ABNGE02020	None	None	WL	-	3812156	Davis	Unprocessed	Animals - Birds - Threskiornithidae - Plegadis chihi
Animals - Birds	Plegadis chihi	white-faced ibis	ABNGE02020	None	None	WL	-	3812166	Grays Bend	Mapped	Animals - Birds - Threskiornithidae - Plegadis chihi
Animals - Birds	Vireo bellii pusillus	least Bell's vireo	ABPBW01114	Endangered	Endangered	-	-	3812156	Davis	Unprocessed	Animals - Birds - Vireonidae - Vireo bellii pusillus
Animals - Birds	Vireo bellii pusillus	least Bell's vireo	ABPBW01114	Endangered	Endangered	-	-	3812157	Merritt	Unprocessed	Animals - Birds - Vireonidae - Vireo bellii pusillus
Animals - Crustaceans	Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	Threatened	None	-	-	3812157	Merritt	Mapped	Animals - Crustaceans - Branchinectidae - Branchinecta lynchi
Animals - Crustaceans	Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	Threatened	None	-	-	3812158	Winters	Mapped and Unprocessed	Animals - Crustaceans - Branchinectidae - Branchinecta lynchi
Animals - Crustaceans	Linderiella occidentalis	California linderiella	ICBRA06010	None	None	-	-	3812156	Davis	Mapped	Animals - Crustaceans - Linderiellidae - Linderiella occidentalis
Animals - Crustaceans	Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	Endangered	None	-	-	3812156	Davis	Mapped	Animals - Crustaceans - Triopsidae - Lepidurus packardi
Animals - Crustaceans	Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	Endangered	None	-	-	3812157	Merritt	Mapped	Animals - Crustaceans - Triopsidae - Lepidurus packardi
Animals - Crustaceans	Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	Endangered	None	-	-	3812166	Grays Bend	Mapped and Unprocessed	Animals - Crustaceans - Triopsidae - Lepidurus packardi
Animals - Fish	Acipenser medirostris	green sturgeon	AFCAA01030	Threatened	None	SSC	-	3812176	Knights Landing	Unprocessed	Animals - Fish - Acipenseridae - Acipenser medirostris
Animals - Fish	Acipenser transmontanus	white sturgeon	AFCAA01050	None	None	SSC	-	3812176	Knights Landing	Unprocessed	Animals - Fish - Acipenseridae - Acipenser transmontanus
Animals - Fish	Lavinia exilicauda exilicauda	Sacramento hitch	AFCJB19012	None	None	SSC	-	3812176	Knights Landing	Unprocessed	Animals - Fish - Cyprinidae - Lavinia exilicauda exilicauda
Animals - Fish	Mylopharodon conocephalus	hardhead	AFCJB25010	None	None	SSC	-	3812176	Knights Landing	Unprocessed	Animals - Fish - Cyprinidae - Mylopharodon conocephalus
Animals - Fish	Pogonichthys macrolepidotus	Sacramento splittail	AFCJB34020	None	None	SSC	-	3812176	Knights Landing	Mapped and Unprocessed	Animals - Fish - Cyprinidae - Pogonichthys macrolepidotus
Animals - Fish	Pogonichthys macrolepidotus	Sacramento splittail	AFCJB34020	None	None	SSC	-	3812177	Eldorado Bend	Mapped	Animals - Fish - Cyprinidae - Pogonichthys macrolepidotus
Animals - Fish	Pogonichthys macrolepidotus	Sacramento splittail	AFCJB34020	None	None	SSC	-	3812166	Grays Bend	Mapped	Animals - Fish - Cyprinidae - Pogonichthys macrolepidotus

Animals - Fish	Hysterocarpus traski traski	Sacramento-San Joaquin tule perch	AFCQK02012	None	None	-	-	3812166	Grays Bend	Unprocessed	Animals - Fish - Embiotocidae - Hysterocarpus traski traski
Animals - Fish	Hysterocarpus traski traski	Sacramento-San Joaquin tule perch	AFCQK02012	None	None	-	-	3812176	Knights Landing	Unprocessed	Animals - Fish - Embiotocidae - Hysterocarpus traski traski
Animals - Fish	Spirinchus thaleichthys	longfin smelt	AFCHB03010	Candidate	Threatened	SSC	-	3812176	Knights Landing	Mapped	Animals - Fish - Osmeridae - Spirinchus thaleichthys
Animals - Fish	Spirinchus thaleichthys	longfin smelt	AFCHB03010	Candidate	Threatened	SSC	-	3812166	Grays Bend	Mapped	Animals - Fish - Osmeridae - Spirinchus thaleichthys
Animals - Fish	Thaleichthys pacificus	eulachon	AFCHB04010	Threatened	None	-	-	3812176	Knights Landing	Mapped	Animals - Fish - Osmeridae - Thaleichthys pacificus
Animals - Fish	Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	-	-	3812177	Eldorado Bend	Mapped	Animals - Fish - Salmonidae - Oncorhynchus mykiss irideus pop. 11
Animals - Fish	Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	-	-	3812176	Knights Landing	Mapped and Unprocessed	Animals - Fish - Salmonidae - Oncorhynchus mykiss irideus pop. 11
Animals - Fish	Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	-	-	3812166	Grays Bend	Mapped	Animals - Fish - Salmonidae - Oncorhynchus mykiss irideus pop. 11
Animals - Fish	Oncorhynchus mykiss irideus pop. 8	steelhead - central California coast DPS	AFCHA0209G	Threatened	None	-	-	3812176	Knights Landing	Unprocessed	Animals - Fish - Salmonidae - Oncorhynchus mykiss irideus pop. 8
Animals - Fish	Oncorhynchus tshawytscha pop. 13	chinook salmon - Central Valley fall / late fall-run ESU	AFCHA0205N	None	None	SSC	-	3812176	Knights Landing	Unprocessed	Animals - Fish - Salmonidae - Oncorhynchus tshawytscha pop. 13
Animals - Fish	Oncorhynchus tshawytscha pop. 13	chinook salmon - Central Valley fall / late fall-run ESU	AFCHA0205N	None	None	SSC	-	3812166	Grays Bend	Unprocessed	Animals - Fish - Salmonidae - Oncorhynchus tshawytscha pop. 13
Animals - Fish	Oncorhynchus tshawytscha pop. 30	chinook salmon - upper Klamath and Trinity Rivers ESU	AFCHA02056	None	None	SSC	-	3812176	Knights Landing	Unprocessed	Animals - Fish - Salmonidae - Oncorhynchus tshawytscha pop. 30
Animals - Fish	Oncorhynchus tshawytscha pop. 6	chinook salmon - Central Valley spring-run ESU	AFCHA0205A	Threatened	Threatened	-	-	3812176	Knights Landing	Mapped and Unprocessed	Animals - Fish - Salmonidae - Oncorhynchus tshawytscha pop. 6
Animals - Fish	Oncorhynchus tshawytscha pop. 7	chinook salmon - Sacramento River winter-run ESU	AFCHA0205B	Endangered	Endangered	-	-	3812176	Knights Landing	Unprocessed	Animals - Fish - Salmonidae - Oncorhynchus tshawytscha pop. 7
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	None	-	-	3812157	Merritt	Mapped	Animals - Insects - Apidae - Bombus crotchii
Animals - Insects	Bombus crotchii	Crotch bumble bee	IIHYM24480	None	None	-	-	3812156	Davis	Mapped	Animals - Insects - Apidae - Bombus crotchii

Animals - Insects	Bombus occidentalis	western bumble bee	IIHYM24250	None	None	-	-	3812156	Davis	Mapped and Unprocessed	Animals - Insects - Apidae - Bombus occidentalis
Animals - Insects	Bombus occidentalis	western bumble bee	IIHYM24250	None	None	-	-	3812157	Merritt	Mapped	Animals - Insects - Apidae - Bombus occidentalis
Animals - Insects	Bombus occidentalis	western bumble bee	IIHYM24250	None	None	-	-	3812158	Winters	Mapped	Animals - Insects - Apidae - Bombus occidentalis
Animals - Insects	Bombus occidentalis	western bumble bee	IIHYM24250	None	None	-	-	3812167	Woodland	Mapped	Animals - Insects - Apidae - Bombus occidentalis
Animals - Insects	Cicindela hirticollis abrupta	Sacramento Valley tiger beetle	IICOL02106	None	None	-	-	3812176	Knights Landing	Mapped	Animals - Insects - Carabidae - Cicindela hirticollis abrupta
Animals - Insects	Cicindela hirticollis abrupta	Sacramento Valley tiger beetle	IICOL02106	None	None	-	-	3812157	Merritt	Mapped	Animals - Insects - Carabidae - Cicindela hirticollis abrupta
Animals - Insects	Cicindela hirticollis abrupta	Sacramento Valley tiger beetle	IICOL02106	None	None	-	-	3812156	Davis	Mapped	Animals - Insects - Carabidae - Cicindela hirticollis abrupta
Animals - Insects	Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	Threatened	None	-	-	3812156	Davis	Mapped	Animals - Insects - Cerambycidae - Desmocerus californicus dimorphus
Animals - Insects	Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	Threatened	None	-	-	3812157	Merritt	Mapped	Animals - Insects - Cerambycidae - Desmocerus californicus dimorphus
Animals - Insects	Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	Threatened	None	-	-	3812158	Winters	Mapped	Animals - Insects - Cerambycidae - Desmocerus californicus dimorphus
Animals - Insects	Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	Threatened	None	-	-	3812176	Knights Landing	Mapped	Animals - Insects - Cerambycidae - Desmocerus californicus dimorphus
Animals - Insects	Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	Threatened	None	-	-	3812167	Woodland	Mapped	Animals - Insects - Cerambycidae - Desmocerus californicus dimorphus
Animals - Insects	Myrmosula pacifica	Antioch multilid wasp	IIHYM15010	None	None	-	-	3812157	Merritt	Mapped	Animals - Insects - Mutillidae - Myrmosula pacifica
Animals - Insects	Myrmosula pacifica	Antioch multilid wasp	IIHYM15010	None	None	-	-	3812156	Davis	Mapped	Animals - Insects - Mutillidae - Myrmosula pacifica
Animals - Mammals	Vulpes vulpes patwin	Sacramento Valley red fox	AMAJA03015	None	None	-	-	3812156	Davis	Unprocessed	Animals - Mammals - Canidae - Vulpes vulpes patwin
Animals - Mammals	Vulpes vulpes patwin	Sacramento Valley red fox	AMAJA03015	None	None	-	-	3812157	Merritt	Unprocessed	Animals - Mammals - Canidae - Vulpes vulpes patwin
Animals - Mammals	Vulpes vulpes patwin	Sacramento Valley red fox	AMAJA03015	None	None	-	-	3812158	Winters	Unprocessed	Animals - Mammals - Canidae - Vulpes vulpes patwin
Animals - Mammals	Vulpes vulpes patwin	Sacramento Valley red fox	AMAJA03015	None	None	-	-	3812167	Woodland	Unprocessed	Animals - Mammals - Canidae - Vulpes vulpes patwin

Animals - Mammals	Vulpes vulpes patwin	Sacramento Valley red fox	AMAJA03015	None	None	-	-	3812168	Madison	Unprocessed	Animals - Mammals - Canidae - Vulpes vulpes patwin
Animals - Mammals	Vulpes vulpes patwin	Sacramento Valley red fox	AMAJA03015	None	None	-	-	3812176	Knights Landing	Unprocessed	Animals - Mammals - Canidae - Vulpes vulpes patwin
Animals - Mammals	Vulpes vulpes patwin	Sacramento Valley red fox	AMAJA03015	None	None	-	-	3812178	Zamora	Unprocessed	Animals - Mammals - Canidae - Vulpes vulpes patwin
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	3812178	Zamora	Unprocessed	Animals - Mammals - Mustelidae - Taxidea taxus
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	3812167	Woodland	Mapped and Unprocessed	Animals - Mammals - Mustelidae - Taxidea taxus
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	3812157	Merritt	Mapped	Animals - Mammals - Mustelidae - Taxidea taxus
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	3812156	Davis	Mapped	Animals - Mammals - Mustelidae - Taxidea taxus
Animals - Mammals	Antrozous pallidus	pallid bat	AMACC10010	None	None	SSC	-	3812156	Davis	Mapped	Animals - Mammals - Vespertilionidae - Antrozous pallidus
Animals - Mammals	Antrozous pallidus	pallid bat	AMACC10010	None	None	SSC	-	3812157	Merritt	Mapped	Animals - Mammals - Vespertilionidae - Antrozous pallidus
Animals - Mammals	Antrozous pallidus	pallid bat	AMACC10010	None	None	SSC	-	3812167	Woodland	Mapped	Animals - Mammals - Vespertilionidae - Antrozous pallidus
Animals - Mammals	Lasionycteris noctivagans	silver-haired bat	AMACC02010	None	None	-	-	3812157	Merritt	Mapped	Animals - Mammals - Vespertilionidae - Lasionycteris noctivagans
Animals - Mammals	Lasionycteris noctivagans	silver-haired bat	AMACC02010	None	None	-	-	3812156	Davis	Mapped	Animals - Mammals - Vespertilionidae - Lasionycteris noctivagans
Animals - Mammals	Lasionycteris noctivagans	silver-haired bat	AMACC02010	None	None	-	-	3812167	Woodland	Mapped	Animals - Mammals - Vespertilionidae - Lasionycteris noctivagans
Animals - Mammals	Lasiurus blossevillii	western red bat	AMACC05060	None	None	SSC	-	3812158	Winters	Mapped	Animals - Mammals - Vespertilionidae - Lasiurus blossevillii
Animals - Mammals	Lasiurus blossevillii	western red bat	AMACC05060	None	None	SSC	-	3812176	Knights Landing	Mapped	Animals - Mammals - Vespertilionidae - Lasiurus blossevillii
Animals - Mammals	Lasiurus cinereus	hoary bat	AMACC05030	None	None	-	-	3812176	Knights Landing	Mapped	Animals - Mammals - Vespertilionidae - Lasiurus cinereus
Animals - Mammals	Lasiurus cinereus	hoary bat	AMACC05030	None	None	-	-	3812167	Woodland	Mapped	Animals - Mammals - Vespertilionidae - Lasiurus cinereus

Animals - Mammals	Lasiurus cinereus	hoary bat	AMACC05030	None	None	-	-	3812156	Davis	Mapped	Animals - Mammals - Vespertilionidae - Lasiurus cinereus
Animals - Mammals	Lasiurus cinereus	hoary bat	AMACC05030	None	None	-	-	3812157	Merritt	Mapped	Animals - Mammals - Vespertilionidae - Lasiurus cinereus
Animals - Mammals	Myotis yumanensis	Yuma myotis	AMACC01020	None	None	-	-	3812158	Winters	Mapped	Animals - Mammals - Vespertilionidae - Myotis yumanensis
Animals - Mollusks	Anodonta californiensis	California floater	IMBIV04020	None	None	-	-	3812166	Grays Bend	Unprocessed	Animals - Mollusks - Unionidae - Anodonta californiensis
Animals - Mollusks	Anodonta californiensis	California floater	IMBIV04020	None	None	-	-	3812176	Knights Landing	Unprocessed	Animals - Mollusks - Unionidae - Anodonta californiensis
Animals - Mollusks	Anodonta californiensis	California floater	IMBIV04020	None	None	-	-	3812168	Madison	Unprocessed	Animals - Mollusks - Unionidae - Anodonta californiensis
Animals - Mollusks	Gonidea angulata	western ridged mussel	IMBIV19010	None	None	-	-	3812158	Winters	Unprocessed	Animals - Mollusks - Unionidae - Gonidea angulata
Animals - Reptiles	Emys marmorata	western pond turtle	ARAAD02030	None	None	SSC	-	3812158	Winters	Mapped	Animals - Reptiles - Emydidae - Emys marmorata
Animals - Reptiles	Emys marmorata	western pond turtle	ARAAD02030	None	None	SSC	-	3812166	Grays Bend	Unprocessed	Animals - Reptiles - Emydidae - Emys marmorata
Animals - Reptiles	Emys marmorata	western pond turtle	ARAAD02030	None	None	SSC	-	3812167	Woodland	Unprocessed	Animals - Reptiles - Emydidae - Emys marmorata
Animals - Reptiles	Emys marmorata	western pond turtle	ARAAD02030	None	None	SSC	-	3812157	Merritt	Mapped and Unprocessed	Animals - Reptiles - Emydidae - Emys marmorata
Animals - Reptiles	Emys marmorata	western pond turtle	ARAAD02030	None	None	SSC	-	3812156	Davis	Mapped	Animals - Reptiles - Emydidae - Emys marmorata
Animals - Reptiles	Emys marmorata	western pond turtle	ARAAD02030	None	None	SSC	-	3812168	Madison	Unprocessed	Animals - Reptiles - Emydidae - Emys marmorata
Animals - Reptiles	Emys marmorata	western pond turtle	ARAAD02030	None	None	SSC	-	3812176	Knights Landing	Mapped and Unprocessed	Animals - Reptiles - Emydidae - Emys marmorata
Animals - Reptiles	Thamnophis gigas	giant gartersnake	ARADB36150	Threatened	Threatened	-	-	3812176	Knights Landing	Mapped and Unprocessed	Animals - Reptiles - Natricidae - Thamnophis gigas
Animals - Reptiles	Thamnophis gigas	giant gartersnake	ARADB36150	Threatened	Threatened	-	-	3812178	Zamora	Mapped and Unprocessed	Animals - Reptiles - Natricidae - Thamnophis gigas
Animals - Reptiles	Thamnophis gigas	giant gartersnake	ARADB36150	Threatened	Threatened	-	-	3812177	Eldorado Bend	Mapped and Unprocessed	Animals - Reptiles - Natricidae - Thamnophis gigas
Animals - Reptiles	Thamnophis gigas	giant gartersnake	ARADB36150	Threatened	Threatened	-	-	3812156	Davis	Mapped	Animals - Reptiles - Natricidae - Thamnophis gigas
Animals - Reptiles	Thamnophis gigas	giant gartersnake	ARADB36150	Threatened	Threatened	-	-	3812157	Merritt	Mapped	Animals - Reptiles - Natricidae - Thamnophis gigas
Animals - Reptiles	Thamnophis gigas	giant gartersnake	ARADB36150	Threatened	Threatened	-	-	3812166	Grays Bend	Mapped and Unprocessed	Animals - Reptiles - Natricidae - Thamnophis gigas
Community - Terrestrial	Great Valley Mixed Riparian Forest	Great Valley Mixed Riparian Forest	CTT61420CA	None	None	-	-	3812177	Eldorado Bend	Mapped	Community - Terrestrial - Great Valley Mixed Riparian Forest

Community - Terrestrial	Great Valley Mixed Riparian Forest	Great Valley Mixed Riparian Forest	CTT61420CA	None	None	-	-	3812176	Knights Landing	Mapped	Community - Terrestrial - Great Valley Mixed Riparian Forest
Community - Terrestrial	Valley Oak Woodland	Valley Oak Woodland	CTT71130CA	None	None	-	-	3812167	Woodland	Mapped	Community - Terrestrial - Valley Oak Woodland
Plants - Vascular	Centromadia parryi ssp. parryi	pappose tarplant	PDAST4R0P2	None	None	-	1B.2	3812156	Davis	Mapped	Plants - Vascular - Asteraceae - Centromadia parryi ssp. parryi
Plants - Vascular	Centromadia parryi ssp. rudis	Parry's rough tarplant	PDAST4R0P3	None	None	-	4.2	3812156	Davis	Unprocessed	Plants - Vascular - Asteraceae - Centromadia parryi ssp. rudis
Plants - Vascular	Centromadia parryi ssp. rudis	Parry's rough tarplant	PDAST4R0P3	None	None	-	4.2	3812166	Grays Bend	Unprocessed	Plants - Vascular - Asteraceae - Centromadia parryi ssp. rudis
Plants - Vascular	Centromadia parryi ssp. rudis	Parry's rough tarplant	PDAST4R0P3	None	None	-	4.2	3812158	Winters	Unprocessed	Plants - Vascular - Asteraceae - Centromadia parryi ssp. rudis
Plants - Vascular	Centromadia parryi ssp. rudis	Parry's rough tarplant	PDAST4R0P3	None	None	-	4.2	3812167	Woodland	Unprocessed	Plants - Vascular - Asteraceae - Centromadia parryi ssp. rudis
Plants - Vascular	Hesperevax caulescens	hogwallow starfish	PDASTE5020	None	None	-	4.2	3812158	Winters	Unprocessed	Plants - Vascular - Asteraceae - Hesperevax caulescens
Plants - Vascular	Lasthenia ferrisiae	Ferris' goldfields	PDAST5L070	None	None	-	4.2	3812178	Zamora	Unprocessed	Plants - Vascular - Asteraceae - Lasthenia ferrisiae
Plants - Vascular	Lepidium latipes var. heckardii	Heckard's pepper-grass	PDBRA1M0K1	None	None	-	1B.2	3812178	Zamora	Mapped	Plants - Vascular - Brassicaceae - Lepidium latipes var. heckardii
Plants - Vascular	Lepidium latipes var. heckardii	Heckard's pepper-grass	PDBRA1M0K1	None	None	-	1B.2	3812177	Eldorado Bend	Mapped	Plants - Vascular - Brassicaceae - Lepidium latipes var. heckardii
Plants - Vascular	Lepidium latipes var. heckardii	Heckard's pepper-grass	PDBRA1M0K1	None	None	-	1B.2	3812166	Grays Bend	Mapped and Unprocessed	Plants - Vascular - Brassicaceae - Lepidium latipes var. heckardii
Plants - Vascular	Lepidium latipes var. heckardii	Heckard's pepper-grass	PDBRA1M0K1	None	None	-	1B.2	3812156	Davis	Mapped	Plants - Vascular - Brassicaceae - Lepidium latipes var. heckardii
Plants - Vascular	Atriplex cordulata var. cordulata	heartscale	PDCHE040B0	None	None	-	1B.2	3812156	Davis	Mapped	Plants - Vascular - Chenopodiaceae - Atriplex cordulata var. cordulata
Plants - Vascular	Atriplex cordulata var. cordulata	heartscale	PDCHE040B0	None	None	-	1B.2	3812157	Merritt	Mapped	Plants - Vascular - Chenopodiaceae - Atriplex cordulata var. cordulata
Plants - Vascular	Atriplex depressa	brittlescale	PDCHE042L0	None	None	-	1B.2	3812166	Grays Bend	Mapped and Unprocessed	Plants - Vascular - Chenopodiaceae - Atriplex depressa
Plants - Vascular	Atriplex depressa	brittlescale	PDCHE042L0	None	None	-	1B.2	3812156	Davis	Mapped	Plants - Vascular - Chenopodiaceae - Atriplex depressa
Plants - Vascular	Extriplex joaquinana	San Joaquin spearscale	PDCHE041F3	None	None	-	1B.2	3812156	Davis	Mapped	Plants - Vascular - Chenopodiaceae - Extriplex joaquinana
Plants - Vascular	Extriplex joaquinana	San Joaquin spearscale	PDCHE041F3	None	None	-	1B.2	3812166	Grays Bend	Mapped	Plants - Vascular - Chenopodiaceae - Extriplex joaquinana

Plants - Vascular	Astragalus pauperculus	depauperate milk-vetch	PDFAB0F6N0	None	None	-	4.3	3812166	Grays Bend	Unprocessed	Plants - Vascular - Fabaceae - Astragalus pauperculus
Plants - Vascular	Astragalus tener var. ferrisiae	Ferris' milk-vetch	PDFAB0F8R3	None	None	-	1B.1	3812157	Merritt	Mapped	Plants - Vascular - Fabaceae - Astragalus tener var. ferrisiae
Plants - Vascular	Astragalus tener var. ferrisiae	Ferris' milk-vetch	PDFAB0F8R3	None	None	-	1B.1	3812156	Davis	Mapped	Plants - Vascular - Fabaceae - Astragalus tener var. ferrisiae
Plants - Vascular	Astragalus tener var. tener	alkali milk-vetch	PDFAB0F8R1	None	None	-	1B.2	3812156	Davis	Mapped	Plants - Vascular - Fabaceae - Astragalus tener var. tener
Plants - Vascular	Astragalus tener var. tener	alkali milk-vetch	PDFAB0F8R1	None	None	-	1B.2	3812166	Grays Bend	Mapped and Unprocessed	Plants - Vascular - Fabaceae - Astragalus tener var. tener
Plants - Vascular	Trifolium hydrophilum	saline clover	PDFAB400R5	None	None	-	1B.2	3812166	Grays Bend	Mapped and Unprocessed	Plants - Vascular - Fabaceae - Trifolium hydrophilum
Plants - Vascular	Juglans hindsii	Northern California black walnut	PDJUG02040	None	None	-	1B.1	3812166	Grays Bend	Unprocessed	Plants - Vascular - Juglandaceae - Juglans hindsii
Plants - Vascular	Juglans hindsii	Northern California black walnut	PDJUG02040	None	None	-	1B.1	3812157	Merritt	Unprocessed	Plants - Vascular - Juglandaceae - Juglans hindsii
Plants - Vascular	Juglans hindsii	Northern California black walnut	PDJUG02040	None	None	-	1B.1	3812158	Winters	Unprocessed	Plants - Vascular - Juglandaceae - Juglans hindsii
Plants - Vascular	Juglans hindsii	Northern California black walnut	PDJUG02040	None	None	-	1B.1	3812156	Davis	Unprocessed	Plants - Vascular - Juglandaceae - Juglans hindsii
Plants - Vascular	Juglans hindsii	Northern California black walnut	PDJUG02040	None	None	-	1B.1	3812176	Knights Landing	Unprocessed	Plants - Vascular - Juglandaceae - Juglans hindsii
Plants - Vascular	Juglans hindsii	Northern California black walnut	PDJUG02040	None	None	-	1B.1	3812167	Woodland	Unprocessed	Plants - Vascular - Juglandaceae - Juglans hindsii
Plants - Vascular	Juglans hindsii	Northern California black walnut	PDJUG02040	None	None	-	1B.1	3812168	Madison	Unprocessed	Plants - Vascular - Juglandaceae - Juglans hindsii
Plants - Vascular	Fritillaria agrestis	stinkbells	PMLIL0V010	None	None	-	4.2	3812156	Davis	Unprocessed	Plants - Vascular - Liliaceae - Fritillaria agrestis
Plants - Vascular	Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	PDMAL0H0R3	None	None	-	1B.2	3812166	Grays Bend	Mapped	Plants - Vascular - Malvaceae - Hibiscus lasiocarpos var. occidentalis
Plants - Vascular	Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	PDMAL0H0R3	None	None	-	1B.2	3812176	Knights Landing	Mapped	Plants - Vascular - Malvaceae - Hibiscus lasiocarpos var. occidentalis
Plants - Vascular	Malacothamnus helleri	Heller's bush-mallow	PDMAL0Q0G0	None	None	-	3.3	3812158	Winters	Unprocessed	Plants - Vascular - Malvaceae - Malacothamnus helleri
Plants - Vascular	Chloropyron palmatum	palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	-	1B.1	3812166	Grays Bend	Mapped	Plants - Vascular - Orobanchaceae - Chloropyron palmatum
Plants - Vascular	Puccinellia simplex	California alkali grass	PMPOA53110	None	None	-	1B.2	3812166	Grays Bend	Mapped	Plants - Vascular - Poaceae - Puccinellia simplex
Plants - Vascular	Puccinellia simplex	California alkali grass	PMPOA53110	None	None	-	1B.2	3812157	Merritt	Mapped	Plants - Vascular - Poaceae - Puccinellia simplex

Plants - Vascular	Puccinellia simplex	California alkali grass	PMPOA53110	None	None	-	1B.2	3812156	Davis	Mapped	Plants - Vascular - Poaceae - Puccinellia simplex
Plants - Vascular	Puccinellia simplex	California alkali grass	PMPOA53110	None	None	-	1B.2	3812177	Eldorado Bend	Mapped	Plants - Vascular - Poaceae - Puccinellia simplex
Plants - Vascular	Puccinellia simplex	California alkali grass	PMPOA53110	None	None	-	1B.2	3812168	Madison	Mapped	Plants - Vascular - Poaceae - Puccinellia simplex
Plants - Vascular	Puccinellia simplex	California alkali grass	PMPOA53110	None	None	-	1B.2	3812167	Woodland	Mapped	Plants - Vascular - Poaceae - Puccinellia simplex
Plants - Vascular	Navarretia cotulifolia	cotula navarretia	PDPLM0C040	None	None	-	4.2	3812166	Grays Bend	Unprocessed	Plants - Vascular - Polemoniaceae - Navarretia cotulifolia
Plants - Vascular	Navarretia leucocephala ssp. bakeri	Baker's navarretia	PDPLM0C0E1	None	None	-	1B.1	3812158	Winters	Mapped	Plants - Vascular - Polemoniaceae - Navarretia leucocephala ssp. bakeri

CNPS California Native Plant Society

Plant List

Inventory of Rare and Endangered Plants

15 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3812178, 3812177, 3812176, 3812168, 3812167, 3812166, 3812158 3812157 and 3812156;

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
Astragalus pauperculus	depauperate milk-vetch	Fabaceae	annual herb	Mar-Jun	4.3	S4	G4
Astragalus tener var. ferrisiae	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	1B.1	S1	G2T1
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S2	G2T2
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	4.2	S3	G3T3
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	1B.1	S1	G1
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
Lepidium latipes var. heckardii	Heckard's pepper-grass	Brassicaceae	annual herb	Mar-May	1B.2	S1	G4T1
Lessingia hololeuca	woolly-headed lessingia	Asteraceae	annual herb	Jun-Oct	3	S3?	G3?
Malacothamnus helleri	Heller's bush-mallow	Malvaceae	perennial deciduous shrub	May-Jul	3.3	S3	G3Q
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G4T2
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	1B.2	S2	G2

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Appendix D. Cultural Resources Analysis

Technical Memorandum

Date: Tuesday, October 02, 2018

Project: Yolo Flood Risk Reduction Feasibility Study

To: MBK Engineers and Yolo County

From: HDR Engineering, Inc.

Subject: Cultural Resources: Summary of Records Search and Field Reconnaissance Results

PROJECT OVERVIEW

The County of Yolo, under the California Department of Water Resources Small Community Flood Risk Reduction Program, is preparing a Yolo Flood Risk Reduction Feasibility Study (Project) in Yolo County, California. The Project involves investigating improvements to the State Plan of Flood Control (SPFC) levee along the left bank of Cache Creek. HDR has been contracted to help identify environmental constraints for the Project, including the potential for the Project to impact previously recorded and newly discovered archaeological and historic built environment resources. The Project area encompasses the town of Yolo, the agricultural lands to the north, west, and east, and the SPFC levee system along Cache Creek. This memo presents the results of the records search and field reconnaissance conducted and a high-level analysis of the potential for cultural resources to be present within the Project area. The purpose of the records search, reconnaissance, and high-level review was to identify the potential for historical properties/historical resources listed on or eligible for listing on the National Register of Historic Places (NRHP) and/or the California Register of Historical Resources (CRHR), and for previously unknown and unevaluated cultural resources to be within the Project area and a 0.25-mile buffer.

RECORDS SEARCH METHODS

The records search request was submitted on July 19, 2018 to the Northwest Information Center (NWIC) of the California Historical Resources Information System, located at Sonoma State University. Requested data for the Project area included all alternatives for the Project footprint, plus a 0.25-mile buffer. Search results were received from the NWIC on August 16, 2018. The information request included a search of previous cultural resources investigations, and previously recorded archaeological sites and built environment resources, the Office of Historic Preservation (OHP) Historic Properties Directory for Yolo County, the OHP Archaeological Determinations of Eligibility for Yolo County, and the California Inventory of Historical Resources (1976). Information was also requested on the Caltrans Bridge Survey, ethnographic information, and local inventories, where present.

RECORDS SEARCH RESULTS

The records search results identified 22 previously conducted cultural resources investigations, 19 previously recorded archaeological sites, and 47 previously recorded historic built environment resources, as summarized below in detail.

Previous Cultural Resources Investigations

There have been 22 previous cultural resources investigations intersecting the Project area (**Error! Reference source not found.~~Table 1~~**). Previous investigations were primarily archaeological or architectural/historical field studies and were conducted for levee repair and rehabilitation projects, culvert construction, pipelines, energy facility, railroad, and transportation projects. These studies documented 177 prehistoric and historical archaeological sites and historical built environment resources.

In addition, there has been one cultural resource investigation within 0.25 mile of the Project area for which detailed information is not available at this time. The investigation was an archaeological survey along Cache Creek, south of the town of Yolo. Additional information regarding this project can be requested if the Project footprint changes to include the location of this study.

Table 1: Previous cultural resources investigations within the Project area

Author(s)	Date	Report Title	Study Type	IC File No.	Results
Bakic, Tracy	March 2000	Negative Historic Property Survey Report, County Road 99W Over Cache Creek Bridge Replacement Project (Bridge No. 22C-022), Yolo County, California	Archaeological, Architectural/ historical, Other research	S-022542	Negative Survey
Bowen, Mark	January 2012	Cultural Resources Analysis for Cache Creek Levee Miles 3.9L and 4.2L	Archaeological, Architectural/ historical, Field study	S-038626a	Negative Survey
Compas, Lyn	March 2000	Negative Archaeological Survey Report, County Road 99W Over Cache Creek Bridge Replacement Project (Bridge No. 22C-022), Yolo County, California	Archaeological, Field study	S-022542a	Negative Survey
Crull, Scott, and Craig Hanson	2015	The History and Archaeology of the California-Pacific; the Central-Pacific; the Southern-Pacific; and the California-Northern Railroad Routes Through Yolo County, California: 1869-Present	Architectural/ historical, Field study	S-046943	22 resources recorded
Egherman, R., and B. Hatoff	June 2002	Roseville Energy Facility, Cultural Resources, Appendix J-1 of Application for Certification	Archaeological, Architectural/ historical, Field study	S-025665	19 resources recorded

Author(s)	Date	Report Title	Study Type	IC File No.	Results
Gilbert, Rebecca H.	January 2012	Department of Water Resources, Supplemental Archaeological Survey Report and Historic Properties Evaluation Report, Cache Creek Critical Erosion Setback Levee Repairs Project: Levee Mile (LM) 3.9L and LM 4.2L	Archaeological, Field study	S-038626	3 resources recorded
Leach-Palm, Laura, Pat Mikkelsen, Paul Brandy, Jay King, Lindsay Hartman, and Bryan Larson	June 2008	Cultural Resources Inventory of Caltrans District 3 Rural Conventional Highways in Butte, Colusa, El Dorado, Glenn, Nevada, Placer, Sacramento, Sierra, Sutter, Yolo, and Yuba Counties	Archaeological, Field study	S-035042	62 resources recorded
Lortie, Frank	August 2001	Historic Resource Evaluation Report for Three Culvert Construction Projects in Yolo County, Esparto, S.R. 16, P.M. 28.10; Glenn County, S.R. 162, P.M. 48.56; Sierra County, S.R. 49, P.M. 32.32, EA 03-2A0500	Architectural/ historical, Evaluation, Field study	S-026702b	Negative Survey
Martinez, Amanda L. and Cindy J. Arrington	September 2008	Cultural Resources Survey for the Levee Repair Project at 20 Locations in Colusa, Sacramento, Sutter, Tehama, and Yolo Counties, California	Archaeological, Field study	S-035301	Negative Survey
Pierce, Wendy	June 2014	NRHP and CRHR Evaluation of Sub-Unit 1 of Unit 126 of the Sacramento River Flood Control Project Levee for the Cache Creek Setback Levee LM 2.8L Project, Yolo County, California	Architectural/ historical, Evaluation, Field study	S-045238	2 resources recorded
Roland-Nawi, Carol, Milford Wayne Donaldson, and Alicia E. Kirchner	July 2014	COE070820A: Project Modification, Cache Creek 408 Project, Yolo County, California	OHP Correspondence	S-045238a	Negative Survey
Schmid, Tracy A.	July 2007	Department of Water Resources Archaeological Survey Report, Cache Creek Setback Levees	Archaeological, Field study	S-033590	Negative Survey

Author(s)	Date	Report Title	Study Type	IC File No.	Results
Shapiro, William and Keith Syda	September 1997	An Archaeological Assessment Within the Left and Right Banks of Cache Creek, Cache Creek East Training Levee, Right Bank of Yolo Bypass (Unit 2), and Right Bank of Knights Landing Ridge Cut (Unit 1), Yolo County, California, Part of the Cultural Resources Inventory and Evaluation for U.S. Army Corps of Engineers, Sacramento District, PL 84-99 Levee Rehabilitation on the Feather, Bear, Sacramento and San Joaquin Rivers System, COE Water Basin System Designations Sac 50 and Sac 55, DACW05-97-P-0465	Archaeological, Field study	S-020007	5 resources recorded
URS	July 2008	Cultural Resources Baseline Literature Review for the Urban Levee Project	Literature search	S-035094a	Negative Survey
URS	July 2008	Cultural Resources Survey Report for the Urban Levee Project	Archaeological, Field study	S-035094	30 resources recorded
Wayne Donaldson, Milford and Nancy Haley	April 2010	COE080730K; Continued Consultation Regarding Section 404 of the Clean Water Act Authorization for the PG&E Line 406 and Line 407 Pipeline Project in Placer, Sacramento, Sutter, and Yolo Counties, California (Regulatory Division SPK-2007-01175)	OHP Correspondence	S-036479a	Negative Survey
Wohlgemuth, Eric	August 2011	Cultural Resources Survey for Line 407 Access Road in Yolo, California (letter report)	Archaeological, Field study	S-039586	Negative Survey
Wohlgemuth, Eric, Laura Leach Palm, Sharon Waechter, Mary Maniery, Cindy Baker, and Stephen Wee	July 2008	Cultural Resources Survey for the PG&E Line 407 Project, Placer, Sacramento, Sutter, and Yolo Counties, California	Archaeological, Field study	S-036479	32 recorded resources

Author(s)	Date	Report Title	Study Type	IC File No.	Results
Wulf, Erick	June 2002	Historic Property Survey Report for the Proposed Culvert Replacement Project in Fifty-Three Locations on Six Routes in Five Counties Within District 3, Caltrans, EA 03-2A0500	Archaeological, Architectural/ historical, Evaluation, Field study	S-026702	2 recorded resources
Wulf, Erick	June 2002	Negative Archaeological Survey Reports for the Proposed Culvert Replacement Project in Fifty-Three Locations on Six Routes in Five Counties Within District 3, Caltrans, EA 03-2A0500	Archaeological, Excavation	S-026702a	Negative Survey
Wulf, Erick	October 2002	Negative Historic Property Survey Report (Supplemental) for the Proposed Culvert Replacement Project in Fifty-Four Locations on Six Routes in Five Counties Within District 3, Caltrans, EA 03-2A0500	Archaeological, Architectural/ historical, Field study	S-026702c	Negative Survey
Wulf, Erick	October 2002	Supplemental Negative Archaeological Survey Report for the Proposed Culvert Replacement Project in Fifty-Four Locations on Six Routes in Five Counties Within District 3, Caltrans, EA 03-2A0500	Archaeological, Field study	S-026702d	Negative Survey

Previously Recorded Cultural Resources

The records search identified four prehistoric archaeological sites and eight historic archaeological sites intersecting the Project area. An additional five prehistoric sites and two historic archaeological sites were identified within 0.25 mile. One site was determined not eligible for the NRHP and CRHR; the remaining sites are all unevaluated.

Prehistoric Sites

There are four recorded prehistoric archaeological sites within the Project area, and an additional five sites within 0.25 mile (**Error! Reference source not found.~~Table 2~~**). Previously recorded site types include a burial, habitation debris and midden sites, lithic scatters, and an unknown site type. One site (P-57-000566) outside the Project area but within 0.25 mile was determined not eligible for the NRHP. The remaining sites have not been evaluated for their NRHP or CRHR eligibility.

Table 2: Previously recorded prehistoric archaeological sites

Primary No.	Trinomial No.	Resource Type	NRHP / CRHR Status	Intersects Project Area?
P-57-000038	CA-YOL-000035	Unknown	Unevaluated	Yes
P-57-000039	CA-YOL-000036	Habitation Debris	Unevaluated	Yes
P-57-000040	CA-YOL-000037	Habitation Debris	Unevaluated	No
P-57-000069	CA-YOL-000071	Lithic Scatter, Habitation Debris	Unevaluated	No
P-57-000076	CA-YOL-000100	Habitation Debris	Unevaluated	Yes
P-57-000102	CA-YOL-000127	Burial, Habitation Debris	Unevaluated	No
P-57-000110	CA-YOL-000135	Lithic Scatter, Burial, Habitation Debris, Other	Unevaluated	No
P-57-000201	CA-YOL-000187	Lithic Scatter, Burial, Habitation Debris, Other	Unevaluated	Yes
P-57-000566	CA-YOL-000218	Lithic Scatter, Habitation Debris	Ineligible for the NRHP / Unevaluated for the CRHR	No

Historic Sites

There are 10 previously recorded historic archaeological sites within the Project area and an additional two sites within 0.25 mile (Error! Reference source not found.~~Table 3~~). The sites include county roads, a cemetery, and historic trees/vegetation landscape sites. All of the historic sites are unevaluated for the NRHP and CRHR.

Table 3: Previously recorded historic archaeological sites

Primary No.	Trinomial No.	Resource Type	NRHP / CRHR Status	Intersects Project Area?
P-57-000132	-	Trees/Vegetation	Unevaluated	Yes
P-57-000592	-	Trees/Vegetation	Unevaluated	No
P-57-000593	-	Trees/Vegetation	Unevaluated	Yes
P-57-000595	-	Trees/Vegetation	Unevaluated	Yes
P-57-000604	-	Trees/Vegetation	Unevaluated	No
P-57-000570	-	County Road	Unevaluated	Yes
P-57-000572	-	County Road	Unevaluated	Yes
P-57-000573	CA-YOL-000245H	County Road	Unevaluated	Yes
P-57-000575	-	County Road	Unevaluated	Yes
P-57-001322	-	Cemetery	Unevaluated	Yes

Historical Built Environment Resources

There are 42 previously recorded historical built environment resources intersecting the Project area and an additional five resources within 0.25 mile (Error! Reference source not found.~~Table 4~~). These include 22 individually recorded structures (houses or farms/ranches, a levee, water conveyance systems, commercial buildings, a razed drive-in theater, a bridge, a railroad depot, library, blacksmith

shop), two railroad districts, the historical town site of Yolo (P-57-001419), and nine listings on the Historical Resources Inventory. Additionally, the Yolo Town Site District is comprised of 13 buildings/structures that have all been assigned Historic Resources Inventory numbers. Most of the previously recorded buildings are within the modern community of Yolo. One 1920's era farmstead (P-57-000652) within the Project area has been determined not eligible for the NRHP or CRHR. The Carnegie Yolo Branch Library (YOL-HRI-135) is listed on the NRHP and CRHR. The remaining 44 resources, including the three districts, are unevaluated.

Site record details indicated that one unevaluated resource – the Cache Creek levee (P-57-000594) – was considered by the U.S. Army Corps of Engineers as eligible for the NRHP under Criterion A as part of the Project Levee District multiple property listing (Pierce 2014:1 and see SHPO letter dated July 25, 2014). However, current information on file with the NWIC lists the property with no official determination of eligibility.

Table 4: Previously recorded historical built environment resources

Primary No.	Other No.	Resource Type	Construction Date (circa [c.])	NRHP / CRHR Status	Intersects Project Area?
P-57-000194	CA-YOL-000178H	Railroad Spur	c. 1869–1946	Unevaluated	No
P-57-000403	-	Homestead	By 1950	Unevaluated	Yes
P-57-000404	-	Homestead	c. 1950	Unevaluated	Yes
P-57-000405	-	Lewis Cramer House	c. 1870s	Unevaluated	Yes
P-57-000406	-	Farmstead	c. 1900	Unevaluated	Yes
P-57-000407	-	Farmstead	c. 1915–1925	Unevaluated	Yes
P-57-000408	-	Farmstead	c. 1920s	Unevaluated	Yes
P-57-000409	-	House	c. 1920s	Unevaluated	Yes
P-57-000410	-	House	c. 1950s	Unevaluated	Yes
P-57-000411	-	Farm/Ranch	c. 1930s	Unevaluated	Yes
P-57-000412	-	Farmstead	c. 1950s	Unevaluated	No
P-57-000567	-	Farm/Ranch	c. 1900–1930	Unevaluated	Yes
P-57-000568	-	House	c. 1930s–1970s	Unevaluated	Yes
P-57-000569	-	Farm/Ranch	c. 1900s, 1990s	Unevaluated	Yes
P-57-000571	-	Water Conveyance System/Well	Unknown	Unevaluated	Yes
P-57-000574	-	Farm/Ranch	c. 1880s	Unevaluated	Yes
P-57-000576	-	Water Conveyance System/Culvert	Unknown	Unevaluated	No
P-57-000594	CA-YOL-000246H	Levee	c. 1930s	Unevaluated	Yes
P-57-000652	-	Farmstead	c. 1920	Ineligible	Yes
P-57-000821	-	Railroad Bridge	c. 1906	Unevaluated	Yes
P-57-000970	--	Railroad (District)	c. 1960s	Unevaluated	No
P-57-000977	-	Railroad (District)	1871	Unevaluated	Yes
P-57-000978	-	Railroad Depot	c. 1870s	Unevaluated	Yes
P-57-001077	-	Drive-in Theater (Razed)	1950	Unevaluated	No

Primary No.	Other No.	Resource Type	Construction Date (circa [c.])	NRHP / CRHR Status	Intersects Project Area?
P-57-001419	YOL-HRI-125 through YOL-HRI-137	Town Site (District)	1853-1918	Unevaluated	Yes
-	YOL-HRI-090	Homestead	c. 1880	Unevaluated	Yes
-	YOL-HRI-091	House	1865	Unevaluated	Yes
-	YOL-HRI-092	House	1870	Unevaluated	Yes
-	YOL-HRI-093	House	1880	Unevaluated	Yes
-	YOL-HRI-094	Commercial Building	Unknown	Unevaluated	Yes
-	YOL-HRI-095	House	c. 1870	Unevaluated	Yes
-	YOL-HRI-104	House	Unknown	Unevaluated	Yes
-	YOL-HRI-105	House	c. 1870	Unevaluated	Yes
-	YOL-HRI-114	House	1929	Unevaluated	Yes
	YOL-HRI-125*	House	1865		
-	YOL-HRI-126*	House	c. 1865	Unevaluated	Yes
-	YOL-HRI-127*	House	c. 1895	Unevaluated	Yes
-	YOL-HRI-128*	House	c. 1865	Unevaluated	Yes
-	YOL-HRI-129*	Commercial Building	Early 1880s – c. 1910	Unevaluated	Yes
-	YOL-HRI-130*	Commercial Building	1879	Unevaluated	Yes
-	YOL-HRI-131*	House	c. 1905	Unevaluated	Yes
-	YOL-HRI-132*	House/Courthouse	1854–1874	Unevaluated	Yes
-	YOL-HRI-133*	Church	1867	Unevaluated	Yes
-	YOL-HRI-134*	Blacksmith Shop	1853	Unevaluated	Yes
-	YOL-HRI-135*	Library	1918	NRHP and CRHR Listed	Yes
-	YOL-HRI-136*	Town Hall	1905	Unevaluated	Yes
-	YOL-HRI-137*	House	1886	Unevaluated	Yes

*Element of district P-57-001419

Potential Historic-Era Cultural Resources Identified on Historic Maps

General Land Office (GLO) survey plats were reviewed to identify potential historic-era resources within the Project area and 0.25-mile buffer (**Table 5**). Some resources depicted on historical maps may become archaeological sites as they disintegrate over time. Potential cultural resources identified include residences, roads, fields, fences, a railroad grade, and the town that became the community of Yolo (BLM 1857, 1858). Depicted resources are primarily west and north of Cache Creek, especially northwest of Cacheville (the present-day town of Yolo). There are no human-made resources depicted within the Project area or 0.25-mile buffer south of the creek except for the *Road to Sacramento*, which extends from Cacheville across Cache Creek and towards the southeast (BLM 1857).

Table 5. Resources depicted on GLO survey plats

Date	Resource Type	Location	Intersects Project Area?
1857	Road to Marysville	Rancho Rio Jesus Maria, T10N, R1E	Yes

Date	Resource Type	Location	Intersects Project Area?
1857	Road to Sacramento	Rancho Rio Jesus Maria, T10N, R1E and R2E	Yes
1857	Nathan's residence	Section 1 of T10N, R1E	Yes
1857	Marion's residence, Marion's field, fences	Rancho Rio Jesus Maria, T10N, R1E	Yes
1857	Cacheville	Rancho Rio Jesus Maria, T10N, R1E	Yes
1857	Gary's residence	Rancho Rio Jesus Maria, T10N, R1E	Yes
1857	Muston(?) residence	Rancho Rio Jesus Maria, T10N, R2E	Yes
1858	House	Rancho Rio Jesus Maria, T10N, R 2E	No

Early United States Geological Survey (USGS) topographic maps were also reviewed to identify potential areas where historical structures may be found (Error! Reference source not found.~~Table 6~~). Woodland 1907 and Yolo 1915 maps depict the town of Yolo in its present-day location (USGS 1907, 1915). Multiple residences are depicted within the Project area concentrated along country roads north and west of Yolo, south side of Cache Creek south of Yolo, and on the east side of the Project area. A later map depicts the same settlement pattern along the same roads with a greater number of residences (USGS 1941). The Southern Pacific Railroad is shown on these early maps running northwest-southeast through the town of Yolo. A second railroad line, labeled as either the Marysville Branch (USGS 1907) or the Oroville Branch (USGS 1915, 1941), runs generally northeast-southwest through the east end of the Project area.

Table 6. Resources depicted on historical USGS topographic maps

Date	Map	Resource Type	Intersects Project Area?
1907, 1915, 1941	Woodland, Yolo	Several residences along roads north and west of the town of Yolo.	Yes
1907, 1915, 1941	Woodland, Yolo	Several residences along roads south of Yolo, along the east side of Cache Creek	Yes
1907, 1915, 1941	Woodland, Yolo	Residences along roads in the east side of the Project area	Yes

FIELD RECONNAISSANCE

A field reconnaissance of the Project area was conducted on August 21, 2018 by John (Jay) Lloyd, M.A. Linguistics, who meets the Secretary of the Interior's Qualification Standards for archaeology and is a Registered Professional Archaeologist (RPA). Methods included reviewing the results of the records search, confirming the absence/presence of previously recorded (and accessible) resources, generally driving across the breadth of the Project area, and assessing major topographical differences between the historic and modern landscape using historic-era maps for comparison.

Today the Project area is generally low and topographically flat and land use is predominantly row-crop agriculture and fruit and nut orchards. Historic-era farms and ranches – with their collection of associated barns, sheds, pump houses, silos, and other outbuildings – are scattered throughout the

Project area, as well as newer homes and commercial buildings. As confirmed by the records search results, the densest concentration of historic-era buildings is within the town of Yolo, although many of these have fallen into disrepair and are not currently maintained.

Historically, the area was traversed by the wandering channel of Cache Creek and numerous named and unnamed creeks and tributaries. Due to historic and modern farming and flood control measures, these watercourses have all been channelized with the larger channels bound by levees. Additionally, the land has been graded and levelled for agricultural purposes, obscuring much, if not all, of the original topography. In this area, prehistoric archaeological sites, particularly large mound sites, tended to be located on natural, high spots in the immediate vicinity of Cache Creek and along the smaller tributaries/channels. Often, early European settlers utilized the same locations, thus it is not uncommon for intact prehistoric site remnants to be present within historic-era settlements.

FEASIBILITY ANALYSIS

Archaeological and built environment sensitivity within the Project area and 0.25-mile buffer is variable and contingent on the type of resource (prehistoric vs. historical) and geography (proximity to the river and the town of Yolo). For most of the Project area, near-surface archaeological sites have likely been disturbed, and possibly destroyed, by decades of agricultural practices. The available documentation for several of the large Native American mound sites indicates that the mounds had been, or were in the process of being, levelled. The records also note extensive artifact collections among local landowners. The full extent of these sites has never been explored and significant, intact (likely buried) cultural deposits may still be present. However, most of the Project area has not been previously surveyed and, accordingly, there is a low-to-moderate potential for near-surface unrecorded prehistoric or Native American sites within the unsurveyed portions of the Project area; as well as a moderate-to-high potential for buried archaeological sites throughout the entire Project area, particularly along the flood plain along Cache Creek.

Historical information available on the Yolo County website indicates that the area was originally settled by Euro-Americans as part of Rancho Rio de Jesus Maria around 1849. In 1856, Cacheville was established on the north side of Cache Creek. The Euro-American population of the area increased in the 1880s once the railroad was constructed, and Cacheville was renamed Yolo in 1900 (Yolo County 2005:6-18). A historical map review indicates that, in addition to the community of Yolo, there were abundant residences or farmsteads along the county roads in the northern and eastern portions of the Project area, in the vicinity of Yolo, and south of Yolo on the east side of Cache Creek. Therefore, sensitivity for historic-era archaeological sites and historical built environment resources is moderate-to-high throughout the proposed Project area, especially in and around the town of Yolo, and in the immediate vicinity of the historic-era residences and drainages.

RESOURCES

General Land Office

1857 Original survey plat map of Ranch Rio Jesus Maria. Map on file with the Northwest Information Center of the California Historical Resources Information System.

Pierce, Wendy

2014 NRHP and CRHR Evaluation of Sub-Unit 1 of Unit 126 of the Sacramento River Flood Control Project Levee for Cache Creek Setback Levee LM 2.8L Project, Yolo County, California. IC. File No. S-45238.

Roland-Nawi, Carol

2014 Correspondence Letter to Alicia E. Kirchner, U.S. Army Corps of Engineer District, Sacramento. Office of Historic Preservation, California State Historic Preservation Officer, Sacramento. On file at the California Historical Resources Information System, Northwest Information Center, Sonoma State University.

U.S. Department of Interior, Bureau of Land Management (BLM)

1858 Original survey map of Township 10N, Range 2 East. Available online at https://glorecords.blm.gov/

1864 Original survey map of Township 10N, Range 1 East. Available online at https://glorecords.blm.gov/

U.S. Geological Survey (USGS)

1907 Topographic map of Woodland. Available online at http://historicalmaps.arcgis.com/usgs/

1915 Topographic map of Yolo. Available online at http://historicalmaps.arcgis.com/usgs/

1941 Topographic map of Woodland. Available online at http://historicalmaps.arcgis.com/usgs/

Yolo County

2005 Yolo County General Plan Update, Background Report. Chapter 6: Cultural Resources. Available online at http://www.yolocounty.org/home/showdocument?id=4494