5th Street Bridge Replacement Project

CITY OF YUBA CITY, SUTTER COUNTY, CALIFORNIA
DISTRICT 3 – SUT – YUBA CITY
BHLS-5163(025)

Initial Study with Mitigated Negative Declaration/ Environmental Assessment and Section 4(f)/6(f) Evaluation with Finding of No Significant Impact

Prepared for the State of California Department of Transportation and the City of Yuba City

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.

August 2014

General Information about This Document

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SCH# _____
3-SUT-Yuba City
BHLS-5163(025)

5th Street Bridge Replacement over the Feather River between the Cities of Yuba City and Marysville in Sutter and Yuba Counties, California

Initial Study with Proposed Mitigated Negative Declaration/ Environmental Assessment and Section 4(f)/6(f) Evaluation

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C) and 49 USC 303

The State of California Department of Transportation

and

City of Yuba City

30 July 2013
Date of Approval

John Webb
Environmental Manager
California Department of Transportation
NEPA Lead Agency

20
Date of Approval

Diana Langley
Deputy Director of Public Works-Engineering
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CALIFORNIA DEPARTMENT OF TRANSPORTATION
FINDING OF NO SIGNIFICANT IMPACT (FONSI)

FOR

5th Street Bridge Replacement Project
City of Yuba City

The California Department of Transportation (Caltrans) has determined that the build alternative will have no significant impact on the human environment. This FONSI is based on the attached Environmental Assessment (EA) and associated technical studies which have been independently evaluated by Caltrans and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an Environmental Impact Statement is not required. Caltrans takes full responsibility for the accuracy, scope, and content of the attached EA and associated technical studies.

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 USC 327.

August 27 2014
Date

John Webb, District 3 Office Chief
Caltrans North Region Environmental

SCH: 2013082011

MITIGATED NEGATIVE DECLARATION

Pursuant to: Division 13, Public Resources Code

Project Description

The City of Yuba City Public Works Department, in cooperation with the California Department of Transportation (Caltrans), proposes to replace the existing 5th Street Bridge and improve the approach roadways to the bridge. This project is located in the Cities of Yuba City and Marysville, Sutter and Yuba Counties, California.

Determination

Yuba City has prepared an Initial Study for this project, and following public review, has determined from this study that the proposed project would not have a significant effect on the environment for the following reasons:

The proposed project would have no effect on farmlands/timberlands, the coastal zone, wild and scenic rivers, or paleontological resources.

In addition, the proposed project would have no significant effect on air quality, growth, parks and recreation facilities, cultural resources, water quality and stormwater runoff, relocations, utilities and emergency services, traffic and transportation systems, geology and soils, hydrology and floodplain resources, climate change, and visual resources.

The proposed project would have no significantly adverse effects on hazardous waste/materials, noise, and biological resources because the following measures would reduce potential effects to insignificance:

- Hazardous Waste Measures HW-1 through HW-7
- Noise Measures NOI-1 through NOI-4
- Biological Resources Measures BIO-1 through BIO-33

These measures can be found throughout the document in their respective discussion sections and in Appendix E: Environmental Commitment Record.

Diana Langley

Diana Langley
Public Works Director
City of Yuba City

8/19/2014
Date

SUMMARY

The City of Yuba City, in cooperation with the California Department of Transportation (Caltrans), proposes to replace the existing 5th Street Bridge over the Feather River with a new four lane structure in the Cities of Yuba City and Marysville, Sutter and Yuba Counties, California. The purpose of the proposed 5th Street Bridge Replacement Project is to: 1) Enhance safety on one of the two major east-west connection corridors which link Yuba City and Marysville by providing a safer vehicular, pedestrian, and bicycle crossing over the Feather River; 2) Provide a transportation facility consistent with Caltrans Standards, as well as local, regional, and statewide plans; and 3) Improve traffic operations and transportation capacity by adding two additional through lanes across the Feather River.

This environmental document is prepared in conformance with the requirements of the National Environmental Policy Act (NEPA) 40 CFR 1500-1508 and the California Environmental Quality Act (CEQA) Public Resources Code 21000-21178. For this project, Caltrans is the NEPA lead agency and Yuba City is the CEQA lead agency. The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327. Compliance with the NEPA is required since the project intends to use federal funding to implement the project. In addition to potential federal funds, the project may also use local funds from Yuba City, Marysville, Sutter County, and Yuba County, as well as regional funding from the Sacramento Area Council of Governments.

In order to provide decision makers, the public, and reviewing agencies a complete description of the project, its purpose and need, and a description of how this project has the potential to impact the natural and human environment, this Initial Study/Environmental Assessment has been prepared as a joint CEQA/NEPA environmental document. The document has been prepared following the Caltrans joint document format which provides an overview of the project in Chapter 1, evaluates each environmental resource for potential impacts and measures to reduce those impacts in Chapter 2, and outlines the environmental process and public involvement in Chapter 3.

The proposed improvements entail replacing the 5th Street Bridge and reconfiguring the approach roadways, ramps, and intersections adjacent to the structure as well as demolition of the existing 5th Street Bridge. Generally speaking, the project extends from the intersection of Shasta Street and Bridge Street in Yuba City, across the 5th Street Bridge, to the intersection of J Street and 5th Street in Marysville. The project area includes an on- and off-ramp system on the Yuba City side, as well as portions of the Riverfront Park on the Marysville Side. The project footprint encompasses approximately 165 acres and would involve partial and full right-of-way acquisitions. The project has been designed to replace the 5th Street Bridge, reduce travel delays in and around the project area associated with traffic congestion, improve multimodal access and mobility, and provide some accommodation for the needs of future local and regional traffic.

Although several alternatives were evaluated early in the preliminary planning stage, based on public response, environmental impacts, Value Analysis study, and cost, it has been determined that one alternative is superior to the others. This environmental document evaluates the Build Alternative and compares the effects it would have in relation to a No Build Alternative, consistent with NEPA requirements.

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CHAPTER 1 - PROPOSED PROJECT

1.1 Introduction

The City of Yuba City, in cooperation with the California Department of Transportation (Caltrans), proposes to replace the 5th Street Bridge (No. 18C-0012) over the Feather River and improve approach roadways to the bridge. Yuba City is the California Environmental Quality Act (CEQA) lead agency, while Caltrans is the National Environmental Policy Act (NEPA) lead agency.

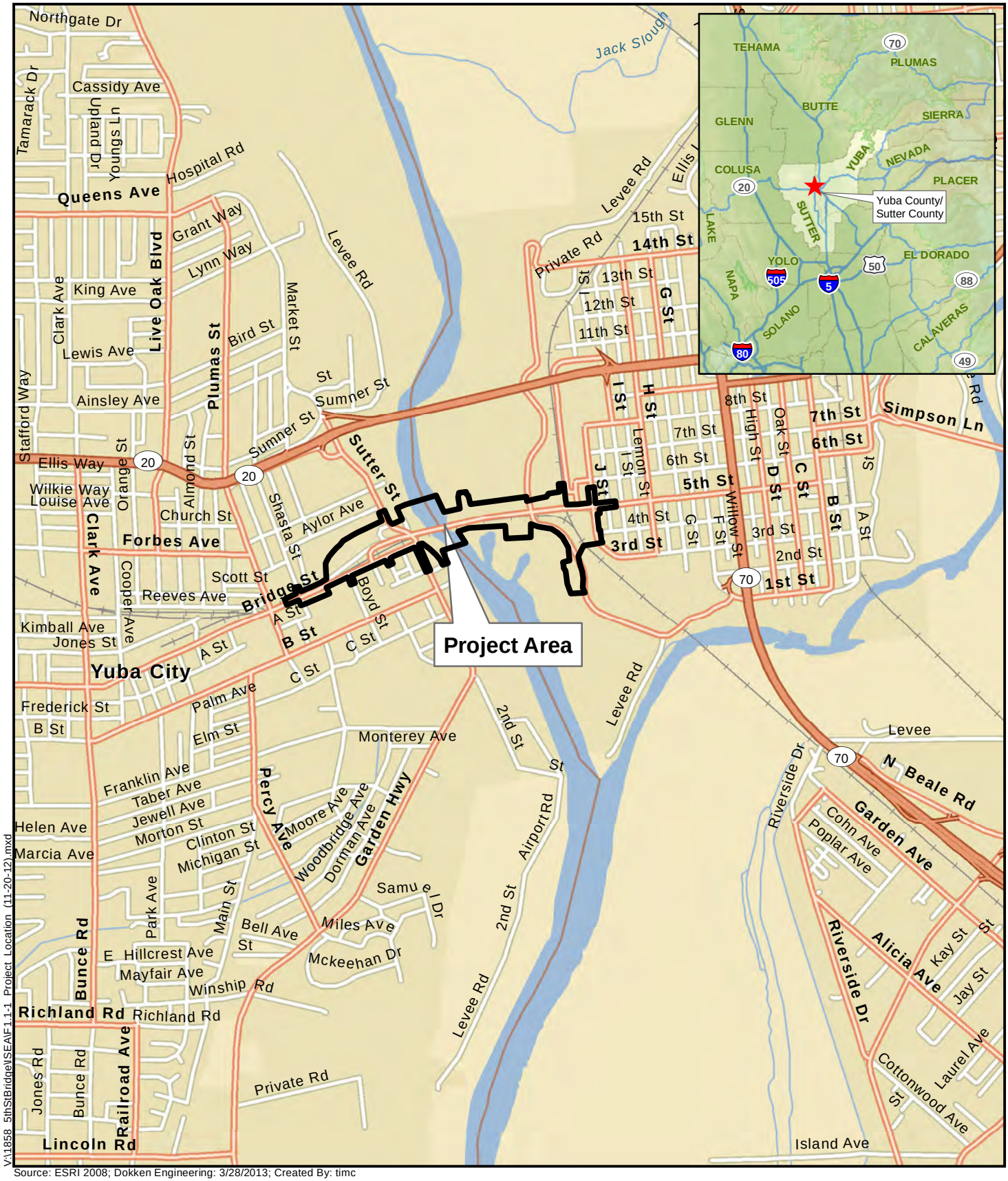
In order to provide decision makers, the public, and reviewing agencies a complete description of the project, its purpose and need, and a description of how this project has the potential to impact the natural and human environment, this Initial Study/Environmental Assessment has been prepared as a joint CEQA/NEPA environmental document. The document has been prepared following the Caltrans joint document format which provides an overview of the project in Chapter 1, evaluates each environmental resource for potential impacts and measures to reduce those impacts in Chapter 2, and outlines the environmental process and public involvement in Chapter 3.

The existing facility is located in Sutter and Yuba Counties and connects Bridge Street in Yuba City to 5th Street in Marysville. Project limits in the City of Marysville span from 5th and I Street to I and 3rd Street in the south, portions of Riverfront Park in the west and continuing over the Feather River into the City of Yuba City limits. Project limits within the City of Yuba City include the roadway along 2nd Street, small portions of Sutter, Yolo and Boyd Streets in the south and the western expanse of Bridge Street at the intersection with 2nd Street and terminating just east of the intersection at Shasta Street (see Figure 1.1-1: Project Location).

This project is being proposed to remedy two major problems associated with the 5th Street Bridge. The bridge is rated as “functionally obsolete” by Caltrans under Federal Highway Administration (FHWA) prescribed inspection criteria. This rating is due to inadequate lane widths, and because the bridge does not meet other structural design standards. In addition, traffic forecasts show that intersection and roadway segments on and nearby the bridge would operate at failing levels of service by 2035 and widening of the facility from the existing two lanes to a four-lane structure would provide needed traffic operations and capacity improvements to the transportation network between Yuba City and Marysville. The project would also improve pedestrian and bicycle movements between the two cities over the Feather River.

A combination of Local Agency and Federal funds (Highway Bridge Program, Regional Surface Transportation Project, and High Priority Project) has been approved for the 5th Street Bridge Replacement project.

The Sacramento Area Council of Governments (SACOG) includes the project in their 2035 Metropolitan Transportation Plan (MTP) identifying the need for more capacity over the Feather River between Yuba City and Marysville. In addition, the project is consistent with Yuba City and Marysville General Plans. This proposed transportation improvement would replace the functionally obsolete bridge and would improve current and future congestion, improve traffic operations, and help address anticipated future demands of motor vehicle traffic within the project area.



Source: ESRI 2008; Dokken Engineering: 3/28/2013; Created By: timc

0 0.25 0.5 0.75 1 Miles

FIGURE 1.1-1
PROJECT LOCATION

Federal Project No. BHLS-5163(025)
Fifth Street Bridge over theFeather River
City of Yuba City, City of Marysville,
Yuba County, and Sutter County, California

1.2 Need and Purpose

As described in the introduction above, the project is being proposed to remedy two problems associated with the 5th Street Bridge. The bridge is rated functionally obsolete due to inadequate lane width and structural design standards, and provides inadequate capacity for current and future traffic demands. The need and purpose are discussed further below.

1.2.1 Need

The existing 5th Street Bridge is rated "functionally obsolete" by Caltrans under FHWA prescribed inspection criteria. The vehicular travel lanes are too narrow to allow for the safe transit of vehicles between Yuba City and Marysville. In the event of an accident, there is limited access for emergency vehicles on the two-lane bridge. Full replacement of the bridge is needed because the current structure does not meet structural design standards and the bridge provides inadequate multimodal access and mobility. Additional capacity is needed because traffic forecasts show intersection and roadway segments operating at failing levels of service by 2035.

1.2.2 Purpose

The purpose of the 5th Street Bridge Replacement Project is to replace a functionally obsolete and structurally deficient bridge in order to:

- Enhance safety on one of only two major east-west connection corridors which link Yuba City and Marysville by providing a safer vehicular, pedestrian, and bicycle crossing over the Feather River;
- Provide a transportation facility consistent with Caltrans Standards, as well as local, regional, and statewide plans;
- Improve traffic operations and transportation capacity by adding two additional through lanes across the Feather River.

1.2.3 Independent Utility and Logical Termini

FHWA regulations (23 CFR 771.111 (f)) require that a proposed project:

- Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
- Have independent utility or independent significance (be usable and require a reasonable expenditure even if no additional transportation improvements in the area are made); and
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The proposed 5th Street Bridge Replacement Project specifically addresses replacing a functionally obsolete bridge and improving existing and forecast congestion and traffic volumes on and around the bridge. The project proposes improvements on the approach roadways, ramps, and intersections on both sides of the bridge. These improvements, in conjunction with the full bridge replacement, would be able to function effectively in addressing each of the project needs. As a result, the proposed project connects logical termini with the existing roadway systems in the Cities of Yuba City and Marysville. The project area is large enough to

appropriately address the potential environmental impacts of the proposed project. In addition, the proposed project can meet the identified need for bridge replacement and congestion relief as an independent project and is not dependent on any other projects to meet the identified purpose for the transportation improvements. Finally, the proposed improvement would be designed and constructed to minimize the potential conflict with other reasonably foreseeable transportation improvements in the area.

1.3 Project Description

This section describes the proposed action and the design alternative that was developed to meet the identified need through accomplishing the project purposes, while avoiding or minimizing environmental impacts. The Build Alternative is discussed below and is contrasted with a No-Build Alternative.

The proposed improvements entail replacing the 5th Street bridge and reconfiguring the approach roadways, ramps, and intersections adjacent to the structure. Generally speaking, the project extends from the intersection of Shasta Street and Bridge Street in Yuba City, across the 5th Street Bridge, to the intersection of J Street and 5th Street in Marysville. The project area includes an on- and off-ramp system on the Yuba City side, as well as some portions of the Riverfront Park on the Marysville Side. The project footprint encompasses approximately 165 acres and would involve partial and full right-of-way (ROW) acquisitions. The project has been designed to replace the 5th Street Bridge, reduce travel delays in and around the project area associated with traffic congestion, improve multimodal access and mobility, and provide some accommodation for the needs of future local and regional traffic.

1.4 Alternatives

Several alternatives were developed and considered by the 5th Street Bridge Replacement Project Development Team (PDT). The PDT includes the Cities of Yuba City and Marysville staff, Caltrans District 3 staff, as well as engineering and environmental consultants (Dokken Engineering, Fehr & Peers Transportation Consultants). Although several build alternatives were considered in the preliminary planning stage, only one build alternative was selected for full analysis in this document. Other alternatives that were considered were eliminated from further consideration due to substantial environmental impacts, public and agency comments, and cost. The Build Alternative is described below, while the other alternatives that were eliminated from further consideration are outlined in Section 1.4.3.

1.4.1 Proposed Build Alternative

The City of Yuba City, in cooperation with the City of Marysville and Caltrans, proposes to replace the 5th Street Bridge (Bridge Number 18C-0012) over the Feather River and improve approach roadways to the bridge. The 5th Street Bridge is a major arterial connector between the two cities serving local, commercial, commuter, pedestrian, and bicycle traffic. Built in 1958, the prestressed concrete stringer bridge is approximately 1,865 feet long, 42 feet wide, and carries two 12-foot lanes of traffic across the river. A 10-foot Class I pedestrian and bicycle path is located next to the two vehicular lanes on the north side of the bridge.

The existing facility is located in Sutter and Yuba Counties and connects Bridge Street in Yuba City to 5th Street in Marysville. Project limits in the City of Marysville span from 5th and I Street to

I and 3rd Street in the south, portions of Riverfront Park in the west and continuing over the Feather River into the City of Yuba City limits. Project limits within the City of Yuba City include the roadway along 2nd Street, small portions of Sutter, Yolo and Boyd Streets in the south and the western expanse of Bridge Street at the intersection with 2nd Street and terminating just east of the intersection at Shasta Street.

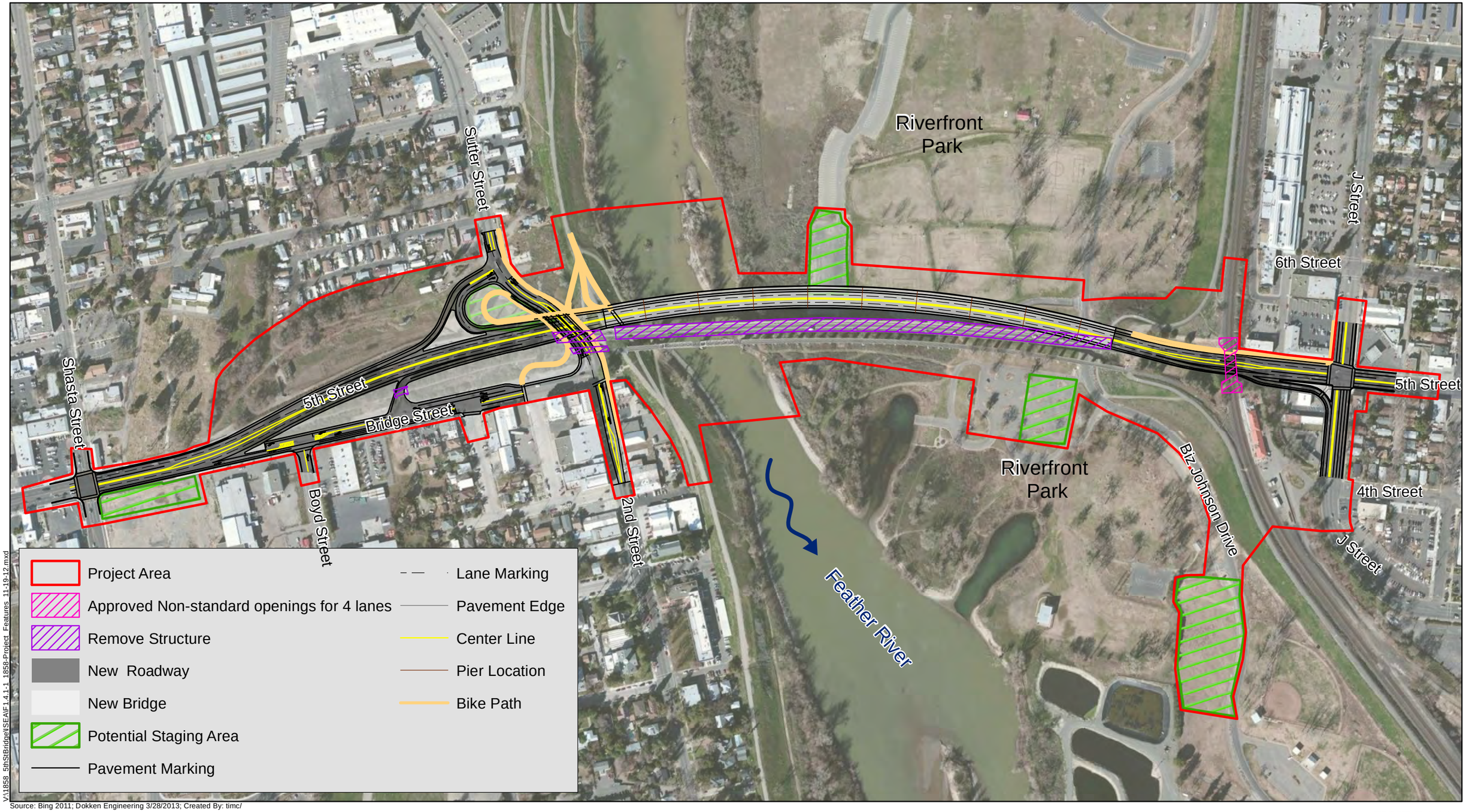
In 2011 Caltrans determined that the bridge is functionally obsolete due to a combination of deficiencies. The bridge has inadequate width, has a history of scour concerns, and is in a floodplain susceptible to seismic liquefaction. As a result, the bridge has been recommended for replacement. The project would replace the existing bridge over the Feather River in order to provide an improved transportation network and improve traffic operations between Yuba City and Marysville. A combination of Local Agency and Federal funds (Highway Bridge Program, Regional Surface Transportation Project, and High Priority Project) has been approved for the 5th Street Bridge Replacement project.

Description of work to be done would include:

- Construction of a new four-lane bridge over the Feather River;
- Construction of a new four-lane bridge over 2nd Street;
- Expansion of 5th Street from two lanes to four lanes between the new bridge and J Street in Marysville, including four lanes under the Union Pacific Railroad (UPR);
- Improvements to the 5th Street and J Street Intersection in Marysville including a new eastbound dedicated right turn lane on to J Street and reconstruction of sidewalks and curb ramps to current Americans with Disabilities Act (ADA) standards;
- Removal of stop logs on the top of the Marysville levee and construction of a short three foot floodwall extension from the bridge. Installation of a levee cut-off wall through the central portion of the levee;
- Widening of the 5th Street approach roadway between 2nd Street and Shasta Street in Yuba City from two lanes to four lanes;
- Realignment of 2nd Street under the bridge, construction of raised median, and extension of the left turn lane from 2nd Street to westbound Bridge Street;
- Reconstruction of the eastbound approach to the bridge and removal of the abandoned UPR overpass above the on-ramps; and
- Adding signalized intersections at the 2nd Street intersections with Bridge Street and the westbound ramp at the intersection of Sutter Street and 2nd Street in Yuba City.
- Potential construction staging areas have been identified at five locations in the project area in both Yuba City and Marysville (see Figure 1.4.1-1)

It is anticipated that the maximum depth of excavation would be 15 feet for the pier foundations and 10 feet deep at the bridge abutments to prepare the location for fill and placement of footings and piles that would support the new bridge.

The project includes a Class I multi-use trail over the river with expanded connectivity in Yuba City. This trail would provide pedestrian and bicycle access over the river between Yuba City and Marysville. The Class I trail would be separated from 5th Street vehicular traffic by a barrier and would be constructed with a flatter profile than the roadway.



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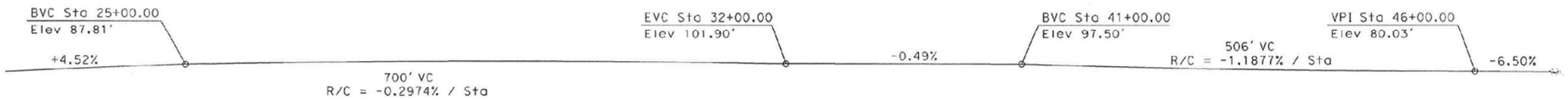
Source: Bing 2011; Dokken Engineering 3/28/2013; Created By: timc/

FIGURE 1.4.1-1
Build Alternative Project Features
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California



PROFILE GRADE

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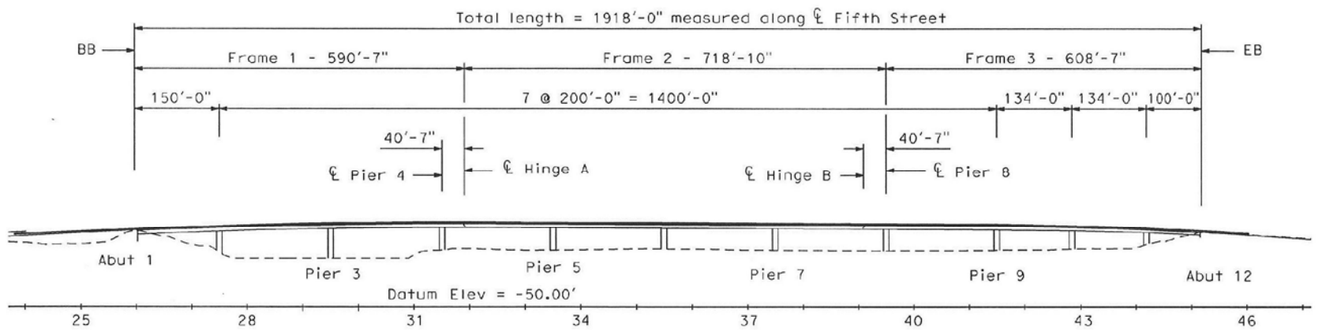
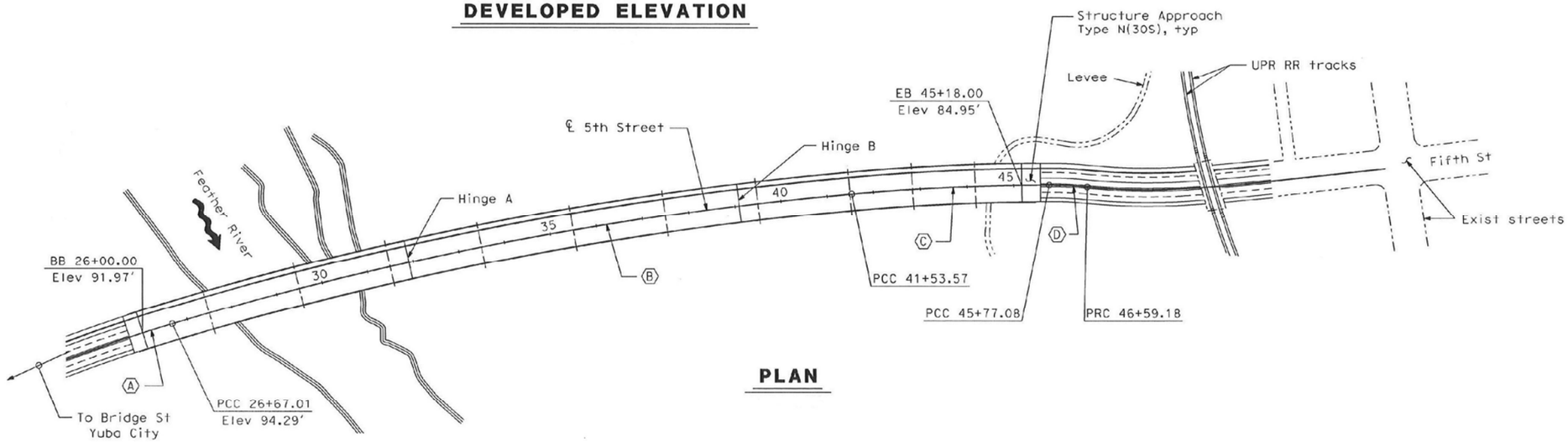


DEVELOPED ELEVATION



PLAN

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FIGURE 1.4.1-2(a)
Advanced Planning Study
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

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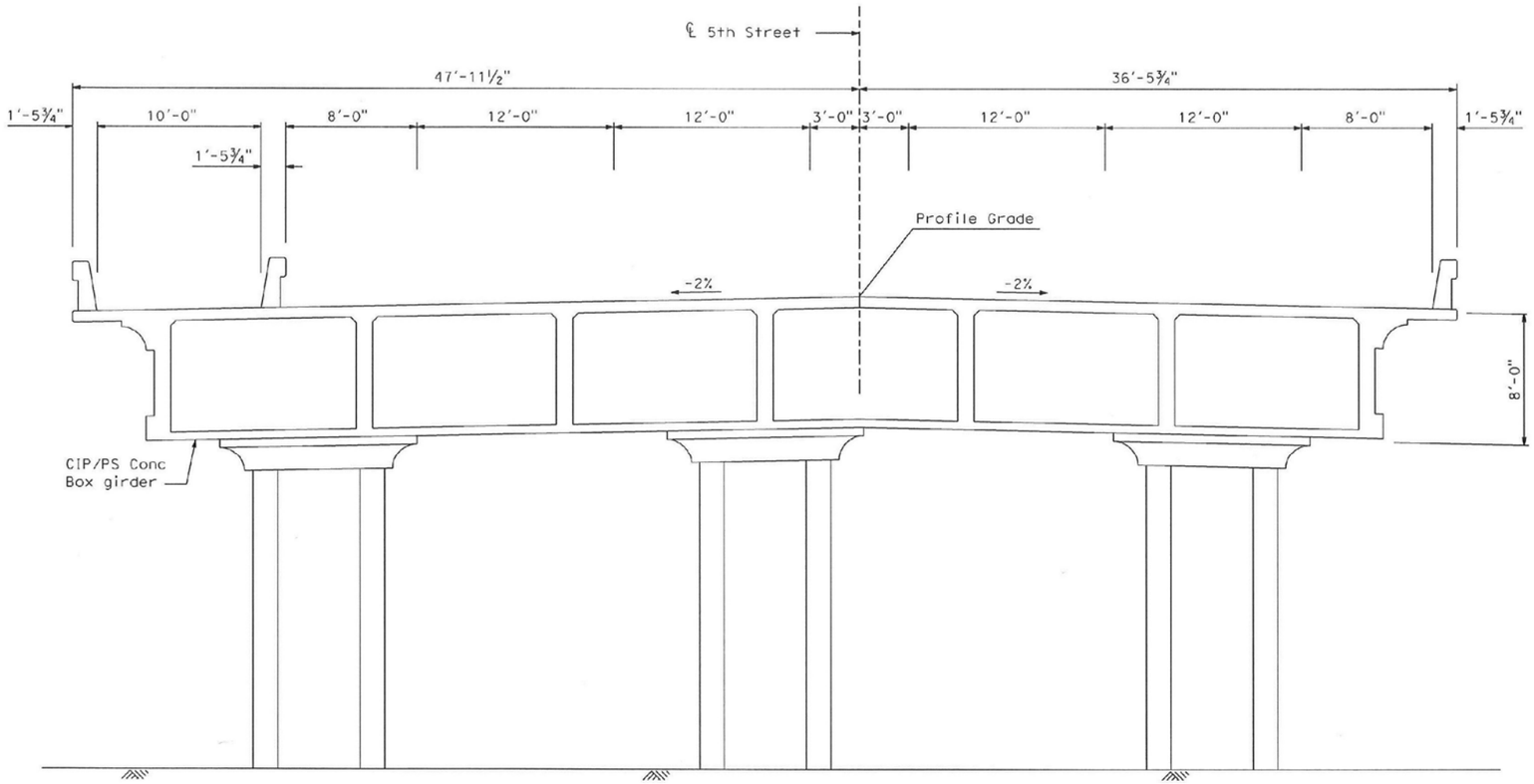

TYPICAL SECTION

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FIGURE 1.4.1-2(b)
Advanced Planning Study
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

Minor relocation of utilities are expected on the bridge approach roadways. The new bridge would contain conduits for bridge lighting, communications and future uses. The new bridge may contain a water line connecting the two independent City systems for use in emergency situations.

The connector roadway from 2nd Street to westbound Bridge Street would cross the Gilsizer County Drainage District stormwater detention facility. Some roadway embankment would be placed in the southeast end of the basin. The detention capacity lost to the new embankment would be replaced with additional capacity by developing an adjacent basin in the center of the westbound loop off-ramp.

Because of the size of the project and the nature of expanding the crossing from two lanes to four, most of the staging areas are included in the proposed construction footprint. However, additional staging areas may be used as necessary for project construction located in the following places: 1) a paved parking area north of the bridge in Riverfront Park; 2) a paved parking area south of the bridge near the boat launch (will only be used during the boating off-season); 3) adjacent to Biz Johnson Drive south of the bridge to be used for replacement Riverfront Park parking; 4) in the existing loop ramp north of the bridge and west of Sutter Street; and 5) a portion of the old Feather River Mill Site at the southeast corner of Shasta and Bridge Streets. All of these potential staging areas are included in the project area.

While the proposed project includes a four lane crossing of the Feather River, the design would consider the possibility of phasing the construction. Dependent upon the timing of construction funds, the first phase would be a new two-lane crossing, followed by the widening to a four-lane crossing in a second construction package.

1.4.2 No-Build Alternative

The No-Build, or "Do Nothing," Alternative would not improve the transportation corridor along Bridge Street between Yuba City and Marysville. If the No-Build Alternative is selected the existing bridge would remain functionally obsolete and out of compliance with structural design standards. The bridge would remain a two-lane facility and failing levels of service would continue to worsen over the next 20 years. The facility would not be consistent with local transportation planning in the region and vehicular, pedestrian, and bicycle safety would not be improved. None of the environmental impacts associated with the proposed project would occur; however, traffic and transportation conditions would continue to worsen.

1.4.3 Alternatives Considered But Eliminated From Further Discussion

1.4.3.1 Two-Lane Bridge Replacement Alternative

This alternative is similar to the Build Alternative in that it would replace the 5th Street Bridge over the Feather River with an alignment north of the existing structure; however, the new structure would only have two-lanes. Other features associated with this alternative would remain the same as far as bridge design, inclusion of a Class I multi-use trail, and lanes and shoulders up to full design width standards. This alternative was removed from further consideration because it does not accomplish the project need to improve capacity over the Feather River and would not substantially improve traffic operations in the project vicinity. This alternative was not found to meet most of the basic project objectives. Further, this alternative was not supported by the public during early public involvement.

1.4.3.2 Four-Lane Bridge Replacement with Flyover Alternative

This alternative would replace the 5th Street Bridge with a high profile crossing over the Feather River and UPR. The proposed four-lane bridge with a Class I multi-use trail would pass 25 feet above the two UPR tracks and then descend into Marysville on a 7.7% grade. This alternative would require a substantial change to the existing traffic network in Marysville and would require substantial ROW acquisition to accommodate the much larger bridge structure that would continue beyond the Marysville Ring Levee and railroad tracks. This alternative was removed from further consideration for a number of reasons. First the project would cause more community impacts both through ROW acquisition and from disruptions during construction. There is an old railroad depot building that is being used as a Salvation Army Women and Children's shelter that would be impacted by the project, causing Community and possibly Environmental Justice impacts. Second, the alternative would not be consistent with preliminary plans for other local transportation improvements associated with a more direct connection between State Route (SR) 70 and SR 20. Third, the alternative would require a structure that is over 3,000 feet long (more than 1,200 feet longer than the proposed Build Alternative) and would require substantial additional construction cost without providing additional benefit to traffic operations in the vicinity. This alternative was found to be infeasible and included unavoidable significant environmental impacts. Further, this alternative was not supported by the public during early public involvement.

1.4.3.3 Four-Lane Bridge Replacement; Southern Alignment

This alternative would replace the 5th Street Bridge over the Feather River with a new bridge to the south of the existing 5th Street Bridge alignment. This structure would have a more direct connection to approaching roadways and would be the same four-lane with Class I trail design as the selected Build Alternative. This alternative was removed from further consideration due to substantial environmental impacts that could be avoided by selecting another alternative. This alternative would have required removal of the potentially historic railroad truss bridge just south of the existing 5th Street Bridge. Removal of this bridge would have caused an adverse effect to the historic property. The historic bridge is also a Section 4(f) resource and the proposed Build Alternative was found to be a prudent and feasible avoidance alternative. This alternative would have had unavoidable significant environmental impacts.

1.5 Permits and Approvals Needed

The following permits, reviews, and approvals would be required for project construction:

Table 1.5-1: Permits and Approvals

Agency	Permit/Approval
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for Threatened and Endangered Species (Valley Elderberry Longhorn Beetle)
National Oceanic and Atmospheric Administration (NOAA)	Section 7 Consultation for Threatened and Endangered Species (Green Sturgeon, Central Valley Steelhead, Central Valley Spring-Run Chinook Salmon)
U.S. Army Corps of Engineers (USACE)	Section 404 Permit (Nationwide 14) for fill into Waters of the U.S.
Central Valley Regional Water Quality Control Board (RWQCB)	Section 401 Water Quality Certification for discharges to a water body
State Water Resources Control Board (SWRCB)	Section 402 National Pollution Discharge Elimination System General Construction Permit will be required
California Department of Fish and Wildlife (CDFW)	Section 1602 Streambed Alteration Agreement for modifications of the bed, bank, or channel of a stream, including impacts to vegetation Incidental Take Permit (2081 or 2080.1) for impacts to State Listed ESA Fish Species
Central Valley Flood Protection Board (CVFPB)	Encroachment Permit for impacts to the flood plain within CVFPB jurisdiction (between levees)
California Public Utility Commission (CPUC)	Encroachment Permit for impacts on railroad ROW
State Lands Commission	Yuba City will coordinate with Sutter County to renew a lease for the 5th Street Bridge crossing over the Feather River.
Levee District One	Levee Permit for work on and within the Yuba City Levee
Marysville Levee District	Levee Permit for work on and within the Marysville Levee

CHAPTER 2 - AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES AND AVOIDANCE, MINIMIZATION AND/OR MITIGATION MEASURES

This chapter explains the impacts that the proposed project could have on the human, physical, and biological environments in the project area. It describes the existing environment that could be affected by the project, potential impacts from the Build Alternative, and proposed avoidance, minimization, and/or mitigation measures pursuant to CEQA and NEPA requirements. A CEQA checklist, which evaluates the level of impacts under each environmental resource is included under Appendix A.

As part of the scoping and environmental analysis conducted for the project, the following environmental issues were considered but no impacts were identified. Consequently, there is no further discussion regarding these issues in this document:

- Farmlands/Timberlands – The project area does not contain farmlands or timberlands. The project area is primarily made up of residential, commercial, recreational, and open space land uses.

- Coastal Zone – The project is located outside of, and is non-contiguous to, the coastal zone and it is not anticipated to have any effects on coastal resources.

- Wild and Scenic Rivers – The project would replace the existing 5th Street Bridge over the Feather River in Yuba City and Marysville. There are no designated Wild and Scenic Rivers in the vicinity of the project.

- Paleontology - The project site is located on younger alluvial deposits and modern levees. Consequently, it is not anticipated that the project will have any effects on paleontological resources.

2.1 Human Environment

2.1.1 Land Use

A *Community Impact Assessment Checklist* for the 5th Street Bridge Replacement Project was prepared for this project in August of 2011 and the following is a summary of the findings made in that study.

2.1.1.1 Existing and Future Land Uses

Existing Land Use

Much of Yuba City's land use pattern can be traced to its evolution as a primary service center within a large agricultural area focused on downtown Yuba City and the intersection of SR 20 and SR 99 as employment cores (Yuba City General Plan, 2004). Much of the residential development is medium and low density single family housing and much of the commercial

development is retail-related. Existing land use in the project area within Yuba City consists of residential and commercial development, as well as parkland and open space.

Development of Marysville dates back to the mid-1800's and the California Gold Rush. Marysville was incorporated in 1851 and became one of the largest cities in California during the Gold Rush era. Regular flooding and the post-Gold Rush crash restricted Marysville's growth but the City remains the Yuba County seat for local government. Existing land use in the project area within Marysville consists of residential and commercial development to the east (near the intersection of J Street and 5th Street); however, recreational and open space land uses associated with the Riverfront Park are found west of the Marysville Ring Levee in the project area.

The proposed project connects the two urban cities and is included in the general plans for Yuba City, Marysville, Sutter County, and Yuba County, respectively.

Future Land Use

Land uses within the project area are predominantly developed and the local general plans do not anticipate any major changes to land uses within the project vicinity. Further this project is not expected to cause any substantial change in the overall land use; however, acquisition of two commercial properties in Marysville is expected. Both Marysville and Yuba City do expect growth and development in the area over the next 20 years; this growth is independent of the project as an existing bridge crossing connecting the two cities and is neither dependent, nor contingent, on this project's completion.

2.1.1.2 Consistency with State, Regional and Local Plans

Regional Transportation Plans

SACOG is an association of local governments in the six-county Sacramento Region. Its members include the counties of El Dorado, Placer, Sacramento, Sutter, Yolo and Yuba as well as 22 cities in the region. SACOG provides transportation planning and funding for the region, and serves as a forum for the study and resolution of regional issues. In addition to preparing the region's long-range transportation plan, SACOG approves the distribution of affordable housing in the region and assists in planning for transit, bicycle networks, clean air and airport land uses. The project is listed in the 2035 SACOG MTP and a record of this inclusion has been provided under Appendix F.

Yuba City/Marysville General Plans

General Plans are prepared pursuant to state mandates which require every city and county within the state to adopt a comprehensive, long-term general plan for the physical development of the community and lands located inside its boundary. Additionally, General Plans establish a comprehensive document which can improve coordination of community development activities among all units of government.

Table 2.1.1-1 lists goals and policies from the 2004 Yuba City General Plan relevant to the proposed project and provides a discussion of the project's consistency with each policy. Table 2.1.1-2 similarly shows goals and policies from the Marysville 1985 General Plan. As explained in the following tables, the proposed project would be consistent with each of these city's master planning documents.

Table 2.1.1-1: Project Consistency with the Yuba City General Plan

Goal, Objective, or Policy	Consistency Discussion
Community Design Element	
Guiding Policy 4.4-G-1: Create a well-connected hierarchy of streets that serve existing and planned neighborhoods and strengthen the visual and aesthetic character of each major corridor. **Guiding Policy 4.4-G-2:** Create a comfortable street environment for motorized and non-motorized users. Policy 4.4I-20: Designate Bridge Street as an important riverfront access corridor. Policy 4.4-I-21: Design streetscape and landscape elements to create a professional sequence of spaces that will enhance the riverfront theme as illustrated in General Plan Figure 4-8 along Bridge Street by installing continual promotional banners and street lights on both sides of the street. Policy 4.4-I-22: Widen the sidewalks and install pedestrian scale street light fixtures on Bridge Street from Boyd Street to 2nd Street to accommodate pedestrians.	**Build Alternative:** Consistent. The purpose of the project is to improve and widen the existing 5th Street Bridge between and within Yuba City and Marysville over the Feather River. The project would provide wider lanes and a safer transportation system between and within each of these cities. The project would improve pedestrian and bicycle access within the project area and would improve the corridor consistent with the prior development along Bridge Street to provide a continuous arterial transportation corridor. **No-Build Alternative:** Not Consistent. No improvements would be made and the existing inadequate facilities would remain unimproved.
Transportation Element	
Guiding Policy 5.2-G-1: Promote safe and efficient vehicle circulation. Policy 5.2-I-7: When constructing or modifying roadways, plan for usage of the roadway space by all users including motor vehicles, transit vehicles, bicyclists, and pedestrians. Policy 5.2-I-11: Maintain the street network through a regular maintenance program, repave streets on a regular basis, and require that any pavement that has been damaged or dug up be returned to its original condition, with no bumps or ruts. Policy 5.2-I-15: Improve intersections as needed to maintain LOS standards and safety on major arterials.	**Build Alternative:** Consistent. The proposed new bridge would improve safety for vehicles, pedestrians, and bicycle users by improving the bridge width to current Caltrans design standards. The new bridge would replace the existing functionally obsolete bridge and would improve traffic operations and transportation capacity in and around the project area by widening the bridge to provide a continuous four lane facility over the Feather River (connecting Bridge Street in Yuba City and 5th Street in Marysville, both of which are currently 4 lane facilities). **No-Build Alternative:** Not Consistent. None of the proposed safety improvements would be made and vehicle circulation would not be improved through increasing capacity across the bridge.

Goal, Objective, or Policy	Consistency Discussion
Guiding Policy 5.2-G-5: Maintain acceptable levels of service and ensure that future development and the circulation system are in balance. Policy 5.2-I-9: Work with Caltrans and regional authorities to develop a minimum of four additional traffic lanes of cross-river capacity by the end of the General Plan period. Policy 5.2-I-15: Improve intersections as needed to maintain LOS standards and safety on major arterials.	**Build Alternative:** Consistent. The proposed project would improve traffic operations and transportation capacity over the bridge and on adjacent roadway facilities by increasing capacity and improving approach roadways and adjacent intersections. These improvements would increase the number of traffic lanes of cross river capacity by 2 – which is half of the General Plan Requirement. **No-Build Alternative:** Not Consistent. No improvements would be made and the existing inadequate facilities would remain unimproved.
Guiding Policy 5.4-G-1: Develop a system of sidewalks and bikeways that promote safe walking and bicycle riding for transportation and recreation. Policy 5.4-I-1: Establish a network of on- and off-roadway bicycle routes and encourage their use for commute, recreation, and other trips. Design bike routes with the safety of cyclists as a priority. Policy 5.4-I-2: Develop bicycle routes that provide access to schools, parks, and the Feather River Parkway. Policy 5.4-I-4: Provide bicycle lanes with a minimum width of five feet on new streets and existing streets whenever they are widened to more than two travel lanes. Policy 5.4-I-11: Establish specific standards for pedestrian facilities to be accessible to physically disabled persons, and ensure that roadway improvement projects address mobility or accessibility for bicyclists or pedestrians.	**Build Alternative:** Consistent. The proposed project would improve the existing pedestrian and bicycle facilities in the project area and would improve non-vehicular access between the two cities and to the recreational and opens space facilities associated with the Feather River. The plan includes a 10 foot wide Class 1 multi-use trail over the bridge and connecting to the existing pedestrian and bicycle facilities in each city respectively. **No-Build Alternative:** Consistent. The existing pedestrian and bicycle facilities are adequate. However, the no build alternative would not improve these facilities and would not provide improved access to recreational and open space resources.

Table 2.1.1-2: Project Consistency with the Marysville General Plan

Goal, Objective, or Policy	Consistency Discussion
Open Space, Conservation, and Recreation Element	
Goal: To designate, protect, and conserve the natural resources, open space, and recreational lands in the city; and provide opportunities for recreational activities to meet citizens needs. Recreation Policy 2: Encourage compatible recreational uses in floodplains of the Feather and Yuba Rivers. Conservation Policy 1: To encourage the preservation of wildlife habitat areas. Conservation Policy 2: To protect the fisheries of the adjacent waterways. Conservation Policy 3: To protect historically significant areas and encourage their preservation and rehabilitation.	**Build Alternative:** Consistent. The proposed project has been designed in order to best avoid and minimize potential environmental impacts to natural resources and recreational lands in the City of Marysville. Some impacts are unavoidable and for each of these impacts, appropriate mitigation measures have been included to ensure that these environmental impacts are not substantial. **No-Build Alternative:** Consistent. This alternative would not have any potential to impact environmental resources.
Circulation Element	
Goal: To provide and maintain a safe and efficient system of streets, highways, and public transportation to service residents' needs, promote sound land use, and protect and enhance scenic highways. Circulation Policy 1: To maintain existing streets in a safe condition and require that new streets be built to city standards. Circulation Policy 4: To promote pedestrian convenience through requirements for sidewalks, walking paths, and hiking trails that connect residential development with commercial, shopping, and employment centers.	**Build Alternative:** Consistent. The proposed new bridge would improve safety for vehicles, pedestrians, and bicycle users by improving the bridge width to current design standards. The new bridge would replace the existing functionally obsolete bridge and would improve traffic operations and transportation capacity in and around the project area by widening the bridge to provide a continuous four lane facility over the Feather River (connecting Bridge Street in Yuba City and 5th Street in Marysville, both of which are currently 4 lane facilities). **No-Build Alternative:** Not Consistent. None of the proposed safety improvements would be made and vehicle circulation would not be improved through increasing capacity across the bridge.

2.1.1.3 Parks and Recreational Facilities

Riverfront Park, located between the Marysville levee and Feather River south of State Route 20 in the City of Marysville, and Veterans Memorial Park located just south of the UPR bridge and east of 2nd Street in Yuba City, are in the immediate vicinity of the 5th Street Bridge Replacement Project. Both Riverfront Park and Veterans Memorial Park meet the criteria of resources protected under Section 4(f) of the U.S. Department of Transportation Act of 1966.

Additionally, there is a multi-use trail traversing through Feather River Park, located on the Yuba City levee. This trail connects with the 5th Street Bridge, local roads, and the Feather River Park (portions of which are located north and south of the project area). This multi-use trail is a public recreational facility owned and maintained by the City of Yuba City and meets the criteria of a resource protected under Section 4(f) of the Department of Transportation Act of 1966. The project would connect with and improve existing bicycle and pedestrian facilities and would maintain access along the existing facilities throughout construction.

For the proposed project, a Section 4(f) Evaluation (de minimis finding) is included in Appendix B of this document. Information from this evaluation is summarized in the remainder of this section.

Riverfront Park has received federal grant funding for recreational improvements from the Land and Water Conservation Fund (LWCF) which is administered by the National Park Service. As such, it qualifies as a Section 6(f) Resource under the Land and Water Conservation Act. As part of the Section 6(f) coordination process, a Reduction in Services Plan was submitted to the California Parks Office of Grants and Local Services (OGALS) and National Parks Service (NPS). This plan outlines that the project would not result in substantial permanent impacts to the Riverfront Park, and temporary impacts during construction would be minor and short term. A summary of this coordination effort and a copy of the Reduction in Services Plan have been included in Appendix B, consistent with Caltrans and FHWA requirements.

Affected Environment

Riverfront Park

The park site affected by the Reduction in Services Plan is the Riverfront Park, which is an approximately 200 acre park located between the Marysville levee and the Feather River in the City of Marysville. The 5th Street Bridge passes over the park and the Feather River and carries travelers east and west between the City of Marysville and Yuba City. Recreational facilities found in the park include:

- motocross area
- baseball/softball fields and associated facilities
- soccer fields
- picnic areas
- boat launch ramp
- parking
- restrooms
- events and concert area

Riverfront Park is a free day-use facility surrounded by the Marysville levee system. It is open to the public most of the year as long as the area is not inundated during seasonal flooding. The park offers recreational uses for fishing, boating, water sports, youth sporting activities, nature observation, motocross, and Mervyn's Pavilion, an event facility. General use of the park and parking are free; however, rental of a larger facility such as the pavilion requires a permit and fee. The motocross area is also fee based.

As a designated community park in the City of Marysville, Riverfront Park is predominantly used for organized activities, sports and large group functions such as meetings and picnics. It is well equipped to deal with both local groups and other regional groups that draw people from outside of Marysville. One of the largest uses of this park is the Yuba Sutter Youth Soccer League which uses the soccer fields in the northern half of the park on Saturdays from August through November. Other, more infrequent organized uses include fundraising events, BBQ lunches and dinners, the Marysville rodeo, and use of the pavilion for concerts or rallies.

Day to day activities in the park include fishing and use of the boat ramp for boating and other water sport activities. Recreational fishing is governed by the runs and fishing seasons. The motocross track at the most northern end of the park is also an attraction.

Feather River Park

The Feather River Park is located along the eastern edge of Yuba City and is made up of a large area of undeveloped open space that is part of the floodplain. In the project area, the only recreational feature within the park is a multi-use trail that travels under, and connects to, the existing 5th Street Bridge.

Veterans Memorial Park

Veterans Memorial Park is located at Bridge Street and 2nd Street in the City of Yuba City, adjacent to the Feather River Levee. This park is a small landscaped park designed as a passive recreational area with a World War I memorial.

Environmental Consequences

Permanent Impacts

Build Alternative

No permanent substantial impacts to the Riverfront Park are anticipated as a result of this project. The bridge would be realigned to the north and would be four lanes instead of two; however, the total area of parkland used by bridge columns would be reduced. The existing bridge is supported by single large oval support columns, spaced every 75 feet (approximately) through the park. A total of 17 of these columns are currently located within Riverfront Park property. The new bridge, although wider, would use three round columns at each pier location. These columns would be spaced approximately 150 feet apart and a total of eight would be located within the Riverfront Park. As a result, once the existing 5th Street Bridge is demolished, the reduced amount of space taken by bridge piers after the proposed project is completed would result in an increase in the amount of recreational space available by approximately 1200 square feet.

No-Build Alternative

Under the No-Build Alternative, the 5th Street Bridge would not be replaced. Consequently, there would be no impacts to the Riverfront Park.

Temporary Impacts

Build Alternative

Riverfront Park

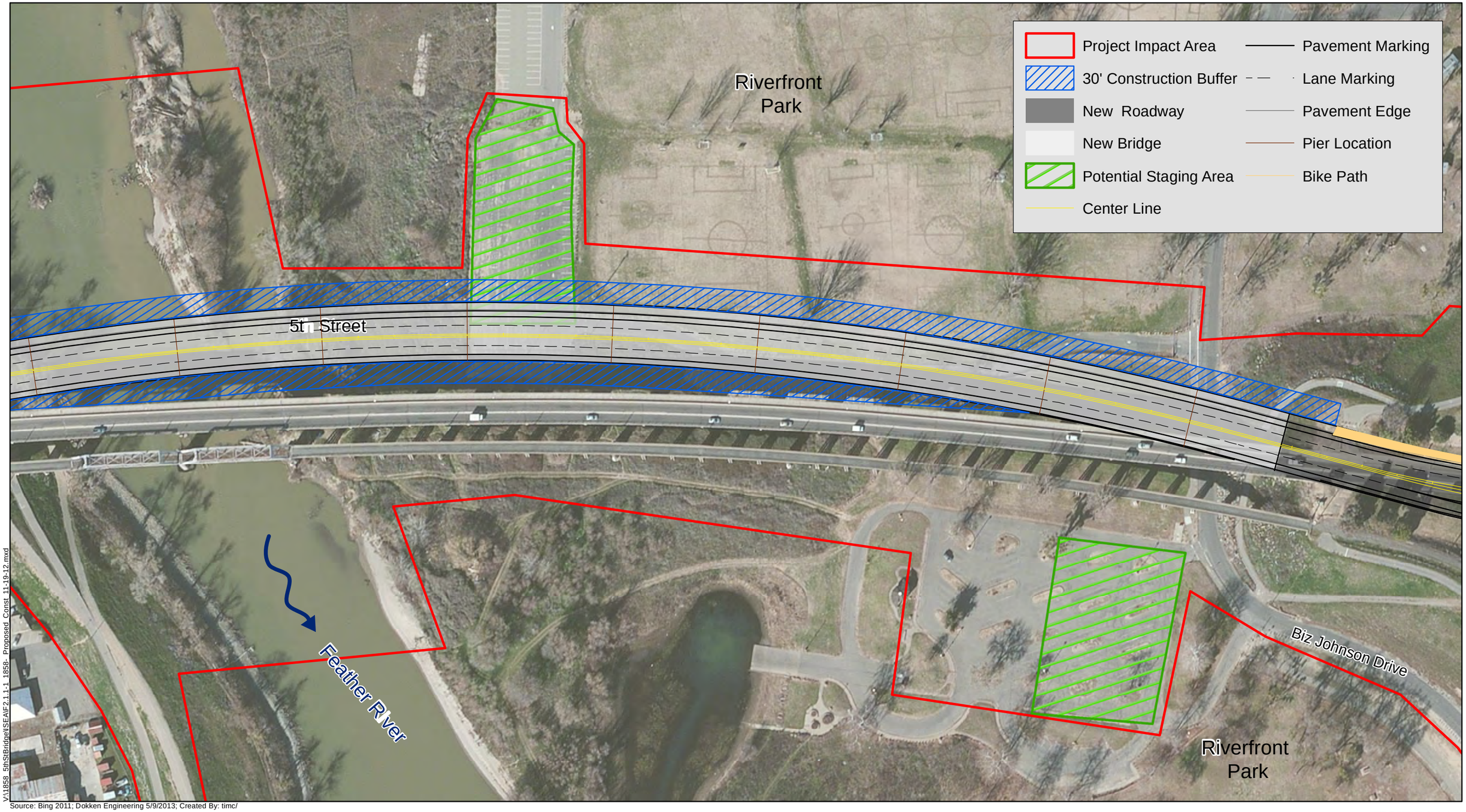
Construction activities for the proposed replacement of the 5th Street Bridge over the Riverfront Park would necessitate a temporary closure of a portion of the park in the immediate vicinity of the existing 5th Street Bridge. Construction activities would be contained to an area approximately 150 feet wide along the existing bridge alignment. During construction, all efforts will be taken to minimize this temporary impact to the park and its facilities. Further, consistent with Land and Water Conservation Fund (LWCF) regulations, no active portion of the park and its facilities would be occupied by construction for more than 6 months. In order to ensure that park activities are not substantially impacted for more than 6 months in any one area, construction staging and construction activities that would impact the recreational use of the park would be done in stages. The order of construction would need to be determined by the construction contractor in coordination with Yuba City. The construction area buffer for the proposed bridge is shown on Figure 2.1.1-1.

The boat ramp located south of the 5th Street Bridge has been identified by the City of Marysville as an important recreational feature of the park during the warm seasons. A construction staging area has been identified on a portion of the parking lot that supports the boat ramp; however, in order to ensure that boating is not affected, construction staging on this parking lot will be limited to October 1 – March 31. It is likely that the construction contractor will not need to use this parking lot during construction.

In addition to the temporary construction impacts, the proposed replacement of the 5th Street Bridge would also require minor changes to the associated facilities within the park. Some of the parking spaces located underneath or adjacent to the new bridge may need to be relocated to a nearby location to ensure that no parking spaces are lost as a result of construction of the new bridge. In addition, the new bridge would require the relocation of a park access road to the approximate area of the existing 5th Street Bridge, and one soccer field would be moved to the north approximately 10 feet. The soccer field would be restriped and no earthwork would be necessary. All temporarily impacted recreational areas, as well as all supporting facilities such as parking and access, would be restored prior to the conclusion of construction.

Feather River Park

The trail and all associated recreational access will be maintained throughout construction. Temporary construction noise may impact users of the Feather River Park, specifically users of the multi-use trail located within the project area. These impacts are expected to be particularly minimal since users of the trail are expected to be moving either north or south; therefore, impacts to individuals would be extremely short term. Construction noise would be further minimized by measures included in Section 2.2.6. No substantial temporary noise impacts to the Feather River Park are expected.



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Source: Bing 2011; Dokken Engineering 5/9/2013; Created By: timc/

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FIGURE 2.1.1-1
Proposed Construction at Riverfront Park
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

Veterans Memorial Park

The Veterans Memorial Park will remain open throughout construction. Temporary construction noise may impact users of the Veterans Memorial Park. A majority of project construction would occur on the east side of the Yuba City Levee which functions as a natural noise barrier to the park. Bridge construction activity over 2nd Street would cause substantial noise, but is expected to only occur for 4-8 weeks in the immediate vicinity of the park. Construction noise would be further minimized by measures included in Section 2.2.6. No substantial temporary noise impacts to the Veterans Memorial Park are expected.

No-Build Alternative

Under the No-Build Alternative, there would be no temporary or construction related impacts to parks and recreational facilities.

Avoidance, Minimization, and/or Mitigation Measures

In addition to the measures listed below, measure NOI-4 (see Section 2.2.6) would help minimize impacts to the parks and recreational resources in the project area caused by temporary construction noise.

Measure PRF-1: Construction activities that temporarily impact the adjacent soccer field and associated parking spaces will be limited to one season of the Yuba Sutter Youth Soccer League fall season (August through November). Project construction will be staged to ensure that no area of the park's recreational features is impacted for more than 6 months total.

Measure PRF-2: The City of Yuba City and the City of Marysville will coordinate with the Yuba Sutter Youth Soccer League prior to construction to ensure that construction activities and closure of one soccer field will minimally affect the main soccer season scheduled in the fall.

Measure PRF-3: Temporary, and, if necessary, permanent replacement parking will be provided at an alternative location to ensure adequate parking is provided for all major organized park activities. No permanent loss of parking would occur in the park as a result of construction of this project. The City of Marysville will coordinate to organize and direct parking through the use of signage.

Measure PRF-4: A temporary chain link fence will be installed by the construction contractor to provide a safety barrier between construction activities and recreational activities.

Measure PRF-5: After construction activities that would affect the soccer fields have been completed, the City of Marysville will relocate the one soccer field that was temporarily closed during construction to the north approximately 10 feet. This relocation is to provide adequate safety for soccer players in terms of the field's proximity to the new bridge column.

Measure PRF-6: During construction activities that take place in or nearby the live Feather River Channel, the following measures shall be implemented to improve safety for the public engaged in recreation along the Feather River:

- Buoys and signage shall be implemented both on the bridge and in the river to alert watercraft users of construction activities and to help watercraft navigate safe passage.

- Nighttime navigational lighting shall be used as necessary to alert watercraft of any change in the river conditions during construction.
- Containment or a protective cover (netting) shall be installed along the live channel used to ensure that falling debris does not endanger the public during construction activities.

2.1.2 Growth

Regulatory Setting

The Council on Environmental Quality (CEQ) regulations, which established the steps necessary to comply with the National Environmental Policy Act (NEPA) of 1969, require evaluation of the potential environmental consequences of all proposed federal activities and programs. This provision includes a requirement to examine indirect consequences, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations (40 Code of Federal Regulations [CFR] 1508.8) refer to these consequences as secondary impacts. Secondary impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

CEQA also requires the analysis of a project's potential to induce growth. The CEQA guidelines (Section 15126.2[d]) require that environmental documents "…discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…"

Affected Environment

Growth was analyzed as part of the *Community Impact Assessment Checklist for the 5th Street Bridge Project* (2011).

The relationship between transportation, economic growth, and land development is a product of multiple social, economic and geographical factors. These factors are presented in greater detail in the *Community Impact Assessment* prepared for this project. It should be noted that a project's potential to induce growth does not automatically result in growth. Growth can only occur through capital investments and new economic opportunities by the public or private sectors. Development is a result of economic investment in an area.

First Cut Screening

Since Census 2000, the State of California has grown by 3.8 million persons for an overall growth rate of 10.1% (US Census Bureau 2012). Sutter County's population has grown from 78,930 in 2000 to 94,737 in 2010, while Yuba County's population has grown from 60,219 to 72,155. Both counties population growth rate was approximately 20% between 2000 and 2010, which is double the California Growth Rate. Current SACOG population projections expect growth in Sutter and Yuba Counties to continue at a similar rate.

<u>How, if at all, does the proposed Project potentially change accessibility?</u>

The proposed Build Alternative would widen the existing 5th Street Bridge from two to four lanes and would improve the approach roadways and intersections adjacent to the bridge. No new routes are proposed and accessibility would not be substantially affected as a result of this project.

How, if at all, do the project type, project location, and growth-pressure potentially influence growth? Is project-related growth reasonably foreseeable as defined by NEPA?

One of the purposes of the proposed project is to provide for existing traffic demand and future traffic growth that has already been projected to occur as a result of regional growth. The proposed project is located within the boundaries of a community region (between Yuba City and Marysville). Development within these areas is focused on urban and suburban development. Main objectives for these community centers defined by each of the Cities' General Plans include allowing for population and economic growth, preserving the character and extent of rural centers and urban communities, emphasizing the natural setting, and promoting built design elements that contribute to the quality of life and economic health of the region. The project accommodates for planned growth, consistent with local General Plan policies.

Construction Impacts

There would be no construction related impacts on growth. All roads to commercial and residential areas would remain open during construction. Construction activities would be temporary and short in duration, lasting less than two years for the longest period of construction. The project will be built in stages providing two lanes of traffic on the new bridge first, followed by demolition of the existing bridge and finally construction of the other two lanes of the new bridge. Full closure of the bridge is not expected to be necessary during construction.

2.1.3 Community Impacts

2.1.3.1 Community Character and Cohesion

Regulatory Setting

The National Environmental Policy Act of 1969 as amended (NEPA), established that the federal government use all practicable means to ensure that all Americans have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 U.S.C. 4331[b][2]). The FHWA in its implementation of NEPA (23 U.S.C. 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.

Under the CEQA, an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects under CEQA.

Affected Environment

Community Impacts have been analyzed as part of the *Community Impact Assessment Checklist for the 5th Street Bridge Project* (2011).

The character of the project area can be classified as urban within the Cities of Yuba City and Marysville. Community regions are areas that allow for urban development. The existing land uses include commercial (retail, restaurant, commercial services, etc), medium residential (single-family dwellings), and recreational (Riverfront Park and Veterans Memorial Park).

Cohesion refers to the degree of interaction among individuals, groups and institutions that make up the community. Factors that contribute to a high level of community cohesion include long average length of residency, frequent person contact, ethnic group clusters and high level of community activity, elderly residents, and single-family home ownership (Caltrans 1997).

According to the 2010 U.S. Census, Yuba and Sutter Counties consist of a population primarily of white ethnicities, representing approximately 60 percent of the total population. The second largest ethnic group is Hispanic or Latino ethnicities which represent approximately 25% of the total population. In the project study area, Census Tract averages are also predominantly made up of white and Hispanic/Latino ethnicities, but they are more diverse averages with white ethnicities making up 35-45% and Hispanic/Latino ethnicities making up 35-45% as well. Average age in the study area ranges from 28.7 to 32.8 years, while average age in the greater Yuba and Sutter Counties ranges from 32.1 to 34.5 years.

Within the project study area, the average household size is approximately 2.51 persons (average of the Census Tracts in the project area within Yuba City and Marysville), which is lower than the average of 2.95 for Sutter and Yuba Counties as a whole. Additionally, tenure, or home ownership, in the study area is substantially lower in the project area at an average of 25.0% than it is in the greater combined counties which have a tenure rate of 60.3%. A map of the Census Tract Block Groups in the project area is shown on Figure 2.1.3-1.

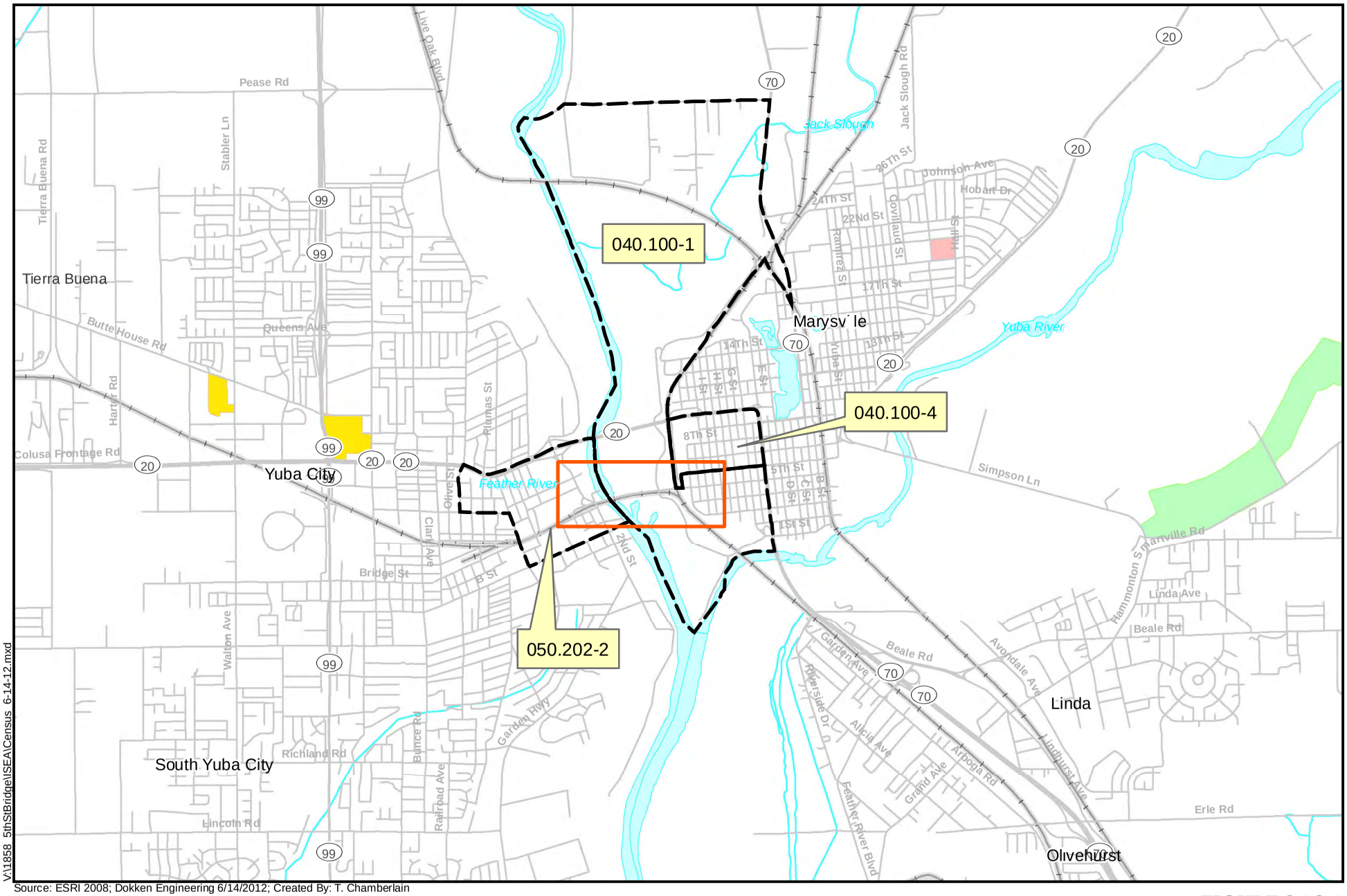
Residents within and nearby the project area exhibit characteristics associated with both strong and weak community cohesion. The project area is made up of urban Yuba City and Marysville and includes community institutions within the project area. Strong cohesion in the area is due to ethnic group clusters, single-family home ownership, and moderate average residency. Although the population is made up predominantly of only two ethnicities, they are divided relatively evenly within the project area. Weak community cohesion characteristics include a lack of ethnic homogeneity, low home ownership tenure, and somewhat limited pedestrian and bicycle facilities. When considering all factors, the community has a moderate to low amount of community cohesion.

Environmental Consequences

Permanent Impacts

Build Alternative

The 5th Street Bridge project area is predominately comprised of commercial uses and the Riverfront Park. The proposed changes to the transportation facility, as well as the temporary impacts associated with construction are not expected to have a substantial impact on any of the above factors that provide greater community character and cohesion. The only individual impact that could negatively affect the community would be impacts to the Riverfront Park and temporary loss of a part of the recreational value it provides; however, no permanent impacts to the park are expected and temporary impacts would be minimized to the greatest extent possible (see Section 2.1.1.3).



Source: ESRI 2008; Dokken Engineering 6/14/2012; Created By: T. Chamberlain

V:\1858 5thStBridge\ISE\Census 6-14-12.mxd

0 0.5 1 1.5 Miles

Project Area

Census Tract Block Group

FIGURE 2.1.3-1

CENSUS TRACT BLOCK GROUPS

5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville
Yuba and Sutter County, California

Since the project would replace an existing bridge and improve existing roadways and intersections it would not cause any physical divisions of the community and would not result in isolation or separation of existing residences from businesses and community facilities. The major permanent impact would be from the required ROW acquisition required to accommodate the intersection improvements at 5th Street and J Street in the City of Marysville. The Build Alternative may require full acquisition of three businesses located on the southwest quadrant of the intersection. However, due to the relatively small number of full acquisitions needed and the correspondingly small number of relocations, this impact would not be considered substantial in terms of community character and cohesion. The relocation process is described in Section 2.1.3.2.

No-Build Alternative

Under the No-Build Alternative, community character and cohesion would not be affected. The bridge would not be replaced, adjacent roadways and intersections would not be improved, and current and future traffic congestion would not be improved in the region.

Temporary Impacts

Build Alternative

Under the Build Alternative, temporary or construction related impacts are anticipated. Construction noise from machinery may be present but would be minimized to the greatest extent possible. Construction activities would result in temporary disruption of connectivity by requiring detours for pedestrians, bicyclists and potentially motorists. No major lane closures are anticipated. Through lanes would be maintained where possible and appropriate detour routes would be made available when necessary. Two lanes of the new bridge are expected to be completed and opened prior to closure of the existing two lane bridge. Construction of the third and fourth lanes of the new bridge would follow. Access to all businesses, schools, and residences would be maintained throughout construction. Some delays on these road sections may occur due to construction. These impacts would be temporary and are not considered significant under CEQA with the implementation of standard traffic management measures.

No-Build Alternative

Under the No-Build Alternative, there would be no construction and no temporary impacts related to community character and cohesion.

Avoidance, Minimization and /or Mitigation Measures

Measures described below would ensure that there is no adverse impact on community character and cohesion during construction of the project.

Measure CCC-1: Where feasible, temporary signage will be installed notifying the public of closures or detours and the expected duration of the closure.

Measure CCC-2: Temporary disruptions to access for businesses in the project area will be minimized by coordinating construction to provide alternative access points and by ensuring that all businesses have at least one open driveway during construction.

Measure CCC-3: Pedestrian and bicycle access will be maintained, where facilities are currently present, on at least one side of the roadway through the project area during construction.

2.1.3.2 Relocation Impacts

Regulatory Setting

Caltrans' Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 CFR Part 24. The purpose of RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. The City of Yuba City will use the Caltrans standard Relocation Assistance Program to provide relocation advisory assistance to any person, business, farm or non-profit organization displaced as a result of acquisition of real property for public use. Please see Appendix D for a summary of the RAP.

All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 U.S.C. 2000d, et seq.). Please see Appendix C for a copy of Caltrans' Title VI Policy Statement.

Affected Environment

The project area includes three main segments: roadway work in Yuba City; the bridge over the Feather River, Riverfront Park and associated area between the levees; and roadway work in Marysville. In Yuba City, properties to the north of Bridge Street are generally residential, while properties immediately to the south and west are generally commercial and industrial. In Marysville, properties adjacent to the project area on 5th Street are commercial; however just south, there are numerous single family homes, a Salvation Army residential crisis center, and further south is the Rideout Regional Medical Center. None of the properties in Yuba City or below the bridge are expected to be substantially affected to require relocations, while the properties affected in Marysville are described further in the Environmental Consequences section below.

Environmental Consequences

<u>Build Alternative</u>

After completion of the Community Impact Assessment in August 2011, a Relocation Impact Memorandum was prepared in July 2012 to address potential impacts caused by partial and full acquisitions of properties in the project area. This memorandum identified that the bridge and roadway improvements would not displace any residential housing.

There are three commercial establishments that would be impacted by ROW acquisitions of two parcels under the Build Alternative. These acquisitions occur on J Street south of 5th Street. All three of the businesses, which are located on two parcels, would require full property acquisitions. Table 2.1.3-1 identifies the parcels impacted by full acquisitions under the Build Alternative. Based on the current availability of 78 retail spaces/properties for lease or sale

within the surrounding City of Marysville community[1], there would be sufficient retail space equal to or better for the three displaced businesses. There are also 10 industrial spaces/properties for lease or sale within the surrounding City of Marysville community, which offer relocation opportunities for the 7 to 7 Smog business[2]. An updated search in June of 2013 confirm that a similar number of available properties for lease or sale are still available for potential commercial relocations.

Table 2.1.3-1: Full Commercial Acquisitions

APN	Area Impacted (sf)	Non Residential Single Business Retail
YUB 010-156-006-000	10,827	California Check Cashing Store
YUB 010-156-005-000	14,770	7 to 7 Smog
		Hague Water
Total	**25,597**	

Source: Parcel Quest, 2011
APN = Assessor's Parcel Number
sf = square feet

Any business that moves from real property, moves personal property from real property as a result of the acquisition of the real property, or is required to relocate as a result of a written notice from a lead agency for a transportation project is eligible for "Relocation Assistance." All activities would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources shall be available to the displacees in compliance with Title VI and State statute, after eligibility has been determined.

No-Build Alternative

Under the No-Build Alternative, there would be no partial or full property acquisitions. No residents or businesses will require relocation advisory assistance.

Temporary Impacts

Businesses being displaced under the Build Alternative would be relocated prior to construction; consequently, these businesses would not experience construction-related impacts.

Avoidance, Minimization and/or Mitigation Measures

Yuba City, in cooperation with the City of Marysville for relocations that occur there, would provide relocation advisory assistance to any person, business, farm or non-profit organization displaced in compliance with Caltrans RAP, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and all applicable federal, state, and local regulations. City officials would assist non-residential displacees by providing information on comparable properties for lease or purchase.

[1] LoopNet.com (http://www.loopnet.com[accessed November 21, 2011]).
[2] CityFeet.com (http://www.cityfeet.com/cont/ca/marysville-industrial-space[accessed July 25, 2012])

A survey of available properties in July 2012 identified multiple suitable locations within a 2 mile radius which could serve as relocation sites for the impacted businesses.

Measure RLC-1: Property owners shall be compensated in accordance with fair market values based on appraisals. The City of Yuba City will use the Caltrans standard Relocation Assistance Program to provide relocation advisory assistance to any person, business, farm or non-profit organization displaced as a result of acquisition of real property for public use.

Measure RLC-2: All efforts would be made to identify relocation opportunities for affected businesses. Wherever feasible, assistance would be made available in identifying suitable relocation sites within the service area of existing businesses.

2.1.3.3 Environmental Justice

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, signed by President Clinton on February 11, 1994. This Executive Order directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2012, this was $23,050 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. Caltrans' commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement, signed by the Director, which can be found in Appendix C of this document.

Affected Environment

A Community Impact Assessment was prepared for the project in August 2011 and is summarized in the following section. This assessment evaluated impacts to people, institutions, neighborhoods, organizations, and larger social and economic systems.

Environmental justice is designed to protect areas with low income and minority populations from disproportionate project impacts. In order to analyze the project and alternatives for possible environmental justice inequities, areas that are sensitive to environmental justice issues must be identified; therefore, areas where low income or minority persons are concentrated are identified using the following criteria:

- **Low Income Neighborhoods.** These are areas defined by Census Tract Block Group (CTBG) where the median income is 80 percent or less than the median income of Sutter and Yuba Counties overall. Eighty percent is used to be consistent with the federal definition of low income household published by the U.S. Department of Housing and Urban Development.

- **Minority Neighborhoods.** These areas are defined by CTBG that have higher concentrations (at least 10 percent) of minority (or non-white) persons than the County overall. Overall, 12.8 percent of the County is minority (non-white) persons. Areas that

are considered minority neighborhoods include CTBG wherein over 20 percent or more of the population are minority persons.

The CTBG in the project area do not meet the criteria for Low Income Neighborhoods but they do meet the criteria for Minority Neighborhoods since approximately 37.6% of the population within these CTBGs is of a minority race. The project does not anticipate to disproportionately affect low-income and minority populations. Project impacts to residents of Yuba City and Marysville City are not anticipated to be substantial and the project has been designed to minimize any potential for impacts. Any reasonably foreseeable adverse social, economic and environmental impacts would not affect disproportionately minority or low-income populations. The project is designed to improve safety for users of the 5th Street Bridge and improve pedestrian and bicycle access in the project area. Temporary impacts associated with construction and benefits from project completion would affect all users of the bridge, Riverfront Park, and other adjacent areas and facilities equally. Therefore, this project is not subject to the provisions of E.O. 12898.

Avoidance, Minimization and/or Mitigation Measures

Based on the above discussion and analysis, the build alternative would not cause disproportionately high and adverse effects on any minority or low income populations as per E.O. 12898 regarding environmental justice.

2.1.4 Utilities and Emergency Services

Affected Environment

Utilities and emergency services have been analyzed as part of the *Community Impact Assessment for the 5th Street Bridge Replacement Project* (2011).

Utilities

In Yuba City, potable water, wastewater, and storm drains are managed and operated by the Yuba City Public Works Department, Utilities Division. Yuba City draws water directly from the Feather River. The City of Marysville potable water is managed and provided by the California Water Service Company, Marysville District. The California Water Service Company draws groundwater through eight wells and conveys it to Marysville via pipeline. The City of Marysville Public Services Department manages the wastewater systems and storm drains within the city.

Pacific Gas and Electric Company (PG&E) provides the area with electric and natural gas services. There are existing electrical lines on power poles in Marysville and Yuba City. Power lines are found at 5th Street in Marysville and at 2nd Street and Bridge Street in Yuba City. There is also an overhead line spanning the Riverfront Park and Feather River located on the abandoned railroad bridge just south of the existing 5th Street Bridge. Table 2.1.4-1 outlines a preliminary list of utilities that are expected to be located within the project area.

Table 2.1.4-1: Existing Utility Facilities

Utility Company	Description of Utility Facility	Utility Location
AT&T	Telecommunication	Existing 5th Street Bridge and underground in the roadway approaches
Comcast	Overhead Fiber Optic and other Telecommunication Lines	J Street and 4th Street, crossing over the Feather River on the Railroad Bridge, and continuing onto Bridge Street.
Pacific Gas and Electric	Overhead Electrical Lines	Along 5th Street, crossing the Feather River north of the 5th Street Bridge and continuing on Bridge Street.
California Water Service	Water Main	5th Street and J Street
Levee District One	Underground Unknown Facilities	Within the West Yuba City Levee
Marysville Levee District	Underground Unknown Facilities	Within the East Marysville Levee
City of Yuba City	Sewer Mains	5th Street and J Street
City of Yuba City	Storm Drains	Throughout the project area in Yuba City.
City of Marysville	Sewer and Water Lines	Under various roadways throughout the Project Area in Yuba City
City of Marysville	Storm Drains	Throughout the project area in Marysville.

Source: Parcel Quest, 2011

Emergency Services

Yuba City is served by the Yuba City Fire Department and Yuba City Police Department for emergency services. Marysville is served by the Marysville Fire Department and Marysville Police Department for emergency services. Both cities receive paramedic services from the Fire Department and bi-county local hospital ambulances. All of the above listed emergency services use the 5th Street Bridge for access between the two cities.

Environmental Consequences

Utilities

Build Alternative

AT&T telecommunication lines are located on the existing 5th Street Bridge and would need to be relocated in a similar duct on the new bridge. Comcast fiber optic and telecommunication lines are located on overhead poles which are in conflict with the proposed project and would need to be relocated. PG&E overhead electric lines are located on poles which are in conflict with the project and would need to be relocated. The California Water Service water main located at 5th Street and J Street has above ground appurtenances that would need to be either relocated underground or reconnected above ground during construction. Levee District One and Marysville Levee District have unknown utilities located in the respective levees which may

be impacted during construction and may require relocation. The City of Marysville has sewer mains on 5th Street and J Street which may need to be relocated, and the City of Yuba City has sewer and water facilities within the City roadway system that may also require relocation during construction.

Each of these utilities would be located during final project design. Full utility coordination, consistent with Caltrans and FHWA requirements, would be performed. All utilities that require relocation during project construction would be moved to another area within the project study area; however, no new environmental impacts of any kind are anticipated as a result of these utility relocations. Any utility relocations required as part of this project have been accounted for in this environmental analysis.

No-Build Alternative

Under the No-Build Alternative, there would be no utility improvements or relocations within the study area.

Emergency Services

Build Alternative

The proposed project would have no adverse effects on emergency response planning, emergency access and risk exposure. The increased capacity on the new bridge (four lanes) would relieve traffic congestion and allow for faster emergency response times. Project features, such as the addition of sidewalks, bike lanes and generally improved ADA access, would improve safety for pedestrians and bicyclists.

Traffic congestion and delays can occur during construction; however, these effects can be avoided through standard traffic management planning which may include timely notification of any lane closures to police and fire departments, the California Highway Patrol and other emergency service providers. Furthermore, the project has been designed to ensure that access across the 5th Street Bridge would remain open throughout the construction process. The new bridge would be built in stages such that two lanes on the new bridge would be built and opened for traffic prior to closure and demolition of the existing bridge. The 3rd and 4th lanes would then be constructed and the full width bridge would be opened to traffic. This would ensure that emergency services would retain full access between the two cities for the entirety of the construction period.

No-Build Alternative

Under the No Build Alternative the existing condition would not change and would therefore have no effect on emergency services.

Avoidance, Minimization and/or Mitigation Measures

Construction of the Build Alternative would require the utility facilities within the project limits to be relocated. A more detailed study would be conducted during the design phase of the project. In addition, the following measures would apply prior to and during construction.

Measure UTL/ES-1: To minimize interruptions of service to utility customers, a series of coordination letters shall be sent to all impacted utility companies to identify utilities within the

proposed project. Letters will indicate where utility relocations are to be performed and the required time to relocate them. Design plans will be sent to involved utility owners during the project development phase. Meetings will be arranged with utility companies as necessary to discuss impacts and relocation plans.

Measure UTL/ES-2: A Transportation Management Plan shall be prepared. It will ensure that there is appropriately designed access for emergency services onto all roads involved in the proposed project. The plan will be provided to emergency public services (including fire, police, and hospital facilities).

Measure UTL/ES-3: Emergency public services, local law enforcement agencies, and local businesses will be notified of the proposed project and of any temporary lane closures one month before construction begins.

2.1.5 Traffic & Transportation/Pedestrian & Bicycle

Regulatory Setting

Caltrans, as assigned by FHWA, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 CFR 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation (USDOT) issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally-assisted programs is governed by the USDOT regulations (49 CFR Part 27) implementing Section 504 of the Rehabilitation Act (29 United States Code [USC] 794). FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to federal-aid projects, including Transportation Enhancement Activities.

Affected Environment

This section summarizes the *Traffic Report for the 5th Street Bridge Replacement Project Study Report/Project Report* (Fehr & Peers 2011).

The Traffic Report was prepared in conformance with methodologies that were developed in coordination with Caltrans and Yuba City. For the following intersections in the project area, traffic impacts were analyzed based upon the effects from area-wide development and general population growth.

1. Bridge Street/SR 99
2. Bridge Street/Gray Avenue
3. Bridge Street/Clark Avenue
4. Bridge Street/Cooper Avenue
5. Bridge Street/Plumas Street
6. Bridge Street/Shasta Street

7. Bridge Street/5th Street Eastbound On-Ramp
8. 5th Street Westbound Off-Ramp/Sutter Street
9. Bridge Street/2nd Street
10. 5th Street/J Street
11. 5th Street/SR 70
12. 3rd Street/SR 70
13. SR 70 Southbound On-Ramp/F Street

Development included both the proposed project and nearby future projects. Traffic counts were collected and an AM and PM peak hour analysis was performed.

Existing Traffic Facilities

The 5th Street Bridge is a two-lane bridge that spans the Feather River. It is situated approximately one third of a mile downstream from the four-lane SR 20 Bridge (the other major connector between Yuba City and Marysville). The 5th Street Bridge is elevated above Sutter Street, the Feather River, Riverfront Park, and Biz Johnson Drive for a total length of nearly a half mile. The bridge has a posted speed limit of 35 miles per hour (mph).

Bridge Street begins west of SR 99 and extends in an east-west direction through Yuba City, terminating at 2nd Street. An on-ramp from eastbound Bridge Street forms the beginning of the 5th Street Bridge. Westbound motorists on the 5th Street Bridge connect directly with Bridge Street. East of SR 99, Bridge Street has four lanes and a posted speed limit of 35 mph with the exception of the 1,900-foot segment of Gray Avenue to Cooper Avenue, which has two lanes and a posted speed limit of 25 mph. Bridge Street provides access to predominately commercial uses as well as an arterial connection with SR 99.

5th Street begins east of SR 70 and extends in an east-west direction through Marysville, becoming the 5th Street Bridge. Between SR 70 and 3rd Street, it is a four-lane undivided roadway with a posted speed limit of 30 mph. 5th Street provides access to a mixture of commercial and residential uses in the surrounding area as well as an arterial connection with SR 70.

The traffic analysis examined the bridge and roadway connecting the two cities, ramp junctions, and the intersection operations under the existing conditions. The 13 study intersections all currently operate at acceptable levels of service (LOS) with the exception of the Bridge Street/2nd Street intersection (LOS E operations during PM peak hour). Table 2.1.5-1 shows existing LOS at the six intersections in the project area.

Vehicle Queuing

Vehicle queues were observed throughout the study corridor. In most instances, maximum queues remained within the available turn lane storage. However, several notable exceptions were observed:

- <u>Bridge Street between Clark Avenue and Cooper Avenue</u>: This segment of Bridge Street has one lane in each direction. The traffic signals at Clark Avenue and Cooper Avenue are situated about 470 feet apart. This close spacing causes traffic to occasionally spill back from one intersection to the other.

Table 2.1.5-1: Level of Service for Existing Intersection Conditions

Intersection		Jurisdiction (Minimum Acceptable LOS)	Control	Peak Hour	Existing Conditions	
					Delay (sec/veh)	LOS
1	Bridge Street / SR 99	Caltrans (E)	Traffic Signal	AM	34	C
				PM	53	D
2	Bridge Street / Gray Avenue	Yuba City (D)	Traffic Signal	AM	25	C
				PM	40	D
3	Bridge Street / Clark Avenue	Yuba City (D)	Traffic Signal	AM	29	C
				PM	41	D
4	Bridge Street / Cooper Avenue	Yuba City (D)	Traffic Signal	AM	32	C
				PM	36	D
5	Bridge Street / Plumas Street	Yuba City (D)	Traffic Signal	AM	35	D
				PM	39	D
6	Bridge Street / Shasta Street	Yuba City (D)	Traffic Signal	AM	17	B
				PM	32	C
7	Bridge Street / 5th Street On-Ramp	Yuba City (Exempt)	Side Street Stop	AM	12	B
				PM	19	C
8	5th Street WB Off-Ramp / Sutter Street	Yuba City (Exempt)	Side Street Stop	AM	19	C
				PM	14	B
9	Bridge Street / 2nd Street	Yuba City (D)	Side Street Stop	AM	24	C
				PM	**42**	**E**
10	5th Street / J Street	Marysville (D)	Traffic Signal	AM	25	C
				PM	40	D
11	5th Street / SR 70	Caltrans (E)	Traffic Signal	AM	34	D
				PM	35	C
12	3rd Street / SR 70	Caltrans (E)	Traffic Signal	AM	57	E
				PM	54	D
13	SR 70 SB On-Ramp / F Street	Caltrans (E)	Uncontrolled	AM	5	A
				PM	24	C

Notes: Intersection delay is based on the average intersection control delay for signalized and all-way stop controlled intersections. The worst case movement is reported for side-street stop controlled intersections

Bold text indicates unacceptable operations.

General Plan Policy 5.2-I-12 permits the Yuba City Council to exempt intersections 7 and 8 from a LOS standard because they are associated with the 5th Street Bridge Crossing

Source: Fehr & Peers, Traffic Study 2011

- Eastbound 5th Street through/right at J Street: The eastbound approach consists of a single lane at the UPRR trestle bridge (375 feet west of the intersection), and then widens to three lanes at the J Street intersection. Vehicles were observed to regularly queue back to the trestle bridge and beyond.

- Northbound SR 70 left turn lane at 5th Street: The northbound left-turn lane features 150 feet of vehicle storage. Field observations reveal that vehicle queues regularly spill out of the turn pocket and into the 3rd and 4th Street intersections.

Although there are signalized intersections at 5th and H Streets as well as 3rd and H Street, these intersections were not analyzed individually because there are very low traffic volumes on H Street. H Street is used for access to local residences and the hospital on 3rd Street and the bridge project is not expected to change the volumes or demand on H Street.

Bottleneck Locations

Field observations and travel time runs revealed the following bottleneck locations along the study corridor:

- Eastbound: Bottleneck locations include the single through lane on Bridge Street from Gray Avenue to Cooper Avenue, imbalanced lane usage at the Plumas and Shasta Street intersections (inside through lane more heavily used in anticipation of accessing the 5th Street Bridge on-ramp), and the 5th Street Bridge merge (located east of the on-ramp).

- Westbound: Bottleneck locations include the heavy left-turn movements on northbound SR 70 at 3rd Street and 5th Street, the merge point just west of the 5th Street/J Street Intersection, and the single through lane on Bridge Street from Cooper Avenue to Gray Avenue.

- 5th Street/J Street Intersection: Causes moderate delays and queuing, but is not currently a major bottleneck in the corridor.

These locations do not necessarily "meter" or limit the amount of traffic that is able to travel through the corridor. Rather, they are locations known to cause increases in delays, which may potentially be affecting motorists' choice of travel route.

Existing Pedestrian and Bicycle Facilities

Pedestrian facilities, such as sidewalks, in the project area are located on 5th Street, Bridge Street, and several other adjacent roadways in Yuba City and Marysville as sidewalks. The existing bridge also has a Class I separated 10-foot wide path for bicycle and pedestrian use. The path over the bridge connects with other paths on the Yuba City side associated with the levee. Some of these connections are lacking ADA access. Intersections in the project area predominantly include crosswalks.

Accident and Safety Information

Although the existing facilities have not reported accident data in excess of state or federal averages, the existing two lane bridge does pose a substantial problem for accident safety.

During an accident event, or even a simple breakdown, the bridge becomes a gridlock and poses access challenges for responding emergency or tow-truck vehicles. Clearing a serious accident on the bridge sometimes requires full closure of the bridge to deal with the emergency situation.

Environmental Consequences

The traffic study assumed an opening year of 2015 and design year of 2035 for the project when modeling future traffic conditions. Based on the projected model, traffic levels on the 5th Street Bridge (average of AM and PM peak hours) are projected to increase by 24% over existing conditions by 2015. Furthermore, if the Build Alternative is selected, and a new four-lane bridge is constructed, traffic levels on the 5th Street Bridge are expected to increase by 40% over existing conditions. These growth rates are explained by the theoretical capacity of a two-lane versus four-lane bridge. Essentially, as congestion increases traffic would use alternative routes to save time, but with additional capacity and improved levels of service under a four-lane condition, more vehicles would use the facility. The projected traffic growth on the Bridge Street/5th Street corridor are shown in Table 2.1.5-2.

Average Daily Traffic (ADT) on the 5th Street Bridge is estimated to be 32,800 under existing conditions and is projected to increase to 40,700 in 2015 and 66,500 in 2035 under a No-Build Alternative. The traffic study indicates that six of the thirteen intersections would operate at unacceptable LOS in 2015 (opening year) and ten out of thirteen would operate at unacceptable LOS in 2035 (not including the two exempt intersections) if improvements are not made (Tables 2.1.5-3 and 2.1.5-4). The LOS comparison between 2035 No-Build and Build Alternatives shows few locations with an actual LOS letter improvement, but the four-lane alternative can move more traffic and will ultimately provide better redundancy for travel across the Feather River when traffic is blocked on the SR 20 Bridge.

Table 2.1.5-2: Projected Traffic Growth on Bridge Street/5th Street Corridor

Segment	Bi-Directional Traffic Volume					
	Existing Conditions		Design Year No-Build Alternative		Design Year Build Alternative	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Bridge Street east of SR 99	1,107	1,644	2,630	3,500	2,780 (6%)	3,640 (4%)
Bridge Street east of Shasta Street	1,276	1,775	3,090	3,930	4,320 (40%)	5,470 (39%)
5th Street Bridge	2,221	2,778	4,450	5,660	6,490 (46%)	7,980 (41%)
5th Street west of SR 70	827	1,092	1,940	2,510	3,350 (73%)	3,860 (54%)
3rd Street west of SR 70	1,360	1,627	2,250	2,800	2,670 (19%)	3,360 (20%)
(x%) = Percent Growth Over Design Year No-Build Alternative						

Source: Fehr & Peers, Traffic Study 2011

Build Alternative

The traffic study prepared for this project includes an analysis of traffic conditions in the opening year (2015) as well the design year which is 20 years after opening (2035). The intersection operation results are presented in Tables 2.1.5-3 and 2.1.5-4.

Table 2.1.5-3: Intersection Operations – Opening Day (2015) Conditions

Intersection		Jurisdiction (Minimum Acceptable LOS)	Control	Peak Hour	No Build Alternative		Build Alternative	
					Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Bridge Street / SR 99	Caltrans (E)	Traffic Signal	AM	42	D	43	D
				PM	74	E	71	E
2	Bridge Street / Gray Avenue	Yuba City (D)	Traffic Signal	AM	28	C	28	C
				PM	41	D	47	D
3	Bridge Street / Clark Avenue	Yuba City (D)	Traffic Signal	AM	43	D	40	D
				PM	**83**	**F**	**102**	**F**
4	Bridge Street / Cooper Avenue	Yuba City (D)	Traffic Signal	AM	35	C	35	C
				PM	**62**	**E**	**74**	**E**
5	Bridge Street / Plumas Street	Yuba City (D)	Traffic Signal	AM	48	D	31	C
				PM	**104**	**F**	37	D
6	Bridge Street / Shasta Street	Yuba City (D)	Traffic Signal	AM	52	D	28	C
				PM	**108**	**F**	40	D
7	Bridge Street / 5th Street On-Ramp	Yuba City (Exempt)	Side Street Stop	AM	13	B	34	D
				PM	45	E	26	D
8	5th Street WB Off-Ramp / Sutter Street	Yuba City (Exempt)	Side Street Stop	AM	37	E	25	C
				PM	23	C	32	C
9	Bridge Street / 2nd Street	Yuba City (D)	Side Street Stop	AM	34	D	36	D
				PM	**54**	**F**	39	D
10	5th Street / J Street	Marysville (D)	Traffic Signal	AM	53	D	23	C
				PM	**123**	**F**	32	C
11	5th Street / SR 70	Caltrans (E)	Traffic Signal	AM	23	C	21	C
				PM	32	C	30	C
12	3rd Street / SR 70	Caltrans (E)	Traffic Signal	AM	38	D	31	C
				PM	64	E	46	D
13	SR 70 SB On-Ramp / F Street	Caltrans (E)	Uncontrolled	AM	6	A	22	C
				PM	6	A	27	D

Notes: Intersection delay is based on the average intersection control delay for signalized and all-way stop controlled intersections. The worst case movement is reported for side-street stop controlled intersections

Bold text indicates unacceptable operations.

General Plan Policy 5.2-I-12 permits the Yuba City Council to exempt intersections 7 and 8 from a LOS standard because they are associated with the 5th Street Bridge Crossing

Source: Fehr & Peers, Traffic Study 2011

Table 2.1.5-4: Intersection Operations – Design Year (2035) Conditions

Intersection		Jurisdiction (Minimum Acceptable LOS)	Control	Peak Hour	No Build Alternative		Build Alternative	
					Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Bridge Street / SR 99	Caltrans (E)	Traffic Signal	AM	63	E	73	E
				PM	**120**	**F**	**130**	**F**
2	Bridge Street / Gray Avenue	Yuba City (D)	Traffic Signal	AM	47	D	31	C
				PM	**122**	**F**	**56**	**E**
3	Bridge Street / Clark Avenue	Yuba City (D)	Traffic Signal	AM	**104**	**F**	47	D
				PM	**204**	**F**	**93**	**F**
4	Bridge Street / Cooper Avenue	Yuba City (D)	Traffic Signal	AM	**152**	**F**	49	D
				PM	**254**	**F**	**68**	**E**
5	Bridge Street / Plumas Street	Yuba City (D)	Traffic Signal	AM	**296**	**F**	**191**	**F**
				PM	**> 300**	**F**	**288**	**F**
6	Bridge Street / Shasta Street	Yuba City (D)	Traffic Signal	AM	**> 300**	**F**	**209**	**F**
				PM	**> 300**	**F**	**> 300**	**F**
7	Bridge Street / 5th Street On-Ramp	Yuba City (Exempt)	Side Street Stop	AM	> 300	F	> 300	F
				PM	> 300	F	> 300	F
8	5th Street WB Off-Ramp / Sutter Street	Yuba City (Exempt)	Side Street Stop	AM	> 300	F	158	F
				PM	185	F	107	F
9	Bridge Street / 2nd Street	Yuba City (D)	Side Street Stop	AM	**> 300**	**F**	**64**	**E**
				PM	**> 300**	**F**	**137**	**F**
10	5th Street / J Street	Marysville (D)	Traffic Signal	AM	**266**	**F**	**79**	**E**
				PM	**273**	**F**	**216**	**F**
11	5th Street / SR 70	Caltrans (E)	Traffic Signal	AM	**103**	**F**	**92**	**F**
				PM	80	E	**119**	**F**
12	3rd Street / SR 70	Caltrans (E)	Traffic Signal	AM	43	D	54	D
				PM	**93**	**F**	58	E
13	SR 70 SB On-Ramp / F Street	Caltrans (E)	Uncontrolled	AM	31	D	23	C
				PM	11	B	10	A

Notes: Intersection delay is based on the average intersection control delay for signalized and all-way stop controlled intersections. The worst case movement is reported for side-street stop controlled intersections

Bold text indicates unacceptable operations.

General Plan Policy 5.2-I-12 permits the Yuba City Council to exempt intersections 7 and 8 from a LOS standard because they are associated with the 5th Street Bridge Crossing

Source: Fehr & Peers, Traffic Study 2011

With implementation of the Build Alternative, traffic operations in the project area as well as on the local and regional highway network would improve. The LOS at the modeled intersections would be generally better in both the opening year and design year compared with the No-Build Alternative. Although, the Build Alternative would double the existing capacity of the bridge, the peak hour congestion related benefits would only be realized for a portion of this additional capacity, since the opening of four lanes would divert traffic away from the SR 20 crossing of the Feather River to the north. The congestion relief benefits are more clearly identified in the opening year, where the Build Alternative would reduce the number of intersections with a failing LOS from six to two.

By the design year, even with the project, most of the modeled facility would be overwhelmed with traffic. As Table 2.1.5-4 shows 12 out of 13 intersections would be operating at a LOS E or F during peak hour. Additional capacity over the Feather River is a goal of the Yuba City and Marysville General Plan Transportation and Circulation Elements, and by 2035, it is possible that additional capacity beyond this project would be added between the two cities. Additionally, as illustrated in Table 2.1.5-4, the average delay would be reduced with the Build Alternative compared with the No-Build Alternative for the majority of intersections.

The Build Alternative would improve facilities for bicycles and pedestrians. The new bridge would have a similar Class I multi-use path; however, roadway work on the adjacent project areas within Yuba City and Marysville would include improvement and addition to the existing sidewalk and bicycle path systems. Additional connections with ADA compliant access would be provided between the Class I trail over the bridge and the existing trails located on and adjacent to the Yuba City levee (see Figure 1.4.1-1). Formalized crosswalks would be added as necessary at each of the affected intersections throughout the project, and in general, pedestrian and bicycle safety would be enhanced by the project.

In order to accommodate the additional two lanes of traffic over the Feather River, permanent tie in connections with the bridge would be required for both Yuba City and Marysville sides of the project. At the Marysville side, the additional two lanes would travel underneath the existing railroad overhead bridge which passes over 5th Street just west of J Street (photo shown below).

This new roadway connection with the 5th Street and J Street intersection would require additional features to ensure traffic safety. A roadway barrier and crash attenuator would be implemented between the two new lanes as they pass under the railroad bridge in order to prevent collision with the bridge support standing between the lanes. This barrier would continue to the east of the bridge to prevent last minute lane changes to enter the new free-right turn-lane from 5th Street east on to J Street south. The other arms of the 5th Street and J Street intersection would be improved, widened, or restriped as needed to accommodate the additional improvements and lanes of traffic across the bridge.

On the Yuba City side of the bridge, the proposed project would include removal of the existing freestanding bridge structures over 2nd Street. These structures include the 5th Street roadway bridge over 2nd Street and the abandoned railroad bridge over 2nd Street. 2nd Street would be realigned from the westbound 5th Street ramp intersection to Bridge Street. The existing curve would be reduced and obstructions such as the Union Pacific Railroad Underpass would be removed to improve sight distance for vehicles turning left onto Bridge Street. This segment of 2nd Street will improve turning movements onto and off of 5th Street and Bridge Street, as well as provide sidewalks and bike trail access to the levee system.

The intersection of Bridge Street and 2nd Street, as well as the intersection with the 5th Street on/off-ramp and 2nd Street would be improved to a signalized intersection. The eastbound on-ramp to the 5th Street Bridge would be changed to a direct access but the west bound on-ramp off of Bridge Street would remain open. Lastly, the access to Bridge Street would be restricted to an eastbound movement to avoid a lane conflict. Vehicles at the intersection of Bridge Street and Boyd Street would now need to take an alternative route to reach the intersection of Bridge Street and Shasta Street to the west. All of the changes described above are shown graphically on Figure 1.4.1-1.

The Build Alternative is expected to increase vehicle trips at the Bridge Street/SR 99 intersection during the PM peak hour. In order to reduce potential traffic impacts, the project has been designed to include a right-turn overlap arrow on the westbound Bridge Street approach to SR 99 and modify the traffic signal progression plans on SR 99 to better manage traffic flows. These changes should minimize the potential impacts caused by the project through the design year; however, these identified impacts are likely to be further minimized by upstream bottlenecks which would meter the amount of traffic able to access the intersection during peak hour conditions. These proposed changes would be made prior to completion of construction and are signalization changes only, no ground disturbance or construction is necessary.

During construction of the Build Alternative, access for vehicles, bicycles and pedestrians may be affected. Travel lane and/or sidewalk closures may occur during various phases of construction, resulting in detours and temporary traffic delays associated with the construction period.

Existing 5th Street Condition under the Railroad Bridge

Proposed 5th Street Condition under the Railroad Bridge

No Build Alternative

The traffic operations analyses are presented in Tables 2.1.5-3 and 2.1.5-4 for intersections, and indicate deficiencies under existing and future conditions. Nearly all intersections in and around the project area would suffer worse congestion conditions under the No Build Alternative in 2015 and traffic conditions are expected to continue to worsen through 2035. The No Build Alternative would be inconsistent with the General Plans of both Yuba City and Marysville.

Under the No Build Alternative, no improvements would be constructed for bicycle and pedestrian facilities and accessibility and connectivity would remain deficient in the project area. The No Build Alternative would not modify existing traffic patterns for residents and businesses. Under the No Build Alternative, improvements would not be constructed; therefore, construction period effects to the transportation system do not apply to this alternative.

Avoidance, Minimization and/or Mitigation Measures

To ensure that there are no negative effects on existing transportation, a Transportation Management Plan (Measure UTL/ES-2) for the Build Alternative would be developed and implemented. If the project is constructed in phases, all applicable avoidance, minimization, and mitigation measures would be implemented during each construction phase and the following measures would be implemented to minimize traffic impacts in the project vicinity:

Measure TRAF-1: All existing non-motorized facilities shall be maintained to ADA standards.

Measure TRAF-2: To minimize the temporary effects to travelers, a Traffic Management Plan will be prepared. Such strategies might include public information campaigns, motorist information, incident management, and inclusion of night work for construction activities.

2.1.6 Visual Resources

Regulatory Setting

The National Environmental Policy Act of 1969 as amended (NEPA) establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, as well as aesthetically (emphasis added) and culturally pleasing surroundings (42 U.S.C. 4331[b][2]). To further emphasize this point, the FHWA in its implementation of NEPA (23 U.S.C. 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

Likewise, CEQA establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities." (CA Public Resources Code [PRC] Section 21001[b])

Affected Environment

A *Visual Impact Assessment* (June 2011) was prepared to evaluate potential impacts the proposed project could have to visual resources within the project area. This report was prepared to define the project setting and viewshed, identify key views for visual assessment, analyze existing visual resources and viewer response, depict the visual appearance of project alternatives, assess the visual impacts of project alternatives, and proposed methods to mitigate adverse visual impacts.

The project area topography is predominately flat, and is comprised of the Feather River, which the 5th Street Bridge crosses over, and associated floodplain. The project area leads directly into downtown Yuba City to the west and Marysville to the east. This project area is formed partially as a result of former agricultural activities, and current recreational activities. Water features in the project area consist of the Feather River, which runs perpendicular to the project area. The Feather River continues south and eventually terminates at the Sacramento River. The Feather River is the principal tributary of the Sacramento River.

The regional landscape consists of riparian vegetation along the Feather River. Two parks exist within the project area, the Riverfront Park and the Veterans Park, both of which are landscaped with grasses and planted trees. Planted trees and landscaped areas also exist along 5th Street and surrounding properties.

The proposed project is within developed areas of the City of Marysville and the City of Yuba City. In the near project vicinity, residential and business structures exist along 5th Street and further away residential development exists along 2nd Street in the City of Yuba City and Olive and J Street in the City of Marysville.

The viewer groups in the project vicinity are motorists, recreationists in the Riverfront Park, recreationists along the levee multi-use trails, and commercial businesses in both Yuba City and Marysville. The residents in the project vicinity, which make up part of the built environment, are

not considered to be a viewer group as the levees and trees surrounding the project area block all views of the proposed project features. Visitors to the old Yuba City Cemetery within Yuba City are also excluded as a viewer group. Individuals visiting the old Yuba City Cemetery have minimal views of the project features and as such, have no potential for visual impact from the proposed project.

Motorists are the first viewer group; however, their sensitivity is relatively low due to the short time span spent along the proposed project area. Moreover, the views from the roadway and bridge are minimally exposed due to the topography and bridge obstructing their views.

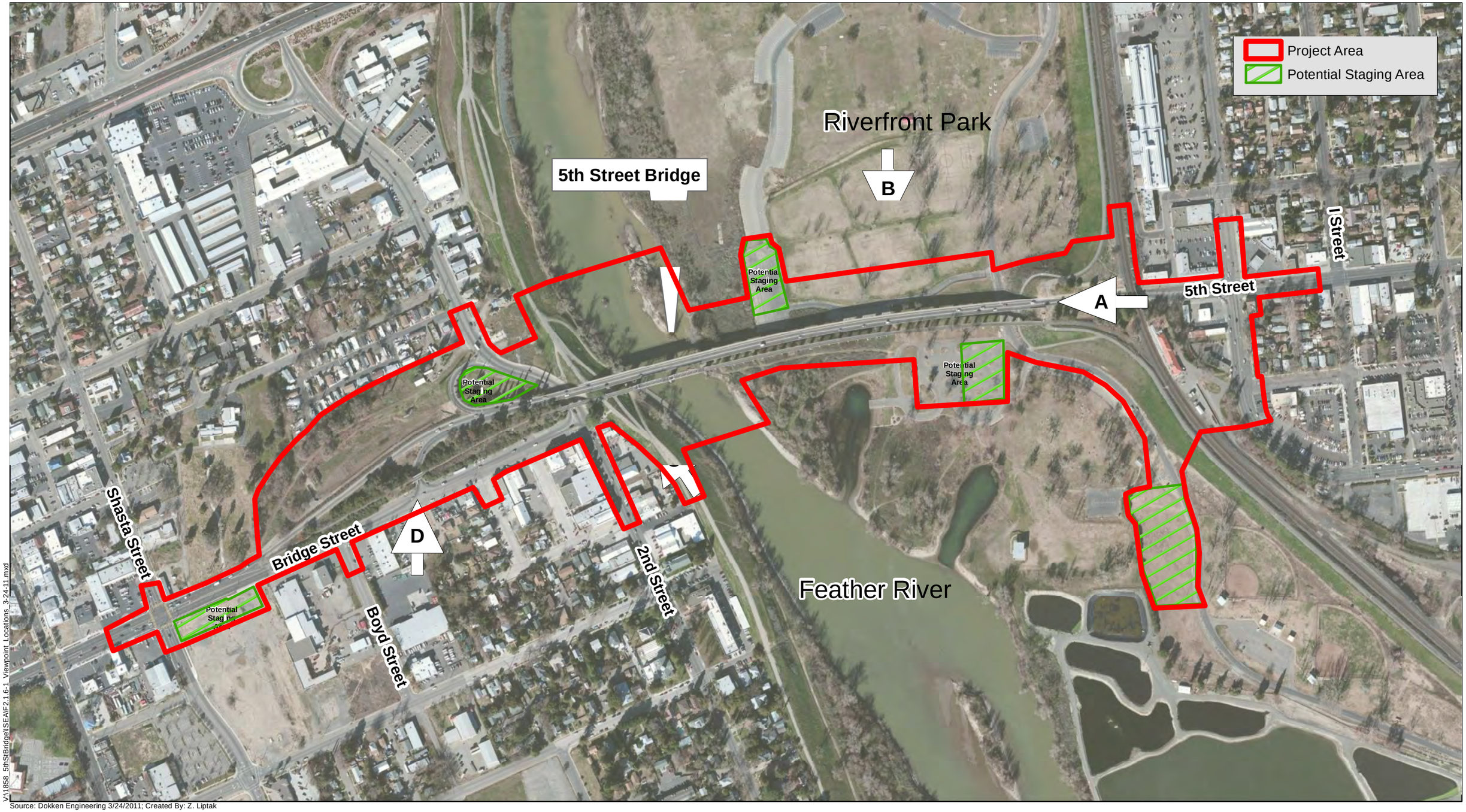
Recreationers at Riverfront Park are the second viewer group, and they would have the highest sensitivity; however, they are only occasional viewers of the area and their views can be obscured by the trees and other development existing within the park. Recreationers along the levee multi use trails are the third viewer group, who have a high sensitivity; however, they are only occasional viewers of the area and their views are often brief due to the majority of recreationists being cyclists.

Commercial businesses are the fourth viewer group. Their viewer exposure is high due to their long-term and constant presence in the area. Business' viewer awareness is also low, due to the obscured views of the existing bridge and roadway, lack of scenery provided by surrounding topography, and lack of memorable views in the distance. Additionally, levees surround the bridge, which block all views of the Riverfront Park and the Feather River for all commercial businesses within the project area. It is also presumed that commercial businesses in the project area were not likely drawn to this location because of the viewshed.

Environmental Consequences

Build Alternative

Key viewpoints A, B, C and D as shown in Figure 2.1.6-1 were selected to display the visual results of the proposed project as viewed from primary viewer groups potentially affected. The visual quality of each key viewpoint was quantified using an evaluation scale of 1-7 (1=Very Low, 4=Medium, 7=Very High) for vividness, intactness, and unity. Vividness, intactness, and unity were evaluated for landscape units: 1) inside the ROW; 2) outside the ROW within the local landscape unit; and 3) outside the ROW outside the local landscape unit.



V:\1858_5thStBridge\SEAIF\2.1.6-1_Viewpoint_Locations_3-24-11.mxd

Source: Dokken Engineering 3/24/2011; Created By: Z. Liptak

0 500 1,000 1,500 Feet

FIGURE 2.1.6-1
Key Viewpoint Locations
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

Key Viewpoint A – Facing West on 5th Street

Key Viewpoint A is the view from the westbound lanes along 5th Street looking west toward the bridge over the Riverfront Park and Feather River. This photograph was taken on 5th Street west of Olive Street and the railroad overcrossing. This view is typical of that experienced by motorists traveling on 5th Street as they approach the bridge from the east. The open-space landscape unit dominates the view, and the built landscape is in the background. The background vista encompasses trees in the distance that are of a homogenous color, texture, and form and are relatively low on the horizon, with an occasional rooftop appearing in breaks of the tree line. The immediate foreground consists of the visible existing 5th Street Bridge and sidewalk. The middle ground consists of utility lines that run the length of the view along the north and south side of 5th Street, the tops of trees within the Riverfront Park, and levees across the Feather River. No residences or businesses within the project vicinity have a view of the existing facility.

The proposed replacement structure forms the center of this view with an increased pavement width including a Class I multi-use trail. Viewers in this location would continue to be primarily motorists traveling west on 5th Street and are not considered very sensitive viewers, as exposure to the proposed structure would be fleeting. Due to the structure being wider, more paved surfaces would be visible and open space in the middle ground and background would be more obscured. Some adjacent tree tops would still be visible. Overall, the views from Key Viewpoint A are not expected to be substantially different than the existing views.

Key Viewpoint A

Key Viewpoint B – Facing South from Riverfront Park

Key Viewpoint B represents the view from the Riverfront Park looking south towards the 5th Street Bridge. This photograph was taken from the soccer complex located within the Riverfront Park, just north of the 5th Street Bridge. This view is typical of that experienced by recreationists using the Riverfront Park. The photographs show the open-space landscape units in the viewshed. The background consists of the existing trees to the south that are of a homogenous color, texture, and form, and are relatively low on the horizon. The immediate foreground consists of the visible existing 5th Street Bridge. The middle ground consists of utility lines that run the length of the view along the north side of 5th Street, trees, and the grasses and shrubs existing within the Riverfront Park.

With the Build Alternative, views would include a fewer number of columns, thereby reducing the man-made encroachment into the natural environment and increasing the opportunity for natural and landscaped features. Recreationists using Riverfront Park would continue to have views of the proposed bridge structure as there would be a minimal change from the existing structure. The replacement bridge would have an increased width, however it would not be noticeable from Key Viewpoint B and the new structure would not obscure any existing views. The improved facility would therefore not create a vivid, memorable feature, nor would it alter the degree of intactness and unity experienced by viewers. There would be little resulting impact on the existing visual quality or character.

Key Viewpoint B

Key Viewpoint C – Facing North on the levee multi-use trail

Key Viewpoint C represents the view from the levee multi-use trail looking north towards the 5th Street Bridge. This photograph was taken facing north and was taken from the bike path towards the 5th Street Bridge. This view is typical of that experienced by recreationers using the existing levee trail and crosses under the 5th Street Bridge. Both built and open-space landscape units are in this view. The background consists of trees that are of a homogenous color, texture, and form, and are relatively low on the horizon. The immediate foreground consists of the grasses, shrubs, and trees that dominate the park's landscape. The middle ground consists of the profile of the railroad bridge just south of the 5th Street Bridge, the profile of the 5th Street Bridge columns, utility lines, open space, and light fixtures.

With the Build Alternative, views would include the new bridge structure as well as new abutments, utility and light poles. Recreationers along the levee trail would continue to have views of a bridge with minimal change from the existing views. The replacement bridge would have a slightly increased width, however it would not be out of place and the structure would not obscure any existing views. The improved facility would therefore not create a vivid, memorable feature, nor would it alter the degree of intactness and unity experienced by viewers. There would be little resulting impact on the existing visual quality or character.

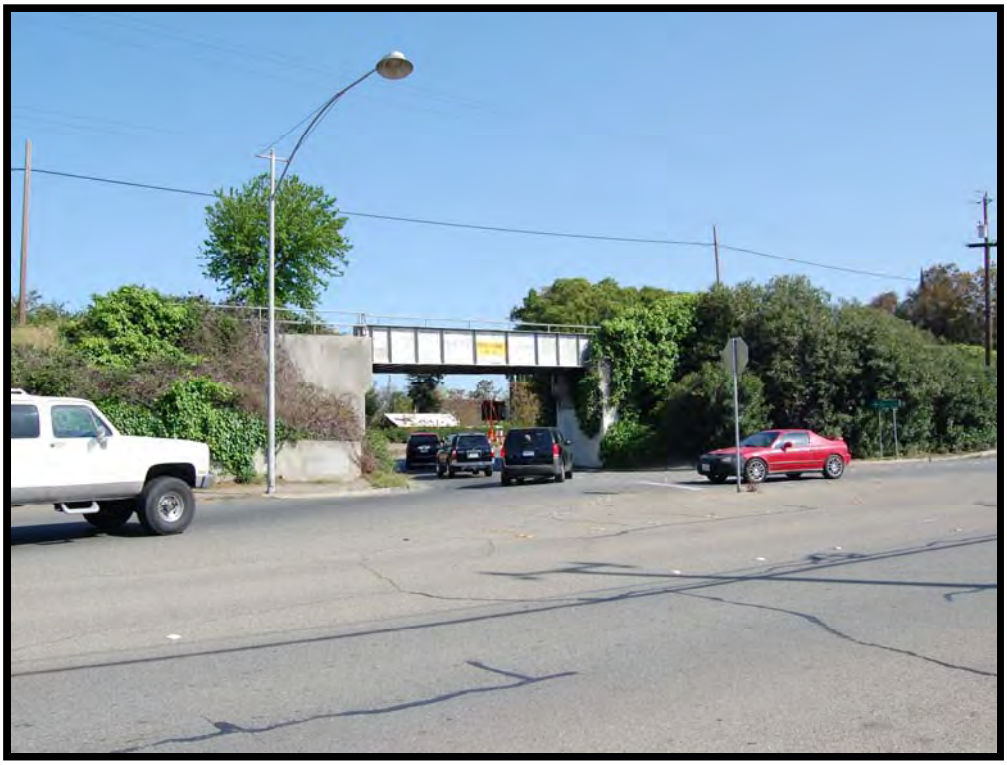
Key Viewpoint C

Key Viewpoint D – Facing Northeast on Bridge Street near the 5th Street Bridge eastbound onramp

Key Viewpoint D represents the view from Bridge Street looking northeast towards the 5th Street Bridge eastbound on-ramp. This photograph was taken facing north and was taken from the sidewalk outside of businesses located at 270 Bridge Street. This view is typical of that experienced by businesses along Bridge Street. The photograph shows the built landscape units in the viewshed. The background consists of the existing trees adjacent to 5th Street and Bridge Street to the north that are of a homogenous color, texture, and form, and are relatively low on the horizon. The immediate foreground consists of the visible existing Bridge Street pavement. The middle ground consists of utility lines that run the length of the view along the north side of 5th Street, trees, shrubs existing along the north side of Bridge Street, and the existing railroad bridge that runs parallel to the 5th Street Bridge.

With the Build Alternative, views include increased pavement width, and new utility and light poles. The businesses closest to Bridge Street have the potential to experience the most change in the visual environment. The proposed project would widen and improve Bridge Street, thus increasing the amount of pavement in view of these businesses. The road already exists within their viewshed and the proposed improvements would provide a view of uniform pavement without damage, therefore these impacts are minimal. The businesses currently exist in a developed area; the proposed project would improve the existing facility. The new road would not be out of place and the road would not obscure any existing views. The improved facility would thereby create a slightly more vivid, memorable feature, as well as slightly increase the degree of intactness and unity experienced by viewers. There would be little resulting impact on the existing visual quality or character.

Existing Key Viewpoint D



Light and Glare: Installation of additional traffic signals, intersection lighting, and lighting on the new 5th Street Bridge would result in a new source of light; however, the potential for associated adverse light and glare impacts is low given the separation between the new light sources and residences. In addition, all signals and street lights are shielded so as not to spill onto adjacent sensitive areas. Although the project would introduce new light sources associated with motor vehicle lights and traffic signal installation, these impacts are not expected to be substantial.

Temporary Impacts

Project construction activities would result in the short-term presence of construction vehicles and equipment, grading and vegetation clearing throughout the project area. Storage of equipment and materials would occur at the proposed staging area. Most of the areas where construction and grading would remove existing natural and landscaped vegetation would only be viewable from Riverfront Park. The presence of construction vehicles and equipment and grading activities would result in a low to moderate temporary change in the visual character of the project site. These activities would be short term and disturbed areas would be revegetated and not permanently disturbed. The temporary visual impact of construction activities is considered low to moderate and is not expected to result in a substantial adverse response to the typical viewer.

Avoidance, Minimization and/or Mitigation Measures

Construction of this project would introduce minor changes to views but would not alter the character of the project area. Impacts to the natural and landscaped vegetation within Riverfront Park and along the riparian vegetation of the Feather River would be minimized through revegetation efforts as part of the process to ensure that park and biological resources are not substantially affected. As a result, no substantial impacts to the visual character within the project area are expected as a result of the proposed project.

2.1.7 Cultural Resources

Regulatory Setting

"Cultural resources" as used in this document refers to all "built environment" resources (structures, bridges, railroads, water conveyance systems, etc.), culturally important resources, and archaeological resources (both prehistoric and historic), regardless of significance. Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act of 1966 (NHPA) , as amended sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation [36 CFR 800]. On January 1, 2004, a Section 106 Programmatic Agreement (PA) between the Advisory Council, the FHWA, State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA's responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 USC 327).

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties. See Appendix B for specific information regarding Section 4(f).

Historical resources are considered under the CEQA, as well as CA PRC Section 5024.1, which established the California Register of Historical Resources (CRHR). PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet National Register of Historic Places listing criteria. It further specifically requires Caltrans to inventory state-owned structures in its rights-of-way.

Affected Environment

The project study area was established and archival research and field investigations were undertaken in 2011. The field investigations of architectural and archaeological resources within the proposed 5th Street Bridge project study area were conducted on November 22-23, 2010, March 29, and April 1, 2011. A *Historic Property Survey Report, Historical Resources Evaluation Report, and Archaeological Survey Report* were prepared in September 2011. A *Finding of Effects Report* prepared in March 2013 documents a finding of No Adverse Effect for the undertaking. SHPO concurred with the No Adverse Effect determination in a letter dated May 3, 2013.

The archival research effort was directed toward identifying potential and previously recorded cultural resources within a one-half-mile radius of the project study limits and gathering pertinent data regarding prehistoric, ethnographic and historic land use and development of the project area. Several repositories were consulted during the effort including local historical societies and the California State Library. Records at the North Central Information Center and Northeast Information Center of the California Historical Resources Information System were searched for information related to the project site. The Native American Heritage Commission and tribes were contacted by letter and telephone regarding ethnographic information, sacred sites and concerns. Refer to the *Historic Property Survey Report* for a complete description of archival research methods, including documents consulted and individual and organizations contacted.

The Historic Property Survey Report identified two historic properties within the Area of Potential Effect (APE): the Marysville Ring Levee which had been previously identified as eligible for inclusion in the NRHP, and the Northern Electric Railroad Bridge which was determined as eligible for the NRHP. The Marysville Ring Levee was determined eligible for inclusion in the NRHP under Criterion A and B and the CRHR under Criterion 1 and 2 for its significance under the themes of flood control and development of the City of Marysville with a period of significance of 1862 to present. The Northern Electric Railroad was determined eligible for the NRHP under Criterion A and the CRHR under Criterion 1 for its significance as a part of a historic trend that has made a significant contribution to the broad patterns in our history.

If cultural materials are discovered during construction, all earth-moving activities within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to PRC Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage

Commission who will then notify the Most Likely Descendent. The Resident Engineer will temporarily cover the remains using materials such as a piece of cloth or plywood and notify a Caltrans archaeologist and/or District Native American Coordinator of the find. Further provisions of PRC 5097.98 are to be followed as applicable.

Environmental Consequences

Build Alternative

The proposed project has been designed to completely avoid the Northern Electric Railroad Bridge; therefore, the project will have no direct impact on this historic property. Although the project would introduce a new bridge into the immediate setting, this change would not diminish the significant historic features. Changes in the setting are further minimized because the proposed new bridge would replace the existing 5th Street Bridge which is currently part of the existing setting.

In order to construct the proposed 5th Street Bridge structure, excavation at the Marysville Ring Levee for one of the abutments would be required. Further, the 5th Street roadway would be widened and the profile of the roadway lowered slightly to provide adequate conformity with the railroad underpass.

The proposed project has the potential to affect the Marysville Ring Levee because the existing and proposed bridges physically cross the Ring Levee. The project does not, however, propose to completely destroy or relocate the levee from its historic location. The proposed project would not result in a change to the levee's historic use or physical features of the levee such as its seven mile length around the perimeter of the city, its trapezoidal shape and earthen fill and unpaved surface, its varied height, its natural surface elevation and sloping walls, or its approximate 10-20 foot width at its crown that contribute to its historic significance. Although the levee will be temporarily affected during construction, it will not significantly affect the overall characteristics that qualify the entire levee for the National Register (such as its length, earthen fill and trapezoidal shape). Further, the areas of the levee that will be physically affected have been previously disturbed and therefore the proposed project would not cause additional damage to the levee in a manner that would diminish its overall historic significance. Therefore the overall levee will continue to convey its historic significance and associations under Criterion A and B. Caltrans sent this determination to the State Historic Preservation Officer (SHPO) and received concurrence the project would have no adverse effect to the Marysville Ring Levee as a historic resource in a letter dated May 3, 2013 (see Appendix J)

Although the introduction of a new bridge has the potential to affect the historic setting of the levee, the proposed bridge is replacing an existing bridge that has been in use since the 1950s. Further, the immediate setting around the bridge crossing has slowly transformed over the years to the extent that, although new features have been introduced (such as ball playing fields and parking lots within the riverbed and new buildings constructed adjacent to the levee on the Marysville side of the levee) the levee retains its overall historic setting with an urban street grid on the east side of the levee and rural and open space in the areas surrounding Marysville.

Therefore, the introduction of a replacement bridge would not significantly affect the characteristics that qualify the levee for the National Register (such as its location around the City of Marysville, its trapezoidal shape, and earthen fill) in a manner that would significantly affect its ability to convey its significance as a earthen fill levee designed for flood control dating from the late 1800s and early 1900s. Furthermore, the replacement bridge would not affect the

levee's historic association with early flood control methods, the development of Marysville, and the lives of two prominent Marysville citizens W. T. Ellis, Sr. and W. T. Ellis, Jr.

No-Build Alternative

Under the No-Build Alternative, no construction activities would occur and the Marysville Ring Levee would not incur ground disturbing activities or changes to its existing features. Likewise, no impacts would occur to the Northern Electric Railroad Bridge. No impacts of any kind would occur to historic properties in the project area.

Section 4(f)

Both the Northern Electric Bridge and the Marysville Ring Levee are protected resources under Section 4(f); however, the project will not result in a use of these resources. Please refer to Appendix B for a discussion of "Resources Evaluated Relative to the Requirements of Section 4(f).

Avoidance, Minimization and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are proposed.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

Regulatory Setting

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The FHWA requirements for compliance are outlined in 23 CFR 650 Subpart A.

In order to comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments
- Risks of the action
- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project.

The base floodplain is defined as "the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year." An encroachment is defined as "an action within the limits of the base floodplain."

Affected Environment

This section is summarized from the 5th Street Bridge *Location Hydraulic Study*, prepared by WRECO in November 2012.

The project site crosses the Feather River from 5th Street in Marysville to Bridge Street in Yuba City. At the project site, the Feather River is a wide trapezoidal shaped channel between the Marysville and Yuba City levees.

The Feather River is a historic floodway which has experienced several large flood events since the area was populated by modern development. The climatology of Marysville is not a significant factor in its flood problems. Most of the annual precipitation in Marysville occurs between October and April with maximum storm intensities between December and March. A large portion of the annual precipitation occurs as snowmelt accumulates at higher elevations (Federal Emergency Management Act [FEMA], 2011).

According to the Central Valley Flood Protection Board (CVFPB), major high water events on the Feather River can occur between November 1st and April 15th from rain and snowmelt. Rain floods generally occur between October and March and snowmelt floods generally occur between April and June. However, in the project area, high water events usually occur due to the result of a warm, heavy storm event coupled with the melting of snow pack in lower elevations. Minor flooding in Marysville can also originate from heavy rain or from ponding within the levee systems due to deficiencies in the city storm drain system (FEMA, 2011).

Nine major floods on the Feather and Yuba Rivers have been documented since 1900 (1904, 1907, 1909, 1928, 1937, 1950, 1955, 1963, and 1964). The levee system sustained severe damage in the flood of 1955 with water going through the levees. The 1955 and 1964 floods are estimated as having a 200-year recurrence frequency on the Feather River, while the recurrence frequency on the Yuba River at Marysville was a 140-year in 1955 and a 160-year in 1964 (FEMA, 2011).

The Feather River is part of the Sacramento River Flood Control Project. Levees were incorporated in the Sacramento River Flood Control Project in 1917. These levees protect areas adjacent to the rivers from the estimated 100-year storm event, including the project area. Lake Oroville on the Feather River, located upstream of the project, is a major flood control structure to control total flows under the Sacramento River Flood Control Project. Lake Oroville is expected to contain the 100-year storm event and decrease downstream discharges in a 500-year storm event on the Feather River. New Bullards Bar Reservoir and Englebright Reservoir on the Yuba River, along with Oroville Dam on the Feather River, make up a coordinated three-dam system providing controls for the flow of the Feather and Yuba Rivers (FEMA, 1981).

Levees adjacent to Feather River help to contain the flood waters within the levee system. There are no identified floodplains in the project area, outside of the levee walls, because the levees provide protection from the 100-year storm event. It is important to note that the levees do not provide full protection nor do they completely eliminate the risk of flooding. The levees on either side of the Feather River, in the project area, are accredited by FEMA as providing adequate protection for a 100-year storm event and the areas behind the levees are shown as such on the FEMA Flood Insurance Rate Maps for Yuba County, CA and Incorporated Areas (2011) and the City of Yuba City, California Sutter County (1984). The Marysville Levee Commission adopted the height of 81.2 feet (North American Vertical Datum) as the official design elevation for levees based on historical flood events reaching that elevation (FEMA, 2011).

After the construction of the Oroville Dam in 1964, only two major flood events have occurred in this area. In the winter of 1986, there was a failure of the left (southern) levee of the Yuba River just across from the City of Marysville inundating the communities of Olivehurst and Linda. In

1997, the Feather River levee broke north of the confluence of the Feather and Bear Rivers (south of the project area), resulting in large areas of flooding. After these flood events, levee improvements were conducted to strengthen the levees in the area (FEMA, 2011). In 2000, the Department of Water Resources (DWR) and the United States Army Corps of Engineers (USACE) reevaluated the levee systems for the Feather, Yuba, and Bear Rivers. In 2003, DWR, USACE, and local government agencies identified freeboard deficiencies on the Bear River levee and geotechnical issues with the Yuba River levee. They did not identify deficiencies with the Feather River levee (MBK Engineers, 2005).

The Three Rivers Levee Improvement Authority (TRLIA) was created in 2004 through a joint powers agency agreement between the County of Yuba and Reclamation District 784 to finance and construct levee improvements surrounding the South Yuba County Area. Four work phases were identified with the goal of achieving the 200-year storm event protection. The four work phase projects are not in the project vicinity. Phase 4 proposes to strengthen the levees along Feather River between Bear and Yuba Rivers, south of the project area (TRLIA, 2007).

Environmental Consequences

Build Alternative

The FHWA defines a significant encroachment as a highway encroachment and any direct support of likely base floodplain development that would involve one or more of the following construction or flood related impacts: 1) a significant potential for interruption or termination of a transportation facility which is needed for emergency vehicles or provides a community's only evacuation route; 2) a significant risk; or 3) a significant adverse impact on the natural and beneficial floodplain values (1994). Based on the Location Hydraulic Study for this project:

1. The project does not have a significant potential for interruption or termination of a transportation facility which is needed for emergency vehicles or provides a community's only evacuation route. The proposed bridge would be no more susceptible to interruption than the SR 20 Bridge. The 5th Street Bridge is the preferred and fastest emergency route from Yuba City to Rideout Hospital. The project would substantially increase the reliability of travel on the 5th Street due to addition of lanes and elimination of the flood boards on the Marysville side of the bridge. Traffic interruption for both the 100-year and 200-year events is not anticipated since the water surface elevation would be below the bridge deck.

2. The level of risk associated with the project is low. Damage to the roadway from the 100-year event is not anticipated. The proposed work would not raise the water surface elevation in the floodplains by a significant amount. The encroachment on the floodplain would be minimal since the increase in water surface elevation in the floodplains would be minimal, as indicated by the hydraulic models. The proposed work would raise the water surface elevation in the floodplains by 0.01 feet. This change in water surface elevation would be insignificant.

3. Existing natural and beneficial floodplain values associated with the Feather River floodplain within or adjacent to the project include open space and outdoor recreation. The proposed project would not have a significant adverse impact on the natural and beneficial floodplain values.

The project would not encourage, allow, serve, or otherwise facilitate additional or incompatible floodplain development. The floodplain encroachments would not be "significant encroachment" (as defined by FHWA in 23 CFR 650.105(q) of the Federal Aid Policy Guide).

The project would serve to improve hydrology in the floodway since it would reduce to total number of bridge piers from 17 to 9 and would raise the freeboard elevation of the 5th Street Bridge.

No-Build Alternative

Under the No-Build Alternative no construction would take place and there would be no changes to the existing hydrology or floodplain conditions and, therefore, there would be no potential for impacts.

Avoidance, Minimization and/or Mitigation Measures

No measures are required for avoidance, minimization and/or mitigation.

2.2.2 Water Quality and Storm Water Run-off

Regulatory Setting

Federal Requirements: Clean Water Act

In 1972 Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. Known today as the Clean Water Act (CWA), Congress has amended it several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. Important CWA sections are:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity, which may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge would comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the USACE.

The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

USACE issues two types of 404 permits: Standard and General permits. There are two types of General permits, Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental

effect. Nationwide permits are issued to authorize a variety of minor project activities with no more than minimal effects.

There are two types of Standard permits: Individual permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. For Standard permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's Section 404 (b)(1) Guidelines (U.S. Environmental Protection Act [EPA] CFR 40 Part 230), and whether permit approval is in the public interest. The Section 404(b)(1) Guidelines were developed by the U.S. EPA in conjunction with USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA), to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

State Requirements: Porter-Cologne Water Quality Control Act (California Water Code)

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined and this definition is broader than the CWA definition of "pollutant". Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

- **NPDES Program**

  Municipal Separate Storm Sewer Systems (MS4)

  Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). The U.S. EPA defines an MS4 as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water." The SWRCB has identified the City of Yuba City as an owner/operator of an MS4 pursuant to federal regulations. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

- **Section 401 Permitting**

  Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the United States must obtain a 401 Certification, which certifies that the project would be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 404 permit.

  In some cases the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

Affected Environment

The proposed project is located within the Lower Sacramento accounting unit, which is part of the Sacramento subregion (National Resource Conservation System [NRCS] 2005). The Sacramento subregion includes the entire area drained by the Sacramento River, which is approximately 5,500 square miles. The major tributaries within the Lower Sacramento basin include the American, Bear, Yuba, Feather, Pit, McCloud, and Sacramento Rivers and Cache and Putah Creeks. The major water bodies are lakes Folsom, Oroville, Almanor, Shasta, Clear Lake, and Berryessa (SacRiver Roadmap, 2010). All drainage water from the San Joaquin and Sacramento Rivers ultimately meet and form the Sacramento-San Joaquin Delta and ultimately

drain west to the Pacific Ocean through the San Francisco Bay. Within the Lower Feather subbasin, the hydrologic subbasins are divided into watersheds and subwatersheds. The proposed project is within the Lower Feather River and Gilsizer Slough-Snake River watersheds, within the Gilsizer Slough-Snake River and Ellis Lake-Feather River subwatersheds (NRCS 2005).

The California Interagency Watershed Map delineation classifies the project in the Sacramento River Hydrologic Region (HR), within the Marysville Hydrologic Unit (HU [major rivers]), in the Lower Feather River Hydrologic Area (HA [major tributaries]). The Marysville HU encompasses the drainages of the Lower Bear River, Lower Feather River, and Lower Yuba River where they intersect with the Feather River and continue to drain southward, eventually connecting with the Sacramento River. The Lower Feather River HA is bounded on the north by the Upper Dry Creek and on the south by the Lower Yuba River (California Watershed Portal 2007). Within the Lower Feather River HA, the proposed project is in the Lower Feather River Super Planning Watershed and in the Lower Feather River Planning Watershed.

The topography of the area is typical of the Yuba-Sutter area terrain. Local drainage basins are relatively large. River channels are moderately steep and well defined. Vegetation is good to fair with species of valley oak with undercover of brushes, and grasses, and occasionally wild grape. The park area surrounding the project site is often flooded during the rainy season. Much of the project area is located on the flat, low-lying flood plain of the Feather River at elevations from 50 to 75 feet above mean sea level. The Feather River runs along the Yuba County and Sutter County dividing line and continues southward, eventually draining into the Sacramento River.

Environmental Consequences

Build Alternative

Existing impervious surfaces within the project area are made up predominantly of roadway pavement, buildings, and the existing 5th Street Bridge. The proposed project would increase impervious areas from approximately 463,200 square feet to approximately 708,900 square feet. This increase would occur from approximately 533,000 additional square feet of roadway and approximately 175,900 additional square feet from the new bridge. Even with the increased impervious surface area, there would be no long-term negative impacts on water quality. The project site drainage would be improved as part of this project and therefore would have a positive impact on stormwater runoff conditions. The bridge currently utilizes scuppers in order to drain the stormwater directly into the Feather River. The proposed project would remove these scuppers and instead create an in-deck drainage system which would collect and discharge stormwater into the existing storm drain systems for both Yuba City and Marysville.

Due to the connector roadway from Second Street to westbound Bridge Street (in Yuba City) that would cross the Gilsizer County Drainage District stormwater detention facility, some roadway embankment would be placed in the southeast end of the basin. The detention capacity lost to the new embankment would be replaced with additional capacity by developing an adjacent basin in the center of the westbound loop off-ramp.

Potential short-term water quality impacts would be primarily associated with erosion of exposed or disturbed soils and pollutants entering the Feather River due to accidental spills, construction material exposure, and/or general construction operation proximity.

Construction of the proposed project would cause disturbances to the ground surface from earthwork and could potentially increase the amount of sediments entering into the Feather River. Runoff during the winter season is of greater concern due to the potential erosion of unprotected graded surfaces and unstabilized areas. Sediments suspended in runoff could be carried downstream, where, if not controlled, could accumulate in downstream watercourses, potentially harming any downstream aquatic resources and water quality. Through the proper application and appropriate use of construction site Best Management Practices (BMPs), potential impacts associated with sedimentation and erosion could be substantially minimized and/or avoided.

Materials used during construction (e.g., concrete curing compounds) may have chemicals that are potentially harmful to aquatic resources and water quality. Accidents or improper use of these materials could release contaminants to the environment. Additionally, oil and other petroleum products used to maintain and operate construction equipment could be accidentally released. As stated above, these compounds could be acutely toxic to aquatic species. It is anticipated that the proper handling of construction materials and the implementation of appropriate mitigation measures will be conducted during construction in order to ensure environmental permit compliance and reduce the risk of potential pollutant exposure.

Suspended material is considered a pollutant of primary concern for construction projects. Exposure of loose soil during excavation, grading, and filling activities during construction and its erosion is the primary source of suspended material. The project would include removal of the existing pier from the riverbed, and could temporarily increase the sediment load thus increasing the turbidity, and total dissolved solids present in stream water. However, through the use of turbidity curtains and other BMP strategies, sediment loads could potentially be reduced to a level considered de minimis.

The suspended solids, dissolved solids, and organic pollutants in surface water bodies could also increase while nearby soils are disturbed and dust is generated. These conditions would likely persist until completion of construction activities and long-term erosion control measures have been implemented. Implementing appropriate dust control measures and other onsite BMPs could minimize and substantially reduce surface water exposure to airborne organics and pollutants associated with earth disturbing activities.

Accidental spills of petroleum hydrocarbons (fuels and lubricating oils), sanitary wastes, and or concrete waste are also a concern during construction activities. An accidental release of these wastes could adversely affect surface water quality, vegetation, and wildlife habitat, causing a potential long-term impact. The extent of potential environmental effects depends on the erodibility of soil types encountered, type of construction practices, extent of disturbed area, duration of construction activities, timing of precipitation, and proximity to drainage channels, and the quantity and nature of the pollutant(s) released into the environment. Standard construction practices relating to material handling procedures are anticipated to be followed, in compliance with the applicable regulatory permits associated with the project, so minor spills do not discharge to drainage conveyances and environmental exposure and potential long term effects are minimized and/or avoided.

Other short-term negative impacts to surface water quality that could occur during construction include slight changes in temperature, pH, dissolved oxygen, nutrient concentrations, toxicity, and ionic concentrations. These minor impacts may not have a substantial impact on water quality, but could negatively affect sensitive aquatic life.

Although there is the potential for a slight increase in polluted runoff due to increased impervious surfaces, because the bridge project would not involve any insecticides, pesticides, or resource extraction, the project is not expected to contribute to releases of specific toxins that are currently affecting this portion of the Feather River, including chlorpyrifos, diazinon, group A pesticides, and mercury. As previously stated, with the inclusion and implementation of standard construction site BMPs, utilized to the maximum extent practicable, project impacts to water quality are expected to be minimized, reduced, and/or avoided.

A Storm Water Pollution Prevention Plan (SWPPP) would be prepared prior to the start of construction, as part of NPDES permit compliance. The SWPPP is a dynamic document that describes how the contractor would address storm water management for the entire project, and prevent storm water degradation through he use of minimization and/or mitigation measures, implemented in accordance with the previously mentioned Federal and State Stormwater Regulations. The contractor is required to implement the provisions contained in this SWPPP and must comply with the standard provisions and reporting requirements contained in the Construction General Permit.

Yuba City will use the following Caltrans guidance and recommendations for drainage systems: Storm water runoff systems should promote sheet flow through vegetation, utilize open vegetated channels and conveyances, and minimize the use of curb, dike, and pipe for drainage. Where open vegetated conveyances are not possible or practical, a concentrated conveyance system would include:

- Caltrans or City Standard curb and gutter throughout the project to maximize collection of storm water runoff
- Caltrans or City Standard drain inlets (with inlet stenciling) and manholes
- Reinforced concrete pipes for storm water collection
- Caltrans or City Standard flared end section with rock slope protection backing to the Feather River

Permanent impacts resulting from planned fill/excavation to “Waters of the U.S.” as defined by the USACE would occur. Permitting and regulatory approval would be obtained for impacts to jurisdictional waters. With the proper application and appropriate use of BMPs, permanent impacts to water quality from disturbed soils within the streambed are expected to be negligible and should prevent potential pollutant loading.

No-Build Alternative

Under the No-Build Alternative no construction would take place and there would be no changes to the drainage system. Consequently, there would be no impacts to water quality and no improvements to the storm drainage system would occur.

Avoidance, Minimization and/or Mitigation Measures

The following are recommended for inclusion on applicable plans prepared for this project. All BMPs and other measures should be prepared in consultation with the project engineer, City of Yuba City, City of Marysville, the RWQCB, USACE, and other regulatory agencies. The regulatory agencies may require additional measures that have not been included in this Water Quality Assessment to ensure acceptable water quality is maintained. Any requirements for

additional avoidance, minimization, and/or mitigation measures will be contained in the permits obtained from all required regulatory agencies and included in the project.

Measure SWR-1: For project areas exceeding one acre, NPDES guidelines necessitate the development of a SWPPP by the contractor prior to construction to establish project-specific permanent and temporary BMPs. During the design phase, a SWPPP will be prepared to determine the minimum control requirements to be included in the project. A Notice of Intent or Notice of Construction will be submitted to the SWRCB along with the completed SWPPP.

Measure SWR-2: BMPs include any facilities and methods used to remove, reduce, or prevent storm water runoff pollutants from entering receiving waters. Erosion control methods, temporary and permanent BMPs, and improvement of drainage facilities along the roadway would minimize impacts from storm water runoff. The SWPPP and NPDES compliance measures would ensure no adverse impacts would occur to water quality associated with the Build Alternative.

2.2.3 Geology/Soils/Seismic/Topography

Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under CEQA.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Caltrans' Office of Earthquake Engineering is responsible for assessing the seismic hazard for Caltrans projects. Structures are designed using Caltrans' Seismic Design Criteria. The Seismic Design Criteria provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see Caltrans' Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria. Yuba City will use the Caltrans Seismic Design Criteria and guidance for design of the proposed replacement bridge.

Affected Environment

A Preliminary Foundation Report was prepared by Dokken Engineering in March of 2011 which provides geotechnical information for the proposed project.

The project lies within the eastern central portion of the Sacramento Valley, southeast of the Sutter Buttes and approximately 15-miles west of the Sierra Nevada foothills. The Sacramento Valley is approximately 60-miles wide and 260-miles long and is a structurally controlled basin between the Sierra Nevada Mountains and the Coast Range (Harwood and Helley, 1987). The valley is generally a flat structural basin bounded by the Sierra Nevada to the east, and the Coast Range to the west.

According to the "Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California," (Helley, E.J., et al., 1985), the site overlies young river channel and alluvial deposits within the Feather River flood plain. The major deposits underlying

the central portion of the project consist of Holocene Stream Channel Deposits, (geologic map symbol: Qsc), and Holocene Alluvium (Qa). Man-made levees line the Feather River floodplain east and west of the Holocene deposits, although are not shown on the geologic map. West of the artificial levee system lie Pleistocene alluvial terrace deposits of the Modesto Formation, Upper member, (Qmu) and to the east lie the Riverbank Formation, Upper member, (Qru).

The project area does not contain any known active earthquake faults but active faults in the region have at times generated ground motion in the project area. Earthquakes of up to a 5.8 magnitude on the Richter Scale have been recorded approximately 35 miles away in the last 50 years. For this reason, seismicity in the project area is a concern, but the probability of major seismic impacts are moderate to low (Sutter County General Plan, 2010).

Based on the available boring data retrieved from the 5th Street Bridge "As-Built Soil Profile" by Ben C. Gerwick, Inc. (1957) and the "Draft Log of Test Borings", by Taber Consultants (2008) the subsurface soils are in general agreement with the published geologic map (Helley, E.J., et al., 1985). Site subsurface material found between the existing bridge abutments generally consist of interbedded and discontinuous layers of well- and poorly-graded sand, and silty sand; sandy silt, clayey silt, sandy clayey silt; with occasional thick sand and silt beds containing varying gravel content, from approximately 10- to over 20-feet thick. The density of the material generally increases with depth across the site, typically consisting of unconsolidated to semi-consolidated (i.e. loose to semi-compact) material found to depths up to approximately 40-feet below ground surface (bgs), and more consolidated material (i.e. compact to dense), from approximately 40-feet bgs to a maximum explored depth of approximately 82-feet bgs.

Within the project site the horizontal and vertical extent of the local lithology varies. According to the Soil Profile by Ben C. Gerwick Inc. (1957) and Taber Consultants (2008) Log of Test Borings, bedrock was not encountered within the project limits and is greater than 150-feet bgs.

Groundwater was encountered at an elevation of 41.1-feet, measured from a boring location on Bridge Street near the eastbound onramp intersection on August 16, 2007. Based on the project site's proximity to the Feather River, surface water may occasionally rise beyond the existing channel limits and saturate the surrounding floodplain during seasons of high precipitation. The California DWR is continuously monitoring the surface elevation of the Feather River at the 5th Street Bridge crossing in Yuba City. According to the DWR, California Data Exchange Center, the historic high surface water elevation measured at this location was an elevation of 78.2-feet on January 2, 1997. As of January 26, 2011, the Feather River is at a measured elevation of 39.8-feet. Due to the unconsolidated native soil conditions within the floodplain, groundwater should be anticipated in shallow and deep excavations. The design groundwater elevation would be set at ground surface for the static and seismic analyses.

Environmental Consequences

Build Alternative

Based on the discussion in the Affected Environment Section, the project area retains a low probability of a major seismic event. Based on the results of the liquefaction evaluation the site soils within the Feather River flood channel are highly susceptible to liquefaction to an elevation depth of approximately 10-feet mean sea level, which would lead to a high potential for lateral spreading and seismically induced settlement. The highest estimated settlements, as the result of liquefaction, are predicted in the areas of existing piers No. 4 thru No. 8. This high liquefaction potential is primarily due to the generally shallow unconsolidated cohesionless

sandy and gravelly nature of the site soils at and below the ground water level and the (0.23g) predicted ground acceleration, used in the evaluation.

No-Build Alternative

Under the No-Build Alternative no construction would take place and there would be no changes to soils or topography. Consequently, there would be no geologic, seismic, or soils related impacts in the project area.

Avoidance, Minimization and/or Mitigation Measures

No specific avoidance, minimization, or mitigation measures are required; however, a comprehensive study of the seismic concerns, specifically regarding liquefaction and settlement shall be performed during design of the bridge structure.

During design of the bridge structure, additional design measures would need to be evaluated to ensure that bridge piles are large enough and deep enough to ensure that the bridge would retain structural stability during a maximum credible seismic event. The City of Yuba City would adhere to Caltrans roadway and bridge design standards which would minimize any potential geologic or seismic related impacts.

2.2.4 Hazardous Waste/Materials

Regulatory Setting

Hazardous materials, including hazardous substances and wastes are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA). The purpose of CERCLA, often referred to as "Superfund," is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. RCRA provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992;
- Clean Water Act;
- Clean Air Act;
- Safe Drinking Water Act;
- Occupational Safety and Health Act (OSHA);
- Atomic Energy Act;
- Toxic Substances Control Act (TSCA); and
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

In addition to the acts listed above, Executive Order (EO) 12088, Federal Compliance with Pollution Control Standards, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the California Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires clean-up of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and clean up contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is encountered, disturbed during, or generated during project construction.

Affected Environment

A *Hazardous Waste Initial Site Assessment* was completed by Dokken Engineering in June 2011 for the project area. The purpose of this assessment was to identify Recognized Environmental Conditions (REC) and potential RECs within and adjacent to the proposed improvement area which could affect the design, constructability, feasibility, and or/ the cost of the proposed project. A record search of federal, state and local databases and map review was conducted and a field survey was completed on May 4, 2011. The field review is conducted to visually confirm information gathered by aerial photos, database searches, and to ensure interviews are accurate and complete.

The entire project area, including existing City ROW and many private parcels located adjacent to the ROW (approximately 65 acres), was evaluated for RECs and/or Activity and Use Limitations (AULs). RECs that have been identified in the project area are included in Table 2.2.4-1 below. Based on the environmental assessment conducted for the proposed project, RECs that could potentially be impacted by construction of this project are discussed in the Environmental Consequences section below.

Several gasoline stations are within the project area that have a history of leaking underground fuel tanks and may require additional remediation of contaminated soils. These stations are found in the following locations: 1) the corner of Bridge Street and Yolo Street in Yuba City, 2) on Sutter Street just north of the 5th Street Bridge off-ramp in Yuba City, and 3) the northeast corner of 5th Street and J Street in Marysville.

Environmental Consequences

Build Alternative

Based on the results of the Hazardous Waste Initial Site Assessment, the 5th Street Bridge project has the potential to incur impacts as a result of encountering the hazardous waste and/or materials identified in Table 2.2.4-1. To confirm if indeed hazardous materials are present, additional actions are recommended to verify the presence/extent of RECs and evaluate the potential for remediation during the Plans, Specifications & Estimates (PS&E) phase of the proposed project. These actions are listed in the Avoidance, Minimization and/or Mitigation Measures Section.

No Build Alternative

The No Build Alternative would not require any construction activities and would therefore have no chance of encountering hazardous waste or hazardous materials.

Table 2.2.4-1: Recognized Environmental Conditions Evidence

Location	Description of REC Evidence Found	Description of Associated AUL
5th Street Bridge structure and any additional structures/buildings that may be moved/altered due to planned construction activities.	Potential for Asbestos Containing Materials (ACM). New uses of ACM were banned by the EPA in 1989. Revisions to regulations issued by the Occupational Safety & Health Administration (OSHA) on June 30, 1995, require that all thermal systems insulation, surfacing materials, and resilient flooring materials installed prior to 1981 be considered presumed ACM and treated accordingly. In order to rebut the designation as presumed ACM, OSHA requires that these materials be surveyed, sampled, and assessed in accordance with 40 CFR 763 (Asbestos Hazard Emergency Response Act). ACM have also been documented in the rail shim sheet packing, bearing pads, support piers, and expansion joint material of bridges.	None Found
Existing City of Marysville and Yuba City roadways	Potential lead and heavy metals associated with pavement striping. Implementation of improvements may require the removal and disposal of yellow traffic stripe and pavement marking materials (paint, thermoplastic, permanent tape, and temporary tape). Yellow paints made prior to 1995 may exceed hazardous waste criteria under Title 22, California Code of Regulations, and require disposal in a Class I disposal site.	None Found
5th Street Bridge structure and any additional structures/buildings that may be moved/altered due to planned construction activities.	Potential lead-based paint on painted portions of the 5th Street Bridge. Also, structures constructed prior to 1978 are presumed to contain lead-based paint unless proven otherwise, although buildings constructed after 1978 may also contain lead-based paints.	None Found
Various pole- and pad-mounted electrical transformers adjacent to the project boundaries.	Potential PCB's in pole- or pad-mounted electrical transformers. As of the date of this ISA, the existence and/or levels of PCB's associated with the pole- or pad-mounted electrical transformers, which may be encountered within the planned construction area, had not been determined.	None Found
Parcels 525-501-08 (NTG gas station); 52-462-04 (GasMax gas station); and 10-161-12 (Chevron, aka Nella Oil #3)	Potential for contamination from petroleum hydrocarbon and/or methyl tertiary butyl ether (MTBE) leakage at the existing NTG gas station (former First Stop; 248 Bridge Street, Yuba City); the GasMax #952 gas station (660 Sutter Street, Yuba City); and Chevron (Nella Oil #3; 929 5th Street,	None Found

	Marysville). These sites had documented evidence of leaking underground storage tanks.	
Sacramento Northern Railroad and Union Pacific Railroad Alignments	Potential for elevated levels of petroleum hydrocarbon contamination, grease, oils and heavy metals, in the surface and near-surface soils along the project study area within 50 feet of the existing and former railroad alignments.	None Found

Avoidance Minimization and/or Mitigation Measures

Measure HW-1: Prior to the start of construction, asbestos surveys shall be conducted to identify presence of asbestos related materials within the project area. Surveys will include the 5th Street Bridge and any other buildings or structures that would be modified or demolished during construction.

Measure HW-2: Yuba City shall remove pavement striping within the project area in accordance with Caltrans Standard Special Provision 15-300 REMOVE TRAFFIC AND PAVEMENT MARKINGS.

Measure HW-3: Prior to the start of construction, lead based paint surveys shall be conducted to identify presence of lead related materials within the project area. Surveys will include the 5th Street Bridge and any other buildings or structures that would be modified or demolished during construction.

Measure HW-4: Any leaking transformers observed during the course of the project should be considered a potential polychlorinated biphenyl (PCB) hazard. Should leaks from electrical transformers (that will either remain within the construction limits or will require removal and/or relocation) be encountered during construction, the transformer fluid should be sampled and analyzed by qualified personnel for detectable levels of PCB's. Should PCBs be detected, the transformer should be removed and disposed of in accordance with the appropriate regulatory agency. Any stained soil encountered below electrical transformers with detectable levels of PCB's should also be handled and disposed of in accordance with the appropriate regulatory agency.

Measure HW-5: Prior to the start of construction, a review of the most current results of the groundwater monitoring wells associated with the existing NTG, GasMax and Chevron gas stations for potentially elevated levels of petroleum hydrocarbons and MTBE contamination shall be conducted. Based on review of the groundwater monitoring well data results, if elevated levels of petroleum hydrocarbons or MTBE are detected in groundwater monitoring wells that are within or immediately adjacent to the project limits a limited Phase II Site Assessment should be performed at those locations. The Phase II Site Assessment should consist of subsurface sampling and laboratory analysis and be of sufficient quantity to define the extent and concentration of contamination within the areal extent and depths of planned construction activities adjacent to the NTG, GasMax and/or Chevron gas stations. The Phase II Site Assessment should also provide both a Health and Safety Plan for worker safety and a Work Plan for handling and disposing contaminated soil during construction.

Measure HW-6: Prior to the start of construction, a preliminary investigation and screening for potentially elevated levels of petroleum hydrocarbon contamination, grease and oils, in the surface and near-surface soils along the project segments within 50 feet of the existing Union Pacific Railroad and former Sacramento Northern Railroad alignments shall be conducted. The

investigation should include a remediation plan for handling and/or removal/disposal of contaminated soil, if encountered.

Measure HW-7: As is the case for any project that proposes excavation, the potential exists for unknown hazardous contamination to be revealed during project construction (such as previously undetected petroleum hydrocarbon contamination from nearby sources or potential explosive threat if a gas pipeline is ruptured during construction). For any previously unknown hazardous waste/material encountered during construction, Yuba City will follow the procedures outlined in the Caltrans Hazards Procedures for Construction.

2.2.5 Air Quality

Regulatory Setting

The Federal Clean Air Act (FCAA), as amended in 1990 is the federal law that governs air quality while the California Clean Air Act of 1988 is its companion state law. These laws, and related regulations by the United States Environmental Protection Agency (U.S. EPA) and California Air Resources Board (ARB), set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns. The criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), broken down for regulatory purposes into particles of 10 micrometers or smaller—(PM_{10}) and particles of 2.5 micrometers and smaller—($PM_{2.5}$), lead (Pb), and sulfur dioxide (SO_2). In addition, state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at a level that protects public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics). Some criteria pollutants are also air toxics or may include certain air toxics within their general definition.

Federal and state air quality standards and regulations provide the basic scheme for project-level air quality analysis under the NEPA and CEQA. In addition to this type of environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.

The FCAA Section 176(c) prohibits the USDOT and other federal agencies from funding, authorizing, or approving plans, programs or projects that are not first found to conform to the State Implementation Plan (SIP) for achieving the goals of Clean Air Act requirements related to the NAAQS. "Transportation Conformity" takes place on two levels: the regional—or, planning and programming—level and the project level. The proposed project must conform at both levels to be approved. Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 CFR 93 govern the conformity process.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the standards set for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas sulfur dioxide (SO_2). California has attainment or maintenance areas for all of these transportation-related "criteria pollutants" except SO_2, and also has a nonattainment area for lead (Pb). However, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on Regional Transportation Plans (RTPs) and Federal Transportation Improvement

Programs (TIPs) that include all of the transportation projects planned for a region over a period of at least 20 years (for the RTP) and four years (for the TIP). RTP and TIP conformity is based on use of travel demand and air quality models to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), FHWA, and Federal Transit Administration (FTA), make determinations that the RTP and TIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or TIP must be modified until conformity is attained. If the design concept, scope, and "open to traffic" schedule of a proposed transportation project are the same as described in the RTP and TIP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires "hot spot" analysis if an area is "nonattainment" or "maintenance" for carbon monoxide (CO) and/or particulate matter (PM_{10} or $PM_{2.5}$). A region is "nonattainment" if one or more of the monitoring stations in the region measures violation of the relevant standard and the U.S. EPA officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially redesignated to attainment by the U.S. EPA and are then called "maintenance" areas. "Hot spot" analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific procedural and documentation standards for projects that require a hot spot analysis. In general, projects must not cause the "hot spot" related standard to be violated, and must not cause any increase in the number and severity of violations in nonattainment areas. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

Affected Environment

An *Air Quality Report* (October 2011) was prepared by Dokken Engineering to present an evaluation of the construction-related and operational impacts of the proposed project on the air quality environment.

The proposed project is located within the Sacramento Valley Air Basin in the region administered by the Feather River Air Quality Management District (FRAQMD). The FRAQMD administers air quality in all of Sutter County and Yuba County. The climate of the Sacramento Valley Air Basin is characterized by hot dry summers and wet or foggy winters. Summer high temperatures average in the 90s ºF, and summer low temperatures average under 50ºF. Wintertime high temperatures average in the low 50s ºF, and winter low temperatures average in the upper 30s ºF, with occasional rainstorms (Western Regional Climate Center, 2011; FRAQMD 2010).

Winds are predominantly from the south. As described by the FRAQMD, local pollutant dispersal is affected by winds as well as temperature inversions. Inversions can occur during summer and winter, which confine pollutants closer to the ground resulting in smog in the summer and little pollutant dispersal during winter inversions (FRAQMD 2010).

Existing air quality conditions in the project area can be characterized in terms of the ambient air quality standards that the state of California (California Ambient Air Quality Standards [CAAQS]) and the federal government (NAAQS) have established for several different pollutants. For some pollutants, separate standards have been set for different measurement periods. Most standards have been set to protect public health. For some pollutants, standards have been

based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). Table 2.2.5-1 shows the state and federal standards for a variety of pollutants.

Table 2.2.5-1: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Average Time	State Standards	Federal Standards	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Ozone (O_3) [2]	1 hour 8 hours 8 hours (conformity process [5])	0.09 ppm 0.070 ppm ---	--- [4] 0.075 ppm [6] 0.08 ppm (4th highest in 3 years)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NOx) in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes.	Federal: Unclassified/ Attainment State: Nonattainment (1-hour and 8-hour)
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm [1] 6 ppm	35 ppm 9 ppm ---	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Federal: No Federal Standard State: Attainment for Sutter County; Unclassified for Yuba County
Respirable Particulate Matter (PM_{10}) [2]	24 hours Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 --- [2]	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).	Federal: Unclassified State: Nonattainment
Fine Particulate Matter ($PM_{2.5}$) [2]	24 hours Annual 24 hours (conformity process [5])	--- 12 µg/m^3 ---	35 µg/m^3 15.0 µg/m^3 65 µg/m^3 (4th highest in 3 years)	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the $PM_{2.5}$ size range. Many aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.	Federal: Nonattainment State: Nonattainment

Pollutant	Average Time	State Standards	Federal Standards	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Nitrogen Dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	0.100 ppm [7] (98th percentile over 3 years) 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain. Part of the "NOx" group of ozone precursors.	Motor vehicles and other mobile sources; refineries; industrial operations.	Federal: Unclassified/Attainment State: Attainment
Sulfur Dioxide (SO_2)	1 hour 3 hours 24 hours Annual	0.25 ppm --- 0.04 ppm ---	0.075 ppm [8] (98th percentile over 3 years) 0.5 ppm 0.14 ppm 0.030 ppm	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Federal: Unclassified/ Attainment State: Attainment
Lead (Pb)[3]	Monthly Quarterly Rolling 3-month average	1.5 µg/m^3 --- ---	--- 1.5 µg/m^3 0.15 µg/m^3	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from gasoline may exist in soils along major roads.	Federal: Attainment State: Attainment
Sulfate	24 hours	25 µg/m^3	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	State Only: **Attainment (entire state)**
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	State Only: Unclassified
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70%	---	Reduces visibility. Produces haze. NOTE: not related to the Regional Haze program under the FCAA, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas.	See particulate matter above.	State Only: Unclassified
Vinyl Chloride[3]	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	State Only: **Unclassified (entire state)**

Based on the California ARB Air Quality Standards chart (http://www.arb.ca.gov/research/aaqs/aaqs2.pdf).

Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter; ppb=parts per billion (thousand million)

1 Rounding to an integer value is not allowed for the State 8-hour CO standard. Violation occurs at or above 9.05 ppm. Violation of the Federal standard occurs at 9.5 ppm due to integer rounding.

2 Annual PM_{10} NAAQS revoked October 2006; was 50 $\mu g/m^3$. 24-hr. $PM_{2.5}$ NAAQS tightened October 2006; was 65 $\mu g/m^3$. In 9/09 U.S. EPA began reconsidering the $PM_{2.5}$ NAAQS; the 2006 action was partially vacated by a court decision.

3 The ARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both the ARB and U.S. EPA have identified lead and various organic compounds that are precursors to ozone and $PM_{2.5}$ as toxic air contaminants. There are no exposure criteria for adverse health effect due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong. Lead NAAQS are not required to be considered in Transportation Conformity analysis.

4 Prior to 6/2005, the 1-hour NAAQS was 0.12 ppm. The 1-hour NAAQS is still used only in 8-hour ozone early action compact areas, of which there are none in California. However, emission budgets for 1-hour ozone may still be in use in some areas where 8-hour ozone emission budgets have not been developed.

5 The 65 $\mu g/m^3$ $PM_{2.5}$ (24-hr) NAAQS was not revoked when the 35 $\mu g/m^3$ NAAQS was promulgated in 2006. Conformity requirements apply for all NAAQS, including revoked NAAQS, until emission budgets for the newer NAAQS are found adequate or SIP amendments for the newer NAAQS are completed.

6 As of 9/16/09, U.S. EPA is reconsidering the 2008 8-hour ozone NAAQS (0.075 ppm); U.S. EPA is expected to tighten the primary NAAQS to somewhere in the range of 60-70 ppb and to add a secondary NAAQS. U.S. EPA plans to finalize reconsideration and promulgate a revised standard by August 2010.

7 Final 1-hour NO_2 NAAQS published in the Federal Register on 2/9/2010, effective 3/9/2010. Initial nonattainment area designations should occur in 2012 with conformity requirements effective in 2013. Project-level hot spot analysis requirements, while not yet required for conformity purposes, are expected.

8 U.S. EPA finalized a 1-hour SO_2 standard of 75 ppb in June 2010.

9 State standards are "not to exceed" unless stated otherwise. Federal standards are "not to exceed more than once a year" or as noted above.

Environmental Consequences

Project-Level Impacts

The *Air Quality Report* (2011) prepared for the proposed project details much of the following analysis. As guided by the Transportation Project-Level Carbon Monoxide Protocol (CO Protocol), it was determined that the project would not worsen air quality because it would not increase the percentage of vehicles operating in cold start mode, it would not substantially increase traffic volumes, and it would not worsen traffic flow. By providing improved access across the Feather River, the project would improve traffic flow and alleviate congestion throughout the circulation system. The majority of the study intersections would experience improved LOS and reduce delay times with the project. The project would not cause or contribute to a violation of the air quality standards for CO.

Regarding PM_{10} and $PM_{2.5}$, the EPA does not require hot-spot analyses, qualitative or quantitative, for projects that are not a project of air quality concern (POAQC) (i.e. not listed in 40 CFR 93.123(b)). The project does not qualify as a POAQC because it is not a new or expanded highway project that has a substantial number or increase in diesel vehicles (defined as greater than 125,000), it is not a new bus and rail terminal or transfer point, and the project is not anticipated to cause new air quality violations or worsen existing violations. The project accommodates future traffic and would relieve potential congestion. On September 28, 2011, the project underwent Interagency Consultation and the Sacramento Council of Governments Regional Planning Partnership reviewed the project and determined it not a POAQC.

Regional Conformity

The proposed project is listed in the 2035 financially constrained MTP/Sustainable Communities Strategy which was found to conform by SACOG on April 19, 2012, and FHWA and FTA made a regional conformity determination on May 3, 2012. The project is also included in SACOG's financially constrained 2011/2014 Metropolitan Transportation Improvement Program page 95 of Appendix 3 Project List. The SACOG 2011/2014 Metropolitan Transportation Improvement Program was determined to conform by FHWA and FTA on December 14, 2010. The design concept and scope of the proposed project is consistent with the project description in the 2035 RTP and the 2011/2014 RTIP, and the open to traffic assumptions of SACOG's regional emissions analysis.

Construction Impacts

Exposure and disturbance of rock and soil that contains asbestos can result in the release of fibers to the air and consequent exposure to the public. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (proper rock name serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Sources of asbestos emissions include: unpaved roads or driveways surfaced with ultramafic rock, construction activities in ultramafic rock deposits, or rock quarrying activities where ultramafic rock is present. Based on the map of naturally-occurring asbestos locations contained in *A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos* (California Department of Conservation, Division of Mines and Geology 2000), major ultramafic rock formations are not found in Sutter County or this part of Yuba County. Therefore, construction and grading would not occur in an area with ultramafic rock that could be a source of emissions of naturally-occurring asbestos.

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include CO, NO_x, VOCs, PM_{10} and $PM_{2.5}$, and toxic air contaminants such as diesel exhaust particulate matter. Ozone is a regional pollutant that is derived from NO_x and VOCs in the presence of sunlight and heat.

Site preparation and roadway construction typically involves clearing, cut-and-fill activities, grading, removing or improving existing roadways, building bridges, and paving roadway surfaces. Construction-related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. These activities could temporarily generate enough PM_{10}, $PM_{2.5}$, and small amounts of CO, SO_2, NO_x, and VOCs to be of concern. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site could deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the U.S. EPA to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent.

In addition to dust-related PM_{10} emissions, heavy-duty trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_x, VOCs and some soot particulate (PM_{10} and $PM_{2.5}$) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

Table 2.2.5-2 below shows the Build Alternative's estimated construction emissions. The South Coast Air Quality Management District's Roadway Construction Emissions model was used to estimate emissions and compare against the FRAQMD Thresholds of Significance. Based on the model, the Build Alternative would not exceed FRAQMD's Thresholds.

Table 2.2.5-2: Construction Emissions

Pollutant	FRAQMD CEQA Threshold	Build Alternative
NO_x	(25 lbs/day multiplied by project length, not to exceed 4.5 tons/year)	4.5 tons/year
ROG	25 lbs/day	2.5 lbs/day
PM_{10}	80 lbs/day	71 lbs/day
$PM_{2.5}$	Not yet established	Not applicable
CO_2	Not yet established	Not applicable
CH_4	Not yet established	Not applicable
Source: FRAQMD Indirect Source Review Guidelines (2010), http://www.fraqmd.org/CEQA%20Planning.html		

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting federal standards can contain 300 parts per million (ppm) or more of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel (not more than 15 ppm), so SO_2-related issues due to diesel exhaust would be minimal. Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site(s). Such odors would be quickly dispersed below detectable thresholds as distance from the site(s) increases.

Construction impacts to air quality are short term in duration and would not result in adverse long term conditions. The measures listed in the Avoidance, Minimization, and/or Mitigation Measures section would minimize air quality impacts resulting from construction activities.

Mobile Source Air Toxins (MSAT)

Following the Interim Guidance, the proposed project is a project with low Mobile Source Air Toxins (MSAT) potential effects because it is a "minor widening project". Minor widening projects are those in which the design year traffic is predicted to be less than 140,000 to 150,000 average annual daily traffic.

For the Build Alternative, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Build Alternative is lower (estimated to be 1% lower by the Draft Traffic Operations Report, 2011) than that for the No-Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This decrease in VMT would lead to decreased MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. Lower MSAT emission rates due to increased speeds is also anticipated to decrease MSAT emissions; according to EPA's MOBILE6.2 model, emissions of all of the priority MSAT, except for diesel particulate matter, decrease as speed increases. The extent to which these speed-related emissions decreases would offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models. Also emissions would likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the U.S. EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes in the Build Alternative may have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under the Build Alternative there could be localized areas where ambient concentrations of MSAT could be higher under the Build Alternative than the No-Build Alternative. MSAT concentrations could potentially increase at localized areas but may be offset due to increases in speeds and reduction in congestion (which is associated with lower MSAT emissions).

<u>Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis</u>

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The U.S. EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (U.S. EPA, http://www.epa.gov/ncea/iris/index.html). Each report contains assessments of non-cancerous

and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the U.S. EPA's MOBILE6.2 model, the California EPA's Emfac2007 model, and the U.S. EPA's DraftMOVES2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel PM emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of U.S. EPA's guideline CAL3QHC model was conducted in an NCHRP study which documents poor model performance at ten sites across the country - three where intensive monitoring was conducted plus an additional seven with less intensive monitoring (http://www.epa.gov/scram001/dispersion_alt.htm#hyroad). The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with NAAQS for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The U.S. EPA and the HEI have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the U.S. EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to

protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires U.S. EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than one in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than one in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld U.S. EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between the Build and No-Build Alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

MSAT Conclusion

What we know about MSAT is still evolving. As the science progresses FHWA would continue to revise and update this guidance. To that end we expect that a number of significant improvements in model forecasting and air pollution analysis guidance are forthcoming in the U.S. EPA's release of the final MOVES model and the issuance of the $PM_{2.5}$ Hot Spot Modeling Guidance. Additional background information on MSAT related research is provided in Appendix D of the Interim Guidance.

Avoidance, Minimization and/or Mitigation Measures

Most of the construction impacts to air quality are short-term in duration and, therefore, would not result in long-term adverse conditions. Implementation of the following measures, some of which may also be required for other purposes such as storm water pollution control, would reduce any air quality impacts resulting from construction activities:

Measure AQ-1: The construction contractor shall comply with Caltrans' Standard Specifications in Section 14 (2010).

- Section 14-9.01 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
- Section 14-9.02 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are contained in Section 18.

2.2.6 Noise

Regulatory Setting

NEPA and CEQA provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project would have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA (and Caltrans, as assigned) involvement, the federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 A-weighted decibles [dBA]) is lower than the NAC for commercial areas (72 dBA). The following table lists the noise abatement criteria for use in the NEPA-23 CFR 772 analysis.

Table 2.2.6-1: Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.

D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC – Reporting Only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC – Reporting Only	Undeveloped lands that are not permitted.

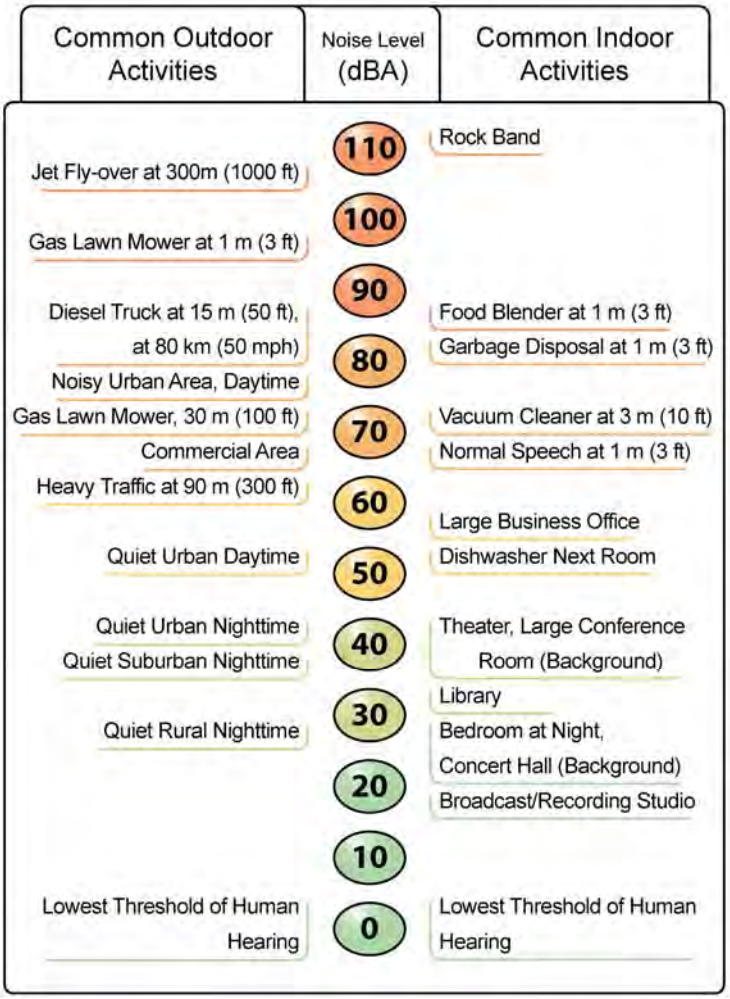
[1] Includes undeveloped lands permitted for this activity category.

In accordance with Caltrans' *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011*, a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project would have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures based on protocols described below that would likely be incorporated in the project.

Caltrans' Traffic Noise Analysis Protocol sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 7 dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents acceptance and the cost per benefited residence.

Table 2.2.6-2: Typical Noise Levels



Source: Caltrans 2012

Affected Environment

A *Noise Study Report* (2011) and Noise Abatement Decision Report (2011) were prepared for this project. The Noise Study Report analyzed existing and future noise at sensitive receptors in the vicinity and the Noise Abatement Decision Report evaluated the costs associated with potential noise abatement.

The following information is from the approved Noise Study Report for the proposed project. Land uses in the project noise study area consists primarily of business and commercial uses, with a large regional park located beneath the existing bridge (and to the north and south of the bridge), between the Feather River levees. There is an existing cemetery located near the western study area.

There are limited residential uses located in the project noise study area, consisting of a single-family residence and mobile home park in the northwest quadrant. In the southwest quadrant there are existing residences located south of Bridge Street, partially shielded from view of the

subject roadways by intervening commercial buildings. No residential uses were identified in the northeast quadrant, which consists primarily of office and commercial uses. In the southeast quadrant, there is a Salvation Army Residential Crisis Center which provides temporary housing and there are four residences which front on J Street, between 4th and 5th Streets.

Because most of the existing land uses in the project study area are relatively insensitive to noise, the selection of short and long-term noise monitoring sites focused primarily on representative residential receptors. Figure 2.2.6-1 illustrates the locations of both short and long-term noise measurement sites as well as modeled receiver locations.

Environmental Consequences

The project is categorized as a Type 1 project under 23 CFR 772.7 because it involves the addition of through-traffic lanes. Noise abatement must be considered and evaluated for feasibility and reasonableness for Type 1 projects if the project is predicted to result in a traffic noise impact.

Traffic noise impacts, as defined in 23 CFR 772.5, occur when the predicted noise level in the design year approaches or exceeds the NAC, or a predicted noise level substantially exceeds the existing noise level (a “substantial” noise increase). Noise levels are expressed in terms of the dBA and the one-hour equivalent sound level (Leq[h]).

Short-term traffic noise level measurements were conducted at four locations during the highest traffic noise hour and one long-term noise level measurement was conducted over a one-day period. Short-term traffic noise level measurements and concurrent traffic counts were conducted at four locations in the project area. Short-term measurements were taken at two locations representing residential uses, one location within a cemetery, and in a parking lot near the southeastern project terminus. The long-term measurement was taken at one outdoor activity area of the Salvation Army Crisis Center. Figure 2.2.6-1 shows the measurement locations.

Using the measurement data, traffic noise was modeled for the Build Alternative and the No-Build Alternative for existing conditions and design-year conditions. Noise impacts were determined for R3, R15, R23, R24, R28, and R29. As documented in the Noise Study Report, R3, R15, R23, and R28 were not considered for Noise Abatement because they are not in an area of frequent human use that would benefit from lower noise levels. R3, R15, R23, and R28 consist of a cemetery, a trail, an office, and a bar, respectively. Noise barriers were also dismissed as a feasible option for the four residences represented by R29 due to the fact that these residences front the roadway and openings for driveway access would render these barriers unable to provide the minimum required noise reduction. As a result, noise abatement was considered for R24, which represents five residences. Table 2.2.6-3 summarizes the results.

Project Area
Modeled Receptor
Short-term Noise Measurement Location
Long-term Noise Measurement Location
Proposed Noise Barrier Location

Riverfront Park
5th Street Bridge
Feather River
Shasta Street
Bridge Street
Boyd Street
2nd Street
I Street
5th Street
R1
R2
R4
R5
R7
R8
R9
R10
R11
R12
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
R28
R29
ST1
ST2
ST3
ST4
LT1
B1

V:\1858_5thStBridge\SEAIF 2.2.7-1_Noise_11-20-12.mxd

Source: Dokken Engineering 3/24/2011; Created By: Z. Liptak

0 500 1,000 1,500 Feet

FIGURE 2.2.6-1
Noise Measurement Sites and Modeled Noise Receptors
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

Table 2.2.6-3: Predicted Future Noise and Barrier Analysis

Receptor # and Location	Existing Noise Level (dBA)	Predicted Noise Level with No-Build (dBA)	Predicted Noise Level with Build (dBA)	Land Use	Difference between No-Build and Exist. in Design Year	Difference between Build and Existing (CEQA baseline)	Difference between Build and No-Build in Design Year	Noise Impact Requiring Abatement	Predicted Noise Level with Abatement (dBA)						Reasonable and Feasible
									6-foot Wall	8-foot Wall	10-foot Wall	12-foot Wall	14-foot Wall	16-foot Wall	
R1	62	63	68	Office	1	6	5	None	-	-	-	-	-	-	-
R2	59	60	67	Retail	1	8	7	None	-	-	-	-	-	-	-
R3	63	64	70	Cemetery	1	7	6	A/E*	-	-	-	-	-	-	-
R4	57	58	64	Retail	1	7	6	None	-	-	-	-	-	-	-
R5	57	59	64	Undev.	2	7	5	None	-	-	-	-	-	-	-
R6	51	52	56	Res.	1	5	4	None	-	-	-	-	-	-	-
R7	56	57	59	Office	1	3	2	None	-	-	-	-	-	-	-
R8	57	58	60	Undev.	1	3	2	None	-	-	-	-	-	-	-
R9	60	61	62	Res.	1	1	1	None	-	-	-	-	-	-	-
R10	59	59	62	Retail	0	3	3	None	-	-	-	-	-	-	-
R11	55	56	60	Res.	1	5	4	None	-	-	-	-	-	-	-
R12	58	58	62	Retail	0	4	4	None	-	-	-	-	-	-	-
R13	56	57	61	Res.	1	5	4	None	-	-	-	-	-	-	-
R14	62	62	65	Res.	0	3	3	None	-	-	-	-	-	-	-
R15	64	65	68	Trail	1	4	3	A/E*	-	-	-	-	-	-	-
R16	59	60	65	ASA	1	6	5	None	-	-	-	-	-	-	-
R17	59	60	65	ASA	1	6	5	None	-	-	-	-	-	-	-
R18	60	61	62	Trail	1	2	1	None	-	-	-	-	-	-	-
R19	59	60	64	ASA	1	5	4	None	-	-	-	-	-	-	-
R20	59	60	64	ASA	1	5	4	None	-	-	-	-	-	-	-
R21	59	60	64	ASA	1	5	4	None	-	-	-	-	-	-	-
R22	56	57	60	Picnic	1	4	3	None	-	-	-	-	-	-	-
R23	68	69	72	Office	1	4	3	A/E*	-	-	-	-	-	-	-
R24	69	70	75	Res.	1	6	5	A/E	68	67	66	65	65	65	Y
R25	68	69	73	Retail	1	5	4	None	-	-	-	-	-	-	-
R26	65	66	72	Retail	1	7	6	None	-	-	-	-	-	-	-
R27	62	63	68	Retail	1	6	5	None	-	-	-	-	-	-	-
R28	66	67	71	Bar	1	5	4	A/E*	-	-	-	-	-	-	-
R29	66	66	70	Res.	0	4	4	A/E**	-	-	-	-	-	-	-
R30	63	63	66	Undev.	0	3	3	None	-	-	-	-	-	-	-

*Noise abatement not considered because it is not an area of frequent human use that would benefit from lower noise level.
**Noise barriers not a feasible option because residences front the roadway and openings for driveway access would render barriers unable to provided minimum required noise reduction.

R24 is located southwest of 5th and J Street in Marysville and represents five residences. Measurements taken at R24 indicate that the existing noise level at that location is 69 dBA. The future noise level at R24 with the project is predicted to be 75 dBA. Because the predicted future noise level exceeds the NAC for residential uses (67dBA), the five residences represented by R24 would be adversely affected by noise. To achieve a five dBA reduction and the additional design goal of 7 dBA for at least one receptor, a 10-foot noise wall would be needed. If the total cost of the wall at this location is less than the total cost allowance, then the wall would likely be incorporated into the project. The total cost allowance, calculated in accordance with Caltrans' Traffic Noise Analysis Protocol, is $275,000. The current estimated cost of the wall is $78,029. Yuba City will coordinate with Caltrans for the exact costs of walls that meet the Protocol criteria. The final decision of the noise abatement would be made upon completion of the project design and the public involvement processes. Figure 2.2.6-1 shows the proposed barrier location (B1).

Construction Noise

Construction equipment is expected to generate noise levels ranging from 70 to 90 dB at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance. Pile driving noise is expected to generate noise levels in excess of those shown in Table 2.2.6-4, with actual levels dependent on the type of pile driving equipment utilized.

Table 2.2.6-4: Noise Abatement Criteria

Equipment	Maximum Noise Level (dBA at 50 feet)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82

No adverse noise impacts from construction are anticipated during most daytime hours because Yuba City would implement construction in accordance with Caltrans Standard Specifications Section 14.8.02 and applicable local noise standards. In addition, construction noise would be short-term, intermittent, and overshadowed by local traffic noise. However, during periods of intensive park usage (concerts, soccer tournaments, etc.), intensive construction activities could generate noise levels which interfere with such activities. Furthermore, nighttime construction, particularly if it involves night pile driving, could result in adverse noise impacts at nearby residences. As a result, the following additional measures are recommended to minimize the potential for adverse public reaction to construction noise:

Avoidance, Minimization and/or Mitigation Measures

Measures NOI-1 through NOI-3 should be implemented to minimize the potential for construction noise impacts.

Measure NOI-1: The project will incorporate noise abatement in the form of (a) barrier(s) at R24, a property located southwest of 5th Street and J Street in Marysville, with respective lengths and average heights of 170 feet in length and 10 feet in height. Calculations based on preliminary design data indicate that the barrier(s) would reduce noise levels by at least 7 dBA for five residences at a cost of $78,029. If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision of the noise abatement will be made upon completion of the project design and the public involvement processes.

Measure NOI-2: Yuba City will require the construction contractor to comply with Caltrans Standard Specifications Section 14-8.02, "Noise Control". Section 14-8.02 provides information that can be considered in determining whether construction would result in adverse noise impacts. The specification states:

- Do not exceed 86 dBA at 50 feet from the job site activities from 9 p.m. to 6 a.m.
- Use an alternative warning method instead of a sound signal unless required by safety laws.
- Construction vehicles shall equip internal combustion engines with the manufacturer recommended muffler.

Measure NOI-3: Substantial noise-generating construction activities, such as pile driving, shall be limited to daytime hours.

Measure NOI-4: Substantial noise-generating construction activities during periods of intensive park usage (concerts, soccer tournaments, etc.), shall be avoided.

CEQA Noise Analysis (Yuba City and Marysville General Plan Noise Element)

Under CEQA, local noise standards are used to determine noise thresholds which can then be used to determine if potential changes in the noise environment would constitute significant impacts. For this project Yuba City's noise standards are used for project changes within Yuba City and Marysville standards are used for project changes within Marysville. These changes and application of the local standards are discussed below.

<u>Yuba City</u>

The predicted noise level under the Build Alternative results in noise levels of 5 dB to 7 dB greater than the existing (baseline) noise level for R1-R6, R11, and R13 in Yuba City. Typically a 3 dB difference is considered a discernible change.

Yuba City's General Plan Policy 9.1-I-2 requires mitigation for all projects that have noise exposure greater than "normally acceptable" levels and Policy 9.1-I-3 states:

> In making a determination of impact under the California Environmental Quality Act (CEQA), consider an increase of four or more DBA to be "significant" if the resulting noise level would exceed that described as normally acceptable for the affected land use in [Figure 2.2.6-2].

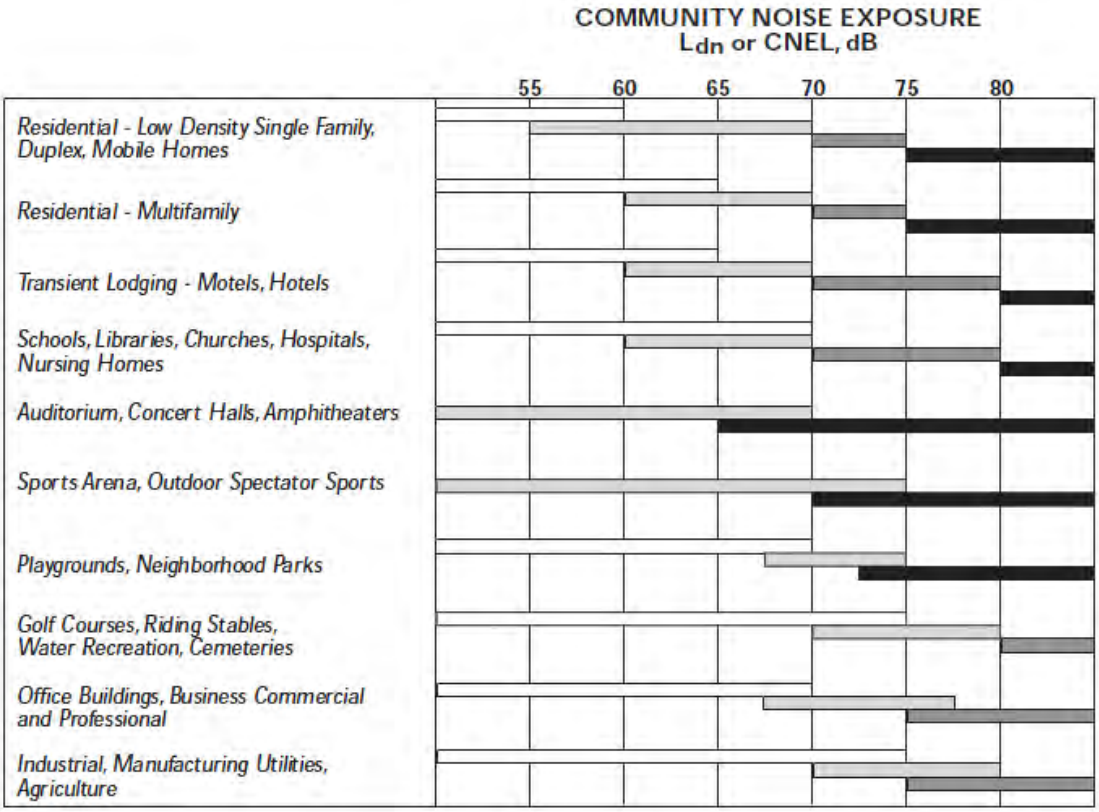
Based on Yuba City's policies, receptors R1—R6 and R11 would not experience a "significant" noise impact under CEQA. Noise levels summarized in Table 2.2.6-3 are of the highest traffic noise hour dB so community noise equivalent level (CNEL) at these locations is anticipated to be lower. The Build Alternative would be below the "normally acceptable" levels described in

Figure 2.2.6-2. Further, R13 would result in a design year noise level of 61 dB; because the 61 dB noise level is of the highest traffic noise hour, the CNEL level at R13 is also not anticipated to be above the "normally acceptable" CNEL level of 60 dB CNEL. Under CEQA, no significant noise impact would occur as a result of the project and no mitigation is required.

City of Marysville

Within Marysville, the predicted noise level under the Build Alternative results in noise levels of 4 to 7 dB greater than the existing (baseline) noise level for R16-R17, R19-R21, and R24-R28. The City of Marysville does not specify local thresholds of significance in the City of Marysville General Plan, Noise Ordinance, or similar standards. Using the guidance in Figure 2.2.6-2, which was originally prepared by the California Office of Planning and Research, noise levels with the project in the design year are "normally acceptable" for R16-R17, R19-R21, and "conditionally acceptable" for R24-R28. As described under the NEPA analysis above, R24 is already recommended for noise abatement and CEQA noise impacts would not occur. Due to the land uses associated with R25-R28, consisting of three retail land uses and a bar, the project is not considered to have a significant noise impact under CEQA.

Figure 2.2.6-2: Land Use Compatibility for Community Noise Environments



INTERPRETATION:

NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any building involved is of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

SOURCE: California Governor's Office of Planning and Research. 1990.

2.3 Biological Environment

Discussion in the following sections summarizes the Natural Environment Study (NES) that was prepared for the proposed project in September of 2012. The biological study area (BSA) was established as the area within which permanent and temporary project impacts (e.g. cut slopes, fill areas, temporary access roads, construction staging areas, etc.) could potentially occur. All potential impacts from the proposed build alternative are included in this area. The biological environment section of this document is divided into the following categories: natural communities, wetlands and other waters, plant species, animal species, threatened and endangered species, and invasive species. Biological investigations for the proposed project were guided by correspondence with the relevant resource agencies.

In addition to field work, literature research was reviewed to identify what types of sensitive plant and animal wildlife would be likely to occur within or nearby the project area. This literature research included review of United States Fish and Wildlife Service (USFWS) Species List, California Department of Fish and Wildlife (CDFW) *California Natural Diversity Database* (CNDDB) and the California Native Plant Society (CNPS) *Electronic Inventory of Rare and Endangered Plants.*

2.3.1 Natural Communities

Regulatory Setting

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors, and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act (FESA) are discussed in the Threatened and Endangered Species Section 2.3.5. Wetlands and other waters are also discussed in Section 2.3.2.

Affected Environment

Regionally, the topography trends downhill towards the center of the San Joaquin Valley from the Sierra foothills to the east. The San Joaquin Valley generally trends downhill to the southwest towards the San Joaquin-Sacramento River Delta, approximately 60 miles to the southwest of the site.

The project site topography is relatively level within the developed portions of the Cities of Marysville and Yuba City. However raised levees have been constructed along the Feather River to add flood protection for the developments within Marysville and Yuba City. The project also includes raised embankments for the 5th Street Bridge structure and adjacent railroad bridge, on the east and west banks of the Feather River within the BSA.

The project elevations generally range between approximately 60- to 65-feet above mean sea level within the Cities of Marysville and Yuba City, with the levees and 5th Street Bridge embankments ranging up to approximately 15- to 20-feet above the surrounding areas.

The BSA is located in the northern Great Valley floristic region and ecological subsection M262Af (River Aluvium). Regional vegetation is dominated by grassland, upland, and riparian vegetation, usually associated with the Sacramento and Feather River channels that are encompassed by this subregion. The BSA contains disturbed valley foothill riparian, disturbed valley oak woodland, and ruderal/non-native grasses vegetation communities which provide habitat for wildlife, including special-status terrestrial and aquatic species. Detailed descriptions of these habitats are provided below.

Disturbed Valley Foothill Riparian

The valley foothill riparian community is found in the BSA in a narrow strip along the banks of the Feather River. This habitat is typified by a dense, deciduous, riparian forest, composed of cottonwoods (*Populus ssp.*), willows (*Salix ssp.*), and box elders (*Acer negundo*), and a shade tolerant understory. This habitat is most commonly found along river channels with fine-textured alluvium where flooding occurs and is commonly found at elevations below 500 feet above mean sea level.

Valley foothill riparian habitat in the study area occurs on the banks and floodplain of the Feather River. Although currently undeveloped, the BSA has been disturbed during bridge and levee construction in and adjacent to the Riverfront Park in Marysville. Levee maintenance, which may include regular vegetation removal, occurs within the project area, and the native trees found in this habitat have been further disturbed by beaver activity.

Valley foothill riparian habitat is typically dominated by Fremont cottonwood, willows, bulrush, cattail, sedge, and mixed grasslands on levees and floodplains. The riparian habitat observed in the BSA includes willow sp, Freemont's cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), box elder, elderberry shrubs and mixed native and non-native grasses; however, this community is disturbed and fragmented, existing only along a narrow strip on each bank of the Feather River.

Disturbed Valley Oak Woodland

A small area of disturbed valley oak woodland occurs in Yuba City, north of Bridge Street and north of the Gilsizer Slough (just east of the cemetery). This habitat is typified by open woodland dominated by valley oaks and a grassy savanna understory. This habitat is most commonly found on deep, well-drained alluvial soils, usually in valley bottoms and is commonly found at elevations below 2000 feet above mean sea level.

This habitat has been disturbed by the development of urban Yuba City with the detention basin and transportation facilities to the south, the cemetery to the west, and residential development to the north. These widely scattered but sparsely occurring woodlands are dominated by valley oaks. Associated tree species in the Central Valley include California sycamore, California black walnut, California box elder, Oregon ash, interior live oak, California buckeye, and blue oak.

Ruderal/Non-Native Grasses

Ruderal/Non-Native Grasses vegetation exist between the Valley/Foothill Riparian areas and the developed areas in the project area and are dominated by non-native grasses and shrubs. These areas were heavily disturbed through the development of Yuba City and Marysville (Riverfront Park) and continue to be disturbed by ongoing maintenance to the park and levee features.

Parkland and other Developed Areas

In the project area, a large portion of the BSA is part of the Riverfront Park which has been developed into manicured park lands (both open and for ball fields to the north of the bridge), and have been landscaped to include lawns and scattered roads, parking areas, and other supporting recreational uses. This park is capable of supporting some wildlife; however, the ongoing park maintenance has greatly reduced the native natural habitats that historically grew here.

The remainder of the BSA is made up of other developed areas including the Marysville and Yuba City urban areas (residential, commercial, and other supporting development). These developed areas are predominately covered by roads, buildings and associated landscaping common to urban development. Habitat types in the BSA are shown on Figure 2.3.1-1

Environmental Consequences

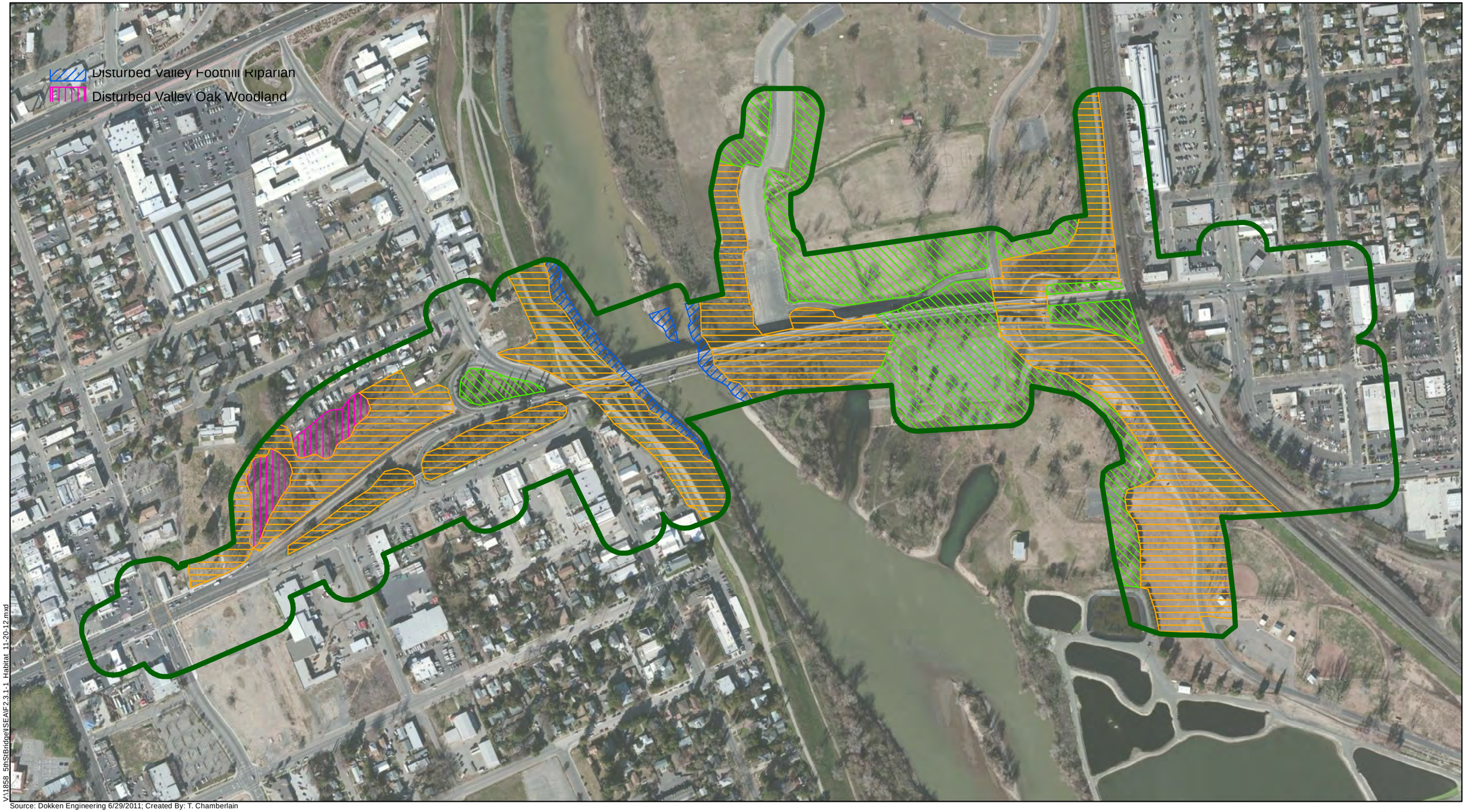
Build Alternative

Direct and indirect impacts to plant communities would occur under the proposed Build Alternative. A portion of the landscaped parkland habitat would be occupied and disturbed by construction, as well as the areas of disturbed valley foothill riparian habitat. Minor impacts to the disturbed valley oak woodlands habitat may occur during construction, and non-native grasses would be disturbed throughout the project area. Impacted trees within these areas would need to be removed during the demolition and construction processes. Damage to adjacent trees' root systems may occur due to soil compaction during fill activities or due to direct root damage during cut activities. Trees and shrubs that may be indirectly impacted were considered to be directly impacted for the purposes of this analysis.

All impacts to disturbed valley foothill riparian habitat would be temporary. This habitat is also considered Critical Habitat for the endangered fish species that use the Feather River for migration and spawning. Section 2.3.5 provides a more thorough evaluation of impacts to this Critical Habitat and includes avoidance, minimization, and mitigation measures appropriate to reduce potential impacts to the habitat within the project area.

Impacts to the remaining habitat types would be temporary during construction. Grass and landscaping associated with the Riverfront Park, as well as landscaped areas in Yuba City would be replanted after the bridge and roadway improvements are completed. A landscaping plan would be prepared with the final plans and specifications for the project.

The Feather River corridor acts as a migration corridor for wildlife in the area, providing linear access under the existing roadway facility free from vehicular and human disturbance. The permanent water source matched with the adjacent riparian habitat creates ideal conditions for wildlife to disperse throughout the region. The high level of development of Yuba City and Marysville limits the suitability of these areas for migration, leaving the river channel passing through the cities as a best option for many migrating species. As the project is replacing an existing facility, any impacts to wildlife migrations associated with project construction would be temporary. At project completion, full usage of the channel as a migration corridor would be restored.



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Source: Dokken Engineering 6/29/2011; Created By: T. Chamberlain

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FIGURE 2.3.1-1
Biological Habitats
5th Street Bridge Replacement Project
Federal Project No. BHLS–5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

Avoidance, Minimization, and/or Mitigation Measures

Measure BIO-1: Prior to the start of construction, Environmentally Sensitive Area (ESA) fencing shall be installed along the construction limits to protect riparian habitat associated with the Feather River from construction activities.

Measure BIO-2: All trees to remain in place within and adjacent to proposed ground disturbances shall be designated as ESA and shall be temporarily fenced with orange plastic construction (exclusion) fencing throughout all grading and construction activities. To the extent feasible, the exclusion fencing shall be installed along the dripline of trees greater than six inches diameter at breast height. The fencing is intended to prevent equipment operations in the proximity of protected trees that may compact soil, crush roots, or collide with the tree trunk and/or overhanging branches.

Measure BIO-3: In order to ensure that vegetated areas are restored to their pre-construction conditions, a landscaping plan will be prepared during design of the project. This plan will include all necessary landscaping to ensure that the Riverfront Park grasses are replaced and that any other landscaping areas impacted by construction will be restored.

2.3.2 Wetlands and Other Waters

Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the CWA (33 USC 1344) is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army of Engineers (USACE) with oversight by the United States Environmental Protection Agency (U.S. EPA).

USACE issues two types of 404 permits: Standard and General permits. There are two types of General permits, Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to authorize a variety of minor project activities with no more than minimal effects.

There are two types of Standard permits: Individual permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. For Standard permits, the USACE decision to approve is based on compliance with CFR Part 230, and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines were developed by the U.S. EPA in conjunction with USACE,

and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this EO states that a federal agency, such as the FHWA and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the CDFW, the SWRCB and the RWQCB. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that would substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement would be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications for impacts to wetlands and waters in compliance with Section 401 of the CWA. Please see the Water Quality Section for additional details.

Affected Environment

The Feather River flowing through the project retains its natural banks and supports a large range of aquatic wildlife and associated species. The riverbed is wide and varied, composed of disturbed riparian vegetation, and on the west side is bordered by the Yuba City levee.

The Feather River is inhabited by aquatic species that use the river for foraging, migration, and breeding. No wildlife was observed during the April 27, 2011 and July 19, 2011 surveys, but, the river is known to support a variety of bird, mammal, reptile, amphibian, and fish species. As identified in 70 FR 52488 and 74 FR 52300, the Feather River has been identified by the National Oceanic and Atmospheric Administration (NOAA) and the National Marine Fisheries Service (NMFS) as being critical habitat for the central valley steelhead (*Oncorhynchus mykiss*), the central valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*), and the green sturgeon (*Acipenser medirostris*).

The segment of Feather River within the project area consists of unvegetated streambed and adjacent riparian habitat and maintained levee. There are no wetlands within the project area.

Environmental Consequences

Some permanent impacts to the Feather River, associated with bridge replacement, would be necessary as part of this project. Two piers supporting the new bridge are proposed within the ordinary high water mark and may require dewatering and/or stream diversion during bridge construction. All other permanent impacts associated with this project would occur outside the ordinary high water mark. Permanent impacts to Waters of the U.S. would be approximately 0.01 acre.

Temporary Impacts

Temporary impacts associated with construction would be necessary for this project. A temporary trestle would be built in order to build the pier columns in the river bed, and it would also be used to support falsework during bridge construction. Additional areas may be used during construction and dewatering and/or stream diversion may also be required. Approximately 3.42 acres of temporary impacts to Waters of the U.S. are anticipated, while approximately 4.07 acres of temporary impacts to Waters of the State are anticipated. The estimated area of impacts to Waters of the U.S. and State would be updated during the permitting process.

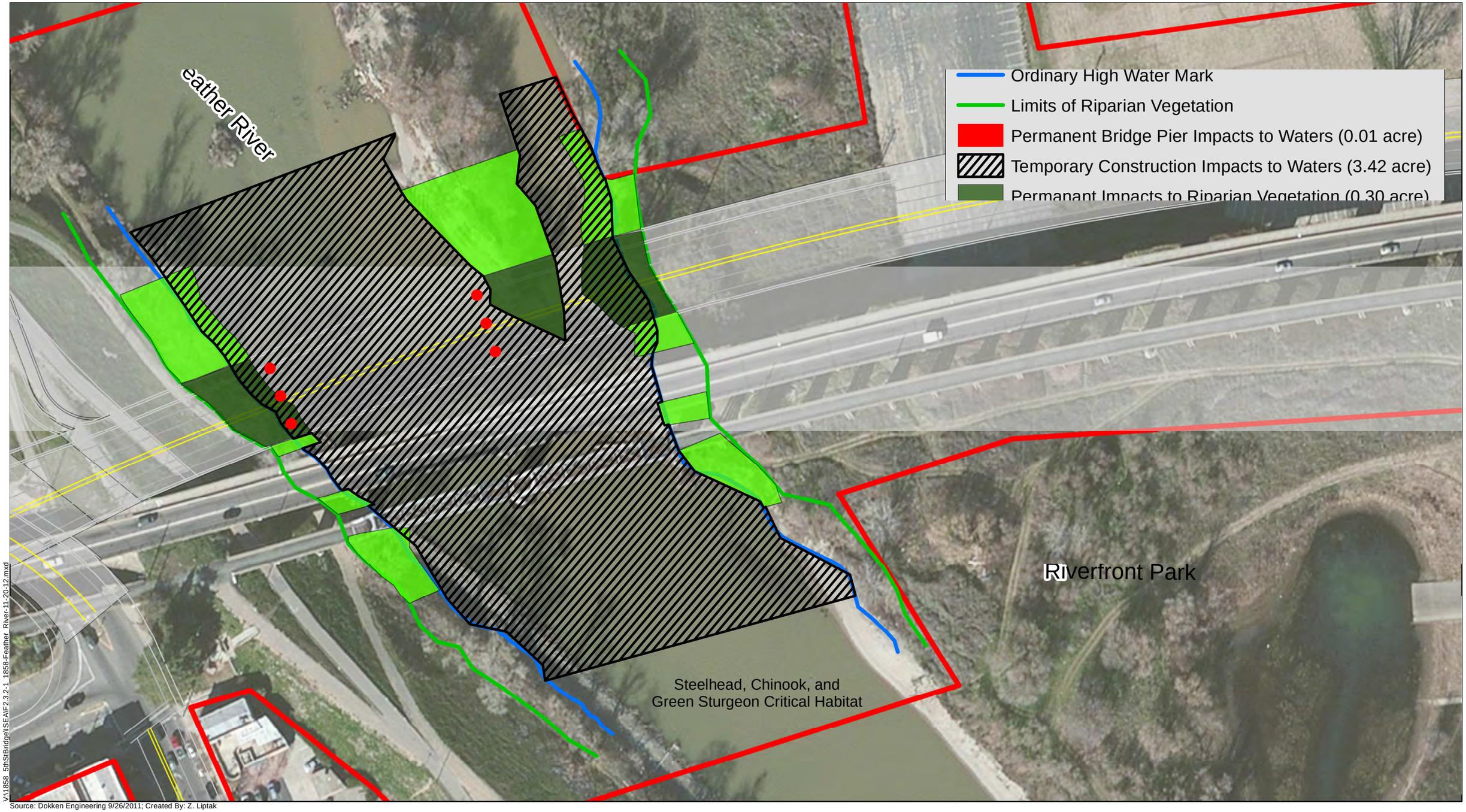
Figure 2.3.2-1 shows the limits of the Waters of the US and Waters of the State within the project area as well as the proposed impacts to waters and associated riparian habitat. On the exhibit, Waters of the US are identified as “Waters” and Waters of the State include both the Waters of the US and all associated riparian habitat.

Avoidance, Minimization and/or Mitigation Measures

The project has been designed to minimize temporary and permanent impacts to the Feather River as it has been identified as a Water of the U.S. and State. Project measures and BMPs incorporated into the design would minimize effects of construction activities on the channel. The project would comply with the following measures:

Measures BIO-4: Prior to initiating construction, ESA fencing shall be installed along the construction limits to prevent encroachment into the riparian areas adjacent to the construction site.

Measures BIO-5: Prior to start of construction activities, the City of Yuba City will obtain all necessary regulatory permits for this project. These permits are expected to include a CWA Section 401 Water Quality Certification from the RWQCB, a Section 402 NPDES Compliance Permit from the SWRCB, a CWA Section 404 Nationwide 14 Permit from the USACE, a Fish and Game Code Section 1602 Streambed Alteration Agreement from the CDFW, and a Floodplain Encroachment Permit from the Central Valley Flood Protection Board. These permits will require appropriate mitigation for impacts to waters of the U. S. and State.



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Source: Dokken Engineering 9/26/2011; Created By: Z. Liptak

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FIGURE 2.3.2-1
Proposed Impacts to the Feather River
5th Street Bridge Replacement Project
Federal Project No. BHLS–5163(025))
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

2.3.3 Plant Species

Regulatory Setting

The United States Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) share regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the FESA and/or the California Endangered Species Act (CESA). Please see the Threatened and Endangered Species Section 2.3.5 in this document for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including CDFW fully protected species and species of special concern, USFWS candidate species, and non-listed CNPS rare and endangered plants.

The regulatory requirements for FESA can be found at 16 USC, Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Caltrans projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and CEQA, PRC, Sections 21000-21177.

Affected Environment

On April 27, 2011 Dokken biologists surveyed the BSA. The spring blooming season for the special status plant species which have the potential to occur in the BSA is April-May. The surveys included a survey and habitat assessment for the following seven sensitive plant species: Ferris' milkvetch, dwarf downingia, woolly rosemallow, legenere, veiny mondardella, Hartweg's golden sunburst, and Wright's trichocoronis. None of the sensitive plant species were encountered during the focused botanical survey and are presumed absent.

Common native plant species that were observed within the BSA are listed under Table 2.3.3-1.

Table 2.3.3-1: Plant Species Observed in the BSA

Scientific Name	Common Name	Native (N) / Non-Native (X)
Acer negundo	Box elder	X
Achillea millefolium	Common yarrow	N
Alianthus altissima	Tree of heaven	X
Alnus rhombifolia	White alder	N
Anagallis arvensis	Scarlet pimpernel	X
Artemisia douglasiana	California Mugwort	N
Baccharis salicifolia	Mule fat	N
Brassica nigra	Black mustard	X
Bromus carinatus	California brome	N

Scientific Name	Common Name	Native (N) / Non-Native (X)
Bromus diandrus	Ripgut	X
Bromus madritensis	Foxtail brome	X
Carya illinoinensis	Pecan	X
Ceanothus sp.	Ceanothus sp.	Unknown
Celtis sp.	Hackberry sp.	X
Cephalanthus occidentalis	Button willow	N
Cinnamomum camphora	Camphor-tree	X
Cirsium vulgare	Bull thistle	X
Chamomilla suaveolens	Pineapple weed	X
Claytonia sp.	Miner's lettuce	N
Conium maculatum	Poison hemlock	X
Cotoneaster sp.	Cotoneaster sp.	X
Cupressus sempervirens	Italian cypress	X
Equisetum laevigatum	Smooth scouring rush	N
Erodium cicutarium	Red stemmed filaree	X
Eschscholzia californica	California poppy	N
Eucalyptus globulus	Blue gum	X
Euryops pectinatus	Yellow bush daisy	X
Ficus carica	Common fig	X
Fraxinus latifolia	Oregon ash	N
Galium aparine	Common bedstraw	N
Geranium dissectum	Cutleaf geranium	X
Hedera canariensis	Canary ivy	X
Hordeum murinum	Foxtail barley	X
Juglans californica	California black walnut	N
Lagerstroemia indica	Crape myrtle	X
Ligustrum lucidum	Japanese privet	X
Lupinus sp.	Lupine sp.	N
Medicago polymorpha	Bur clover	X
Melilotus sp.	Yellow sweet clover	X
Morus alba	Mulberry	X
Nerium oleander	Oleander	X
Nicotiana glauca	Tree tobacco	X
Phoradendron sp.	Mistletoe	N
Photinia glabra	Japanese photinia	X
Plantago lanceolata	English plantain	X
Platanus x acerifolia	London plane tree	X
Platanus racemosa	California Sycamore	N
Populus fremontii	Fremont cottonwood	N
Prunus dulcis	Domestic almond	X
Pyracantha sp.	Firethorn sp.	X
Pseudotsuga menziesii	Douglas fir	N
Quercus lobata	Valley oak	N
Quercus x moreha	Oracle oak	N
Querucs wislizeni var. *wislizeni*	Interior live oak	N

Scientific Name	Common Name	Native (N) / Non-Native (X)
Ranunculus muricatus	Pricklefruit buttercup	X
Rosa californica	California rose	N
Rubus armeniacus	Himalayan blackberry	X
Rubus ursinus	Californian blackberry	N
Rumex crispus	Curly dock	X
Salix exigua	Narrow leaved willow	N
Salix gooddingii	Gooding's willow	N
Salix laevigata	Red willow	N
Sambucus mexicana	Elderberry	N
Silybum marianum	Blessed milkthistle	X
Sonchus oleraceus	Common sow thistle	X
Symphoricarpos albus	Common snowberry	N
Umbellularia californica	California bay	N
Veronica persica	Birdeye speedwell	X
Vicia sativa	Spring vetch	X
Vicia villosa	Hairy vetch	X
Vinca minor	Periwinkle	X
Vitis californica	California grape	N
Vulpia myuros	Rat tail fescue	X

Environmental Consequences

Focused surveys were conducted for each of the seven special status plant species discussed above in the Affected Environment section. No sensitive plant species were observed during the focused surveys and each species is presumed absent from the BSA. No impacts to special status plant species are anticipated as a result of this project.

Avoidance, Minimizations and/or Mitigation Measures

No measures are needed for special status plant species.

2.3.4 Animal Species

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The USFWS, the NOAA Fisheries and the CDFW are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under the CESA or FESA. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.5 below.

Federal laws and regulations pertaining to wildlife include:

- National Environmental Policy Act;
- Migratory Bird Treaty Act; and

- Fish and Wildlife Coordination Act.

State laws and regulations pertaining to wildlife include:

- California Environmental Quality Act;
- Sections 1600 – 1603 of the Fish and Game Code; and
- Section 4150 and 4152 of the Fish and Game Code.

Affected Environment

On April 27, 2011, Dokken biologists surveyed the BSA. The surveys included a biological reconnaissance with focused attention for the following four special status species: burrowing owl, northern harrier, white-tailed kite, and western pond turtle. None of the special status species were observed during the biological survey, however potentially suitable habitat for each species except for burrowing owl was determined to be present within the BSA. Threatened and/or endangered animal species are discussed in Section 2.3.5, while all other common and special status animal species are discussed below.

Common native animal species that were observed within the BSA can be found in Table 2.3.4-1.

Table 2.3.4-1: Animal Species Observed in the BSA

Scientific Name	Common Name	Native (N) / Non-Native (X)
BIRDS		
Buteo lineatus	Red shouldered hawk	N
Carduelis tristis	American goldfinch	N
Cathartes aura	Turkey vulture	N
Charadrius vociferus	Killdeer	N
Colaptes auratus	Northern flicker	N
Columba livia	Rock dove	X
Corvus brachyrhynchos	American crow	N
Falco sparverius	American kestrel	N
Hirundo pyrrhonota	Cliff swallow	N
Mimus polyglottos	Northern mockingbird	N
Pica nuttali	California Magpie	N
Pipilo crissalis	California towhee	N
order *Strigiformes*	Owl sp.	N
Sturnus vulgaris	European starling	X
Troglodytes aedon	House wren	N
Turdus migratorius	American robin	N
REPTILES		
Sceloporus occidentalis biseriatus	Western fence lizard	N
MAMMALS		
Castor canadensis	American beaver	N

Scientific Name	Common Name	Native (N) / Non-Native (X)
Tadarida brasiliensis	Mexican freetail bat	N
Lepus californicus	Black-tailed jack rabbit	N
Mephitis mephitis	Striped skunk	N
Procyon lotor	Raccoon	N
INVERTEBRATES		
Papilio rutulus	Swallowtail butterfly	N

Northern Harrier

The northern harrier is a State Species of Special Concern, but is currently not a Federally listed species. The northern harrier is a migratory raptor preferring northern lattitudes in the summer and southern latitudes in the winter. The northern harrier most commonly inhabits areas with marshes, farmland, and grasslands, as these provide the best foraging habitat. Although most of its original habitat has been destroyed or degraded within the California Central Valley, this region still supports the majority of northern harriers in California. Harriers breed mainly at private or public wetlands or other reserves as well as in some types of agricultural fields and pasturelands. Northern harriers breed and forage in a variety of open (treeless) habitats that provide adequate vegetative cover, an abundance of suitable prey, and scattered hunting, plucking, and lookout perches such as shrubs or fence posts. In California such habitats include freshwater marshes, brackish and saltwater marshes, wet meadows, weedy borders of lakes, rivers and streams, grasslands, and some croplands. Harriers feed on a broad variety of small to medium sized vertebrates, primarily rodents and passerines. Harriers nest on the ground mostly within patches of dense, often tall, vegetation in undisturbed areas (Sibley 2003, CNDDB 2011).

During the April 27, 2011 biological surveys, no sign of the northern harrier were observed. There is a limited amount of suitable foraging habitat in the BSA, predominantly associated with the Feather River. However, the northern harrier nests on the ground and the disturbed habitats and developed areas within the BSA do not provide suitable nesting habitat for the species. When compared with the surrounding areas which provide abundant breeding and foraging habitat for the species, the likelihood of this project impacting suitable breeding or foraging habitat is considered very low. There are recorded occurrences of the species, the nearest being approximately ten miles from the site.

White-tailed Kite

The white-tailed kite is a state fully protected species. This species typically breeds in open country and nests in trees, usually located near water. The white-tailed kite preys mostly on small mammals, but would occasional include birds, insects, reptiles, and amphibians in its diet. The species tends to forage in undisturbed, open grasslands, meadows, farmlands, and emergent wetlands. The Feather River Corridor provides nesting, roosting, and foraging habitat for the species, however, the disturbed and relatively small areas suitable for these activities make it highly unlikely for the species to take residence within the BSA. The most likely use of the BSA would be simply as a migration corridor, and to move up and down the Feather River channel (CNDDB 2011).

During the April 27, 2011 biological surveys, no sign of the white-tailed kite were observed. There is a limited amount of disturbed foraging and nesting habitat in the BSA, predominantly associated with the Feather River. When compared with the surrounding areas which provide abundant breeding and foraging habitat for the species, the likelihood of this project impacting suitable breeding or foraging habitat is considered very low. The most likely chance of an occurrence in the BSA would be from a species using the Feather River as a migration corridor. The nearest CNDDB occurrence of this species is approximately 5 miles from the project area.

Western Pond Turtle

The western pond turtle is not a State or Federally listed species, but is a CDFW Species of Special Concern. The western pond turtle is a fully aquatic turtle, inhabiting ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. The species requires suitable basking sites such as logs, rocks and exposed banks and associated upland habitat consisting of sandy banks or grassy open fields for reproduction. The species is omnivorous, consuming aquatic wildlife and vegetation for dietary requirements. The western pond turtle is known to hibernate underwater beneath a muddy bottom in colder climates, and reproduce from March to August (Zeiner 1990, CNDDB 2011).

During the April 27, 2011 biological surveys, no sign of western pond turtle were observed. The Feather River occurs within the project limits and its channel and banks have potentially suitable basking sites with limited reproductive upland habitat. There are recorded occurrences of the species, the nearest being approximately seven miles from project site.

Migratory Bird Species

Native birds, protected under the Migratory Bird Treaty Act (MBTA) and similar provisions under CDFG code, currently nest or have the potential to nest within the BSA and the project impact area. During the April 27, 2011 biological surveys, habitat was determined to be favorable to canopy, cavity and structural nesting birds. Extensive evidence of cliff swallow (*Hirundo pyrrhonota*) nesting was present under both the 5th Street and railroad bridge structures.

Bats

The April 27, 2011 and July 19, 2011 field surveys identified signs of a large number of bats in the BSA. Signs of bats within the BSA were observed in the form of urine stains, guano and audible noises made by the animals. These bats were observed using the adjacent railroad bridge structure, located immediately adjacent to and south of the 5th Street Bridge for daytime roosting. Given the large quantity of signs, this colony may utilize the railroad bridge for nighttime roosting and breeding habitat. It is likely the bat population forages within the BSA and surrounding areas. No sign of bats were observed occupying the 5th Street Bridge, likely due to the lack of suitable roosting locations on the open exposed sides of the bridge, which does not provide roosting structures.

Environmental Consequences

Northern Harrier

Northern harriers were not observed during the April 27, 2011 and July 19, 2011 surveys, but could occur within the project vicinity. The BSA does not provide any suitable nesting habitat

and has minimal amount of disturbed foraging habitat. As such, the northern harrier is not expected to be present in the BSA and no impacts to this species are anticipated. Further, by incorporating Measure BIO-6, if any northern harriers are found, potential construction related impacts would be avoided or minimized.

White-tailed Kite

White-tailed kite were not observed during the April 27, 2011 and July 19, 2011 surveys, but could occur within the project vicinity. Habitat for this species within the BSA has been disturbed from prior bridge construction/maintenance and urban development. Because the species is likely to use the Feather River as a migration corridor, the estimated project impacts to the white-tailed kite are unknown. However, considering the scale of the project, adherence to Measure BIO-6, and the project design, the project would not impact the viability of the overall population and would provide protection for nesting birds.

Western Pond Turtle

No sign of western pond turtle was observed during the April 27, 2011 surveys, and the species would have been expected to be active during this timeframe (not seasonally hibernating). Considering the scale of the project, minimization and avoidance measures, and project design, the project would not impact the viability of the overall population.

Migratory Birds

Native birds are protected under the MBTA and similar provisions under California Department of Fish and Game Code. During the April 27, 2011 biological surveys, habitat within the BSA was determined to be favorable to canopy, cavity and structural nesting birds. Extensive evidence of cliff swallow (*Hirundo pyrrhonota*) nesting was present under both the 5th Street and railroad bridge structures. Measures BIO-6 through BIO-8 shall be utilized to ensure protection of migratory nesting birds.

Bats

Considering the absence of bat use on the 5th Street Bridge, no bat exclusion would be necessary prior to demolition of the structure. Project activities would not have any direct adverse effects on bats in the project area; however, some construction activities may have negative indirect impacts in the form of noise and vibration. Considering the existing condition, and the proximity to the 5th Street Bridge which is actively used as a vehicle thoroughfare, construction disturbance would only incrementally increase the potential for noise and vibration impacts, and those impacts would be temporary. For these reasons, the proposed project would not have an adverse effect on the continued existence of the regional bat population.

Avoidance, Minimization and/or Mitigation Measures

Migratory Bird Species

Measures BIO-6: To ensure compliance with MBTA and California Department of Fish and Game Code, vegetation removal and initiation of construction activities should not occur during the nesting season (defined as February 15 – August 31). If this is not possible and vegetation removal or initiation of work is to occur during the nesting season, a pre-construction survey will be required. The pre-construction survey shall be performed by a qualified biologist, to

determine the presence of nesting birds and ensure active nests are not directly or indirectly impacted during construction. The pre-construction survey area will include the limits of the project impact area plus a 500-foot buffer. If work is planned to begin during the nesting season (February 15 – August 31), all vegetation removal shall be completed within two weeks of the nesting survey where the survey determines no active nests are present. If the nest of a protected bird is found, the perimeter shall be flagged and a qualified biologist will coordinate with USFWS and CDFW to determine an appropriate buffer distance from construction to ensure protection of the nest. The contractor shall stop work in the nesting area and is prohibited from conducting work that could disturb the nesting birds until the buffer is established (as determined by the project biologist in coordination with resource agencies). The buffer shall remain in the protected area until the biologist has determined that nesting activities are complete.

Measure BIO-7: Construction activities shall not disturb nesting swallows. A qualified biologist shall coordinate with CDFW and USFWS to determine what construction activities, if any, can occur once nesting activities commence.

Measure BIO-8: If demolition of the existing 5th Street Bridge is planned to occur during the nesting season, measures shall be taken to avoid impacts to migratory swallows. To protect migratory swallows, unoccupied nests will be removed from the existing bridge structure prior to the nesting season (February 15 – August 31). During the nesting season, the bridge structure shall be maintained free from nests either through use of exclusion devices and/or the active removal of partially constructed nests. After a nest is completed, it can no longer be removed until an approved biologist has determined that all birds have fledged and the nest is no longer being used.

Western Pond Turtle

Measure BIO-9: An environmental awareness training shall be conducted prior to the onset of construction activities with construction personnel to brief them on how to recognize western pond turtle and whom to contact should any turtles be found in the work area.

Measure BIO-10: A preconstruction survey for western pond turtle shall be conducted by a qualified biologist within 24 hours of the start of construction activities. If western pond turtles are located within the construction area, the turtles shall be relocated out of the area and exclusion fencing shall be installed to prevent the movement of turtles back into the construction area.

Measure BIO-11: If any western pond turtles are found at any time during project work, construction shall stop and the animal allowed to leave the project area, or would be actively relocated by CDFW approved biologist.

2.3.5 Threatened and Endangered Species

Regulatory Setting

The primary federal law protecting threatened and endangered species is the FESA: 16 USC Section 1531, et seq. See also 50 CFR Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the FHWA, are required to consult with the USFWS and the NOAA Fisheries Service to ensure that they are not

undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence and/or documentation of a no effect finding. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, CESA, California Fish and Game Code Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The CDFW is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

Affected Environment

The following listed (threatened or endangered) species have the potential to exist within the project area, or suitable habitat has been identified within the BSA.

Swainson's Hawk

Swainson's hawk is not listed under FESA, but is listed as threatened under CESA and is a migratory bird species protected under the federal MBTA. Swainson's hawk breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Its breeding range occurs from southwestern Canada to Northern Mexico. While most of the population winter in Central America, some small populations have been found wintering in the Sacramento-San Joaquin Delta area (Herzog 1996). Foraging habitat for Swainson's hawk consists of relatively open stands of grass dominated vegetation, sparse shrublands, and cropland. Swainson's hawks will migrate long distances and tend to build their nest in large sparsely vegetated flatlands characterized by valleys, plateaus, broad floodplains, and large expanses of desert. In California, these birds typically return to nest sites from early March to April and migrate south in late August and September.

During the April 27, 2011, and July 19, 2011 biological surveys, no sign of Swainson's hawk was observed. Surveys concluded that the BSA contains some tall scattered trees suitable for nesting; however, potential foraging habitat is limited to the non-native grasslands occupying the levees. Development from the surrounding cities (including Riverfront Park) makes the site less desirable as a Swainson's hawk breeding location. Adjacent areas surrounding the two cities provide abundant breeding and foraging habitat outside of the more urban project area which would be preferable to the species. There are recorded occurrences of the species, the nearest being approximately two miles from the project site.

Green Sturgeon

Green sturgeon is listed as threatened under the FESA (74 FR 52300) and is under the jurisdiction of the NMFS. The Southern Distinct Population Segment (DPS) of Green sturgeon consists of populations utilizing coastal U.S. marine waters from Monterey Bay, California, north to Cape Flattery, Washington; the Sacramento River, lower Feather River, and lower Yuba River in California; the Sacramento-San Joaquin Delta and Suisun, San Pablo, and San Francisco bays in California; the lower Columbia River estuary; and certain coastal bays and estuaries in California, Oregon, and Washington. The final rule designating Critical Habitat was issued on October 9, 2009 (74 FR 52300).

Although anadromous, green sturgeon is primarily a marine dwelling species of estuaries, bays and oceanic waters. During the breeding season, mature green sturgeon navigate upstream to freshwater riverine environments from February to July. Spawning is relatively infrequent and believed to occur once every 2 to 5 years, from March to July (February to July in the Feather River) in cold, clean waters (NMFS 2011d and DWR 2004c). Among the threats contributing to the Green sturgeon's decline are invasive species, inaccessibility to reaches within its native range, pollution, water development projects, insufficient water levels, fishing and habitat loss (71 FR 17757). In addition, the loss of shaded riparian corridors and alterations to natural flow regimes have contributed to harmful water temperatures during egg deposition (preferred 46-57 degrees Fahrenheit) and larval development (preferred 52°F-66°F) (NMFS 2011b, NMFS 2011d).

The Feather River in the vicinity of the project area has been documented to contain adult Green sturgeon, but with no records of juveniles. Mature, breeding Green sturgeon have utilized the river within the project area as a migratory corridor and holding area prior to spawning (NMFS 2011d, Jones and Stokes 2009). The project is located within designated Critical Habitat for this species. Since the species is known to occur in the Feather River, it is presumed present in the BSA on a seasonal basis.

Central Valley Steelhead

Central Valley steelhead was listed as threatened under the FESA (63 FR 13347, March 19, 1998). This DPS consists of steelhead in the Sacramento and San Joaquin River basins in the Central Valley. The Feather River Hatchery and the Coleman National Fish Hatchery steelhead populations, although previously included in the DPS, were not part of the listed steelhead population until January 5, 2006 (74 FR 834). The final rule designating Central Valley steelhead critical habitat was issued September 2, 2005 (70 FR 52614). Mature, breeding steelhead have utilized the river within the Project area as a migratory corridor, migrating to spawning habitat between September and March (DWR. 2004a).

The Feather River, in the project area, provides suitable habitat for central valley steelhead, and is listed by NMFS as critical habitat. This species is known to occur in the river and it is presumed present in the BSA on a seasonal basis.

Central Valley Spring-run Chinook Salmon

The Central Valley spring-run Chinook salmon Evolutionarily Significant Unit (ESU) includes populations in the Sacramento River and its tributaries in California, including the Feather River, as well as the Feather River Hatchery spring-run Chinook program. They are listed as threatened under both CESA and FESA (70 FR 37160). The final rule designating critical habitat was issued on September 2, 2005 (70 FR 52598). Mature, breeding Chinook have utilized the river within the Project area as a migratory corridor between March and June, migrating to upstream summer spawning habitat (DWR 2004b and Jones and Stokes 2009).

The Feather River, in the project area, provides suitable habitat for central valley spring-run Chinook salmon, and is listed by NMFS as critical habitat. This species is known to occur in the river and it is presumed present in the BSA on a seasonal basis.

Valley Elderberry Longhorn Beetle

Valley Elderberry Longhorn Beetle (VELB) is federally listed as a threatened species. Critical habitat was designated by the USFWS on August 8, 1980 (45 Federal Register [FR] 52803). In 2006 discussions regarding the potential delisting of VELB occurred, however, to date no final determination has been made.

Elderberry shrubs are obligate hosts for VELB larvae. Elderberry shrubs are often associated with cottonwood, willow, ash, oak and walnut – species common to the riparian forests and adjacent uplands in the Central Valley and foothills the elderberry inhabits (Barr 1991). The VELB's range has been reduced and greatly fragmented due to a loss of elderberry inhabited communities, most especially riparian habitat loss. Habitat loss is derived from agricultural development, urbanization, levee maintenance and pesticide drift where aerial application or fogging of crops occurs near riparian habitats (USFWS 1999 and Barr 1991).

Adult VELB feed on elderberry foliage and are present from March through early June. During this time, the adults mate within the canopy and females lay their eggs, either singularly or in small clusters, in living elderberry bark crevices or at the junction of stem/trunk or leaf petiole/stem (Barr 1991). After eggs hatch, the first instar larvae burrow into the host elderberry stems to feed on pith for one to two years. As the larvae becomes ready to pupate, it chews outward from the center of the stem through the bark. After the larvae plugs the newly constructed emergent hole with shavings, it returns to the pupal chamber to metamorphose, and will emerge in mid-March through June as adults (USFWS 2006). Elderberry stems with emergence holes indicates current and/or previous VELB presence. VELB utilize stems greater than 1 inch diameter and produce circular to oval emergent holes 7 to 10 millimeters in diameter with the majority occurring 4 feet or less above the ground (Barr 1991).

The biological surveys conducted on April 27 and July 19, 2011 revealed 25 elderberry bushes with stems greater than one inch, the minimum size for the federally threatened VELB to utilize elderberry as its host species, are within the project limits. Shrubs were measured for number of stems greater than 1" and measured at ground level; Table 2.3.5-1 lists the measurement data recorded from the field. When the elderberry shrubs were searched for presence of VELB, one shrub (see shrub ID # 16) was observed having potential emergence holes on several dead

branches. There were no observed signs of emergence holes, past or current on the live tissues of shrub ID # 16.

The elderberry shrubs were observed growing beneath both the existing bridge and railroad structures, most often adjacent to a concrete pier from the existing 5th Street Bridge. Valley oak, box elder, cottonwood, California walnut, wild grape and willows were found in proximity to the elderberry shrubs. Within the BSA, elderberry shrubs were only observed on the eastern side of the Feather River. Figure 2.3.5-1 shows the locations of each of the elderberry shrubs identified within the BSA.

Table 2.3.5-1: Elderberry Shrubs identified within the BSA

Shrub ID #	Stem diam.* 1”-2”	Stem diam.* 3”- 5”	Stem diam. * > 5”	Approx .Height	Condition	Potential Exit Holes	Approximate Distance from work area	Habitat
1	5	1	--	8’	Good	No	Adjacent to river and beneath 5th Street bridge deck.	Riparian
2	1	--	--	7’	Good	No	See 1	Riparian
3	1	--	--	7’	Good	No	See 1	Riparian
4	1	--	--	3’; leaning	Good	No	Beneath Railroad bridge deck.	Riparian
5	1	--	--	12’	Good	No	See 4	Riparian
6	5	--	--	10’	Good	No	See 4	Riparian
7	1	--	--	8’	Good	No	See 4	Riparian
8	--	1	--	10’	Good	No	See 4	Riparian
9	--	1	--	10’	Good	No	Between Railroad bridge and 5th Street Bridge;	Riparian
10	1		--	7’	Good	No	See 9	Riparian
11	1	--	--	8’	Good	No	See 9	Riparian
12	--	1	--	8’	Good	No	See 9	Riparian
13	--	--	1 (6”)	10’	Good	No	See 9	Riparian

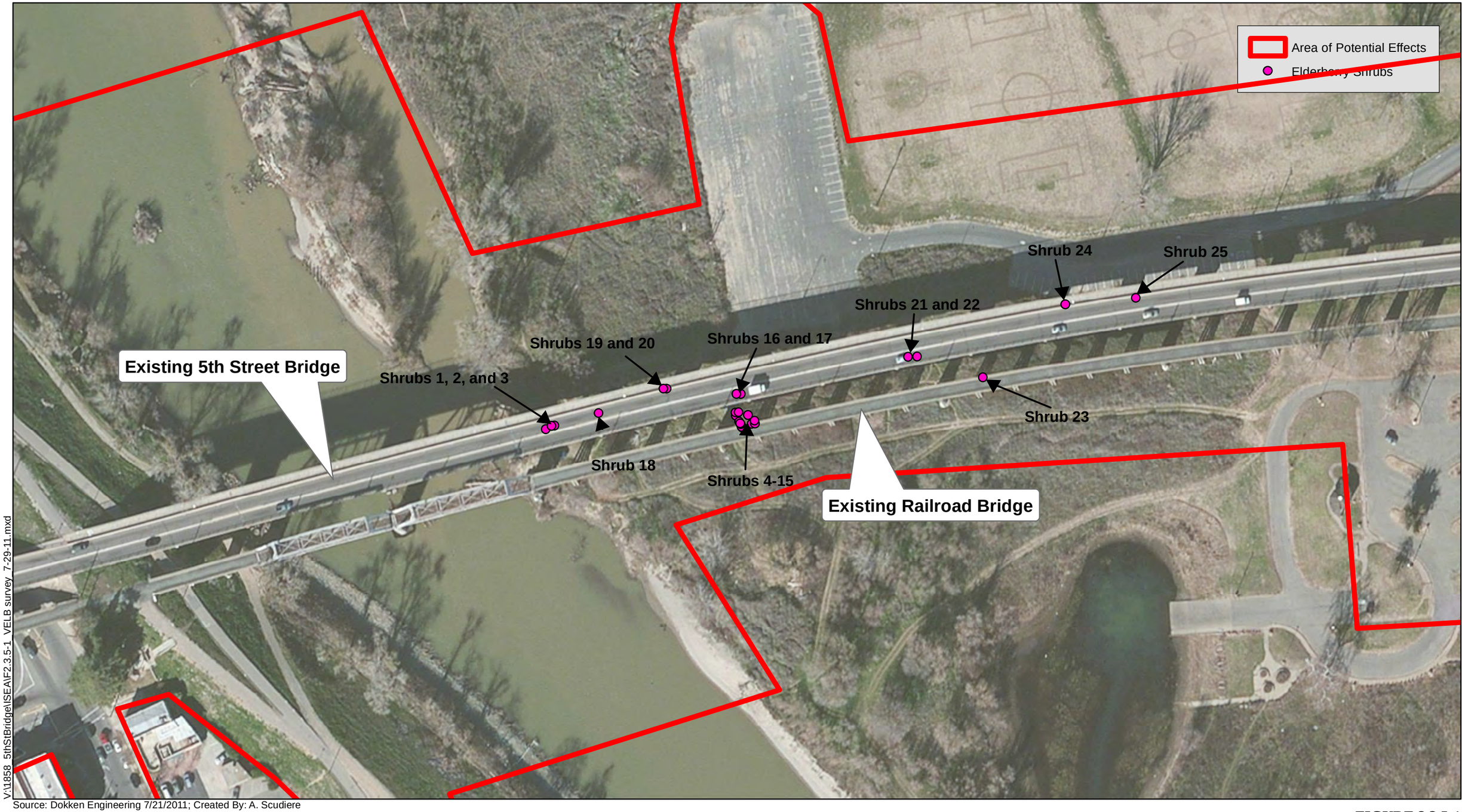
Shrub ID #	Stem diam.* 1”-2”	Stem diam.* 3”- 5”	Stem diam. * > 5”	Approx .Height	Condition	Potential Exit Holes	Approximate Distance from work area	Habitat
14	1	--	--	6’	Good	No	See 9	Riparian
15	1	--	--	8’	Good; wrapped around a box elder.	No	See 9	Riparian
16	--	--	1 (15”)	12’	Fair	Yes	Beneath 5th Street bridge deck.	Riparian/ Upland
17	--	1	--	10’	Good	No	See 16	Riparian/ Upland
18	--	--	1 (10”)	20’	Good	No	See 16	Riparian/ Upland
19	1	--	--	8’	Good	No	See 16	Riparian/ Upland
20	3	--	--	8’	Good	No	See 16	Riparian/ Upland
21	1	--	--	3’; leaning	Good	No	See 16	Riparian/ Upland
22	2	--	--	3’	Good	No	See 16	Riparian/ Upland
23	1	--	--	6’	Good	No	See 16	Riparian/ Upland
24	1	--	--	8’	Good	No	See 16	Non-riparian
25	6	1	--	8’	Good	No	See 16	Non-riparian

*Diameter measured at ground level

Environmental Consequences

Swainson’s Hawk

Swainson’s hawk was not observed during the April and July surveys, but could occur within the project vicinity. Due to the lack of suitable foraging habitat, surrounding development, and the abundance of suitable foraging and breeding habitat in the areas surrounding Yuba City and Marysville, Swainson’s hawk is not expected to be present in the BSA and no impacts to this species are anticipated. Further, by incorporating Measure BIO-6, if any nesting Swainson’s hawks are found, potential construction related impacts would be avoided or minimized.



V:\1858_5thStBridge\ISEA\F2.3.5-1_VELB survey_7-29-11.mxd

Source: Dokken Engineering 7/21/2011; Created By: A. Scudiere

0 100 200 300 400 Feet

FIGURE 2.3.5-1
Elderberry Shrub Locations
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

Fish Species (Green Sturgeon, Central Valley Steelhead, Central Valley Spring-Run Chinook Salmon)

A Biological Assessment was prepared which documented the anticipated impacts to fish species, a detailed project description including specific construction methodologies that would be used by the contractor for work in the Feather River, as well as the avoidance, minimization, and mitigation measures proposed to protect fish during construction. This document also included the determination that the proposed project may affect, is likely to adversely affect green sturgeon, steelhead, or Chinook salmon species. Further, project activities may adversely affect Critical Habitat for green sturgeon, steelhead, or Chinook salmon.

Project impacts to each of the three protected fish species are derived from two main categories: temporary construction-related impacts, and any permanent impacts that could affect each species. For this project, both temporary and permanent impacts for each of the three fish species would be the same; therefore, impacts and any associated avoidance, minimization and mitigation measures are discussed for all three species together. Construction-related impacts include a temporary increase in sedimentation and turbidity, temporary increase in underwater noise and vibrations from pile driving, stranded fish individuals in cofferdams, and harm to fish as a result of accidental hazardous materials and chemical spills. Permanent impacts would occur as a result of changes to the physical environment, most notably to the areas noted as critical habitat for the species.

Temporary Increase in Sedimentation and Turbidity

Increased sedimentation and turbidity resulting from project construction would be temporary and limited to a small portion of the river during construction of the temporary trestle and of the pier located within the live river channel. If turbidity testing shows that water quality levels have decreased to an unacceptable level, turbidity curtains will be used up- and/or down-stream of construction as necessary. This practice will be consistent with the requirements of the Section 401 Permit issued by the Central Valley RWQCB. Dewatering that occurs at the location of each new pier column should be treated to ensure that when water is discharged back into the river it is at acceptable turbidity and pH levels. Settling tanks will be used for all water that is removed at the pier locations and elsewhere as necessary. As part of the Section 402 NPDES Compliance permit discussed under Measure BIO-5, a Stormwater Pollution Prevention Plan (SWPPP) would be implemented to ensure all BMPs for water quality are performed during construction activities. In addition, restricting the in-channel activities to the low flow period between June 1 through October 1, would minimize sediment inputs and avoid the period of peak abundance of the three fish species juveniles. Measures are provided below which would minimize potential impacts as a result of temporary increases in sedimentation and turbidity.

Temporary Increase in Underwater Noise and Vibrations from Pile Driving

Adult and juvenile fish may be present in the project area during construction activities in the live river channel. Green Sturgeon most commonly migrate through the construction area March through November, with the highest likely abundance occurring between April and June. Central Valley Steelhead most commonly migrate through the construction area between September and April. Central Valley Spring-run Chinook salmon most commonly migrate through the construction area between March through June. It is expected that pile driving would expose some fish to underwater sound that may adversely affect those individuals. Given that adult fish species would be migrating through the project area, pile driving noise and associated activities

are anticipated to temporarily harass individuals, causing them to actively move away from the construction area. Injury or mortality is considered much less likely than temporary harassment.

Fish Stranding in Cofferdams

Closure of a cofferdam may trap fish that would ultimately die from stress, injury, and mortality caused by poor water quality, predation, dewatering, or construction activities within the cofferdam. Juvenile fish are most susceptible to entrapment because of their slower escape response and tendency to remain along shallow river margins. No juvenile rearing habitat was identified within the project area so occurrences of juveniles of the three protected fish species are expected to be low.

Harm to Fish as a Result of Accidental Hazardous Materials and Chemical Spills

Construction related activities could potentially impair water quality if hazardous chemicals (e.g. fuels and petroleum-based lubricants) or other construction materials are spilled or otherwise enter the Feather River. In general, construction-related chemical spills could potentially affect fisheries and aquatic resources by causing physiological stress, reducing biodiversity, altering primary and secondary production, interfering with fish passage, and causing direct mortality.

Valley Elderberry Longhorn Beetle

A Biological Assessment was prepared which documented the anticipated impacts to VELB habitat, as well as the avoidance, minimization, and mitigation measures proposed to offset potential direct and indirect impacts to VELB and its habitat. This document also made the determination that the proposed project may affect, and is likely to adversely affect VELB.

The project would require removal of 12 elderberry shrubs greater than or equal to 1 inch currently growing beneath the 5th Street Bridge. The shrubs that would be impacted by the project include shrubs 1, 2, 3, 16, 17, 18, 19, 20, 21, 22, 24, and 25 (see Table 2.3.5-1 above).

One of the 12 shrubs requiring removal, shrub 16, was observed to have old VELB exit holes on several dead stems; no exit holes were observed on living elderberry tissues. In compliance with USFWS 1999 guidelines, elderberry shrubs beneath the existing 5th Street Bridge structure shall be transplanted where practicable. Should a shrub be unlikely to survive transplantation because of poor condition or location, or be extremely difficult to move because of access problems, mitigation credits shall be purchased at three times the final calculated credit for those shrubs to offset the additional habitat loss.

As the project is outside VELB designated Critical Habitat and no past or current VELB emergence holes were identified on living elderberry tissues, the project is not expected to directly impact the VELB. However, the presence of old emergence holes on dead elderberry branches indicate the scattered, loosely clumped elderberry shrubs may provide habitat for VELB.

Considering many of the observed elderberry plants occur beneath the 5th Street Bridge, most impacts would be direct, with the exception of 13 shrubs located between the existing bridge structure and the railroad structure. Indirect impacts to shrubs would be limited to dust accumulation and the additional disturbance to riparian habitat. However, avoidance,

minimization and mitigation measures have been incorporated into the project design to offset potential indirect impacts to VELB.

Avoidance, Minimization and/or Mitigation Measures

Swainson's Hawk

Incorporation of measure BIO-6 would ensure that potential construction impacts to Swainson's hawk during are not substantial and are minimized to the greatest extent practicable.

Fish Species (Green Sturgeon, Central Valley Steelhead, Central Valley Spring-Run Chinook Salmon)

Consistent with the requirements of Section 7 of the Endangered Species Act, Caltrans initiated Section 7 Consultation with the National Marine Fisheries Service for potential impacts to Green Sturgeon, Central Valley Steelhead, and Central Valley Spring-run Chinook salmon. Caltrans requested initiation of Formal Consultation with the NMFS on October 22, 2012. NMFS deemed the formal consultation package from Caltrans complete on July 23, 2013 and initiated formal consultation. On May 19, 2014, NMFS issued a Biological Opinion that the project Is Likely to Adversely Affect, but Not Likely to Jeopardize Green Sturgeon, Central Valley Steelhead, and Central Valley Spring-Run Chinook Salmon. Furthermore, the project May Effect, but is Not Likely to Adversely Destroy or Modify designated critical habitat for these three fish species. Lastly, the project will adversely affect the essential fish habitat of Pacific salmon in the action area. The Biological Opinion and a full record of consultation with NMFS is included under Appendix G.

The project has been designed to utilize vibratory driving methods to the greatest extent practicable and would restrict all pile driving effects to what is necessary during temporary trestle pile installation. Based on initial geotechnical information, it is anticipated that the temporary trestle can be installed almost entirely with vibratory methods. Measures BIO-12, BIO-15 and BIO-16 are included to reduce the potential for noise related impacts to each of the special status fish species to the greatest extent possible.

Measures BIO-12 and BIO-13 would minimize potential adverse effects on the three fish species from potential entrapment. These measures propose to restrict the work window within the live channel of the river and to prepare and implement a fish salvage plan to recover and relocate any individuals entrapped in a cofferdam.

The City would minimize the potential for accidental spills of hazardous, toxic, or petroleum substances and the potential for these substances to adversely affect fish and other biological resources by requiring the construction contractor to prepare a Spill Prevention Control and Countermeasure Plan.

Avoidance, minimization, and mitigation measures are included in the Biological Opinion from NMFS to protect fish during construction and are included below.

Measure BIO-12: All construction work that will take place in the live channel shall occur between June 1-October 1 during the summer low-flow period to minimize potential exposure of juveniles to pile driving noise/vibration, and to minimize fish entrapment within cofferdams.

Measure BIO-13: A qualified biologist shall prepare and implement a fish salvage plan to recover any individuals entrapped in cofferdams. The fish salvage plan shall receive approval from NMFS prior to initiating any in-channel work. At a minimum, the plan will incorporate the following:

- Provide for the collection, transfer, and release of all entrapped sensitive fish by a qualified biologist to a designated location downstream of project activities;
- A record of the electrical conductivity, temperature (water and air), and pH within both the enclosure and within the free flowing river; and,
- Ensure all rescued sensitive fish be kept in aerated water and at appropriate temperatures at all times prior to release.

At a minimum, four fish rescues will be implemented as described in the prepared fish salvage plan above, and must be provided during the following activities:

- Season 1 – After partial dewatering, a rescue event following construction of each temporary encasement at Pier 2 (to include each column, three total, at Pier 2) and a rescue event at Pier 3 (to include each column, 3 total, at Pier 3); and
- Season 2 – After partial dewatering, a rescue for each of the temporary water diversions (Phase 1 and Phase 2)

Additional fish rescues will be required for any new locations or actions not specified above requiring diversions or dewatering to prevent entrapment of sensitive fish.

Measure BIO-14: To minimize the potential for accidental spills of materials hazardous to the aquatic environment, a Spill Prevention Control and Countermeasure Plan shall be prepared.

Measure BIO-15: Any piles driven into the river channel for use as a temporary construction trestle shall be installed using vibratory driving to the greatest extent possible. If use of an impact hammer cannot be avoided, a hydraulic hammer shall be used. The force of the hammer blow can be controlled with hydraulic hammers, and reducing the impact force would reduce the intensity of the resulting sound.

Measure BIO-16: Prior to construction, an acoustical monitoring plan shall be prepared by a qualified biologist. The acoustical monitoring plan shall receive approval from NMFS prior to in-channel work and shall be implemented during all vibratory and impact pile driving activities. At a minimum, the plan will incorporate the following:

- Daily acoustical monitoring by a qualified biologist during all pile driving activities;
- Measurement of underwater background levels using current NMFS methodology;
- Require equipment for underwater sound monitoring (hydrophone, signal amplifier, and calibrator) to utilize current National Institute of Standards and Technology traceable calibration methodology;

- Require a minimum recordation distance of 10 meters from each pile being monitored; and,

- The monitoring biologist may stop work if observed migrating fish are stunned or otherwise directly impacted by noise and vibration from pile driving. Work shall not resume until the fish clears the construction area under its own power, or through collection and release by the qualified fish biologist.

Measure BIO-17: Contract specifications will include the following BMPs, where applicable, to reduce erosion during construction.

- Implementation of the Project will also require approval of a site-specific SWPPP that would implement effective measures to protect water quality, which may include a hazardous spill prevention plan and additional erosion prevention techniques.

- Scheduling. A specific work schedule will be implemented to coordinate the timing of land disturbing activities and the installation of erosion and sedimentation control practices to reduce on-site erosion and off-site sedimentation.

- Preservation of Existing Vegetation. Existing vegetation shall be protected in place where feasible to provide an effective form of erosion and sediment control, as well as watershed protection, landscape beautification, dust control, pollution control, noise reduction, and shade.

- Mulching. Loose bulk materials shall be applied to the soil surface as a temporary cover to reduce erosion by protecting bare soil from rainfall impact, increasing infiltration, and reducing runoff.

- Soil Stabilizers. Stabilizing materials shall be applied to the soil surface to prevent the movement of dust from exposed soil surfaces on construction sites as a result of wind, traffic, and grading activities.

- Slope Roughening/Terracing/Rounding. Roughening and terracing will be implemented to create unevenness on bare soil through the construction of furrows running across a slope, creation of stair steps, or by utilization of construction equipment to track the soil surface. Surface roughening or terracing reduces erosion potential by decreasing runoff velocities, trapping sediment, and increasing infiltration of water into the soil, aiding in the establishment of vegetative cover from seed.

Measure BIO-18: The City shall prepare a riparian restoration plan to be reviewed and approved by CDFW, the CVFPB, and any other applicable agencies. This plan will include restoration of areas impacted by the proposed project, as well as areas that have been disturbed from previous activities or events.

Measure BIO-19: In-channel work shall not be conducted at night to afford fish quiet, unobstructed passage during night time migratory hours.

Measure BIO-20: The number and size of piles will be limited to the minimum necessary to meet the engineering and design requirements of the project.

Measure BIO-21: Prior to initiating construction, environmentally sensitive area fencing will be installed along the construction limits to prevent encroachment into the riparian areas adjacent to the construction site.

Measure BIO-22: Project activities that may affect the flow of the river through placement of fill, bridge construction, or dewatering of the channel must comply with the 2001 *NMFS Guidelines for Salmonid Passage at Stream Crossings*, where applicable. The guidelines include but are not limited to:

- A minimum water depth (12 inches for adults and six inches for juveniles) at low fish passage;
- A maximum hydraulic drop of one foot for adults and six inches for juveniles;
- Avoidance of abrupt changes in water surface and velocities; and,
- Structures shall be aligned with the stream, with no abrupt changes in flow direction upstream or downstream of the crossing.

Measure BIO-23: All water pumped or otherwise withdrawn from the river must comply with *1997 NMFS Fish Screening Criteria for Anadromous Salmonids*, where applicable, to avoid entrapment of the fish. The criteria include but are not limited to the following:

- Screen design must provide for uniform flow distribution over the surface of the screen;
- Screen material openings must not exceed 3/32 inch for fry sized salmonids and shall not exceed ¼ inch for fingerling sized salmonids;
- Where physically practical, the screen must be constructed at the diversion entrance. The screen face should be generally parallel to river flow and aligned with the adjacent bankline; and,
- The design approach velocity must not exceed 0.33 feet per second for fry sized salmonids or 0.8 feet per second for fingerling sized salmonids; and the screen design must provide for uniform flow distribution over the surface of the screen.

It is anticipated that the exact specification requirements for fish screening equipment will be determined by the on-site fish biologist monitor in accordance with the 1997 NMFS criteria described above.

Measure BIO-24: A bubble curtain shall be utilized to attenuate noise and vibration when other, more effective attenuation cannot be provided (such as a dewatered coffer dam).

Valley Elderberry Longhorn Beetle

Consistent with the requirements of Section 7 of the Endangered Species Act, Caltrans initiated Section 7 Consultation with the USFWS for potential impacts to VELB on January 9, 2012. A Biological Assessment was prepared which documented the anticipated impacts to VELB and its habitat, as well as the avoidance, minimization, and mitigation measures proposed to protect the species during construction. On May 10, 2013 the USFWS provided a Biological Opinion

that the project is likely to adversely affect VELB in the project area. The Biological Opinion included the following conservation measures to reduce potential adverse effects to VELB.

Measure BIO-25: The City of Yuba City will compensate for the effects of the proposed project on the beetle by transplanting 12 elderberry shrubs during the recommended transplant window, November 1 to February 15. The shrubs will be transplanted to the River Ranch Conservation Bank, or another USFWS approved conservation bank, and a total of 10 VELB mitigation credits will be purchased.

Measure BIO-26: If any of the 12 elderberry shrubs that are proposed for transplantation are unlikely to survive transplantation because of poor condition or if any of the shrubs cannot be safely removed due to access problems since they are in such close association with the existing 5th Street Bridge, the proposed compensation ratios will be doubled (for that individual shrub) to offset the additional habitat loss.

Measure BIO-27: Due to the proximity of the 13 avoided elderberry shrubs to the existing bridge and railroad structure, a 20-foot construction zone will not be feasible during demolition activities. Therefore, a modified construction zone will be installed by placing fencing around each elderberry shrub. The fencing will be placed at the drip line of each shrub in closest proximity to the existing bridge or railroad structure and will taper out to the 20-foot zone recommended for the remainder. A USFWS approved biologist will be present during the installation of fencing.

Measure BIO-28: Prior to the commencement of construction activities, fencing will be installed along Environmentally Sensitive Area (ESA) boundaries to prevent encroachment into the riparian areas adjacent to the construction site.

Measure BIO-29: Contractors will be provided with environmental awareness training, which will brief them on the need to avoid damage to the elderberry shrubs and the possible penalties for not complying with these requirements.

Measure BIO-30: A USFWS approved biologist will periodically monitor construction activities to ensure elderberry shrubs within the action area are not disturbed.

Measure BIO-31: Elderberry shrubs within 100 feet of construction activities will be rinsed with clean water once each week, or when necessary to remove dust caused by construction activities.

2.3.6 Invasive Species

Regulatory Setting

On February 3, 1999, President Clinton signed EO 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." FHWA guidance issued August 10, 1999 directs the use of the State’s invasive species list currently maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the NEPA analysis for a proposed project.

Affected Environment

Based on the California Invasive Plant Council Inventory Database for the Sacramento Valley floristic province, the following non-native species observed during biological surveys are listed in Table 2.3.6-1 below:

Table 2.3.6-1: Non-Native Plant Species Observed in the BSA

Scientific Name	Common Name	Invasiveness Rating
Alianthus altissima	Tree of heaven	Moderate
Brassica nigra	Black mustard	Moderate
Bromus diandrus	Ripgut brome	Moderate
Cirsium vulgare	Bull thistle	Moderate
Conium maculatum	Poison hemlock	Moderate
Erodium cicutarium	Red stemmed filaree	Limited
Eucalyptus globulus	Blue gum	Moderate
Ficus carica	Common fig	Moderate
Geranium dissectum	Cutleaf geranium	Moderate
Medicago polymorpha	Bur clover	limited
Nicotiana glauca	Tree tobacco	Moderate
Plantago lanceolata	English plantain	Limited
Rubus armeniacus	Himalayan blackberry	High
Rumex crispus	Curly dock	Limited
Silybum marianum	Blessed milkthistle	Limited
Vulpia myuros	Rat tail fescue	Moderate

Environmental Consequences

Construction activities and soil disturbance from the proposed project could result in the introduction and spread of noxious weeds and other invasive plants, as could inappropriate erosion control measures. Erosion control measures such as use of straw bales and seed can also result in the inadvertent introduction of invasive plants to the project area. The project area already is moderately impacted by non-native species, and no new invasive species should be introduced. Measures to avoid, minimize, and compensate for the introduction and spread of additional noxious weeds are discussed below.

Avoidance, Minimization and/or Mitigation Measures

To reduce the risk of spreading noxious weeds, the following measures would be implemented:

Measure BIO-32: All landscaping and revegetation shall consist of Yuba City approved plants or seed mixes from native, locally adapted species.

Measure BIO-33: Prior to arrival at the project site and prior to leaving the project site, construction equipment that may contain invasive plants and/or seeds shall be cleaned to reduce the spreading of noxious weeds.

2.4 Cumulative Impacts

Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this proposed project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under the NEPA, can be found in 40 CFR, Section 1508.7 of the CEQ Regulations.

Affected Environment

The cumulative impact analysis included in this section is based on projects that are currently proposed, approved, or under construction within Yuba City and Marysville, or within a two-mile radius of the project area. A current list of projects included in the cumulative analysis is presented in Table 2.4-1.

Table 2.4-1: Planned and Future Development in the Project Vicinity

Project/Activity	Jurisdiction	Project/Action Summary	Status
Yuba City Feather River Fish Screen	Yuba City	This project includes an upgrade and expansion of the Yuba City Water Treatment Plant and intake structure on the Feather River.	Construction in Progress
SR 70 and 20 Pavement Improvements	Caltrans	Improve pavement within Marysville for the SR 70 and 20 facilities.	Construction in Progress
SR 70 Marysville Levee Bypass	Caltrans	New bypass route for SR 70 along the Marysville Ring Levee to bypass the traffic signals through town.	Project Initiation

Project/Activity	Jurisdiction	Project/Action Summary	Status
Feather River Parkway Project	Yuba City	Construction of a new park along the Feather River in the Willow Island area approximately 70 acres in size. The project includes the construction of walking and biking trails, picnic benches, and other items of work.	Construction in Progress
Feather River Mills Development	Yuba City	Residential Development	Preliminary Planning

Environmental Consequences

Transportation projects and other actions requiring federal approval are generally subject to laws and permit processes requiring consideration of and mitigation for impacts to special-status species and their habitats; wetlands/water of the U.S.; to water quality, cultural resources; and parklands. These laws and requirements assure that impacts of such undertakings would be fully mitigated. Minimization and mitigation for these projects ensure that they have no contribution to cumulative impacts.

With these projects and the 5th Street Bridge Replacement Project, there are several environmental resources that could be subject to cumulative impacts. Only environmental resources that have potential to incur project specific impacts are discussed below.

Community Impacts

Resource Study Area

The resource study area for community impacts is intended to encompass an area where population and housing impacts due to the project could reasonably occur. Specifically, the communities and businesses located directly adjacent to the project area.

Direct Impacts to Resources of Concern

The Build Alternative would require minor amounts of property acquisitions, both from partial and full takes, adjacent to existing project ROW. The project would result in minor increases in noise, minor changes to visual quality, improvement in traffic operations, and improvement in air quality.

Indirect Impacts to Resources of Concern

Construction of the proposed project would occur concurrently with other ongoing and planned projects in the vicinity. The Build Alternative may result in reductions in traffic congestion and improved LOS in the project area as well as increased traffic safety. The proposed project would have no negative impacts to long-term additional employment, income, housing opportunities, and business opportunities in the region. Other projects in the resource study area that are improving road conditions would contribute to improving the overall transportation network of the region.

Cumulative Impacts

All of the relevant projects planned for the project area are consistent with land use policies and designations for the Yuba City and Marysville General Plans. Planned development in the project vicinity, in conjunction with the Build Alternative, would not result in adverse cumulative community impacts. The Build Alternative would result in the displacement of three businesses that would require relocation; however, this does not constitute a cumulative impact when considering other projects in the area and the large numbers of available relocation opportunities. No other known projects in the study area are proposing to displace businesses. Consequently, available commercial property for any relocation associated with this project would be available. The proposed project would not induce unplanned growth or have cumulative effects beyond those already envisioned and planned for in the Yuba City and Marysville General Plans. Thus, no cumulative impacts are anticipated with respect to community impacts.

Utilities/Emergency Services

Resource Study Area

The resource study area for utilities/emergency services is intended to cover all areas that are being provided services by the utilities/emergency services used within the proposed project area. For utilities, this consists of all water, telephone and cable, high-pressure gas, sewer, communication, manhole/water valve, and telecom facilities. For emergency services, this area consists of all fire, police, and ambulance services.

Direct Impacts to Resources of Concern

The proposed project would accommodate for all utilities to be relocated within the project area with minimal interruption of services to customers. Also, the proposed project would not result in a need for any additional water supplies, nor would it generate a substantial amount of wastewater. Adequate fire, police, and ambulance services are currently being provided in the resource study area. A result of this project would be improved response times for these emergency services due to increased access reliability since an accident would be less likely to cause a full bridge closure.

Indirect Impacts to Resources of Concern

Construction activities of one or more of the projects have the potential to result in temporary, localized, site-specific disruptions, including partial lane closures, and detours. This could lead to an increase in delay times for emergency response vehicles during construction. The potential for disruption or obstruction of emergency services access in the project area to occur as a result of construction activities would be avoided with the preparation of a Transportation Management Plan. The plan would take into consideration other projects being constructed nearby the project area and in the 5th Street Bridge transportation region. Cumulative impacts are not anticipated. If they occur, they would be minor and temporary.

Cumulative Impacts

Continued development in the project area as envisioned by the Cities' General Plans would create additional demand for local utility and emergency services. The development review process in each jurisdiction requires that prior to development approval, adequate utility service

is provided to each project. In addition, each project is reviewed by emergency service providers to ensure that adequate services can be provided, and if not, appropriate mitigation is required. Due to the extensive review process, there are adequate utilities and emergency services to accommodate for the proposed project and all other planned projects in the resource study area. There would not be a cumulative impact on these services.

Traffic and Transportation/Pedestrian and Bicycle Facilities

Resource Study Area

The resource study area for traffic and transportation as well as pedestrian and bicycle facilities include the routes within, and adjacent to, the project area. This includes 5th Street, J Street, and SR 70 in Marysville, Bridge Street, Sutter Street, Boyd Street, Shasta Street, and SR 99 in Yuba City, and connections to the greater transportation area network.

Direct Impacts to Resources of Concern

In recent years Yuba City and Marysville have experienced an increase in growth. As a result, there are many planned improvements needed within the transportation network to accommodate for the additional traffic. The traffic analysis for the proposed project is based on future traffic conditions in the year 2035, which account for future development in the project area. As a result, the analysis contained in Section 2.1.5 constitutes the operational cumulative analysis for the proposed project.

Indirect Impacts to Resources of Concern

Construction activities of this project have the potential to result in temporary, localized, site-specific disruptions, including partial lane closures, and detours. This could lead to an increase in delay times for vehicles during construction. No road closures are anticipated for the proposed project. The potential for disruption or obstruction of access in the project area would be avoided with the preparation of a Transportation Management Plan that takes into consideration any other projects being constructed in the vicinity that could have the potential to contribute to cumulative construction impacts. While bicycle facilities are being constructed, cyclists would be able to continue to use the existing Class I facility over the existing 5th Street Bridge. When feasible, pedestrian facilities would be maintained to ADA standards during construction. As a result, construction of the proposed project would not contribute to any substantial impacts on pedestrian or bicycle transportation. Cumulative impacts are not anticipated.

Cumulative Impacts

Permanent cumulative effects would be beneficial, as the project would improve levels of service on the transportation facilities in the project area. The Transportation Management Plan would minimize the potential for cumulative traffic impacts associated with construction activities.

Visual Resources

The Build Alternative does not have the potential to substantially impact visual resources in the project area. The project would necessitate the removal of some riparian habitat but would not

substantially degrade or change the visual character in the project area. As a result, there is no potential for cumulative impacts to visual resources.

Water Quality and Stormwater Runoff

Resource Study Area

The resource study area for water quality and stormwater runoff is the Lower Feather River and Gilsizer Slough watersheds.

Direct Impacts to Resources of Concern

The proposed project, in combination with other roadway improvements and development in the area, would contribute to increased pollutants in stormwater runoff that if not addressed could adversely affect local and regional surface water quality. BMPs would be implemented in compliance with the NPDES permit requirement to minimize the potential for impacts to water quality, including the violation of any water quality standard or waste discharge requirement. It is not anticipated that there would be a measurable increase in the amount of waterborne pollutants existing on the proposed project site with the implementation of the identified minimization measures; therefore, the potential for cumulative impacts would be minimal. It is further assumed that other large scale projects would be required to comply with NPDES regulations, thus reducing their potential for water quality impacts.

Indirect Impacts to Resources of Concern

Construction of the proposed project, in the context of simultaneous construction of other nearby projects, could have a temporary adverse additive cumulative impact on water quality. Strict adherence to permit conditions and stormwater pollution prevention plans would be required. With implementation of the above avoidance, minimization, and mitigation measures in conjunction with acquisition of the necessary water quality permits (in particular Section 402 of the CWA), no cumulatively considerable contribution to the degradation of surface waters within the region are anticipated from the proposed project.

Cumulative Impacts

The project would create additional impervious surfaces relative to natural soil, thereby increasing the velocity and volume of flow draining to the discharge channel and receiving waters. However, the project includes substantial stormwater drainage improvements including formalizing a detention basin on the Yuba City side of the project and draining all bridge and roadway runoff into that basin. These permanent improvements, combined with the preparation of a SWPPP, consistent with Section 402 of the Clean Water Act, would ensure the project would not contribute to cumulative water quality impacts.

Hazardous Waste/Materials

Resource Study Area

The resource study area for hazardous waste/materials includes the project site and the properties immediately adjacent.

Direct Impacts to Resources of Concern

Historically, hazardous waste/materials were used during construction; specifically hazards such as lead and asbestos. Projects in the area that have demolished or modified structures constructed prior to 1978 (use of lead) or 1981 (use of asbestos) have potentially encountered hazardous materials. The proposed project, in combination with other projects in the area, has the potential to spread or release of hazardous materials, which could affect nearby residents and businesses. However, this project would not contribute to any cumulative impacts because any potential effects would be addressed through testing and remediation required under CEQA, NEPA, and other regulatory agencies and implementation of standard minimization measures including cleanup requirements for individual projects that may encounter contaminated soil or groundwater.

Indirect Impacts to Resources of Concern

Any contaminated material encountered during the construction of the proposed project or any of the others in the vicinity would be handled, transported, and disposed in accordance with all applicable laws, regulations, and agency oversight.

Cumulative Impacts

Any contaminated material encountered during the construction of the project or any of the others in the vicinity would be handled, transported, and disposed in accordance with all applicable laws, regulations, and agency oversight, cumulative adverse impacts are not anticipated.

Air Quality

Resource Study Area

The resource study area for air quality is considered the FRAQMD.

Direct Impacts to Resources of Concern

Historically, air quality was a concern that resulted in the U.S. EPA enforcing the FCAA of 1970 (with amendments in 1977 and 1990). Yuba City and Marysville are currently designated as a NAAQS nonattainment area for $PM_{2.5}$ and a CAAQS nonattainment area for Ozone and PM_{10}.

The proposed project is listed in the conforming 2009/2012 MTP and MTIP. The proposed project meets the Regional- and Project-Level Air Quality Conformity requirements. The air quality analysis discussed is based on future traffic conditions in the year 2035, which accounts for development in the project area and region as envisioned in local General Plans, SACOG Projections, and the roadway improvements listed in the MTP and MTIP. In addition, the proposed project would alleviate congestion in the project area, improving air quality.

Indirect Impacts to Resources of Concern

Air quality impacts during construction of the 5th Street Bridge Replacement Project would not be substantial due to the relative scale of the project. Measures for air quality and dust control during construction, as stipulated by the AQMD and Caltrans Standard Specifications Section 7-1.01F and Section 10 of the Caltrans Standard Specifications (2010), would also be

implemented as necessary to ensure the proposed project does not contribute to cumulative impacts on air quality. The City of Yuba City will implement Caltrans Standard Specifications to be used as air quality best management practices.

Cumulative Impacts

Analysis contained in Section 2.2.5 constitutes the operational cumulative analysis for the proposed project and finds that implementation of the project would not result in any cumulative impacts.

Noise

Resource Study Area

The resource study area for project-related noise impacts includes the project site and properties immediately adjacent.

Direct Impacts to Resources of Concern

Noise in the resource study area is made up predominantly of vehicle noise on 5th Street, Bridge Street, and the adjacent transportation network. Ambient noise levels from the surrounding area were monitored and included in the project's noise model. The operational noise impact analysis proposed for the proposed project is predicated based on future traffic projections. These future projections assume other projects in the vicinity to be in place and functioning as planned. No additional cumulative impacts, therefore, are expected beyond those that are disclosed in the noise impact analysis. Noise from existing and proposed development and projects is incorporated into any decisions regarding noise abatement. Other planned development in the project area would also be required to include design features to mitigate or abate noise impacts.

Indirect Impacts to Resources of Concern

Noise from equipment required for constructing the proposed project could generate noise levels that would generally range from 80 to 85 dBA during peak periods at 50 feet from the center of construction activities. Construction of the proposed project in conjunction with other nearby projects could increase overall background noise levels; however, given the distance of the four closest projects surrounding the project area and the measures to minimize construction noise required on projects, it is unlikely that the proposed project would result in a cumulative impact.

Cumulative Impacts

On a cumulative level, vehicle-generated noise tends to be less substantial because noise dissipation occurs over a relatively short distance from the subject roads and impacts to sensitive receptors are limited to the project vicinity. No cumulative impacts are anticipated because the proposed project would not substantially change the current noise levels from the existing facilities.

Biological Environment

Resource Study Area

The resource study area for the biological environment consists of adjacent water resources and suitable habitat for the sensitive species that have the potential to occur within the project's BSA. Historically, as development has increased in the surrounding area, suitable habitat for these species has decreased.

Natural Communities, Plant and Animal Species

Direct Impacts to Resources of Concern

Implementation of the project would result in a loss of riparian habitat along the Feather River in order to construct the new bridge and demolish the old one. In conjunction with other projects such as the Yuba City Feather River Fish Screen Project, loss of this habitat could potentially constitute a cumulative impact to riparian habitat. Impacts to riparian habitat would be mitigated through a habitat restoration plan associated with impacts to Critical Habitat for the three federally listed fish species that migrate through the Feather River corridor. With incorporation of this mitigation, along with mitigation programs set up for the Yuba City Feather River Fish Screen Project, no cumulative impacts to natural communities, plant and animal species are expected to occur.

Indirect Impacts to Resources of Concern

Habitats present within the project site are judged low quality for protected species because of their proximity to residential, commercial, and parkland development as well as existing roads; therefore, many plants and animals potentially present are either relatively tolerant of human presence or are already being negatively affected by current conditions. Construction activities would result in the disturbance of habitats in the project area; however, activities would be confined by ESA fencing to as small of an area as possible. Vegetation would be trimmed, rather than removed, where possible. No sensitive habitats would be impacted outside of the disturbed Valley Foothill Riparian habitat as discussed. Construction would not have a cumulatively considerable contribution to the decline of sensitive habitats in the region. Other projects in the region would also be required (by USFWS, USACE, CDFW, and local jurisdictions) to avoid, minimize, and mitigate for construction impacts on habitats that are potentially suitable for protected species. Consequently, there would not be a cumulative impact on sensitive habitats.

Cumulative Impacts

The project proposes to mitigate for impacts to riparian habitat by restoring the habitat after completion of bridge construction. This habitat restoration would occur as part of the mitigation required due to Section 7 Consultation between Caltrans as the federal lead agency and NMFS for impacts to Critical Habitat for federally listed fish species that use the Feather River as a migration corridor. With this mitigation incorporated, no cumulative impacts are expected.

Threatened and Endangered Species

Direct Impacts to Resources of Concern

The project is expected to have direct impacts to federally listed VELB habitat through the removal of up to 12 elderberry shrubs within the project area.

The project has the potential to have direct impacts to federally listed Green Sturgeon, Central Valley Steelhead, and Central Valley Spring-run Chinook Salmon. Impacts could occur by entrapment within a cofferdam or diversion, noise and vibration impacts caused by pile driving, or increases in turbidity due to ground disturbance within the live river channel. The project would also impact Critical Habitat (riparian) for each of the listed fish species along the Feather River corridor.

Indirect Impacts to Resources of Concern

Indirect impacts could occur to VELB habitat adjacent to the project area. These impacts include increases in dust generation and impacts to adjacent riparian habitat. These impacts are expected to be minor and would be further minimized by measures that have been included with the proposed project.

Cumulative Impacts

Pursuant to the FESA, Section 7 Consultation between Caltrans (as the federal lead agency) and the USFWS (VELB) and NMFS (fish) has been initiated to evaluate the potential impacts this project could cause on sensitive species and their habitat within the project area. As part of this consultation process, the regulatory agencies would review the proposed construction activities and the proposed avoidance, minimization, and mitigation measures included as part of the project. If the proposed measures are not suitable, additional measures would be added and incorporated into the Final Environmental Document which would ensure that potential direct and indirect impacts are minimized to the greatest extent possible, and do not result in cumulative impacts to each of the federally listed species.

Invasive Species

Direct Impacts to Resources of Concern

Transportation corridors and construction activities provide opportunities for the spread of invasive species through the landscape. Non-native seed can inadvertently be introduced into the project area on equipment during construction and through the use of imported soil or mulch materials.

Indirect Impacts to Resources of Concern

No indirect impacts as a result of invasive species are anticipated.

Cumulative Impacts

Erosion control and landscaping designs for the proposed project would not contain species on the California list of noxious weeds in the plant selections or the seed mixtures. In order to reduce impacts from invasive species, Section 2.3.6 includes a discussion of avoidance,

minimization, and mitigation measures. These measures would reduce potential invasive species impacts and would ensure the project does not contribute to cumulative impacts.

2.5 Climate Change (CEQA)

For the purposes of this section, the City of Yuba City has chosen to adopt the Caltrans standards for assessing impacts to climate change under CEQA.

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988, has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light duty trucks, other trucks, buses, and motorcycles make up the largest source [second to electricity generation]) of GHG emitting sources. The dominant GHG emitted is CO_2, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change. "Greenhouse Gas Mitigation" is a term for reducing GHG emissions in order to reduce or "mitigate" the impacts of climate change. “Adaptation," refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels)[3].

There are four primary strategies for reducing GHG emissions from transportation sources: 1) improving the transportation system and operational efficiencies, 2) reducing growth of vehicle miles traveled (VMT), 3) transitioning to lower GHG emitting fuels, and 4) improving vehicle technologies. To be most effective all four strategies should be pursued collectively. The following Regulatory Setting section outlines state and federal efforts to comprehensively reduce GHG emissions from transportation sources.

Regulatory Setting

State

With the passage of several pieces of legislation including State Senate and Assembly bills and EOs, California launched an innovative and pro-active approach to dealing with GHG emissions and climate change.

[3] http://climatechange.transportation.org/ghg_mitigation/

Assembly Bill 1493 (AB 1493), Pavley. Vehicular Emissions: Greenhouse Gases, 2002: requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year. In June 2009, the U.S. EPA Administrator granted a Clean Air Act waiver of preemption to California. This waiver allowed California to implement its own GHG emission standards for motor vehicles beginning with model year 2009. California agencies will be working with federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger cars model years 2017-2025.

EO S-3-05: (signed on June 1, 2005, by former Governor Arnold Schwarzenegger) the goal of this EO is to reduce California's GHG emissions to: 1) year 2000 levels by 2010, 2) year 1990 levels by the 2020, and 3) 80 percent below the year 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

AB 32, the Global Warming Solutions Act of 2006, Núñez and Pavley: AB 32 sets the same overall GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that ARB create a scoping plan, (which includes market mechanisms) and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases."

EO S-20-06: (signed on October 18, 2006 by former Governor Arnold Schwarzenegger) further directs state agencies to begin implementing AB 32, including the recommendations made by the California's Climate Action Team.

EO S-01-07: (signed on January 18, 2007 by former Governor Arnold Schwarzenegger) set forth the low carbon fuel standard for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least ten percent by the year 2020.

Senate Bill 97 (SB 97) Chapter 185, 2007: required the Governor's Office of Planning and Research to develop recommended amendments to CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Caltrans Director's Policy 30 (DP-30) Climate Change (approved June 22, 2012): is intended to establish a Caltrans policy that will ensure coordinated efforts to incorporate climate change into Caltrans decisions and activities. This policy contributes to the Caltrans' stewardship goal to preserve and enhance California's resources and assets.

Federal

Although climate change and GHG reduction is a concern at the federal level; currently there are no regulations or legislation that have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the U.S. EPA nor the FHWA has promulgated explicit guidance or methodology to conduct project-level GHG analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process–from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will facilitate decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the state has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in the growth of vehicle hours travelled.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean Car Program" and EO 13514 - Federal Leadership in Environmental, Energy and Economic Performance.

EO 13514 is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also direct federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

On April 2, 2007, in Massachusetts v. EPA, 549 U.S. 497 (2007), the Supreme Court found that greenhouse gases are air pollutants covered by the Clean Air Act and that the U.S. EPA has the authority to regulate GHG. The Court held that the U.S. EPA Administrator must determine whether or not emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- **Endangerment Finding**: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6--in the atmosphere threaten the public health and welfare of current and future generations.

- **Cause or Contribute Finding**: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the U.S. EPA's Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles, which was published on September 15, 2009[4]. On May 7, 2010 the final *Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards* was published in the Federal Register.

U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations. These steps were outlined by President Obama in a Presidential Memorandum on May 21, 2010.[5]

[4] http://www.epa.gov/oms/climate/regulations.htm#1-1
[5] http://epa.gov/otaq/climate/regulations.htm

The final combined U.S. EPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, (the equivalent to 35.5 miles per gallon [MPG] if the automobile industry were to meet this CO_2 level solely through fuel economy improvements. Together, these standards will cut GHG emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

On November 16, 2011, U.S. EPA and NHTSA issued their joint proposal to extend this national program of coordinated greenhouse gas and fuel economy standards to model years 2017 through 2025 passenger vehicles.

Project Analysis

An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its *incremental* change in emissions when combined with the contributions of all other sources of GHG.[6] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines sections 15064(h)(1) and 15130). To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult, if not impossible, task.

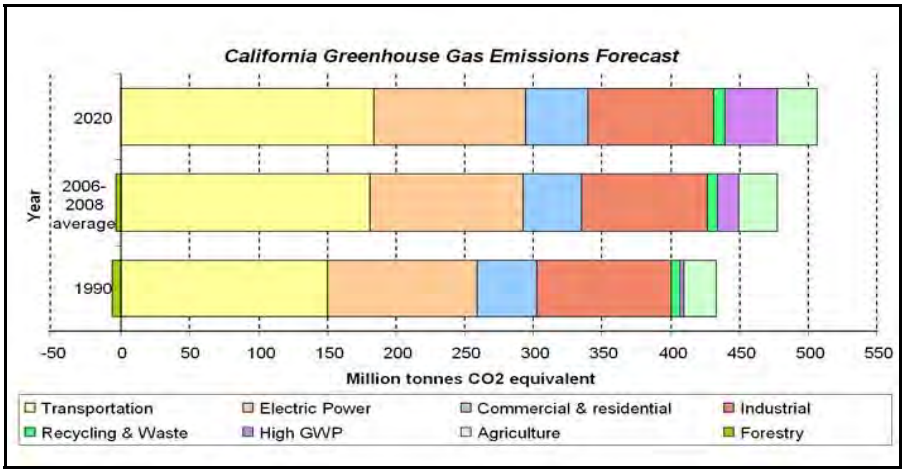
The AB 32 Scoping Plan mandated by AB 32 contains the main strategies California would use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, ARB released the GHG inventory for California (forecast last updated: October 28, 2010). The forecast is an estimate of the emissions expected to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.[7]

[6] This approach is supported by the AEP: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the US Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

[7] Caltrans Climate Action Program is located at the following web address: http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf

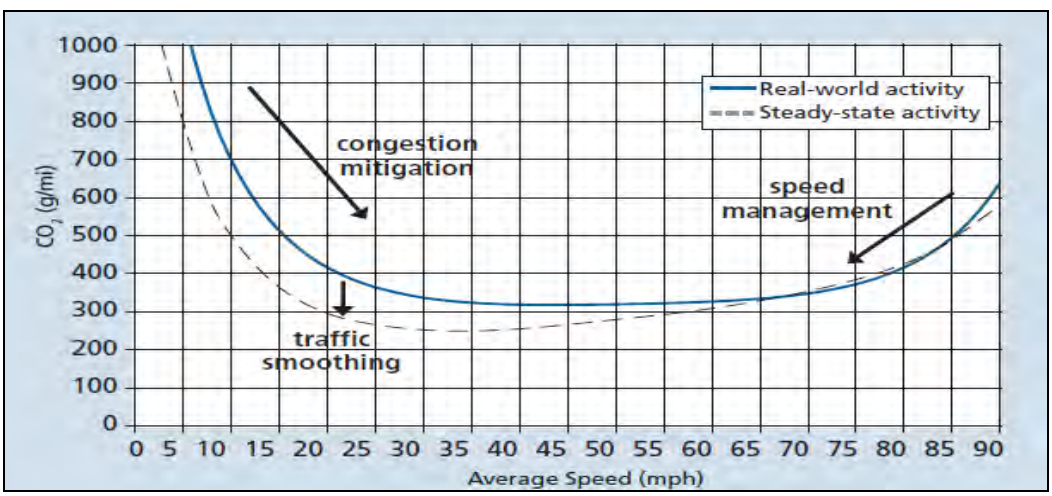
Figure 2.5-1: California Greenhouse Gas Forecast



Source: http://www.arb.ca.gov/cc/inventory/data/forecast.htm

One of the main strategies in Caltrans' Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of CO_2 from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 mph) and speeds over 55 mph; the most severe emissions occur from 0-25 mph (see Figure 2.5-2). To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors GHG emissions, particularly CO_2, may be reduced.

Figure 2.5-2: Possible Effect of Traffic Operation Strategies in Reducing On-Road CO2 Emissions[8]



[8] **Traffic Congestion and Greenhouse Gases:** Matthew Barth and Kanok Boriboonsomsin(TR News 268 May-June 2010)<http://onlinepubs.trb.org/onlinepubs/trnews/trnews268.pdf>

The 5th Street Bridge Replacement Project has been designed, in part, to reduce congestion and vehicle time delays in the larger transportation network between Yuba City and Marysville. The 2011 Traffic Study prepared for the project by Fehr and Peers identifies that the proposed project is expected to reduce VMT by one percent and notes that a smaller percentage of this VMT occurs at speeds of less than 15 mph. This is important because lower travel speeds are known to generate higher levels of GHG per mile driven. As a result, a qualitative analysis of the project yields improvements to GHG emissions when compared with the No-Build Alternative.

Quantitative Analysis

While LOS would become worse without the project, the proposed project traffic volumes are not expected to substantially change for regional transit based on the Build versus No-Build Alternatives. The proposed project would not generate new trip sources or destinations but would only increase capacity and transportation efficiency along 5th Street, Bridge Street, and the surrounding roadway network. While a minor reduction in VMT would slightly improve GHG emissions, the No-Build Alternative and Build Alternative are expected to generate roughly the same amount of CO_2.

Using EMFAC, CO_2 emissions were estimated comparing the existing condition and future conditions for the No-Build and Build. Table 2.5-1 shows the ADT levels for traffic handled by 5th Street Bridge and SR-20. The existing ADT for this area is 74,000 and in the design year is anticipated to be 170,000 due to growth in the area. Since the project diverts traffic volumes from SR-20, CO_2 emissions are anticipated to be similar with or without the project at 0.35 tons/day in 2035.

Table 2.5-1: Quantitative CO2 Emissions

Study Segment	Year 2015		Year 2035	
	Build Alternative	No Build Alternative	Build Alternative	No Build Alternative
5th Street Bridge	0.16 tons/day	0.16 tons/day	0.35 tons/day	0.35 tons/day

Note: Modeled using EMFAC 2007, Burden Mode; Calculated for the summer season. EMFAC output data included in 5th Street Bridge Air Quality Study

These CO_2 emissions numbers are only useful for a comparison between alternatives. The numbers are not necessarily an accurate reflection of what the true CO_2 emissions would be because CO_2 emissions are dependent on other factors that are not part of the model such as the fuel mix (EMFAC model emission rates are only for direct engine-out CO_2 emissions not full fuel cycle; fuel cycle emission rates can vary dramatically depending on the amount of additives like ethanol and the source of the fuel components), rate of acceleration, and the aerodynamics and efficiency of the vehicles.

Construction Emissions

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include

emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions would be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. To reduce construction emissions, the proposed project would incorporate Measures AQ-1 and GHG-1.

CEQA Conclusion

While construction would result in a slight increase in GHG emissions, it is anticipated that any increase in GHG emissions due to construction would be offset by no additional increases in local GHG emissions and improvement in regional operational GHG emissions. While it is Yuba City's determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct impact and its contribution on the cumulative scale of climate change, Yuba City is firmly committed to implementing measures to help reduce GHG emissions. These measures are included in the Section 2.2.5 Air Quality, as well as in the following section below.

Greenhouse Gas Reduction Strategies

AB 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as ARB works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Former Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a $222 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including $100.7 billion in transportation funding during the next decade. The Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in GHG emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together are expected to reduce congestion. The Strategic Growth Plan relies on a complete systems approach to attain CO_2 reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as depicted in The Mobility Pyramid.

Mobility Pyramid

Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high density housing along transit corridors. Caltrans works closely with local jurisdictions on planning activities but does not have local land use planning authority. Caltrans assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by U.S. EPA and ARB.

Table 2.5-2 summarizes Caltrans and statewide efforts that Caltrans is implementing in order to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

To the extent that it is applicable or feasible for the proposed project and through coordination with the PDT, the following measures would also be included in the proposed project to reduce the GHG emissions and potential climate change impacts from projects. In addition to the following measure, the proposed project shall comply with Measures BIO-2, BIO-3, BIO-18, and BIO-25 which concern revegetation and landscaping. These measures would help reduce surface warming and, through photosynthesis, decrease CO_2.

Measure GHG-1: Energy efficient lighting, such as LED traffic signals and street lights, will be used when possible.

Adaptation Strategies

"Adaptation strategies" refer to how Caltrans and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects would vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the White House CEQ, the Office of Science and Technology Policy (OSTP), and the NOAA, released its interagency report on October 14, 2010 outlining recommendations to President Obama for how Federal Agency policies and programs can better prepare the U.S. to respond to the impacts of climate change. The Progress Report of the Interagency Climate Change Adaptation Task Force recommends that the federal government implement actions to expand and strengthen the nation's capacity to better understand, prepare for, and respond to climate change.

Table 2.5-2: Climate Change/CO2 Reduction Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Inter-governmental Review (IGR)	Caltrans	Local Govern-ments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stake-holders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements and Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.07	2.17
Mainstream Energy and GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational and Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening and Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 0.36	4.2 3.6
Goods Movement	Office of Goods Movement	CalEPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					**2.72**	**18.18**

Source: Department of Transportation Standard Environmental Reference, 2012

Climate change adaption must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts would help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, former Governor Arnold Schwarzenegger signed EO S-13-08 which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea level rise.

The California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state and federal public and private entities to develop. The California Climate Adaptation Strategy (Dec 2009)[9], which summarizes the best known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to EO S-13-08 that specifically asked the Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the California Environmental Protection Agency; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continues to be developed and collected, the state's adaptation strategy would be updated to reflect current findings.

The Resources Agency was also directed to request the National Academy of Science to prepare a Sea Level Rise Assessment Report by December 2010[10] to advise how California should plan for future sea level rise. The report is to include:

- Relative sea level rise projections for California, Oregon and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates.
- The range of uncertainty in selected sea level rise projections.
- A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems.
- A discussion of future research needs regarding sea level rise.

Prior to the release of the final Sea Level Rise Assessment Report, all state agencies that are planning to construct projects in areas vulnerable to future sea level rise were directed to consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess

[9] http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF
[10] Pre-publication copies of the report, *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*, were made available from the National Academies Press on June 22, 2012. For more information, please see http://www.nap.edu/catalog.php?record_id=13389.

project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. Sea level rise estimates should also be used in conjunction with information regarding local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data

Interim guidance has been released by The Coastal Ocean Climate Action Team (CO-CAT) as well as Caltrans as a method to initiate action and discussion of potential risks to the states infrastructure due to projected sea level rise.

All projects that have filed a Notice of Preparation as of the date of EO S-13-08, and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines. The proposed project is outside the coastal zone and direct impacts to transportation facilities due to projected sea level rise are not expected.

EO S-13-08 also directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level rise affecting safety, maintenance and operational improvements of the system, and economy of the state. Caltrans continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change effects, Caltrans has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, Caltrans would be able review its current design standards to determine what changes, if any, may be warranted in order to protect the transportation system from sea level rise.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is an active participant in the efforts being conducted in response to EO S-13-08 and is mobilizing to be able to respond to the National Academy of Science Sea Level Rise Assessment Report.

CHAPTER 3 - COMMENTS AND COORDINATION

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation, the level of analysis required, and to identify potential impacts and mitigation measures and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including PDT meetings, interagency coordination meetings, and public outreach meeting. This chapter summarizes the results of the City of Yuba City's efforts to fully identify, address and resolve project-related issues through early and continuing coordination.

3.1 Scoping Process

Several alternatives were developed and considered by the 5th Street Bridge Replacement PDT that includes Yuba City Public Works, Marysville Public Works, Caltrans District 03 staff, and engineering and environmental planning consultants (Dokken Engineering, Fehr & Peers Transportation Consultants). After public involvement, only one build alternative met the purpose and need of the project and is discussed in Chapter 1 of the document.

3.2 Agency Consultation and Coordination

During the preparation of the technical studies for the project, extensive contacts were made with public agencies and local organization with interests in the project.

3.2.1 Interagency Meetings

Public Utility Commission/Union Pacific Railroad

The PDT met with the members of the Public Utilities Commission and Union Pacific Railroad to discuss the proposed project on January 13, 2011. This meeting focused on how the project would replace the 5th Street Bridge with a four-lane facility and how the project might impact the 5th Street Underpass at the Railroad on the Marysville side of the project. The options discussed included widening into the two vacant lanes under the bridge, or a new overpass type structure which would locate the bridge over the railroad. The railroad representatives identified concerns with accidents occurring at the 5th Street Underpass bridge. These concerns were addressed through design of additional safety measures which were provided to the Union Pacific Railroad on preliminary plan sheets for their review.

Central Valley Flood Protection Board

The PDT coordinated a Pre-Application Meeting on February 24, 2011 with the CVFPB to discuss the project and the requirements of an Encroachment Permit. CVFPB identified other levee projects and requested that the City of Yuba City and Dokken Engineering coordinate their efforts with these existing projects, particularly for the design of the bridge abutments in correlation with the existing Yuba City and Marysville levees. The PDT also explored the requirements for a CVFPB Encroachment Permit which will be prepared during final design of the proposed project. The PDT will also need to involve the USACE in regards to freeboard requirements.

California Parks Office of Grants and Local Services (OGALS)/National Park Service (NPS)

The PDT met with staff from the OGALS on September 18, 2012 to discuss the proposed project and potential impacts to the Riverfront Park as a Section 6(f) Resource. The meeting discussed Section 6(f) regulations and confirmed that the project would result in a temporary Reduction in Services of the park. OGALS gave instruction on the preparation of a Reduction in Services Plan and explained that after their review and approval of the document it would be submitted to the NPS for their concurrence. Compliance with Section 6(f) is discussed in Appendix B and NPS concurrence is required prior to approval of the Final Environmental Document.

City of Marysville

The City of Yuba City has coordinated with the City of Marysville on many issues throughout the project planning process. David Lamon, the City Services Director for the City of Marysville, has been a regular participant in the PDT meetings. Mr. Lamon has provided special insight with regards to project features and design on the Marysville side of the project as well as major environmental concerns for resources located in Marysville.

Section 4(f) and Section 6(f) coordination for the Riverfront Park has included Mr. Lamon as the main point of contact at the City of Marysville. The City owns the park and is the agency with jurisdiction over it for Section 4(f) purposes, and the City of Marysville is the proponent for the Reduction in Services request made to OGALS and NPS.

National Marine Fisheries Service (NMFS)

The PDT met with staff from the NMFS on October 9, 2012 to discuss the project and its potential to impact federally listed fish species. The group discussed the Biological Assessment prepared for the project and how construction methodology choices could affect Section 7 Consultation efforts in progress. NMFS staff provided additional instruction on the type of construction methodology information they would like included for Section 7 Consultation and these materials were used to update the Biological Assessment prior to formally initiating Section 7 Consultation.

California State Historic Preservation Officer (SHPO)

On September 22, 2012, Caltrans initiated consultation with the SHPO in a letter requesting concurrence with the determinations that the Northern Electric Railroad Bridge is eligible for listing in the NRHP and that the remaining resources that were evaluated in the Historic Property Survey Report are not eligible for listing in the NRHP. On October 31, 2012 an email from Caltrans notified SHPO that the 30 day review period had ended and that the project would move forward pursuant to the Programmatic Agreement between Caltrans and SHPO.

On April 5, 2013, Caltrans sent a second letter to Caltrans with the Finding of Effect report prepared for the 5th Street Bridge Project. Caltrans requested concurrence from SHPO that a finding of No Adverse Effect would be appropriate for potential impacts to both the Marysville Ring Levee and the Northern Electric Railroad Bridge. Both resources were previously determined eligible for inclusion in the NRHP. On May 3, 2013, SHPO responded to Caltrans in a letter that concurred with Caltrans finding of No Adverse Effect for both historic resources. A full record of this consultation is included under Appendix J.

3.3 Public Participation

Informational meetings were held on January 31, 2011 and February 10, 2011 at the Yuba-Sutter Fairgrounds and the Yuba County Board Chambers, respectively. Residents and business owners within a one-mile-radius of the project were sent mailings to notify them of the public meetings. Between 10-20 people attended each meeting. The concerns voiced by the public included design elements, ROW acquisition, traffic and questions on specific engineering alignments, input on the different alternatives, changes to bicycle and pedestrian facilities, and impacts to emergency services.

Pursuant to NEPA and CEQA requirements, this proposed Initial Study/Environmental Assessment was circulated for 30 days with the goal of soliciting agency and public comments. A public meeting was held by the City of Yuba City on August 22, 2013. Staff from the City and Dokken Engineering was available to answer questions raised by the public and written comments were received on comment cards. All comments received during the public circulation period between August 2, 2013 and September 3, 2013 have been included under Appendix O of this document along with the responses provided by Caltrans and Yuba City.

All Public Notices, Newspaper Advertisements, and Mailings used for the public circulation of the draft environmental document are included under Appendix N.

CHAPTER 4 - LIST OF PREPARERS

City of Yuba City

Kevin Bradford	Project Engineer
George Musallam	Director of Public Works

City of Marysville

David Lamon	City Services Director

California Department of Transportation

Cara Lambirth	Environmental Coordinator
Maureen Doyle	Biological Resources
Gail St. John	Cultural Resources
Eric Royer	Traffic Operations

Dokken Engineering

Matt Griggs	Project Manager
Megan Carter	Project Engineer
Tim Chamberlain	Environmental Coordinator Environmental Document (Primary Author) Community Impact Assessment Visual Impact Assessment Section 4(f)/Section 6(f) Evaluation
Namat Hosseinion	Environmental Manager Historic Property Survey Report Archaeological Survey Report
Sarah Holm	Biological Resources
Angela Scudiere	Natural Environment Study Biological Assessments
Cherry Zamora	Air Quality Report
Carlene Grecco	Water Quality Assessment Relocation Impact Memorandum
Mike Wilson	Hazardous Waste Initial Site Assessment

Mary Elizabeth Northeimer	Noise Abatement Decision Report

Fehr and Peers

John Gard	Traffic Study
Katie Spangler	Traffic Study

Bollard Acoustical Consulting

Paul Bollard	Noise Study Report

Galvin Preservation and Associates

Andrea Galvin	Historic Resources Evaluation Report Finding of No Adverse Effect Report

WRECO

Flannery Banks	Location Hydraulic Study

CHAPTER 5 - DISTRIBUTION LIST

All Property Owners within a 300 foot buffer of the project area.

State Clearinghouse
P.O.Box 3044
Sacramento, CA 95812

Yuba City Public Works
Attn: Kevin Bradford
1201 Civic Center Blvd.
Yuba City, CA 95993

City of Marysville
Attn: David Lamon
526 C Street
Marysville, CA 95901

California Department of Transportation
District 3
Attention: Cara Lambirth
703 B Street
Marysville, CA 95901

Yuba County
Public Works Department
915 8th Street, Suite 125
Marysville, CA 95901

Sutter County
Public Works Department
1130 Civic Center Blvd. Suite G
Yuba City, CA 95993

United State Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way
Sacramento, CA 95825

National Marine Fisheries Service
Attn: Dylan Van Dyne
650 Capitol Mall, Fifth Floor - Suite 5-100
Sacramento, CA 95814

U.S. Army Corps of Engineers
Regulatory Branch
1325 J Street
Sacramento, CA 95814

Central Valley Flood Protection Board
3310 El Camino Avenue Room 151
Sacramento, CA 95821

California Department of Fish and Wildlife Region 2
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670

California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Central Valley Regional Water Quality Control Board
Sacramento Office
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670

United States Coast Guard
Eleventh Coast Guard District
Building 50-2 Coast Guard Island
Alameda, CA 94501-5100

California State Historic Preservation Officer
P.O. Box 942896
Sacramento, CA 94296

Sacramento Area Council of Governments
300 S Street, Suite 300
Sacramento, CA 95816

California Highway Patrol
Office of Special Projects
2555 1st Ave.
Sacramento, CA 94298

AT&T
Re: Utility Relocation
12824 Earhart Ave.
Auburn, CA 95602

Comcast Cable
Re: Utility Relocation
1242 National Drive
Sacramento, CA 95834

Pacific Gas and Electric
Re: Utility Relocation
343 Sacramento Street
Auburn, CA 95603

Levee District One of Sutter County
243 2nd Street
Yuba City, CA 95991

Marysville Levee District
Attn: Frank Miller, Levee Manager
526 C Street
Marysville, CA 95901

Union Pacific Railroad Company
Mr. Terrel Anderson
Manager, Industry & Public Projects
9451 Atkinson Street
Roseville, CA 95747

CHAPTER 6 - REFERENCES

Air Quality Report

2011 Air Quality Report for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. October 2011

Biological Assessment for Central Valley Steelhead, Central Valley Spring-run Chinook Salmon, and North American Green Sturgeon

2012 Biological Assessment for Central Valley Steelhead, Central Valley Spring-run Chinook Salmon, and North American Green Sturgeon for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. October 2012

Biological Assessment for Valley Elderberry Longhorn Beetle

2011 Biological Assessment for Valley Elderberry Longhorn Beetle for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. September 2011

City of Marysville General Plan

1985 City of Marysville General Plan, August 1985

City of Yuba City General Plan

2004 City of Marysville General Plan, April 2004

Community Impact Assessment

2011 Community Impact Assessment for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. June 2011.

Finding of No Adverse Effect Report

2011 Finding of No Adverse Effect Report for the 5th Street Replacement Project, Yuba City, California. Prepared by Galvin Preservation and Associates. December 2012.

Hazardous Waste Initial Site Assessment

2011 Hazardous Waste Initial Site Assessment for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. August 2011.

Historic Property Survey Report

2011 Historic Property Survey Report for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. September 2011

Location Hydraulic Study

2012 Location Hydraulic Study for the 5th Street Replacement Project, Yuba City, California. Prepared by WRECO. November 2012

Natural Environment Study

2012 Natural Environment Study for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. September 2012

Noise Study Report

2011 Noise Study Report for the 5th Street Replacement Project, Yuba City, California. Prepared by Bollard Acoustical Consulting. September 2011

Noise Abatement Decision Report

2012 Noise Abatement Decision Report for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. August 2012

Relocation Impact Memorandum

2012 Relocation Impact Memorandum for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. July 2012

Traffic Report

2009 Traffic Report for the 5th Street Replacement Project, Yuba City, California. Prepared by Fehr and Peers Transportation Consultants. September 2011.

Visual Impact Assessment

2009 Visual Impact Assessment for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. June 2011

Water Quality Assessment

2009 Water Quality Assessment for the 5th Street Replacement Project, Yuba City, California. Prepared by Dokken Engineering. August 2011

Appendix A California Environmental Quality Act Checklist

The following checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. The California Environmental Quality Act impact levels include "potentially significant impact," "less than significant impact with mitigation," "less than significant impact," and "no impact."

Supporting documentation of all California Environmental Quality Act checklist determinations is provided in Chapter 2 of this Initial Study/Environmental Assessment. Documentation of "No Impact" determinations is provided at the beginning of Chapter 2. Discussion of all impacts and avoidance, minimization, and/or mitigation measures is under the appropriate topic headings in Chapter 2.

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

The proposed project would have potentially significant impacts to:

☐	Aesthetics	☐	Agriculture Resources	☐	Air Quality
☐	Biological Resources	☐	Cultural Resources	☐	Geology/Soils
☐	Greenhouse Gas Emissions	☐	Hazards & Hazardous Materials	☐	Hydrology/Water Quality
☐	Land Use/Planning	☐	Mineral Resources	☐	Noise
☐	Population/Housing	☐	Public Services	☐	Recreation
☐	Transportation/ Traffic	☐	Utilities/Service Systems	☐	Mandatory Findings of Significance

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐
IV. BIOLOGICAL RESOURCES: Would the project:				
a) 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 Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) 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 Wildlife or US Fish and Wildlife Service?	☐	☒	☐	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) 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?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☒	☐
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be 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?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
VII. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Yuba City has included this good faith effort in order to provide the public and decision-makers as much information as possible about the project, it is Yuba City's determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct and indirect impact with respect to climate change. Yuba City does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are out-lined in the body of the environmental document.			
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				
VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) 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 or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒
X. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XII. NOISE: Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) 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 or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XIII. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
XIV. PUBLIC SERVICES:				
a) 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?	☐	☐	☒	☐
XV. RECREATION:				
a) 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?	☐	☐	☐	☒
b) 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?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) 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?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Appendix B Section 4(f) De Minimis Finding and Section 6(f) Reduction in Services Plan

SECTION 4(f) DE MINIMIS FINDING

5th STREET BRIDGE REPLACEMENT PROJECT

YUBA CITY, CALIFORNIA

BHLS-5163 (025)

Prepared by:

Dokken Engineering
110 Blue Ravine Road, Suite 200
Folsom, California 95630

Prepared for:

City of Yuba City
1201 Civic Center Boulevard
Yuba City, CA 95993

and

California Department of Transportation District 3
703 B Street
Marysville, CA 95901

Pursuant to 49 U.S.C. 303

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried-out by the California Department of Transportation under its assumption of responsibility pursuant to 23 U.S.C. 327.

June 2014

INTRODUCTION

Section 6009(a) of SAFETEA-LU amended Section 4(f) legislation at 23 United States Code (USC) 138 and 49 USC 303 to simplify the processing and approval of projects that have only de minimis impacts on lands protected by Section 4(f). This revision provides that once the U.S. Department of Transportation (USDOT) determines that a transportation use of Section 4(f) property, after consideration of any impact avoidance, minimization, and mitigation or enhancement measures, results in a de minimis impact on that property, an analysis of avoidance alternatives is not required and the Section 4(f) evaluation process is complete. FHWA's final rule on Section 4(f) de minimis finding is codified in 23 Code of Federal Regulations (CFR) 774.3 and CFR 774.17.

Responsibility for compliance with Section 4(f) has been assigned to the California Department of Transportation (Caltrans) pursuant to 23 USC 326 and 327, including determinations and approval of Section 4(f) evaluations, as well as coordination with those agencies that have jurisdiction over a Section 4(f) resource that may be affected by a project action.

As part of the 5th Street Bridge Replacement Project, the City of Yuba City proposes to construct a new bridge over the Riverfront Park in the City of Marysville. This project will require temporary use of a portion of the park for approximately 18 months and will result in a de minimis impact to recreational activities located there. The park is located on the west side of the City of Marysville and is located within the floodplain, between the Marysville Ring Levee and the Feather River. The park is publicly owned recreation land and is subject to the provisions of Section 4(f) of the Department of Transportation Act. The project would also include earthwork at the Marysville Ring Levee which has been determined a historic resource eligible for inclusion in the National Register of Historic Places (NRHP) and is also subject to the provisions of Section 4(f) regulations.

LEAD AGENCY UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT

In July 2012, President Barack Obama signed into law a federal transportation reauthorization bill called the Moving Ahead for Progress in the 21st Century Act (MAP-21). This law allows Caltrans to assume the Federal Highway Administration's responsibilities under the National Environmental Policy Act (NEPA) and other federal environmental laws. As a result Caltrans is the federal lead agency for the proposed project.

SECTION 4(f) DE MINIMIS IMPACT DETERMINATION REQUIREMENTS

SAFETEA-LU Section 6009(a) amends existing Section 4(f) legislation to allow the U.S. Department of Transportation to determine that certain uses of 4(f) land, which includes publicly owned recreation land, will have a de minimis impact as long as the project does not adversely affect the activities, features, or attributes that qualify the resource for protection under Section 4(f). As the NEPA-delegated federal agency, Caltrans must conduct the evaluation of potential Section 4(f) impacts under the proposed project. As stated in the SAFETEA-LU:

> "*De minimis* impacts on publicly owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not adversely affect the activities, features, and attributes of the 4(f) resource. The official(s) with jurisdiction over the property must provide written concurrence that the project will not adversely affect the activities, features, and attributes

that qualify the property for protection under Section 4(f), and the public must be afforded the opportunity to review and comment on the effect of the project on the identified 4(f) resource(s). When identifying *de minimis* impacts on publicly owned parks, recreation areas and wildlife and waterfowl refuges, it is important to distinguish the activities, features, and attributes of a Section 4(f) resource that are important to project from those that can be "used" without adverse effects."

After consideration of any impact avoidance, minimization, and mitigation or enhancement measures, Caltrans can make the determination whether a use of a Section 4(f) property would result in a *de minimis* impact on that property and no further Section 4(f) evaluation would be required.

PROJECT DESCRIPTION

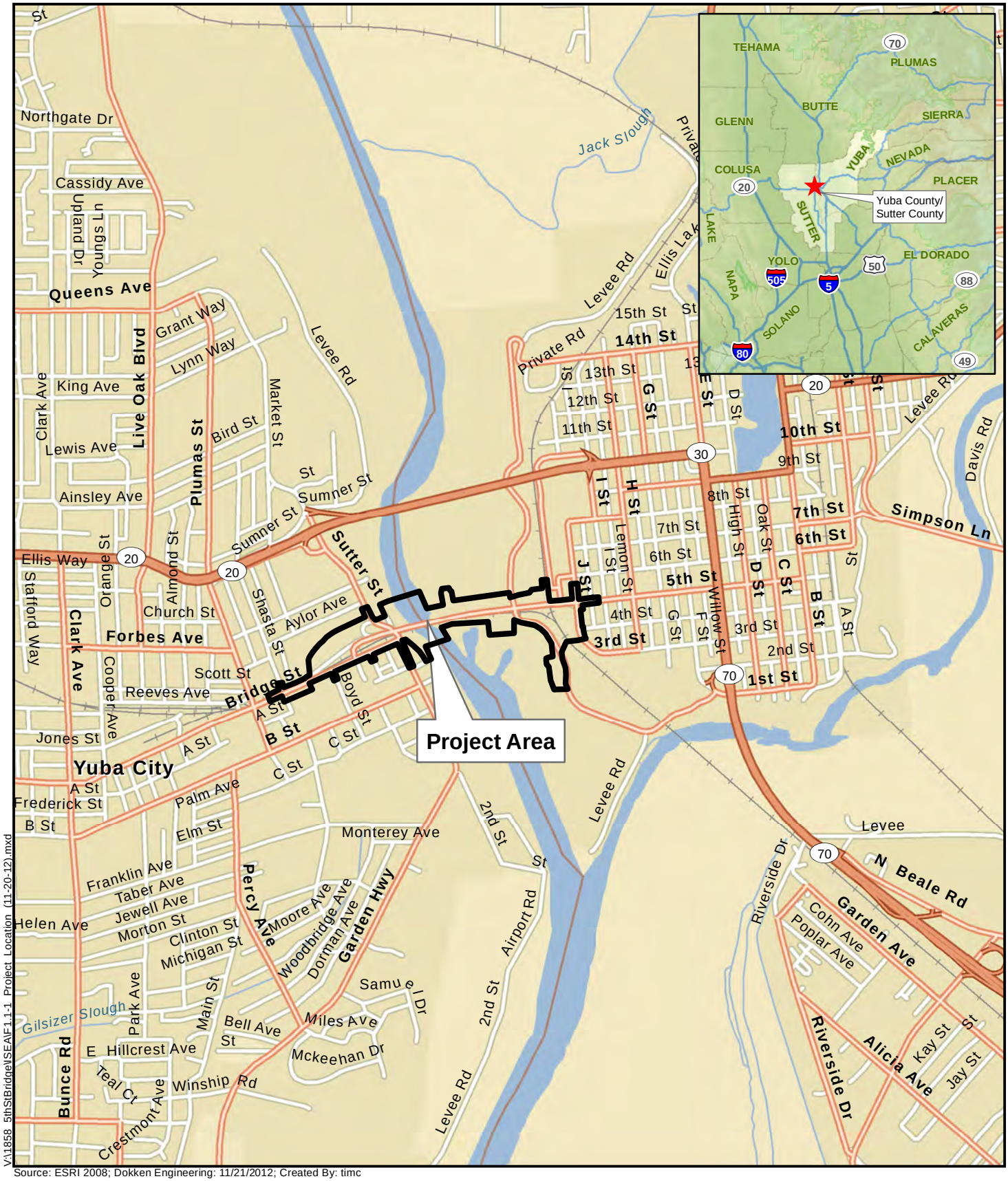
The City of Yuba City, in cooperation with the City of Marysville, proposes to replace the 5th Street Bridge (Bridge Number 18C-0012) over the Feather River and improve approach roadways to the bridge. The 5th Street Bridge is a major arterial connector between the two cities serving local, commercial, commuter, pedestrian, and bicycle traffic. Built in 1958, the prestressed concrete stringer bridge is approximately 1,865 feet long, 42 feet wide, and carries two 12-foot lanes of traffic across the river. A 10-foot Class I pedestrian and bicycle path is located next to the two vehicular lanes on the north side of the bridge.

The existing facility is located between Sutter and Yuba Counties and connects Bridge Street in Yuba City to 5th Street in Marysville. Project limits in the City of Marysville span from 5th and I Street to I and 3rd Street in the south, portions of River Front Park in the west and continuing over the Feather River into the City of Yuba City limits. Project limits within the City of Yuba City include the roadway along 2nd Street, small portions of Sutter, Yolo and Boyd Streets in the south and the western expanse of Bridge Street at the intersection with 2nd street and terminating just past the intersection at Shasta Street (see Figure 1).

In 2011 the Caltrans determined that the bridge is functionally obsolete due to a combination of deficiencies. The bridge has inadequate width, has a history of scour concerns, and is in a floodplain susceptible to liquefaction. As a result, the bridge has been recommended for replacement. The project would replace the existing bridge over the Feather River in order to provide an improved transportation network and improve traffic operations between Yuba City and Marysville. A combination of Local Agency and Federal (Highway Bridge Program, Regional Surface Transportation Project, and High Priority Project) funds have been approved for the 5th Street Bridge Replacement project.

Description of work to be done would include:

- Construction of a new four-lane bridge over the Feather River;
- Construction of a new four-lane bridge over 2nd Street;
- Expansion of 5th Street from two lanes to four lanes between the new bridge and J Street in Marysville, including four lanes under the Union Pacific Railroad;
- Improvements to the 5th Street and J Street Intersection in Marysville including a new eastbound dedicated right turn lane on to J Street and reconstruction of sidewalks and curb ramps to current ADA standards;



V:\1858 5thStBridge\SEA\F1.1-1 Project Location (11-20-12).mxd

Source: ESRI 2008; Dokken Engineering: 11/21/2012; Created By: timc

FIGURE 1
PROJECT LOCATION

Federal Project No. BHLS-5163(025)
Fifth Street Bridge over theFeather River
City of Yuba City, City of Marysville,
Yuba County, and Sutter County, California

- Removal of stop logs on the top of the Marysville levee and construction of a short three foot floodwall extension from the bridge. Installation of a levee cut-off wall through the central portion of the levee;
- Widening of the 5th Street approach roadway between 2nd Street and Shasta Street from two lanes to four lanes;
- Realignment of 2nd Street under the bridge, construction of raised median, and extension of the left turn lane from 2nd Street to westbound Bridge Street;
- Reconstruction of the eastbound approach to the bridge and removal of the abandoned UPR overpass above the on-ramps; and
- Add signalized intersections at the 2nd Street intersections with Bridge Street and the westbound ramps at the intersection of Sutter Street and 2nd Street in Yuba City.

It is anticipated that the maximum depth of excavation would be 15 feet for the pier foundations and 10 feet deep at the bridge abutments to prepare the location for fill and placement of footings and piles that would support the new bridge.

The project includes a Class I multi-use trail over the river with expanded connectivity in Yuba City. This trail would provide pedestrian and bicycle access over the river between Yuba City and Marysville. The Class I trail would be separated from 5th Street by a barrier and would be constructed with a flatter profile than the roadway.

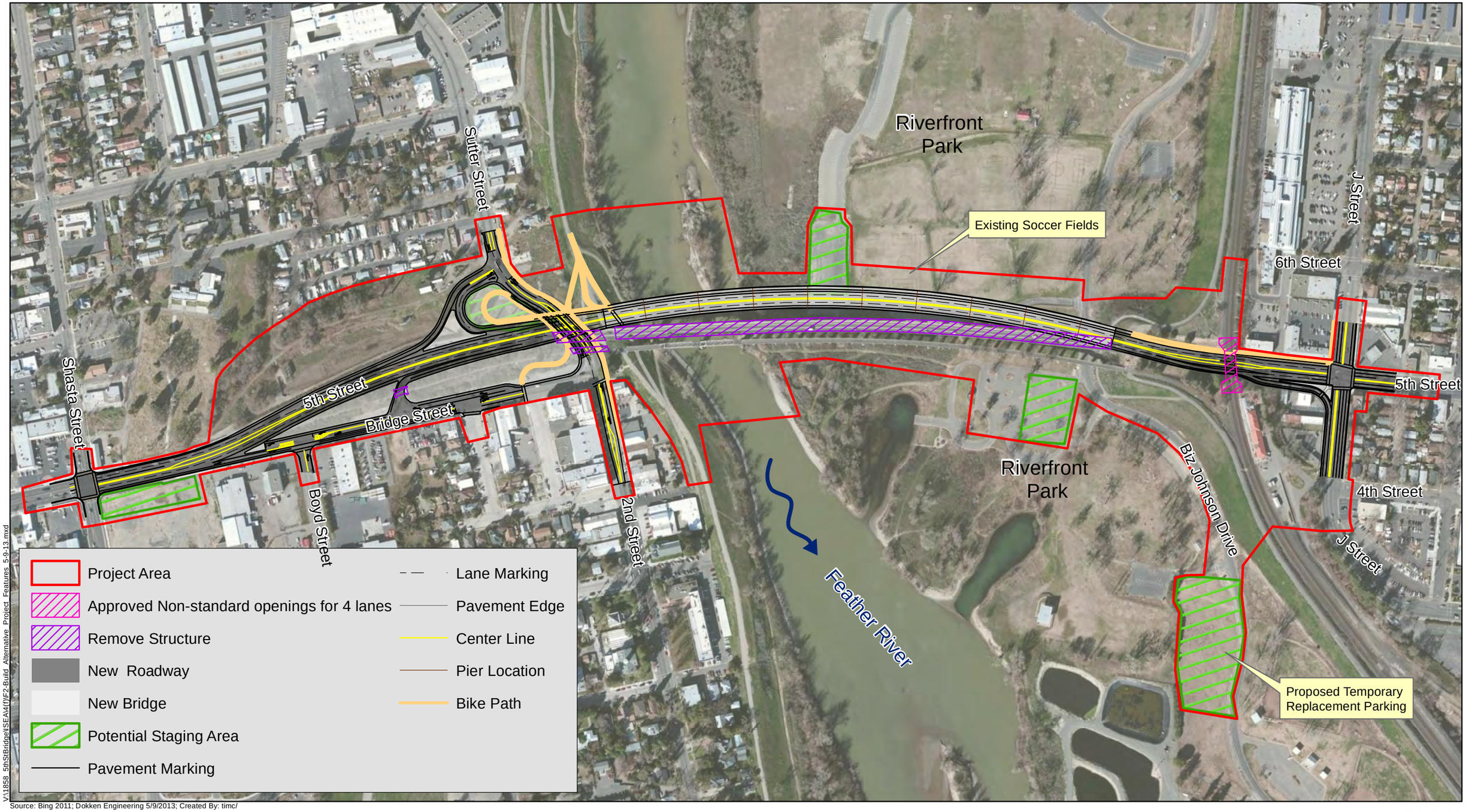
Minor relocation of utilities are expected on the bridge approach roadways. The new bridge would contain conduits for bridge lighting, communications and future uses. The new bridge may contain a water line connecting the two independent City systems for use in emergency situations.

The connector roadway from 2nd Street to westbound Bridge Street would cross the Gilsizer County Drainage District stormwater detention facility. Some roadway embankment would be placed in the southeast end of the basin. The detention capacity lost to the new embankment would be replaced with additional capacity by developing an adjacent basin in the center of the westbound loop off-ramp.

Because of the size of the project and the nature of expanding the crossing from two lanes to four, most of the staging areas are included in the proposed construction footprint. However additional staging areas may be used as necessary for project construction located in the following places: 1) a paved parking area north of the bridge in Riverfront Park, 2) a paved parking area south of the bridge near the boat launch (will only be used during the boating off season), 3) adjacent to Biz Johnson Drive south of the bridge to be used for replacement Riverfront Park parking, 4) in the existing loop ramp north of the bridge and west of Sutter Street, and 5) a portion of the old Feather River Mill Site at the southeast corner of Shasta and Bridge Streets. All of these potential staging areas are included in the project area.

While the proposed project includes a four-lane crossing of the Feather River, the design would consider the possibility of phasing the construction. Depending upon the timing of construction funds, the first phase would be a new two-lane crossing, followed by the widening to a four-lane crossing in a second construction package.

The proposed project features are shown in Figure 2.



V:\11858_5thStBridge\SEA\4(0)\F2-Build Alternative Project Features 5-9-13.mxd

Source: Bing 2011; Dokken Engineering 5/9/2013; Created By: timc/

0 375 750 1,125 1,500 Feet

FIGURE 2
Build Alternative Project Features
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

DESCRIPTION OF SECTION 4(f) PROPERTIES

Parks and Recreation: Riverfront Park

Riverfront Park is an 800 acre park located on the east bank of the Feather River in the City of Marysville. The 5th Street Bridge passes over the park and the Feather River and carries travelers east and west between the City of Marysville and Yuba City. Recreational facilities found in the park include:

- motocross area
- baseball/softball fields and associated facilities
- soccer fields
- picnic areas
- boat launch ramp
- parking
- restrooms
- events and concert area

Riverfront Park is a free day-use facility surrounded by the Marysville levee system. It is open to the public most of the year, as long as the area is not inundated during occasional seasonal flooding. The park offers recreational uses for fishing, boating, water sports, youth sporting activities, nature observation, motocross, and facilities such as Mervyn's Pavilion is available for rental. General use of the park and parking are free; however, rental of a larger facility such as the pavilion requires a permit and fee.

As a designated community park in the City of Marysville, Riverfront Park is predominantly used for organized activities, sports and large group function such as meetings and picnics. It is well equipped to deal with both local groups and other regional groups that draw people from outside of Marysville. One of the largest uses of this park is the Yuba Sutter Youth Soccer League which use the soccer fields in the northern half of the park on Saturdays from August through November. Other, more infrequent organized uses include fundraising events, BBQ lunches and dinners, and use of the pavilion for concerts or rallies.

Day to day activities in the park include fishing and use of the boat ramp for boating and other water sport activities. Recreational fishing is governed by the runs and fishing seasons. The motocross track at the most northern end of the park is also an attraction. As a recreational resource that is open to the public, Riverfront Park is considered a Section 4(f) resource.

Feather River Park

The Feather River Park is located along the eastern edge of Yuba City and is made up of a large area of undeveloped open space that is part of the floodplain. In the project area, the only recreational feature that is eligible for Section 4(f) protection is a multi-use trail.

Veterans Memorial Park

Veterans Memorial Park is located at Bridge Street and 2nd Street in the City of Yuba City, adjacent to the Feather River Levee. This small park resources is a small landscaped park designed as a passive recreational area with a World War I memorial.

Historic Resource: Marysville Ring Levee

The Marysville Ring Levee was constructed beginning in 1862, with the majority constructed after 1875, to protect the City of Marysville from flooding. It was determined eligible for inclusion in the NRHP in 2009 and the Office of Historic Preservation concurred with this determination on January 27, 2010 (see Attachment A: Records and Correspondence). As a historic resource that has been determined eligible for inclusion in the NRHP, the Marysville Ring Levee is considered a Section 4(f) resource.

Historic Resource: Northern Electric Railroad Bridge

The Northern Electric Railroad Bridge was constructed in 1906 by the Northern Electric Railroad Company and is located over the Feather River between Yuba City and Marysville, California. It is approximately 243 feet northeast of the intersection of 2nd and Bridge Streets in Yuba City and approximately 27 feet southeast from the 5th Street Bridge. The bridge was determined eligible for inclusion in the NRHP in 2011 under Criterion A and is therefore considered a Section 4(f) resource.

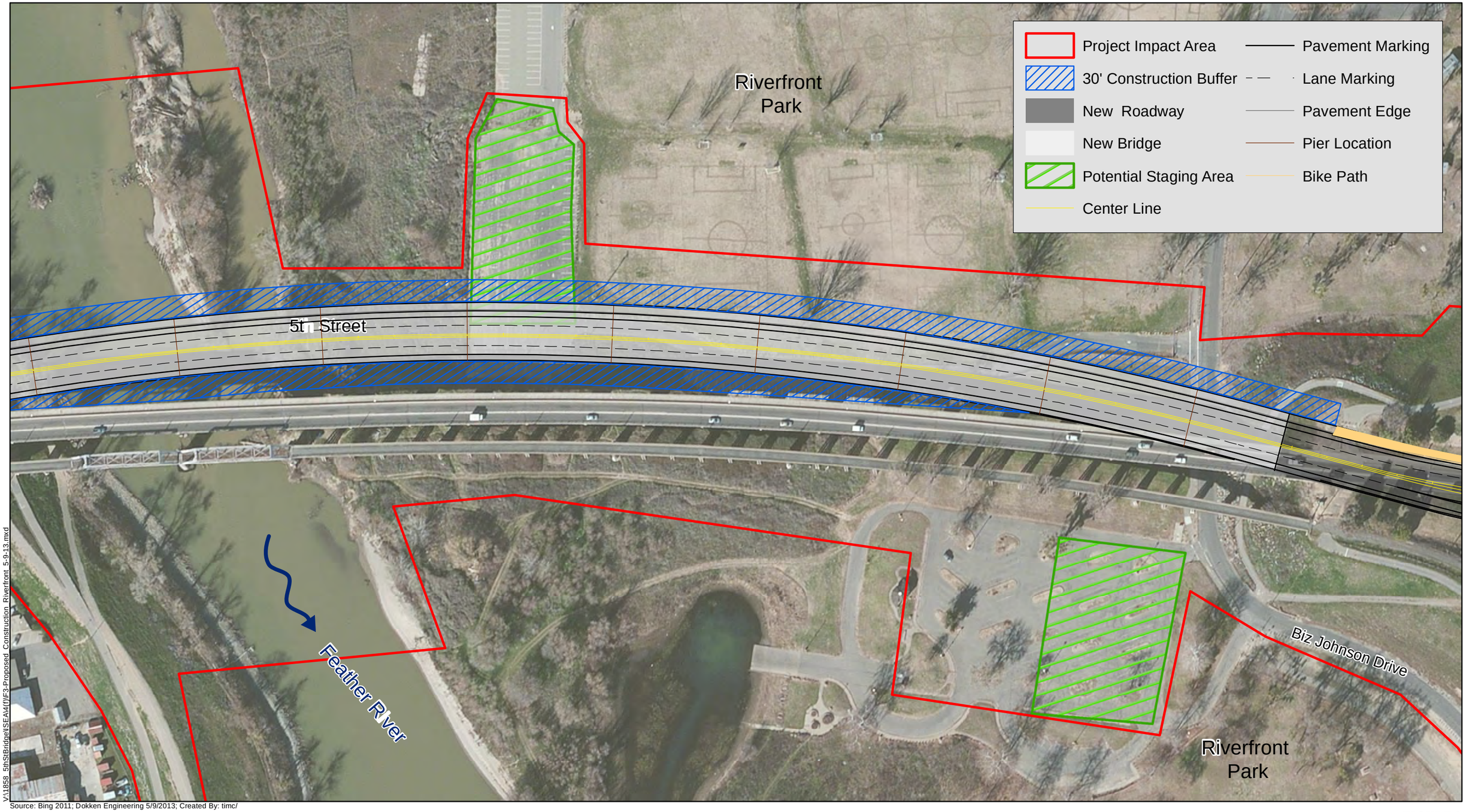
IMPACTS ON SECTION 4(f) PROPERTIES

Parks and Recreation: Riverfront Park

Construction activities for the proposed replacement of the 5th Street Bridge over the Riverfront Park will necessitate a temporary closure of portions of the park. These portions include the immediate vicinity of the existing 5th Street Bridge approximately 150 feet wide along the existing bridge alignment (see blue hatching on Figure 3) and potential staging areas located on existing parking lots (see green hatching on Figure 3). During construction, all efforts to minimize this temporary impact to the park and its facilities will be taken. Figure 3 shows the work area that is expected during construction. Construction will be staged at the discretion of the contractor as a way to further minimize the areas that are closed to the public. Each portion of the park will be closed for no more than 6 months at a time.

In addition to the temporary construction impacts included above, the proposed replacement of the 5th Street Bridge would also require minor changes to the associated facilities within the park. Some of the parking spaces located underneath or adjacent to the new bridge may need to be relocated to a nearby location to ensure that no parking spaces are lost as a result of construction of the new bridge. In addition, the new bridge will require the relocation of a park access road to the approximate area of the existing 5th Street Bridge, and one soccer field will be moved to the north approximately 10 feet. All temporarily impacted recreational areas, as well as all supporting facilities such as parking and access will be restored prior to the conclusion of construction and no park features will be permanently impacted or degraded as a result of this project.

The boat ramp located south of the 5th Street Bridge has been identified by the City of Marysville as an important recreational feature of the park during the warm seasons. A construction staging area has been identified on a portion of the parking lot that supports the boat ramp; however, in order to ensure that boating is not affected, construction staging on this parking lot will be limited to October 1 – March 31. It is likely that the construction contractor will not need to use this



V:\1858_5thStBridge\SEA\4(0)\F3-Proposed Construction Riverfront 5-9-13.mxd

Source: Bing 2011; Dokken Engineering 5/9/2013; Created By: timc/

0 200 400 600 Feet

FIGURE 3
Proposed Construction at Riverfront Park
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

parking lot during construction. The motocross track is outside the project area and will not be affected by the proposed project.

Permanent changes to the park as a result of this project will, in general, be improvements to the facility. Although the existing bridge is a two-lane facility and the new bridge will be a four lane facility, the amount of piers in the park will be reduced, thus increasing the amount of park area usable for recreational activities. The existing bridge has 19 piers, 15 of which are in the park boundary. The new bridge will have 10 piers, 7 of which are in the park boundary.

The project has been designed to ensure that no permanent impacts to the park and its recreational facilities would occur. Further, the project has been designed to minimize the area and the duration of temporary closure of the park so that it will minimize temporary impacts to the park and users of the recreational facilities. The City of Marysville is owner and agency with jurisdiction over the Riverfront Park. On January 31, 2012 the City of Marysville concurred that the project would only result in temporary impacts to the park as a recreational resource and concurred that the project would result in a de minimis impact to the park as a Section 4(f) resource.

Feather River Park

The trail and all associated recreational access will be maintained throughout construction. Temporary construction noise may impact users of the Feather River Park, specifically users of the multi-use trail located within the project area. These impacts are expected to be particularly minimal since users of the trail are expected to be moving either north or south; therefore, impacts to individuals would be extremely short term. Construction noise would be further minimized by measures included in Section 2.2.6 of the Initial Study/Environmental Assessment. No substantial temporary noise impacts to the Feather River Park are expected.

Veterans Memorial Park

The Veterans Memorial Park will remain open throughout construction. Temporary construction noise may impact users of the Veterans Memorial Park. A majority of project construction would occur on the east side of the Yuba City Levee which functions as a natural noise barrier to the park. Bridge construction activity over 2nd Street would cause substantial noise, but is expected to only occur for 4-8 weeks in the immediate vicinity of the park. Construction noise would be further minimized by measures included in Section 2.2.6 of the Initial Study/Environmental Assessment. No substantial temporary noise impacts to the Veterans Memorial Park are expected.

Historic Resource: Marysville Ring Levee

In order to construct the proposed 5th Street Bridge structure, excavation at the Marysville Ring Levee for one of the abutments would be required. Bridge construction would require removal of the stop logs on the top of the Marysville Ring Levee and construction of a short three foot floodwall extension from the bridge. Further, the 5th Street roadway would be widened and the profile of the roadway lowered slightly to provide adequate conformity with the railroad underpass. A Finding of Effect Report prepared to evaluate these impacts to the historic resource determined that the project would not result in an adverse effect to the historic Marysville Ring Levee, since the changes would not substantially alter the feature and would not change the characteristics of the levee that make it eligible for inclusion in the NRHP under criteria A and B. Caltrans sent this determination to the State Historic Preservation Officer (SHPO) and received

concurrence the project would have no adverse effect to the Marysville Ring Levee as a historic resource in a letter dated May 3, 2013 (see Attachment A).

SHPO is the agency with jurisdiction over Section 4(f) historic resources and concurrence with a No Adverse Effect determination also serves as concurrence that the proposed project would have a de minimis impact on the Marysville Ring Levee as a Section 4(f) resource.

Historic Resource: Northern Electric Railroad Bridge

The proposed project has been designed to completely avoid the Northern Electric Railroad Bridge; no direct impacts are anticipated. The project would only indirectly affect the historic resource's setting and would not change the characteristics of the historic bridge that make it eligible for inclusion in the NRHP under Criterion A. Caltrans sent this determination to the State Historic Preservation Officer (SHPO) and received concurrence the project would have no adverse effect to the Northern Electric Railroad Bridge as a historic resource in a letter dated May 3, 2013 (see Attachment A).

MEASURES TO MINIMIZE HARM TO THE SECTION 4(f) PROPERTY

To minimize harm to the Section 4(f) property, the project will comply with the measures listed below, in addition to measures listed in the attached Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment (e.g. NOI-4 which minimizes temporary construction noise). Implementation of these measures will ensure that impacts to the Section 4(f) Resources in the project area are not substantial.

Measure PRF-1: Construction activities that temporarily impact the adjacent soccer field and associated parking spaces will be limited to one season of the Yuba Sutter Youth Soccer League fall season (August through November). Project construction will be staged to ensure that no area of the park's recreational features is impacted for more than 6 months total.

Measure PRF-2: The City of Yuba City and the City of Marysville will coordinate with the Yuba Sutter Youth Soccer League prior to construction to ensure that construction activities and closure of one soccer field will minimally affect the main soccer season scheduled in the fall.

Measure PRF-3: Temporary, and, if necessary, permanent replacement parking will be provided at an alternative location to ensure adequate parking is provided for all major organized park activities. No permanent loss of parking would occur as a result of construction of this project. The City of Marysville will coordinate to organize and direct parking through the use of signage.

Measures PRF-4: A temporary chain link fence will be installed by the construction contractor to provide a safety barrier between construction activities and recreational activities.

Measure PRF-5: After construction activities that would affect the soccer fields have been completed, the City of Marysville will relocate the one soccer field that was temporarily closed during construction to the north approximately 10 feet. This relocation is to provide adequate safety for soccer players in terms of the field's proximity to the new bridge column.

Measure PRF-6: During construction activities that take place in or nearby the live Feather River Channel, the following measures shall be implemented to improve safety for the public engaged in recreation along the Feather River:

- Buoys and signage shall be implemented both on the bridge and in the river to alert watercraft users of construction activities and to help watercraft navigate safe passage.
- Nighttime navigational lighting shall be used as necessary to alert watercraft of changed in the river conditions during construction.
- Containment or a protective cover (netting) shall be installed along the live channel used to ensure that falling debris does not endanger the public during construction activities.

COORDINATION

Coordination for the Riverfront Park was done through the City of Marysville since they are the owner and operator of the park and have jurisdiction over the recreational facilities as a Section 4(f) resource. Likewise, coordination for the Veterans Memorial Park and Feather River Park was done through the City of Yuba City since they are the owner and operator of these parks and have jurisdiction over the recreational facilities as Section 4(f) resources. Caltrans, on behalf of FHWA, is proposing a de minimis determination under Section 4(f) for impacts to the Riverfront Park, Feather River Park, and Veterans Memorial Park. Impacts to the protected activities, features, and attributes of the Section 4(f) resources will be reduced to a de minimis level with implementation of the minimization measures detailed above. On April 1, 2014 the City of Marysville concurred that the project would only result in temporary impacts to the park as a recreational resource and concurred that the project would result in a de minimis impact to the park as a Section 4(f) resource. A copy of this letter is provided under Attachment A: Records and Correspondence.

Coordination for the historic resources in the project area was done through the Office of Historic Preservation since they have jurisdiction over these historic properties as Section 4(f) resources. Concurrence that the project would not result in any adverse effects and would therefore result in a de minimis impact was obtained from SHPO on May 3, 2013.

Section 6(f) of the Land and Water Conservation Act

During preliminary environmental scoping for the project, the Riverfront Park was identified as a recreational facility that had previously received federal grant funding from National Parks Service (NPS) Land and Water Conservation Fund (LWCF). As such, the park and all of its associated recreational facilities is protected under Section 6(f) of the Land and Water Conservation Act and is under the jurisdiction of the NPS. The City of Marysville (as the owner of the park), and Caltrans initiated coordination efforts in March of 2012 with the California State Parks Office of Grants and Local Services (OGALS), the agency that reviews projects on behalf of NPS for Section 6(f) resources within California. This coordination effort resulted in the determination that this project would result in a temporary use of the park and a Temporary Reduction in Services Plan was prepared and submitted to OGALS in September 2012. Comments and corrections were provided on this plan through multiple reviews and a final report was submitted on June 30, 2013. This report is included with this Section 4(f) Evaluation under Attachment B: Section 6(f) Reduction in Services Plan.

OGALS and NPS reviewed the Section 6(f) Reduction in Services Plan and on May 16, 2014, the City of Marysville received a letter from OGALS stating that the requested temporary non-conforming use at Riverfront Park was authorized by NPS. NPS provided a concurrence letter on April 3, 2014 which also included a separate NEPA determination for that agency. All of this correspondence is provided in Attachment B of this Section 4(f) Evaluation.

Attachment A: Records and Correspondence

CITY OF MARYSVILLE

526 "C" Street • P.O. Box 150 • Marysville, CA 95901

CITY SERVICES DEPARTMENT
David B. Lamon, P.E., Director
(530) 749-3902

Public Works	(530) 749-3902
Planning	(530) 749-3904
Building	(530) 749-3904
Fax	(530) 749-3991

March 31, 2014

Yuba City Public Works
Diana Langley
Director of Public Works
1201 Civic Center Drive
Yuba City, CA 95993

SUBJECT: 5th Street Bridge Replacement Project – Riverfront Park Reduction in Services

Dear Ms. Langley,

The City of Marysville is a responsible agency for the 5th Street Bridge Project and is the agency with jurisdiction over Riverfront Park. After a careful review of the 5th Street Bridge Replacement Project Riverfront Park Reduction in Services Plan, the City of Marysville agrees that a temporary reduction of Riverfront Park services will be necessary in order to fulfill construction obligations for this project. The City of Marysville understands that the project will require the temporary closure of one soccer field and use of approximately 80 parking spaces for equipment and vehicle staging during construction and that these closures will last up to 12 months. The City of Marysville also understands that Measures PRF-1 through PRF-6 (identified in the project's environmental document) will be implemented in order to ensure that temporary impacts to the park are minimized to the greatest extent possible.

In order to ensure that temporary impacts associated with project construction are further reduced, the City of Marysville will coordinate with the Yuba Sutter Youth Soccer League representatives to ensure they are aware of the temporary reduction in services and help plan Soccer Saturdays during construction so that the loss of one soccer field and parking does not negatively impact their use of the facilities. The City of Marysville concurs with the need for minor temporary impacts to Riverfront Park recreational facilities, and finds the Reduction in Services Plan that has been prepared for this project to be an adequate description of the temporary impacts. Further, the City of Marysville finds that the proposed measures to minimize temporary impacts to the park and its users are reasonable and appropriate.

Please use this letter as the City's concurrence with this proposed project for the purposes of Section 4(f) coordination with Caltrans and FHWA, as well as Section 6(f) coordination with the California State Parks Office of Grants and Local Services and National Park Service.

Sincerely,

David B. Lamon, P.E.
Director of City Services
City of Marysville

4/1/13
Date

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

May 3, 2013 Reply To: FHWA110926A

Anmarie Medin
Chief, Cultural Studies Office
Caltrans Division of Environmental Analysis, MS 27
PO Box 942874
Sacramento, CA 94274-0001

Re: Finding of Effect for the Proposed 5th Street Bridge Replacement Project, Yuba City, CA

Dear Ms. Medin:

Thank you for consulting with me about the subject undertaking in accordance with the *Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (PA).

Caltrans has determined that the proposed project will have no adverse effect to either the Marysville Ring Levee or the Northern Electric Railroad, two properties eligible for the National Register of Historic Places (NRHP). Based on review of the submitted documentation, I concur with this finding.

Thank you for considering historic properties during project planning. If you have any questions, please contact Natalie Lindquist of my staff at (916) 445-7014 or email at natalie.lindquist@parks.ca.gov.

Sincerely,

Susan K Stratton for

Carol Roland-Nawi, Ph.D.
State Historic Preservation Officer

STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

January 27, 2010

In Reply Refer To: COE100125A

Francis C. Piccola
Chief, Planning Division
Department of the Army
U.S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Re: Marysville Ring Levee Project, Yuba County, California

Dear Mr. Piccola:

Thank you for submitting to my office, your letter and supporting documentation regarding the undertaking noted above. The U.S. Army Corps of Engineers (COE), Sacramento District is seeking my concurrence on the effects that the proposed Marysville Ring Levee Project will have on historic properties, pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act. The proposed undertaking is the strengthening of the existing Marysville levee to address through-and-under seepage problems. The undertaking will be built in four phases and will include the construction of in-levee slurry walls, levee slope reshaping, jet grouting, secant pile walls, and stability berms. The completion of these project aspects will reinforce the levee and provide increased protection to the City of Marysville from future flood events. As the visual effects of the proposed undertaking are transitory, an architectural APE was not determined.

Due to the potential for vibration effect of some construction activities, the COE has configured the Area of Potential Effects (APE) to include an area larger than that encompassed by the Ring Levee and associated staging/access locations. I concur that the APE has been appropriately determined pursuant to 36 CFR Parts 800.4(a)(1) and 800.16(d). In addition to your letter of January 22, 2010 and attachments (project description and Area of Potential Effects maps), you have submitted the following documents in support of your efforts to identify and evaluate historic properties in the project Area of Potential Effects (APE):

- *Cultural Resources Archaeological Survey and National Register Evaluation of the Marysville Ring Levee and Properties for the Marysville Ring Levee Project, Yuba County, California* (Melissa Montag, U.S. Army Corps of Engineers, Sacramento District: January 2010).

• *Memorandum for Record: Marysville Ring Levee EDR – Bok Kai Temple Construction Impact Evaluation* (Erik W. James, Civil Engineer, Levee Safety Section, U.S. Army Corps of Engineers, Sacramento District: January 14, 2010).

• DRAFT: *Memorandum of Agreement among the U.S. Army Corps of Engineers, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Marysville Ring Levee Project, Yuba County, California* (undated).

Identification efforts by the COE concluded that there are five historic properties located within, or in close proximity to, the APE. These include the Marysville Ring Levee, the Marysville Sand Company Plant, the Western Pacific Railroad Spur, the Bok Kai Temple, and the Marysville Historic Commercial District. The COE has determined that the Marysville Sand Company Plant and the Western Pacific Railroad Spur are not eligible for the National Register of Historic Places (NRHP) under any criteria. I concur with these determinations.

The COE has also determined that the Marysville Ring Levee is eligible for the NRHP under both criterion A, for its importance in local flood control and the development of the City of Maryville, and criterion B, for its association with the lives of two prominent local citizens, W. T. Ellis Sr. and W. T. Eliis Jr. The COE has determined that the actions proposed for this undertaking will have no adverse effect on the Marysville Ring Levee as they consist of standard maintenance and upgrade activities and that post-project, the levee will be functionally and visually unchanged. I concur that the Marysville Ring Levee is eligible for the NRHP under criteria A and B.

The Bok Kai Temple is listed on the NRHP (#75000498, added 1975) under criteria A and C for the period of significance of 1875-1899. Although this historic building is not located within the construction footprint of the proposed undertaking, its proximity suggested that indirect effects from vibrations generated by construction activities could cause structural damage. Although project effect studies and a structural evaluation of the Bok Kai Temple by the COE have determined that vibration effects from the proposed project activities should not adversely affect this historic property, the COE has determined that a program of management practices to minimize vibration potential is needed to ensure that the Bok Kai Temple is not aversely affected. The COE has concluded that a Memorandum of Agreement, with an attached Historic Property Management Plan, executed among the COE, the SHPO and the Advisory Council on Historic Preservation (if they wish to participate) is a necessary condition for this undertaking.

A second NRHP listed historic property was also identified by the in close proximity to, but outside of, the APE. This is the Marysville Historic Commercial District (#99000692, added 1999), which was listed under criterion A, and which is comprised of 85 buildings and one structure. The COE has determined that this NRHP district will not be affected by the proposed undertaking, but that the same provisions being implemented regarding the potential for vibration effects should also be implemented regarding the Marysville Historic Commercial District.

With the implementation of the proposed MOA and an HPTP that addresses conditions to minimize vibrations created by the proposed activities, the COE has determined that the appropriate finding of effect for the Marysville Ring Levee Project is that of No Adverse Effect with conditions, in accordance with 36 CFR Part 800.5(b).

Based on my review of your letter and supporting documentation, I have no objection to your finding of No Adverse Effect with conditions. My concurrence with this finding is predicated on the execution of the proposed MOA and the implementation of the provisions as outlined in the Historic Properties Management Plan (HPMP) as stated in the January 14, 2010 Memorandum for Record. The conditions should be more clearly identified as an HPMP and included as an appendix to the MOA. William Soule of my staff will provide additional comments regarding this consultation as required via email, and specific comments regarding the draft MOA through track changes to a Word copy.

Please notify the Advisory Council on Historic Preservation regarding this finding and proposed MOA, provide them with copies of all documentation, and invite their participation in the consultation and MOA. Thank you for seeking my comments and for considering historic properties in planning your project. If you require further information, please contact William Soule, Associate State Archeologist at phone 916-654-4614 or email wsoule@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

Attachment B: Section 6(f) Reduction in Services Plan

State of California • Natural Resources Agency
Edmund G. Brown Jr., *Governor*

DEPARTMENT OF PARKS AND RECREATION
P.O. Box 942896 • Sacramento, CA 94296-0001
(916) 653-7423
Major General Anthony L. Jackson, USMC (Ret), *Director*

May 16, 2014

David Lamon
City Services Director
City of Marysville
526 C Street
Marysville, CA 95901

Re: National Park Service Concurrence
Temporary Reduction in Service
Project Numbers: 06-00497, 06-00691, 06-01040 –
Riverfront Park Development

Dear David Lamon:

The National Park Service reviewed your June 30, 2013 request for approval of temporary non-conforming use at Riverfront Park in Marysville, California. The Office of Grants and Local Services received the enclosed concurrence letter dated April 3, 2014 from the National Park Service with a copy of the National Environmental Protection Act (NEPA) determination.

The temporary non-conforming use approval is for six months in any given area in the park. As the letter states, a conversion will result if the temporary use exceeds six months. Please notify Project Officer Jeanne Ekstrom, with the start and end dates for the temporary non-conforming use.

If you have any questions or need additional information, please contact Project Officer Jeanne Ekstrom at (916) 651-7737 or Jeanne.Ekstrom@parks.ca.gov.

Sincerely,

Jean A. Lacher

Jean Lacher, Chief
Office of Grants and Local Services

Enclosure

Cc: Viktor Patiño, Manager, Office of Grants and Local Services
Richard Rendón, Supervisor, Office of Grants and Local Services
Jeanne Ekstrom, Project Officer, Office of Grants and Local Services

United States Department of the Interior

NATIONAL PARK SERVICE
Pacific West Region
333 Bush Street, Suite 500
San Francisco, California 94104-2828

IN REPLY REFER TO:

RECEIVED
APR 07 2014
OFFICE OF GRANTS & LOCAL SERVICES

L32(PWR-PR)

April 3, 2014

Ms. Jean Lacher, Chief
Office of Grants and Local Services
California Department of Parks and Recreation
PO Box 942896
Sacramento, CA 94296-0001

Re: LWCF Projects 06-00497; 06-00691; 06-01040. Riverfront Park – Temporary Non-Conforming Use

Dear Ms. Lacher:

We have reviewed your June 30, 2013 request for approval of temporary non-conforming use at Riverfront Park in Marysville, California, along with the supporting documentation and supplemental information provided through mail and e-mail.

A combined environmental document meeting the requirements of both a CEQA Initial Study and a NEPA Environmental Assessment was completed for the bridge replacement project as a whole - involving a larger area than the park. The analysis included a DOT Act of 1966 §4f *de minimis* finding. That analysis concluded that no park features will be permanently impacted or degraded as a result of this project. Along with that environmental documentation, you submitted a LWCF Proposal Description and Environmental Screening Form, and a LWCFA §6f protected area Reduction in Services Plan in support of your request.

We have determined that this project qualifies for categorical exclusion from further NEPA review under 516 DM §12.5.C.(18), "Construction or rehabilitation in previously disturbed or developed areas, required to meet health or safety regulations, or to meet requirements for making facilities accessible to the handicapped.," and §12.5.D.(2): "Minor changes in amounts and types of visitor use for the purpose of ensuring visitor safety or resource protection in accordance with existing regulations." Please find a copy of our NEPA determination enclosed.

TAKE PRIDE IN AMERICA

Based on the information you have provided, we find that this project qualifies as a temporary non-conforming use according to LWCF policy and criteria contained in Manual section 8.I. We also concur in the *de minimis* finding of the DOT Act of 1966 §4f regarding potential impacts to park resources. This approval for temporary use of defined areas for other than public outdoor recreation purposes is limited to a 6-month maximum duration in any given area of the park. As you have acknowledged, anything exceeding 6 months will be considered a conversion and will be required to meet the conversion requirements of the LWCF Manual and 36 CFR §59.

Please let us know if you have any questions.

Sincerely,

David P. Siegenthaler
Program Officer, Land and Water Conservation Fund

Enclosure

National Park Service
Land and Water Conservation Fund Grant
Categorical Exclusion

Project: Riverfront Park - Temporary Non-Conforming Use LWCF #06-01040 T
Project Sponsor: City of Marysville, California
Date: 31 March 2014

Project Scope: Temporary non-conforming use of park due to bridge reconstruction project.

This project involves replacement of an existing bridge, within an existing right-of-way, that runs through the park. The bridge has been declared obsolete and the replacement is needed due primarily to safety issues. The primary effects of this project on the park will be a reduction in the number of bridge supports from 15 to 7 (resulting in improved recreational utility at the conclusion of the project), as well as temporary reduction in outdoor recreation use in certain areas of the park while construction is underway. These reductions in public recreation use will not exceed 6 months in any given area. The project has been reviewed by the California Department of Parks and Recreation Office of Grants and Local Services and forwarded to NPS with the recommendation that it be approved as a temporary non-conforming use as presented in the request.

A combined CEQA Initial Study and NEPA Environmental Assessment was completed for the bridge repair project as a whole - involving an area much greater than just the park. The NEPA analysis included a DOT Act of 1966 Section 4f de minimis finding. That analysis concluded that no park features will be permanently impacted or degraded as a result of this project. An NPS environmental screening form, the CEQA Initial Study, the NEPA Environmental Assessment, the 4f determination, and a LWCF Reduction in Services Plan were included in support of this request.

Describe the category used to exclude the action from further NEPA analysis:

This project qualifies for categorical exclusion from further NEPA review under 516 DM §12.5.C.(18), "Construction or rehabilitation in previously disturbed or developed areas, required to meet health or safety regulations, or to meet requirements for making facilities accessible to the handicapped.," and §12.5.D.(2): "Minor changes in amounts and types of visitor use for the purpose of ensuring visitor safety or resource protection in accordance with existing regulations."

Describe any agency or public involvement effort conducted:

An EA was prepared as a joint NEPA/CEQA document along with an Initial Study, for the larger bridge replacement project. It was circulated to the public for 30 days pursuant to CEQA and NEPA regulations in August and September of 2013. No comments of any kind were received in relation to the Riverfront Park or potential impacts caused by this project.

Certification

On the basis of the project agreement, proposal narrative, and supporting documentation contained in the project application, I am categorically excluding the proposed action, approval of Land and Water Conservation Fund project № 06-01040 T, Riverfront Park - Temporary Non-Conforming Use, from further NEPA analysis. No exceptional circumstances or conditions in section B of the Environmental Screening Form apply and the action is fully described in 516 DM §12.

Martha J. Lee, Deputy Regional Director

4/2/14
Date

NPS Contact Person

David Siegenthaler
Pacific West Region, 333 Bush Street. Suite 500, San Francisco, CA 94104-2828
(415) 623-2334

Section 6(f) Reduction in Services Plan

for the

5th Street Bridge Replacement Project

PROJECT DESCRIPTION

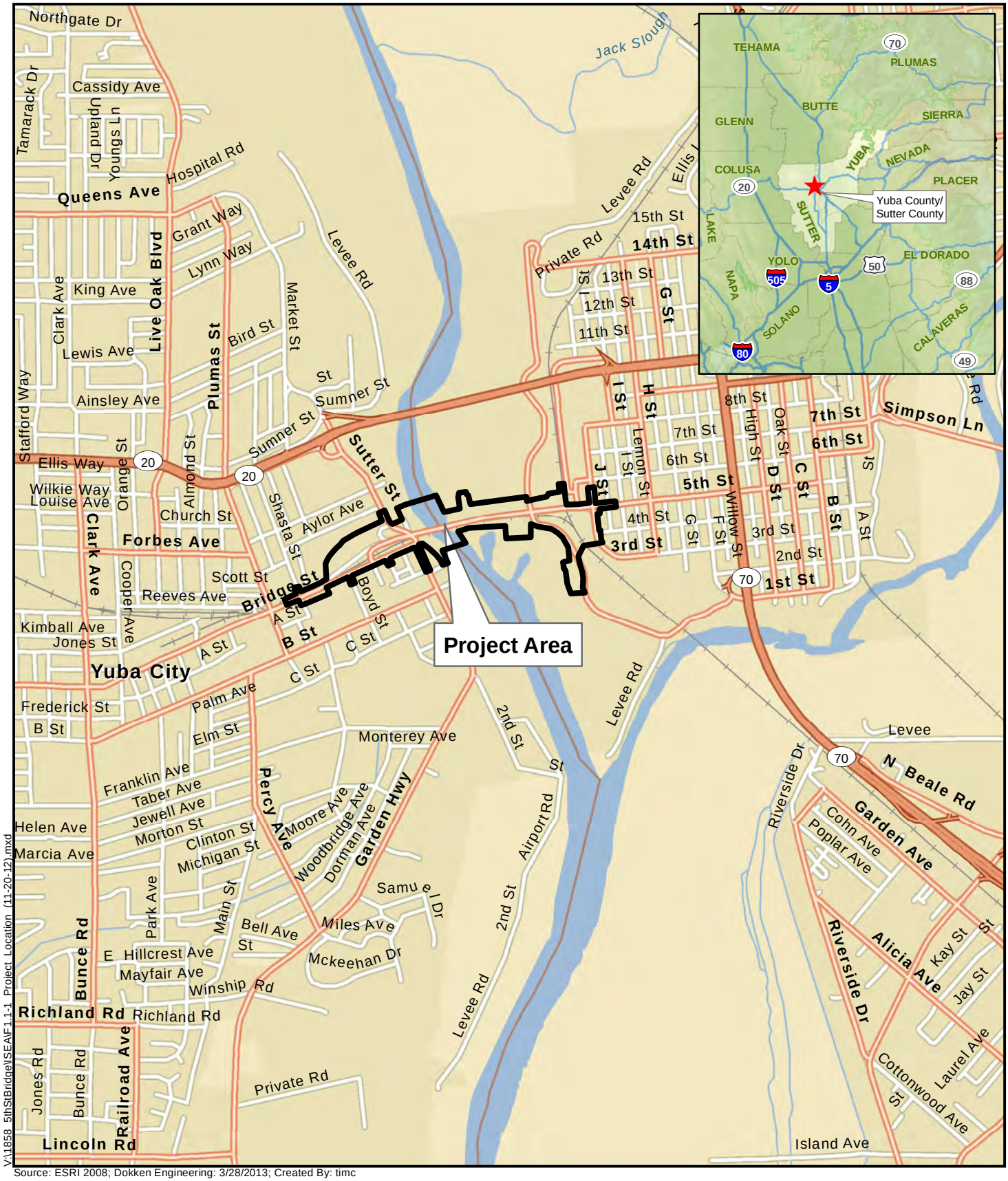
The City of Yuba City, in cooperation with the City of Marysville, proposes to replace the 5th Street Bridge (Bridge Number 18C-0012) over the Feather River and improve approach roadways to the bridge. The 5th Street Bridge is a major arterial connector between the two cities serving local, commercial, commuter, pedestrian, and bicycle traffic. Built in 1958, the prestressed concrete stringer bridge is approximately 1,865 feet long, 42 feet wide, and carries two 12-foot lanes of traffic across the river. A 10-foot Class I pedestrian and bicycle path is located next to the two vehicular lanes on the north side of the bridge deck.

The existing facility is located between Sutter and Yuba Counties and connects Bridge Street in Yuba City to 5th Street in Marysville (see Figure 1). Project limits in the City of Marysville span from 5th and I Street to I and 3rd Street in the south, portions of Riverfront Park in the west and continuing over the Feather River into the City of Yuba City limits. Project limits within the City of Yuba City include the roadway along 2nd Street, small portions of Sutter, Yolo and Boyd Streets in the south and the western expanse of Bridge Street at the intersection with 2nd Street and terminating just past the intersection at Shasta Street.

PARK SITE AFFECTED BY REDUCED SERVICE PLAN

The park site affected by the Reduction in Services Plan is the Riverfront Park which is an 800 acre park located on the east bank of the Feather River in the City of Marysville. The 5th Street Bridge passes over the park and the Feather River and carries travelers east and west between the City of Marysville and Yuba City. Recreational facilities found in the park include:

- motocross area
- baseball/softball fields and associated facilities
- soccer fields
- picnic areas
- boat launch ramp
- parking
- restrooms
- events and concert area



Source: ESRI 2008; Dokken Engineering: 3/28/2013; Created By: timc

0 0.25 0.5 0.75 1 Miles

FIGURE 1.1-1
PROJECT LOCATION

Federal Project No. BHLS-5163(025)
Fifth Street Bridge over theFeather River
City of Yuba City, City of Marysville,
Yuba County, and Sutter County, California

Riverfront Park is a free day-use facility surrounded by the Marysville levee system. It is open to the public most of the year, as long as the area is not inundated during seasonal flooding. The park offers recreational uses for fishing, boating, water sports, youth sporting activities, nature observation, motocross, and facilities such as Mervyn's Pavilion is available for rental. General use of the park and parking are free; however, rental of a larger facility such as the pavilion requires a permit and fee.

An updated Section 6(f)3 Boundary Map for the Riverfront Park has been prepared and is included under Figure 2.

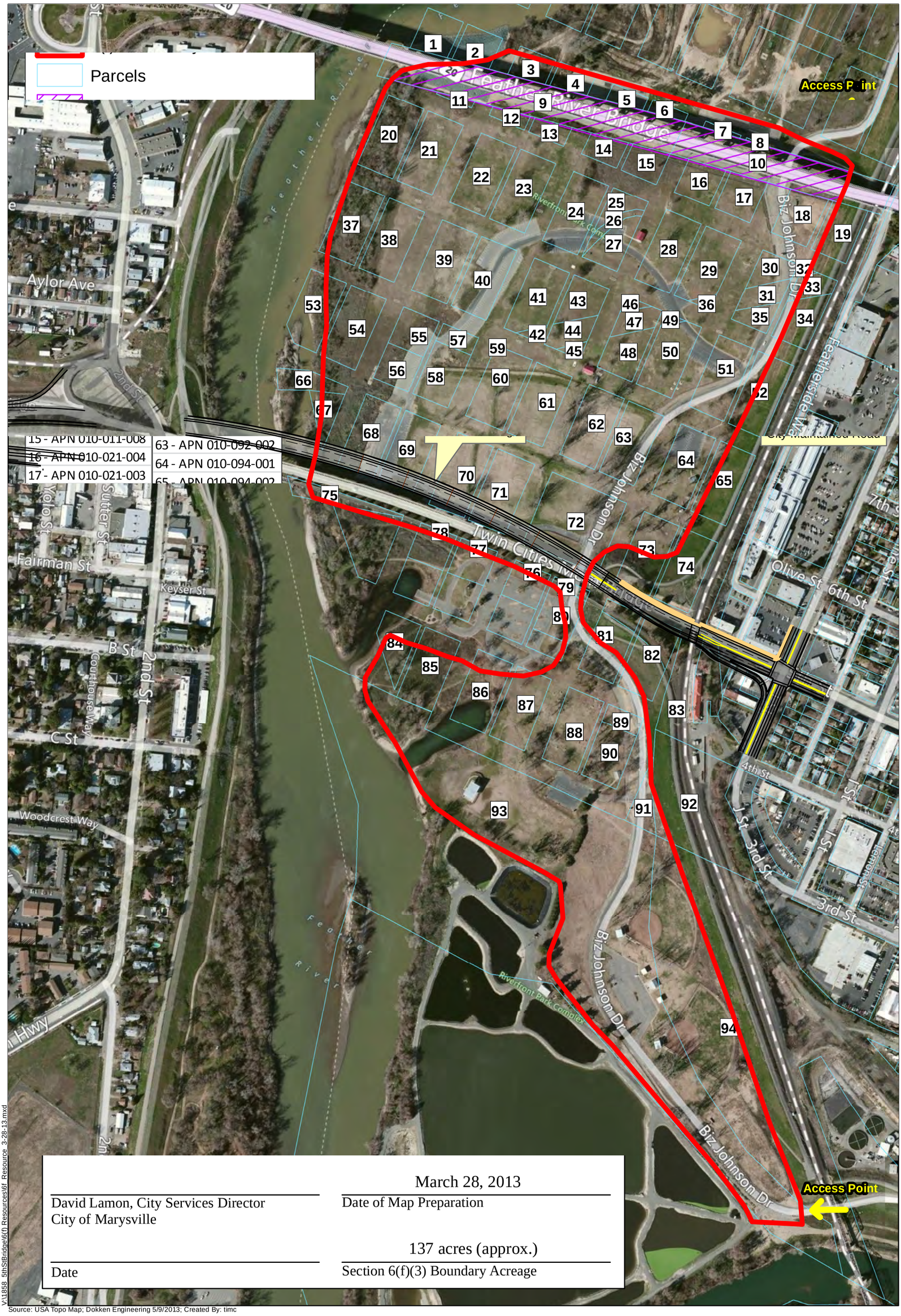
ATTENDANCE AND USE PATTERNS

As a designated community park in the City of Marysville, Riverfront Park is predominantly used for organized activities, sports and large group function such as meetings and picnics. It is well equipped to deal with both local groups and other regional groups that draw people from outside of Marysville. One of the largest uses of this park is the Yuba Sutter Youth Soccer League which use the soccer fields in the northern half of the park on Saturdays from August through November. Other, more infrequent organized uses include fundraising events, BBQ lunches and dinners, and use of the pavilion for concerts or rallies.

Day to day activities in the park include fishing and use of the boat ramp for boating and other water sport activities. Recreational fishing is governed by the runs and fishing seasons. The motocross track at the most northern end of the park is also an attraction.

PROPOSED TEMPORARY REDUCTION IN SERVICES

Construction activities for the proposed replacement of the 5th Street Bridge over the Riverfront Park will necessitate a temporary closure of a portion of the park in the immediate vicinity of the existing 5th Street Bridge. The full project area is shown on Figure 3. Construction activities will be contained to an area approximately 150 feet wide along the existing bridge alignment. During construction, all efforts to minimize this temporary impact to the park and its facilities will be taken. Further, consistent with LWCF regulations, no active portion of the park or its facilities will be occupied by construction for more than 6 months. In order to ensure that park activities are not substantially impacted for more than 6 months in any one area, construction staging and construction activities that would impact the recreational use of the park will be done in stages. Although the exact order of construction will need to be determined by the construction contractor, an example of how this construction staging would be accomplished is shown on Figures 4-5.



March 28, 2013

David Lamon, City Services Director
City of Marysville

Date of Map Preparation

137 acres (approx.)

Date

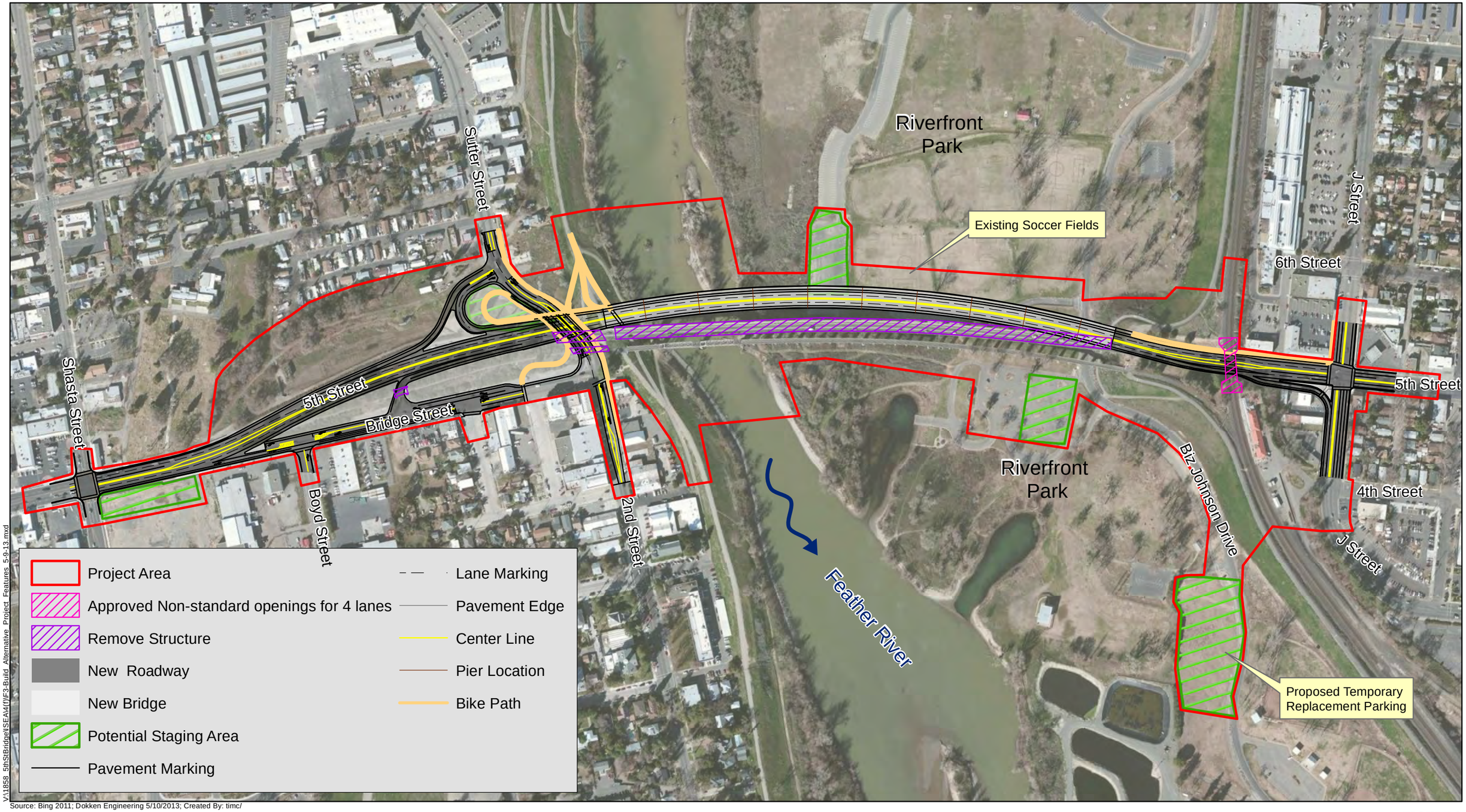
Section 6(f)(3) Boundary Acreage

V:\1858_5thStBridge\6(f) Resources\6f_Resource_3-28-13.mxd

Source: USA Topo Map; Dokken Engineering 5/9/2013; Created By: timc

0 400 800 1,200 1,600 Feet

FIGURE 2
Section 6(f)3 Boundary Map
Fifth Street Bridge Over the Feather River
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County, and Sutter County, California

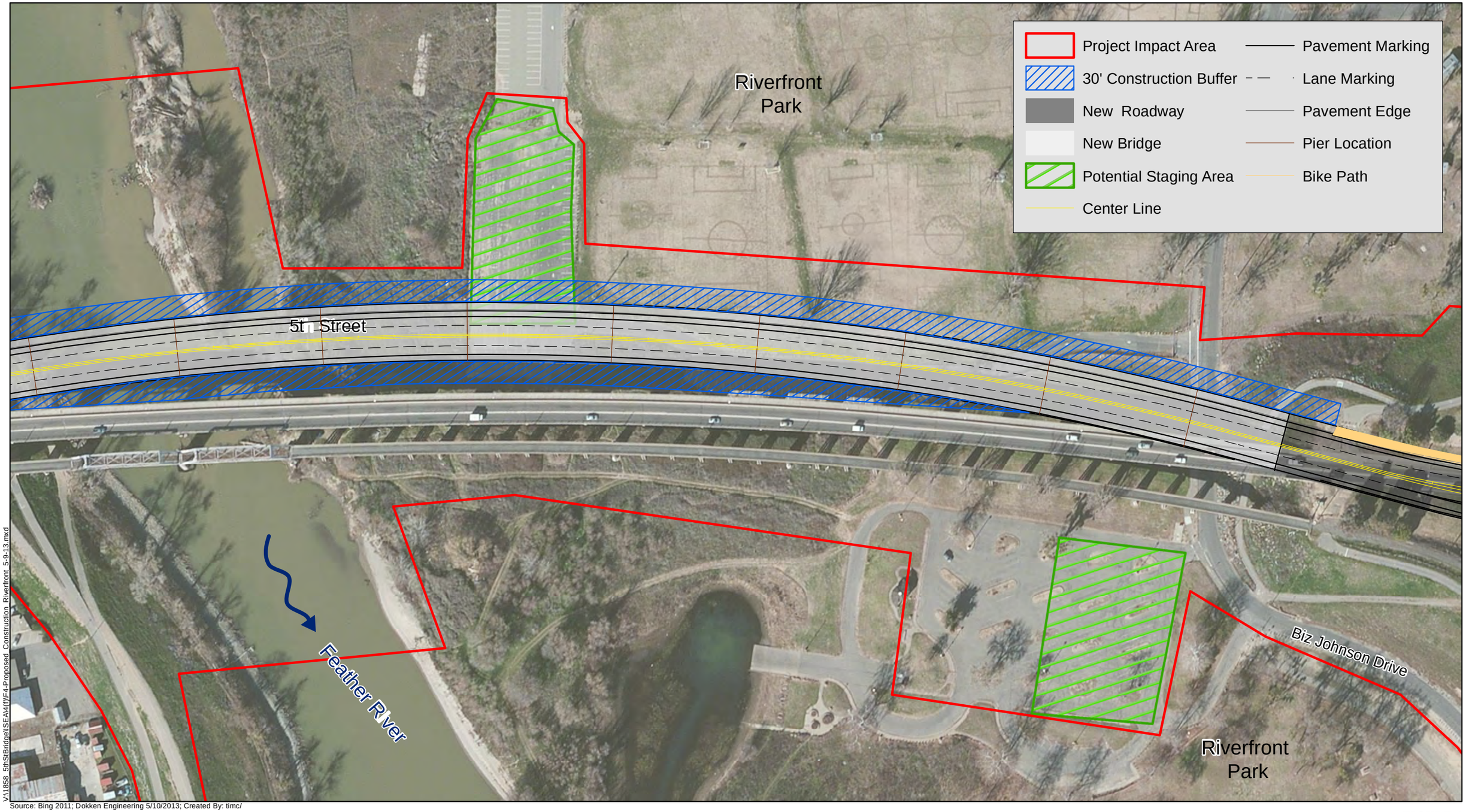


V:\11858_5thStBridge\SEA\4(0)\F3-Build Alternative Project Features 5-9-13.mxd

Source: Bing 2011; Dokken Engineering 5/10/2013; Created By: timc/

0 375 750 1,125 1,500 Feet

FIGURE 3
Build Alternative Project Features
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California

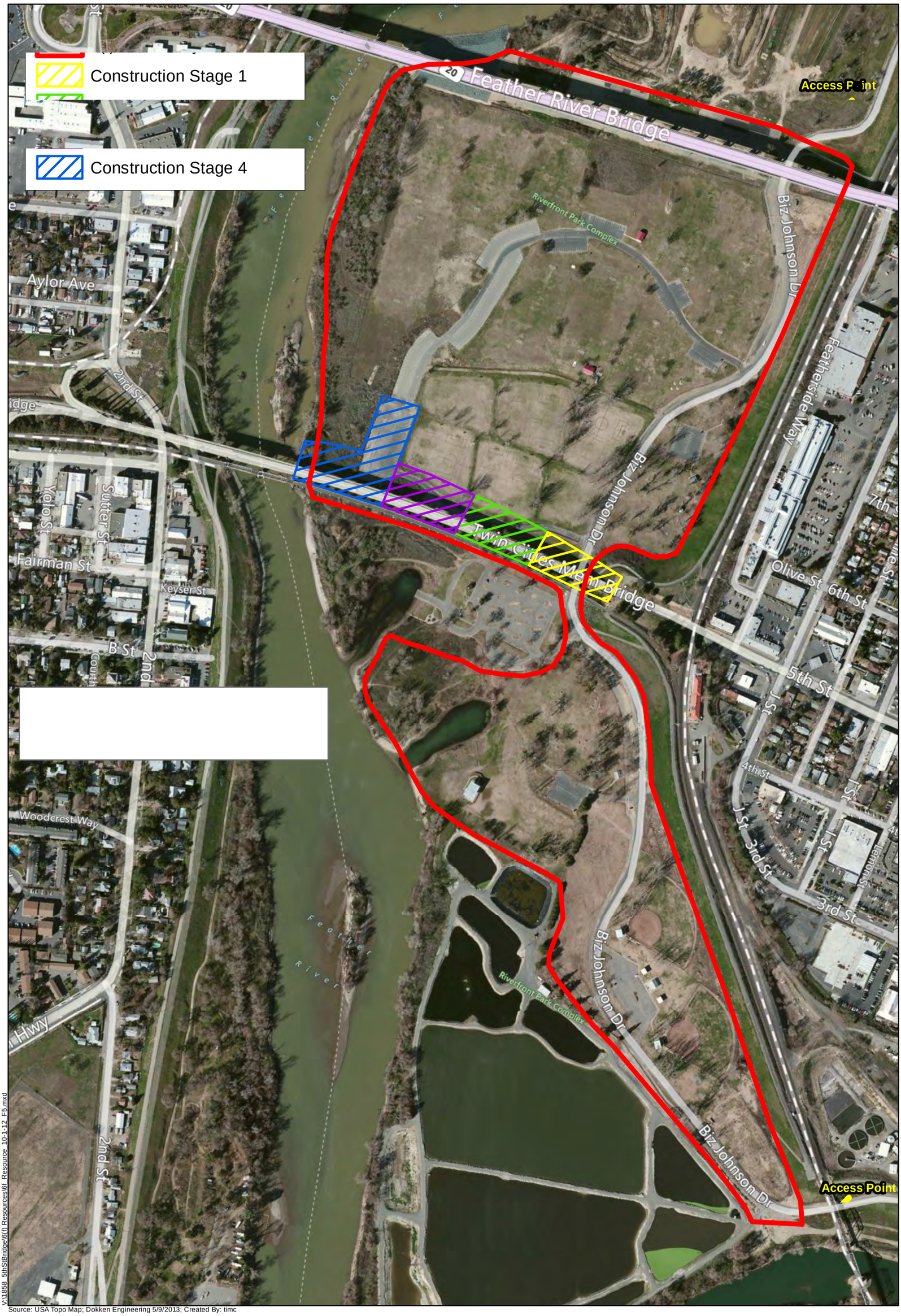


V:\1858_5thStBridge\SEA\(0)\F4-Proposed Construction Riverfront 5-9-13.mxd

Source: Bing 2011; Dokken Engineering 5/10/2013; Created By: timc/

0 200 400 600 Feet

FIGURE 4
Proposed Construction at Riverfront Park
5th Street Bridge Replacement Project
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County and Sutter County, California



V:\1858_5thStBridge\6(f) Resources\6f_Resource_10-1-12_F5.mxd

Source: USA Topo Map; Dokken Engineering 5/9/2013; Created By: timc

0 390 780 1,170 1,560 Feet

FIGURE 5
Section 6(f)3 Construction Staging
Fifth Street Bridge Over the Feather River
Federal Project No. BHLS-5163(025)
City of Yuba City, City of Marysville,
Yuba County, and Sutter County, California

In addition to the temporary construction impacts previously discussed, the proposed replacement of the 5th Street Bridge would also require minor changes to the associated facilities within the park. Some of the parking spaces located underneath or adjacent to the new bridge may need to be relocated to a nearby location to ensure that no parking spaces are lost as a result of construction of the new bridge. In addition, the new bridge will require the relocation of a park access road to the approximate area of the existing 5th Street Bridge, and one soccer field will be moved to the north approximately 10 feet. All temporarily impacted recreational areas, as well as all supporting facilities such as parking and access will be restored prior to the conclusion of construction and no park features will be permanently impacted or degraded as a result of this project.

Permanent changes to the park as a result of this project will, in general, be improvements to the facility. Although the existing bridge is a two-lane facility and the new bridge will be a four lane facility, the amount of piers in the park will be reduced, thus increasing the amount of park area usable for recreational activities. The existing bridge has 19 piers, 15 of which are in the park boundary. The new bridge will have 10 piers, 7 of which are in the park boundary.

CURRENT OPERATING COSTS AND PROJECT SAVINGS, IF ANY

The City of Marysville does not track Riverfront Park costs as a separate cost item. Costs associated with the park are lumped together with all the City's costs relating to parks and recreational uses.

In terms of revenue, the City only collects revenue from its rental of park facilities. The proposed construction may impact one soccer field and up to 80 parking spaces but is not expected to reduce any potential revenue from rental of park facilities. As such, the proposed Reduction in Services is not anticipated to result in any loss of revenue, nor increase the current operating costs of the park.

PROPOSED TIMETABLE FOR REDUCTION OF SERVICES

Construction activities for the full proposed bridge replacement project are expected to last for 18-24 months. Currently, the project is expected to start construction in the spring of 2015. As described above, construction staging would be used to ensure that each area of park would be impacted by construction for a maximum of 6 months. The temporary reduction in services would only impact recreational facility use for the "Soccer Saturdays" during the period of August through November when the Yuba Sutter Youth Soccer League is using the soccer fields and parking facilities. Use of the other areas during construction, surrounding the existing bridge, is not expected to reduce the usability of the park or any other recreational facilities found there.

NEED FOR REDUCTION OF SERVICES AT RIVERFRONT PARK

Construction activities that will take place within Riverfront Park include, but are not limited to, construction of the new bridge piers, grading and ground disturbance, bridge deck construction, demolition of the existing bridge, equipment, vehicle, and material storage, and minimal vegetation removal. There is no construction alternative where temporary impacts to the park could be completely avoided. In order to provide adequate space for construction activities, as well as protect park users from construction equipment, a 30 foot buffer has been proposed from the areas of direct bridge construction work (see figure 4). This will provide space for construction equipment to maneuver while maintaining an appropriate buffer from users of the park facilities.

The City of Marysville Public Works Department has reviewed the proposed project and its estimated reduction in services to recreational uses within the park and concurs that this plan is both reasonable and necessary. A letter providing this concurrence has been included as an attachment to this Reduction in Services Plan.

In order to minimize impacts to the park and its recreational facilities, the following measures will be included in the project design and will be implemented before, during, and after construction has been completed as appropriate:

> **Parks 1**: Construction activities that temporarily impact the adjacent soccer field and associated parking spaces will be limited to one season of the Yuba Sutter Youth Soccer League fall season (August through November). Project construction will be staged to ensure that no area of the park's recreational features is impacted for more than 6 months total.
>
> **Parks 2**: Temporary, and, if necessary, permanent replacement parking will be provided at an alternative location to ensure adequate parking is provided for all major organized park activities. No permanent loss of parking would occur as a result of construction of this project. The City of Marysville will coordinate to organize and direct parking through the use of signage.
>
> **Parks 3**: A chain link fence will be installed by the construction contractor to provide a safety barrier between construction activities and recreational activities.
>
> **Parks 4**: After construction activities that would affect the soccer fields have been completed, the City of Marysville will relocate the one soccer field that was temporarily closed during construction to the north approximately 10 feet. This relocation is to provide adequate safety for soccer players in terms of the field's proximity to the new bridge column.

GRANT PROJECTS COMPLETED FOR RIVERFRONT PARK

The Riverfront Park complex exists along the eastern border of the Feather River within the City of Marysville. The Riverfront Park has received funding on three separate occasions from the LWCF for many park improvement projects. The first instance of funding was during the fiscal year 1975/76 in which $75,825 was allotted for restrooms, a picnic area, a water line for irrigation, parking, lighting, a nature trail, drinking fountain, and signs. The second instance was during the fiscal year of 1978/79 in which $162,560 was allotted for ball fields, a restroom, a concession building, parking, fencing, scoreboards, and bleachers. The third instance was during the fiscal year of 1983/84 in which $9,445 was allotted to provide electricity to the arena area and fencing of the motocross area (LWCF summary and map attached). There are no current grant projects allocated to the Riverfront Park.

STEWARDSHIP OF RIVERFRONT PARK FACILITIES

The Riverfront Park is a City of Marysville owned, maintained, and operated park with a wide variety of recreational facilities. The City Public Works department is responsible for monitoring, maintaining, and operating the facility, as well as overseeing any construction and improvements to the site.

NATURAL AND CULTURAL RESOURCES OF RIVERFRONT PARK

In addition to the recreational uses the park offers, there is an important corridor associated with the Feather River that supports a wide variety of natural wildlife. The river is a migration corridor for fish and aquatic birds and the river has associated riparian vegetation adjacent to the live channel. These areas are outside of the designated park recreational areas, but can be accessed from the boat ramp or for bank fishing. This natural corridor provides additional natural resources which further improve the value of the park as a recreational facility.

Although there are no cultural resources directly associated with Riverfront Park, the City of Marysville has a rich cultural history dating back to the gold rush era. The Marysville ring levees surrounding the City and bordering Riverfront Park were built to protect the City from frequent flooding in the area and have recently been determined to have historic value. In addition, the Union Pacific Railroad Truss Bridge over the Feather River is a historic structure associated with the railroad's contribution to grown in the region.

LEGAL ISSUES AFFECTING THE SITE

The City of Marysville reports no legal issues related to Riverfront Park.

ATTACHMENTS

CITY OF MARYSVILLE

526 "C" Street • P.O. Box 150 • Marysville, CA 95901

CITY SERVICES DEPARTMENT
David B. Lamon, P.E., Director
(530) 749-3902

Public Works	(530) 749-3902
Planning	(530) 749-3904
Building	(530) 749-3904
Fax	(530) 749-3991

January 31, 2012

RECEIVED
FEB 3 2012
CITY OF YUBA CITY
PUBLIC WORKS DEPT

Mr. George Musallam
Director of Public Works
Yuba City Public Works
1201 Civic Center Drive
Yuba City, CA 95993

Dear Mr. Musallam:

SUBJECT: 5th Street Bridge Replacement Project – Riverfront Park Reduction in Services

The City of Marysville is a responsible agency for the 5th Street Bridge Project and is the agency with jurisdiction over the Riverfront Park. After a careful review of the 5th Street Bridge Replacement Project Riverfront Park Reduction in Services Plan, the City of Marysville agrees that a temporary reduction of Riverfront Park services will be necessary in order to fulfill construction obligations for this project. The City of Marysville understands that the project will require the temporary closure of one soccer field and use of approximately 80 parking spaces for equipment and vehicle staging during construction and that these closures will last up to 12 months. The City of Marysville also understands that measures Park 1 through Park 4 will be implemented in order to ensure that temporary impacts to the park are minimized to the greatest extent possible.

In order to ensure that temporary impacts associated with project construction are further reduced, the City of Marysville will coordinate with the Yuba Sutter Youth Soccer League representatives to ensure they are aware of the temporary reduction in services and help plan Soccer Saturdays during construction so that the loss of one soccer field and parking does not negatively impact their use of the facilities. The City of Marysville concurs with the need for minor temporary impacts to Riverfront Park recreational facilities, and finds the Reduction in Services Plan that has been prepared for this project to be an adequate description of the temporary impacts. Further, the City of Marysville finds that the proposed measures to minimize temporary impacts to the park and its users are reasonable and appropriate.

In compliance with Land and Wildlife Conservation Fund Section 6(f) requirements, Marysville staff will prepare a resolution for the Marysville City Council recommending approval of the proposed Reduction in Services Plan.

Sincerely,

David B. Lamon, P.E.
Director of City Services

Land and Water Conservation Fund Program Funded Projects

Sutter County

Date Street Park

Date Street Park Rehabilitation Project *2005/06* $277,335

Renovate Date Street Park in the City of Live Oak with a walking trail, playground equipment and minor support amenities.

Feather River Park

Feather River Park Acquisition *1970/71* $14,435

Acquisition of 61 acres.

Gray Avenue Park

Gray Avenue Park Development *1983/84* $19,525

Site preparation, irrigation and water supply for multi-use playfields.

Yuba County

Lindhurst Memorial Park

Lindhurst Memorial Park Development *2000/01* $15,300

Development of picnic areas, sports and playfields, and support facilities.

Riverfront Park

Riverfront Park Development *1983/84* $9,445

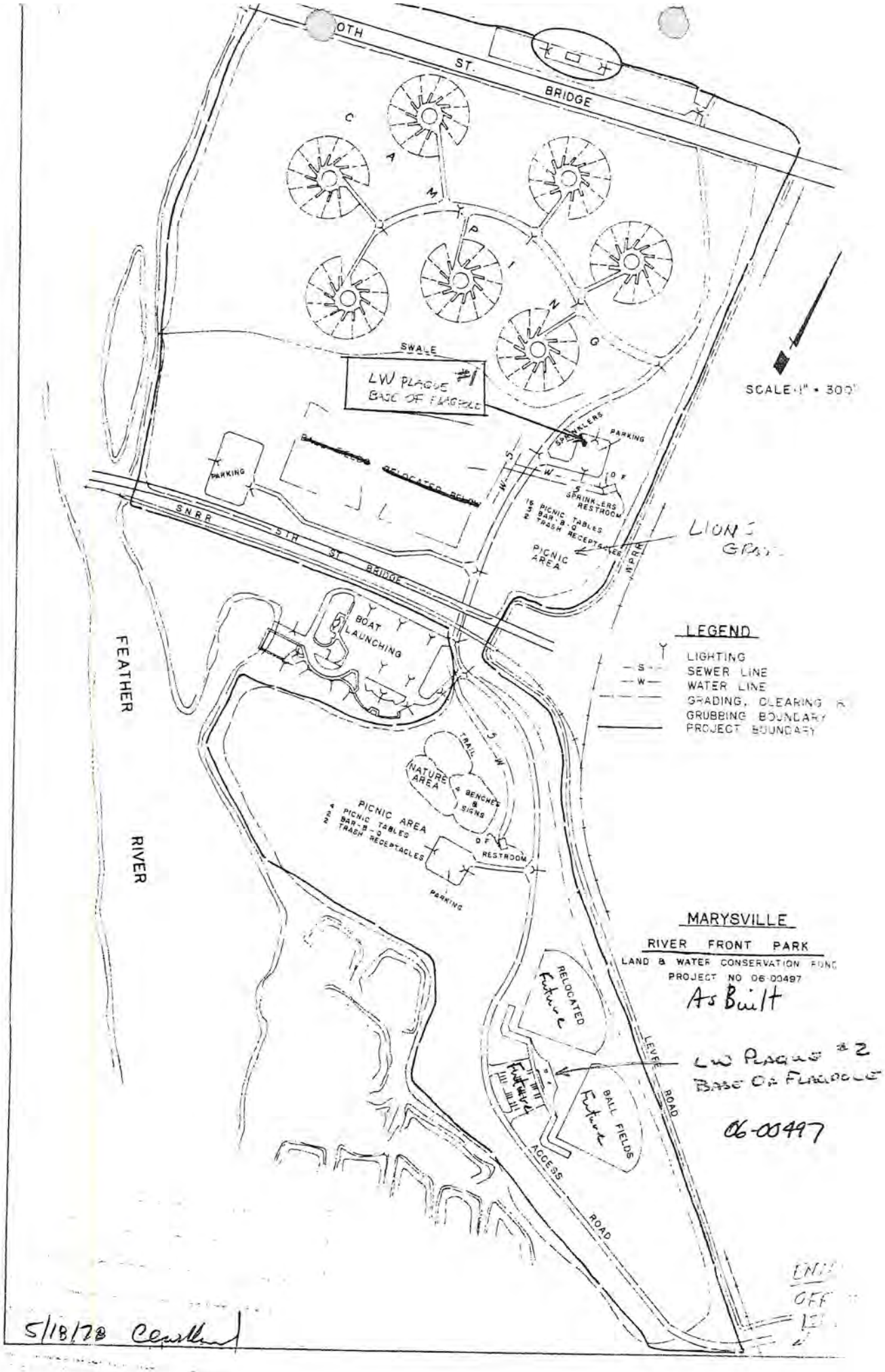
Electricity to arena area and fencing of motorcross area.

Riverfront Park Development *1975/76* $75,825

Restrooms, picnic area, water line for irrigation, parking, lighting, nature trail, drinking fountain, signs.

Riverfront Park Development *1978/79* $162,560

Ballfields, restroom, concession building, parking, fencing, scoreboards, bleachers.



5/18/78 Cerullo

Appendix C Title VI Policy Statement

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
P.O. BOX 942873, MS-49
SACRAMENTO, CA 94273-0001
PHONE (916) 654-5266
FAX (916) 654-6608
TTY 711
www.dot.ca.gov

Flex your power!
Be energy efficient!

March 2013

NON-DISCRIMINATION POLICY STATEMENT

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

For information or guidance on how to file a complaint based on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, please visit the following web page: http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

Additionally, if you need this information in an alternate format, such as in Braille or in a language other than English, please contact the California Department of Transportation, Office of Business and Economic Opportunity, 1823 14th Street, MS-79, Sacramento, CA 95811. Telephone: (916) 324-0449, TTY: 711, or via Fax: (916) 324-1949.

MALCOLM DOUGHERTY
Director

Appendix D Summary of Relocation Benefits and Relocation Impact Memorandum

RELOCATION ASSISTANCE ADVISORY SERVICES

The City of Yuba City will use the Caltrans standard Relocation Assistance Program to provide relocation advisory assistance to any person, business, farm or non-profit organization displaced as a result of acquisition of real property for public use. Yuba City will assist residential displacees in obtaining comparable decent, safe and sanitary replacement housing by providing current and continuing information on sales price and rental rates of available housing. Non-residential displacees will receive information on comparable properties for lease or purchase. This assistance will also include supplying information concerning federal and state assisted housing programs, and any other known services being offered by public and private agencies in the area.

Your Rights and Benefits as a Displaced Business, Farm or Nonprofit Organization Under the Uniform Relocation Assistance Program

Introduction

In building a modern transportation system, the displacement of a small percentage of the population is often necessary. However, it is the policy of Caltrans that displaced persons shall not suffer unnecessarily as a result of programs designed to benefit the public as a whole.

Displaced businesses, farms, and nonprofit organizations may be eligible for relocation advisory services and payments.

This brochure provides information about available relocation services and payments. If you are required to move as the result of a Caltrans transportation project, a Relocation Agent will contact you. The Relocation Agent will be able to answer your specific questions and provide additional information.

Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 As Amended "The Uniform Act"

The purpose of this Act is to provide for uniform and equitable treatment of persons displaced from their business, farm or nonprofit organization, by federal and federally assisted programs and to establish uniform and equitable land acquisition policies for federal and federally assisted programs.

49 Code of Federal Regulations Part 24 implements the "Uniform Act" in accordance with the following relocation assistance objective:

> To ensure that persons displaced as a direct result of federal or federally-assisted projects are treated fairly, consistently and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

While every effort has been made to assure the accuracy of this booklet, it should be understood that it does not have the force and effect of law, rule, or regulation governing the payment of benefits. Should any difference or error occur, the law will take precedence.

Relocation Services

The California Department of Transportation has two programs to aid businesses, farms and nonprofit organizations which must relocate.

These are:

1. The Relocation Advisory Assistance Program, which is to aid you in locating a suitable replacement property, and

2. The Relocation Payments Program, which is to reimburse you for certain costs involved in relocating. These payments are classified as:

    - Moving and Related Expenses (costs to move personal property not acquired).

    - Reestablishment Expenses (expenses related to the replacement property).

    - In-Lieu Payment (a fixed payment in lieu of moving and related expenses, and reestablishment expenses).

NOTE: *Payment of loss of goodwill is considered an acquisition cost. California law and the federal regulations mandate that relocation payments cannot duplicate other payments such as goodwill. You will* **not** *be eligible to receive any relocation payments until the State has actually made the first written offer to purchase the property. You will also receive at least 90 days' written notice before you must move.*

Some Important Definitions...

Your relocation benefits can be better understood if you become familiar with the following terms:

Business: Any lawful activity, with the exception of a farm operation, conducted primarily for the purchase, sale, lease and rental of personal or real property, or for the manufacture, processing, and/or marketing of products, commodities, or any other personal property, or for the sale of services to the public, or solely for the purpose of this Act, and outdoor advertising display or displays, when the display(s) must be moved as a result of the project.

Displaced Person or Displacee: Any person who moves from real property or moves personal property from real property as a result of the acquisition of the real property, in whole or in part, or as the result of a written notice from the agency to vacate the real property needed for a transportation project. In the case of a partial acquisition, Caltrans shall determine if a person is displaced as a direct result of the acquisition.

Owners and tenants **not lawfully present** in the United States are not eligible to receive relocation payments and assistance.

Contributes Materially: A business or farm operation must have had average annual gross receipts of at least $5,000 **or** average annual net earnings of at least $1,000, or their income must have contributed at least 33 1/3 percent of the owner's or operator's average annual gross income form all sources, in order to qualify as a bona-fide operation.

Farm Operation: Any activity conducted solely or primarily for the production of one or more agricultural products or commodities, including timber, for sale and home use, and customarily producing such products or commodities in sufficient quantity to be capable of contributing materially to the operator's support.

Nonprofit Organization: A public or private entity that has established its nonprofit status under applicable law.

MOVING EXPENSES

If you qualify as a displaced business, farm or nonprofit organization, you are entitled to reimbursement of your moving costs and certain related expenses incurred in moving. To qualify you must legally occupy the property as the owner or lessee/tenant when Caltrans initiates negotiations for the acquisition of the property **OR** at the time Caltrans acquires title or takes possession of the property. However, to assure your eligibility and prompt payment of moving expenses, you should contact your Relocation Agent before you move.

You Can Choose Either:

Actual Reasonable Moving Costs – You may be paid for your actual reasonable moving costs and related expenses when a commercial mover performs the move. Reimbursement will be limited to a move of 50 miles or less. Related expenses, with limitations, ***may*** include:

- Transportation.
- Packing and unpacking of personal property.
- Disconnecting and reconnecting personal property related to the operation.
- Temporary storage of personal property.
- Insurance while property is in storage or transit, or the loss and damage of personal property if insurance is not reasonably available.
- Expenses in finding a replacement location.
- Professional services to plan and monitor the move of the personal property to the new location.
- Licenses, permits and fees required at the replacement location.

OR

Self-Move Agreement – You may be paid to move your own personal property based on the lower of two acceptable bids obtained by Caltrans.

Under this option, you will still be eligible for reimbursement of related expenses listed above that were not included in the bids.

OR

In-Lieu Payment – You can accept a fixed payment between $1,000 and $20,000, based on your annual earnings IN LIEU OF the moving cost, related expenses and reestablishment cost.

Actual Reasonable Moving Costs

You may be paid the actual reasonable and necessary costs of your move when a professional mover performs the move. All of your moving costs must be supported by paid receipts or other evidence of expenses incurred. In addition to the transportation costs of your personal property, certain other expenses may also be reimbursable, such as packing, crating, unpacking and uncrating, and the disconnecting, dismantling, removing, reassembling, and reinstalling relocated machinery, equipment, and other personal property.

Other expenses such as professional services necessary for planning and carrying out the move, temporary storage costs, and the cost of licenses, permits and certifications may also be reimbursable. This is not intended to be an all-inclusive list of moving related expenses. Your Relocation Agent can provide you with a complete explanation of reimbursable expenses.

Self-Move Agreement

If you agree to take full responsibility for all or part of the move of your business, farm, or nonprofit organization, the Department may approve a payment not to exceed the lower of two acceptable bids obtained by the Department from qualified moving firms or a qualified Department staff employee. A low-cost or uncomplicated move may be based on a single bid or estimate at the Department's discretion. The advantage of this moving option is the fact that it relieves the displaced business, farm or nonprofit organization operator from documenting all moving expenses. The Department may make the payment without additional documentation as long as the payment is limited to the amount of the lowest acceptable bid or estimate. Other expenses, such as professional services for planning, storage costs, and the cost of licenses, permits, and certifications may also be reimbursable if determined to be necessary. These latter expenses must be pre approved by the Relocation Agent.

Requirements:

Before you move, you must provide Caltrans with the:

- Certified inventory of all personal property to be moved.
- Date you intend to vacate the property.
- Address of the replacement property.
- Opportunity to monitor and inspect the move from the acquired property to the replacement property.

Related Expenses

1. **Searching Expenses for Replacement Property:** Displaced businesses, farms and nonprofit organizations are entitled to reimbursement for actual reasonable expenses incurred in searching for a replacement property, not to exceed $2,500. Expenses may include transportation, meals, and lodging when away from home; the reasonable value of the time spent during the search; fees paid to the real estate agents, brokers or consultants; and other expenses determined to be reasonable and necessary by the Department.

2. **Direct Loss of Tangible Personal Property:** Displaced businesses, farms, and nonprofit organizations may be eligible for a payment for the actual direct loss of tangible personal property which is incurred as a result of the move or discontinuance of the operation. This payment will be based upon the lesser of:

    a. The fair market value of the item for continued use at the displacement site minus the proceeds from its sale.

    OR

    b. The estimated cost of moving and reinstalling the replaced item, based on the lowest acceptable bid or estimate obtained by the Department for eligible moving and related expense4s, including dismantling and reassembly, but with no allowance for storage, cost of code requirement betterments or upgrades at the replacement site.

EXAMPLE:
You determine that the "document shredder" cannot be moved to the new location because of its condition, and you will not replace it at the new location.

Fair Market Value of the Document Shredder Based on its use at the current location		$ 1,500
Proceeds: Price received from selling the Document Shredder	-	$ 500
Net Value		$ 1,000

OR

Estimated cost to move	$ 1,050
Based on the "lesser of", the amount of the "Loss of Tangible Personal Property" =	**$ 1,000**

Note: You are also entitled to all reasonable costs incurred in attempting to sell the document shredder (e.g. advertisement).

3. Purchase of Substitute Personal Property: If an item of personal property, which is used as part of the business, farm, or nonprofit organization, is not moved but is promptly replaced with a substitute item that performs a comparable function at the replacement site, the displacee is entitled to payment of the lesser of:

   a. The cost of the substitute item, including installation costs at the replacement site, minus any proceeds from the sale or trade-in of the replaced item;

   OR

   b. The estimated cost of moving and reinstalling the replaced item, based on the lowest acceptable bid or estimate obtained by the Department for eligible moving and related expenses, including dismantling and reassembly, but with no allowance for storage, cost of code requirement betterments or upgrades at the replacement site.

EXAMPLE A:

You determine that the copying machine cannot be moved to the new location because it is now obsolete and you will replace it.

Cost of a substitute copy machine Including installation costs at the replacement site		$ 3,000
Trade-in Allowance	-	$ 2,500
Net Value		$ 500

OR

Estimated cost to move	$ 550
Based on the "lesser of", the amount of the "Substitute Personal Property" =	**$ 500**

EXAMPLE B:

You determine that the chairs will not be used at the new location because they no longer match the décor and you will replace them.

Cost of substitute chairs		$ 1,000
Proceeds from selling the chairs	-	$ 100
Net Value		$ 900

OR

Estimated cost to move	$ 200
Based on the "lesser of", the amount of the "Substitute Personal Property" =	**$ 200**

Note: You are also entitled to all reasonable costs incurred in attempting to sell the copy machine and/or chairs.

4. **Disconnecting and Reinstallation:** You will be reimbursed for your actual and reasonable costs to disconnect, dismantle, remove, reassemble and reinstall any machinery, equipment or other personal property in relation to its move to the new location. This includes connection to utilities available nearby and any modifications to the

personalty that is necessary to adapt it to utilities at the replacement site.

5. **Physical changes at the new location:** You may be reimbursed for certain physical changes to the replacement property if the changes are necessary to permit the reinstallation of machinery or equipment necessary for the continue operation of the business. ***Note:*** *The changes cannot increase the value of the building for general purposes, nor can they increase the mechanical capability of the buildings beyond its normal requirements.*

6. The cost of installing utilities from the right of way line to the structure(s) or improvements on the replacement site.

7. Marketing studies, feasibility surveys and soil testing.

8. Professional real estate services needed for the purchase or lease of a replacement site.

9. One-time assessments or impact fees for anticipated heavy utility usage.

Reestablishment Expenses

A small business, farm or nonprofit organization may be eligible for a payment, not to exceed $10,000, for expenses actually incurred in relocating and reestablishing the enterprise at a replacement site.

Reestablishment expenses may include, but are not limited to, the following:

1. Repairs or improvements to the replacement real property required by Federal, State or local laws, codes or ordinances.

2. Modifications to the replacement real property to make the structure(s) suitable for the business operation.

3. Construction and installation of exterior signing to advertise the business.

4. Redecoration or replacement such as painting, wallpapering, paneling or carpeting when required by the condition of the replacement site or for aesthetic purposes.

5. Advertising the new business location.

6. The estimated increased costs of operation at the replacement site during the first two years, for items such as:

    a) Lease or rental charges
    b) Personal or real property taxes
    c) Insurance premiums, and
    d) Utility charges (excluding impact fees).

7. Other items that the Department considers essential for the reestablishment of the business or farm.

Note: *A nonprofit organization must substantiate that it cannot be relocated without a substantial loss of existing patronage (membership or clientele). The payment is based on the average of two years annual gross revenues less administrative expenses.*

In-Lieu Payment (Fixed)

Displaced businesses, farms and nonprofit organizations may be eligible for a fixed payment in lieu of (in place of) actual moving expenses, personal property losses, searching expense, and reestablishment expenses. The fixed payment may not be less than $1,000 or more than $20,000.

For a business to be eligible for a fixed payment, the Department must determine the following:

1. The business owns or rents personal property that must be moved due to the displacement.

2. The business cannot be relocated without a substantial loss of existing patronage.

3. The business is not part of a commercial enterprise having more than three other businesses engaged in the same or similar activity, which are under the same ownership and are not being displaced by the department.

4. The business contributed materially to the income of the displaced business operator during the two taxable years prior to displacement.

Any business operation that is engaged solely in the rental of space to others is not eligible for a fixed payment. This includes the rental of space for residential or business purposes.

Eligibility requirements for farms and nonprofit organizations are slightly different than business requirements. If you are being displaced from a farm or your represent a nonprofit organization and are interested in a fixed payment, please consult your relocation counselor for additional information.

The Computation of Your In-Lieu Payment:

The fixed payment for a displaced business or farm is based upon the average annual net earnings of the operation for the two taxable years immediately preceding the taxable year in which it is displaced. Caltrans can use a different two year period if it is determined that the last two taxable years do not accurately reflect the earnings of the operation.

EXAMPLE: Caltrans acquires your property and you move in 2005:

2003 Annual Net Earnings	$ 10,500
2004 Annual Net Earnings	$ 12,500
TOTAL	$ 23,000
Average over two years	**$ 11,500**

This would be the amount of your in-lieu payment. Remember – this is in-lieu of all other moving benefits, including reestablishment expenses. You must provide the Department with proof of net earnings to support your claim.

Proof of net earnings can be documented by income tax returns, certified financial statements, or other reasonable evidence of net earnings acceptable to the Department.

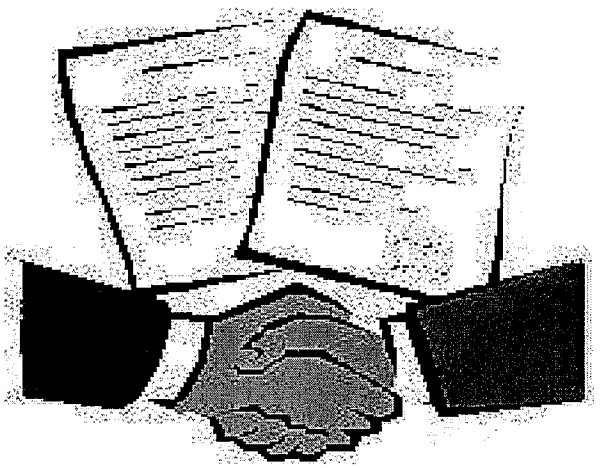
Note: The computation for nonprofit organizations differs in that the payment is computed on the basis of average annual gross revenues less administrative expenses for the two year period specified above.

Before You Move:

A. Request a determination of entitlement for in-lieu payment from your Relocation Agent.
B. Include a written statement of the reasons the business cannot be relocated without a substantial loss in net earnings.

C. Provide certified copies of tax returns for the two tax years immediately preceding the tax year in which you move. (If you move anytime in the year 2005, regardless of when negotiations began or the State took title to the property, the taxable years would be 2003 and 2004).
D. You will be notified of the amount you are entitled to after the application is received and approved.
E. You cannot receive the payment until after you vacate the property, AND submit a claim for the payment within 18 months of the date of your move.

Relocation Advisory Assistance



Any business, farm or nonprofit organization displaced by Caltrans shall be offered relocation advisory assistance for the purpose of locating a replacement property. Relocation services are provided by qualified personnel employed by Caltrans. It is their goal and desire to be of service to you and assist in any way possible to help you successfully relocate.

A Relocation Agent from Caltrans will contact you personally. Relocation services and payments will be explained to you in accordance with your eligibility. During the initial interview with you, your needs and desires will be determined as well as your need for assistance.

You can expect to receive the following services, advice and assistance from your Relocation Agent who will:

- Determine your needs and preferences.
- Explain the relocation benefits and eligibility requirements.
- Provide information on replacement properties for your consideration.
- Provide information on counseling you can obtain to help minimize hardships in adjusting to your new location.
- Assist you in completing loan documents, rental applications or Relocation Claims Forms.

AND provide information on:

- Security deposits
- Interest rates and terms
- Typical down payments
- Permits, fees and local planning
- SBA loan requirements
- Real property taxes.
- Consumer education literature

If you desire, your Relocation Agent will give you current listings of other available replacement property. Transportation will be provided to inspect available property, especially if you are elderly or handicapped. Though you may use the services of a real estate broker, Caltrans cannot provide a referral.

Your Relocation Agent is familiar with the services provided by others in your community and will provide information on other federal, state, and local programs offering assistance to displaced persons. If you have special needs, your Relocation Agent will make every effort to secure the services of those agencies with trained personnel who have the expertise to help you.

If the highway project will require a considerable number of people to be relocated, Caltrans will establish a temporary Relocation Field Office on or near the project. Project relocation offices will be open during convenient hours and evening hours if necessary.

In addition to these services, Caltrans is required to coordinate its relocation activities with other agencies causing displacements to ensure that all persons displaced receive fair and consistent relocation benefits.

Remember - YOUR RELOCATION AGENT is there to offer advice and assistance. Do not hesitate to ask questions. And be sure you fully understand all of your rights and available benefits.

YOUR RIGHTS AS A DISPLACEE

It is important to remember that your relocation benefits will not have an adverse affect on your:

- Social Security Eligibility
- Welfare Eligibility
- Income Taxes

In addition, the Title VIII of the Civil Rights Act of 1968 and later acts and amendments make discriminatory practices in the purchase and rental of most residential units illegal if based on race, color, religion, sex, or national origin.

Caltrans' Non-Discrimination Policy ensures that all services and/or benefits will be administered to the general public without regard to race, color, national origin, or sex in compliance with Title VI of the 1964 Civil Rights Act (42 USC 2000d. et seq.).

And you always have the Right to Appeal any decision by Caltrans regarding your relocation benefits and eligibility.

Your Right of Appeal is guaranteed in the "Uniform Act" which states that any person may file an appeal with the head of the responsible agency if that

person believes that the agency has failed to properly determine the person's eligibility or the amount of a payment authorized by the Act.

If you indicate your dissatisfaction, either verbally or in writing, Caltrans will assist you in filing an appeal and explain the procedures to be followed. You will be given a prompt and full opportunity to be heard. You have the right to be represented by legal counsel or other representative in connection with the appeal (but solely at your own expense).

Caltrans will consider all pertinent justifications and materials submitted by you and other available information needed to ensure a fair review. Caltrans will provide you with a written determination resulting from the appeal with an explanation of the basis for the decision. If you are still dissatisfied with the relief granted, Caltrans will advise you that you may seek judicial review.

Sus Derechos y Beneficios Como Negocio, Operación Agrícola o Organización No Lucrativa Desplazada Bajo el Departmento de Transportación de California, Programa para Asistencia de Reubicación

Introducción

Cuando se está construyendo un sistema de transporte moderno, el desplazamiento de un pequeño porcentaje de la población es a veces necesario. Sin embargo, es el procedimiento de Caltrans que las personas desplazadas no deben de sufrir innecesariamente como resultado de los programas diseñados para el benificio del público en general.

Los negocios, operaciones agrícolas, y organizaciones no-lucrativas desplazadas pueden ser elegibles para servicios de reubicación y pagos.

Este libreto le provee información acerca de los servicios y pagos de reubicación disponibles. Si usted tiene que mudarse como resultado de un proyecto de transportación de Caltrans, un Agente de Reubicación lo contactará. El Agente de Reubicación estará disponible para responderle preguntas específicas y darle información adicional.

Acta de Procedimiento Uniforme de Asistencia para Reubicación y Adquisición de Bienes Raíces de 1970, Emendada
“El Acta Uniforme”

El propósito de esta Acta es de proveer uniformidad e igualdad de tratamiento a personas desplazadas de sus negocios, operaciones agrícolas, u organización no-lucrativa, por programas federales o programas asistidos con fondos federales, y de establecer uniformidad e igualdad en los procedimientos para adquisión de tierras para los programas federales y programas asistidos con fondos federales.

El Código de Regulaciones Federales 49, Parte 24 implementa el “Acta Uniforme” de acuerdo a los siguientes objetivos de asistencia de relocalización:

> Para asegurar que las personas desplazadas como resultado directo de proyectos federales o proyectos asistidos con fondos federales sean tratados con justicia, consistencia e igualdad de tal manera que esas personas no sufran daños desproporcionados como resultado de los proyectos diseñados para el beneficio del público en general.

Mientras se ha hecho todo esfuerzo para asegurar la veracidad de este folleto, debe entenderse que no tiene la fuerza ni efecto de la ley, regla o regulaciones que gobiernan el pago de los beneficios. Si alguna diferencia o error resulta, la ley tomará precedencia.

Servicios de Reubicación

El Departamento Transportación tiene dos programas para de ayudar a negocios, granjas y organizaciones no-lucrativas que tienen que reubicarse. Estas son:

1. El Programa de Consejos de Asistencia de Reubicación, que es para ayudarle en localizar una propiedad de reemplazo conveniente, y

2. El Programa de Pagos para Reubicación, que le reembolsará de ciertos costos envueltos en la reubicación. Estos pagos están clasificados como:

   - Gastos Relacionados a Mudanza (costos de mover propiedad personal no adquirida).
   - Gastos de Reestablecimiento (gastos relacionados a la propiedad de reemplazo.)
   - Pagos Fijos (pago fijo en vez de los gastos de mudanzas y otros gastos relacionados, y gastos de reestablecimiento).

Nota: *Pagos por pérdida de clientela es considerado un costo de adquisición. La ley de California y las regulaciones federales mandan que los pagos de reubicación no pueden duplicar otros pagos, como los pagos de pérdida de clientela.*

Usted **no** puede ser elegible a recibir ningún pago de reubicación hasta que el Estado haya hecho la primera oferta escrita para comprar su propiedad. Usted tambien recibirá un aviso escrito por lo menos 90 días antes que se tenga que mover.

Algunas Definiciones Importantes…

Sus beneficios de relocalización pueden ser entendidos mejor si usted se familiariza con los siguientes términos:

Negocio: Cualquier actividad legal, con la excepción de operaciones agrícolas, conducida principalmente para la compra, venta, arrendamiento, y alquiler de bienes personales o bienes raices, o para la fabricación, elaboración y/o mercadotecnia de productos, mercancías, u otros bienes personales, o solamente para el propósito de ésta Acta, un rótulo con anuncio o anuncios, cuando el rótulo(s) tenga(n) que ser movido(s) como resultado del proyecto.

Negocios Pequeños: Un negocio que tenga no más de 500 empleados trabajando en el lugar que esta siendo adquirido o desplazado por un programa o proyecto.

Contribuye Materialmente: Un negocio u operación agrícola debe de haber tenido un ingreso bruto en recibos de al menos $5,000 o un promedio anual de ingreso netos de al menos $1,000, para poder calificar como una operación de buena fé.

Operación Agrícola: Cualquier actividad conducida sola o primarialemente para la producción de uno o más productos de agricultura o mercancías, incluyendo venta de madera, para la venta y uso en casa, y producción ordinaria de tales productos o mercancía en cantidades suficientes para tener la capacidad de contribuir materialmente al soporte del operario.

Organización No-lucrativa: Una entidad pública o privada que haya establecido su estado de organización no-lucrativa bajo las leyes aplicables.

Persona desplazada: Cualquier individuo o familia que se muda de una propiedad o mueva sus bienes personales de una propiedad como resultado de la acquisición de bienes raíces, en todo o en parte, o como resultado de una notificación escrita de una agencia para desocupar la propiedad que se necesita para un proyecto de transportación. En el caso de una adquisición parcial, Caltrans determinará si la persona es desplazada directamente como resultado de la adquisición.

Los residentes que no están legalmente en los Estados Unidos no son elegibles para recibir pagos y asistencia de reubicación.

Los beneficios de reubicación varían según el tipo y tiempo de ocupación. Como una persona desplazada de un unidad residencial usted puede ser clasificado como:

- Un dueño ocupante de una propiedad residencial (incluye casas movibles)
- Un inquilino ocupante de una propiedad Residencial (incluye casas movibles y cuartos para dormir)

GASTOS DE MUDANZA

Si usted califica como un negocio, operación agrícola, u organización no-lucrativa desplazada, usted puede recibir reembolso de los gastos de mudanza y ciertos gastos relacionados incurridos en la mudanza. Para calificar, usted tiene que ocupar la propiedad legalmente como dueño o inquilino cuando Caltrans inicie negociaciones para la adquisición de la propiedad, O al tiempo que Caltrans adquiera título, o tome posesión de la propiedad. Sin embargo, para asegurar su elegibilidad y el pronto pago de los gastos de mudanza, usted tiene que haber contactado a su Agente de Reubicación antes de que se mude.

Usted Puede Escoger Entre:

Gastos Razonables de Mudanza Actual – Usted tiene que haber pagado por sus gastos de mudanza razonables y gastos relacionados cuando una compañia comercial hace la mudanza.

El reembolso será limitado a mudanza de 50 millas o menos. Los gastos relacionados, con limitaciones, ***pueden*** incluir:

- Transportación.
- Empacamiento y desempacamiento de la propiedad personal.
- Desconnección y reconneción relacionada a la operación de la propiedad personal.
- Almacenamiento temporal de la propiedad personal.

Seguros mientras la propiedad está en almacenamiento o en tránsito, o la propiedad personal es perdida y dañada, si los seguros no son razonablemente disponible.

- Gastos en encontrar un lugar de reemplazamiento.
- Servicios profesionales para planificar y supervisar la mudanza de la propiedad personal al nuevo lugar.
- Licencias, permisos y honorarios requiridos en el lugar de reemplazamiento.

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Contrato de Mudanza Propia – Usted puede ser pagado por mover su propia propiedad personal basado en la más baja de dos ofertas aceptables obtenidas por Caltrans. Bajo esta opción, usted deberá todavía ser elegible para el reembolsamiento de los gastos arriba relacionados que no fueron incluídos en la oferta

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Pago Fijo – Usted puede aceptar un pago fijo entre $1,000 y $20,000 basado en sus ganancias anuales EN VEZ de los costos y gastos relacionados de la mudanza.

Costos Actuales Razonables de Mudanza:

Pueden pagársele los gastos actuales razonables y necesarios de su mudanza si lo transporta con una compañía comercial de muebles y mudanzas. Todos sus gastos deben de ser respaldados con recibos u otra evidencia de gastos incurridos. Además de los gastos de transportación de su propiedad personal, ciertos otros gastos también pueden ser reembolsados, tales como empaque, embalaje, desempaque y desembalaje, desconexión, desmantelación, removimiento, reensamblamiento, y reinstalación de maquinaria relocalizada, equipos y otras propiedades personales. Otros gastos necesarios tales como servicios profesionales para planificar y supervisar la mudanza, almacenaje temporal y el costo para licencias, permisos y certificados también pueden ser reembolsables. Esta no es la intención de ser una lista inclusiva de todos los gastos relacionados de mudanza. Su Agente de Reubicación puede proveerle una explicación completa de los gastos reembolsables.

Contrato de Mudanza Propia

Si usted elige tomar la responsabilidad total o parcial para la mudanza de su negocio, operación agrícola, u organización no-lucrativa, Caltrans puede aprobar un pago sin exceder el presupuesto mas bajo de dos ofertas aceptables de una compañía comercial de muebles y mudanzas o por el Agente de Reubicación. Una mudanza a costo bajo o sin complicaciones puede ser basada en una sola oferta o estimado. En realidad, la ventaja de esta opción es que releva de la obligación al operador del negocio, operación agrícola u organización no-lucrativa desplazadas de documentar todos los gastos de mudanza. Caltrans puede hacer el pago sin documentación adicional siempre y cuando el pago sea limitado a la cantidad más baja aceptable de la oferta o del estimado. Otros gastos tales como servicios profesionales para planificar, costos de almacenaje y el costo de licencias, permisos, y certificados también pueden ser reembolsables si son necesarios. Estos gastos tienen que ser aprobados de ante mano por el Agente de Reubicación.

Requisitos:

Antes de que se mueva, usted tiene que proveer a Caltrans con:

- El inventario certificado de toda la propiedad personal que va a mover.
- La fecha que usted intenta desalojar la propiedad.
- La dirección de la propiedad de reemplazamiento.
- La oportunidad de supervisar e inspeccionar la mudanza desde la propiedad adquirada a la propiedad de reemplazo.

Gastos Relacionados

(1) **Gastos Para la Búsqueda de una Propiedad de Reemplazo** – Negocios, operaciones agrícolas, y organizaciones no-lucrativas tienen derecho a un reembolso por gastos actuales razonables, incurridos en la búsqueda de una propiedad de reemplazo, sin exceder $1,000. Los gastos pueden incluir transportación, alimento y alojamiento cuando esté lejos de su casa; el valor razonable del tiempo que ha gastado buscando una propiedad de reemplazo; los honorarios pagados a agentes de bienes raíces o asesores; y otros gastos determinados por Caltrans como razonables y necesarios.

(2) **Pérdidas Directas de Bienes Personales Tangibles:** Los negocios, operaciones agrícolas, y organizaciones no-lucrativas desplazadas pueden ser elegibles para un pago por pérdidas directas de bienes personales tangibles incurrido como resultado de la mudanza o descontinuación de la operación. Este pago deberá ser basado en el menor de:

(a) El valor de mercado de un producto para uso continuo en el sitio de desplazamiento menos la ganancia por su venta.

O

(b) El costo estimado de mudanza y reinstalación de los objetos reemplazados es basado en la oferta mas baja o el estimado obtenido por Caltrans para mudanza elegible y costos relacionados, incluyendo desmantelamiento y reemsamblaje, pero sin pago por almacenamiento.

POR EJEMPLO:

Usted determina que el "cortador de documentos" no puede ser movido a la nueva localidad por su condición, y usted no lo va a reemplazar en la nueva localidad.

El Valor de Mercado del Cortador de Documentos basado en su uso actual en la localidad actual es de	$1,500
Ganancia: Precio recibido por la venta del Cortador de Documentos	– $ 500
Valor Neto	$1,000
Ó	
El costo estimado de moverlo	$ 1,050
Basado en el "menor de", la cantidad de la "Perdida de Propiedad Personal Tangible"	= **$ 1,000**

Nota: *Usted tambien tiene derecho a todos los costos rasonables incurrido en su esfuerzo por vender el cortador de documentos (por ejemplo, anuncio commercial)*

(3) Compra de Substitución de la Propiedad Personal: Si un objeto de propiedad personal, el cual es usado como parte del negocio, la operación agrícola, o la organización no-lucrativa, no es movido pero es prontamente reemplazado con un objeto substituto que hace una función comparable en el sitio de reemplazo, el desplazado tiene derecho al menor de:

(a) El costo de un objeto substituto, incluyendo los costos de instalación en el sitio de reemplamiento, menos cualquier ganacia por la venta o intercambio del objeto reemplazado.

O

(b) El costo estimado de mudanza y reinstalación del objeto de reemplazo, basado en la oferta mas baja aceptable o el estimado obtenido por Caltrans para una mudanza elegible y gastos relacionados, incluyendo el desmantelamiento y reensamblaje, pero sin pago por almacenamiento

EJEMPLO A:

Usted puede determinar que la máquina copiadora no puede ser movida a la nueva localidad porque es ahora obsoleta y la va a reemplazar.

Costo de substuitir una Máquina Copiadora incluyendo costos de instalación en el sitio de reemplazamiento.	$ 3,000
Pago por el Intercambio	– $ 2,500
Valor Neto	$ 500
O	
Costo estimado de la mudanza	$ 550
Basado en el “menor de” la cantidad de “La Propiedad Personal Substituida”	**$ 500**

EJEMPLO B:

Usted determina que las sillas no van a ser usadas en la nueva localidad, porque ya no combinan con la decoración, y usted las quiere reemplazar.

Costo de la sillas substitutas	$ 1,000
Ganancias: Por la venta de las Sillas	– $ 100
Valor Neto	$ 900
O	
Costo estimado de la mudanza	$ 200
Basado en el “menor de”, la cantidad de “La Propiedad Personal de Substitución”	**$ 200**

NOTA: *Usted tambien tiene derecho a todos los gastos razonables incurridos en su esfuerzo por vender la copiadora (Ejemplo A) o las sillas (Ejemplo B).*

(4) **Desconección y Reinstalación:** Usted va a ser reembolsado por los costos actuales y razonables de desconección, desmantelamiento, mudanza, reem-samblaje, e reinstalación de cualquier maquinaria, equipo u otra propiedad personal en relación a la mudanza a su nuevo local. Esto incluye conección a los servicios públicos disponibles en el lugar y a cualquier modificación de los objectos personales que sean necesario para adaptar a los servicios públicos en el sitio de reemplazamiento.

(5) **Cambios Físicos en el nuevo local:** Usted puede ser reembolsado por ciertos cambios físicos de la propiedad de reemplazamiento si los cambios son necesarios para permitir la reinstalación de la maquinaria o equipo necesario para la continua operación del negocio.

Nota: *Los cambios no pueden incrementar el valor del edificio para propósitos generales, tampoco pueden incrementar la capacidad mecánica de los edificios más alla de los requerimientos normales.*

Gastos De Reestablecimiento

Un pequeño negocio, operación agrícola, u organización no-lucrativa puede ser elegible para un pago, que no exceda $10,000, para los gastos actuales incurridos en la reubicación y el reestablecimiento en el sitio de reemplazo.

Gastos de reestablecimiento pueden incluir, pero no están limitados a, lo siguiente:

1. Reparación y mejoramiento de la propiedad de reemplazamiento requerido por las leyes, códigos, u ordenanzas federales, estatales o locales.

2. Modificaciones de la propiedad de reemplazamiento para hacer la estructura(s) apropiado para la operación del negocio.

3. Construcción e instalación de los letreros exteriores para anunciar el negocio.

4. El costo de instalación de servicios públicos desde la línea del derecho de vía a la estructura(s) o mejoramientos en el sitio de reemplazamiento.

5. Redecoración o reemplazamiento como pintura, tapizado de pared, paneles, o carpetas cuando sean requeridas por la condición del sitio de reemplazo o con propósitos estéticos.

6. El costo de licencias, honorarios, y permisos cuando no sean cubiertos como gastos de mudanza.

7. Estudios de mercado, estudios de factibilidad y exámen de suelo.

8. Anunciar la localidad del nuevo negocio.

9. Servicios profesionales de bienes raíces necesarios para la compra o la renta de un lugar de reemplazo.

10. El aumento del costo estimado de operación en el lugar de reemplazo durante los primeros dos años, por objectos como:

    a. Cargas de rentas,
    b. Impuestos de propiedad personal o propiedad real
    c. Prima de seguros, y
    d. Carga de servicios públicos (excluyendo honorarios de impacto).

11. Evaluación de una-vez o honorarios de impacto por alta utilización de servicios públicos.

12. Otros objetos que el Departmento considere esenciales para el reestablecimiento del negocio ú operación agrícola.

Pago De Una Vez (O Pago Fijo)

Negocios que han sido desplazados, operaciones agrícolas, y organizaciones no-lucrativas podrían ser elegibles para un pago fijo (en vez de) por los gastos actuales de mudanza, pérdida de propiedad personal, gastos de búsqueda, y gastos de reestablecimiento. Los pagos fijos no podrán ser menos de $1,000 o más de $20,000.

Para que un negocio sea elegible por un pago fijo, Caltrans debe de determinar lo siguiente:

1. El negocio posee o renta propiedad personal que debe de ser movida debido al desplazamiento.

2. El negocio no puede ser relocalizado sin una pérdida substancial de la clientela existente.

3. El negocio no es parte de un empresa comercial que tiene mas de tres otros negocios conectados en una misma o actividad similar, las cuales están bajo el mismo dueño y no están siendo desplazadas por el Departamento.

4. El negocio contribuyó materialmente a las ganancias del operador del negocio desplazado durante los dos años anteriores al desplazamiento.

Cualquier operación del negocio que está conectado solamente en la renta del espacio de otros, no es elegible para un pago fijo. Esto incluye la renta de espacio con propósitos residenciales o de negocios.

Los requerimientos de elegibilidad para las operaciones agrícolas y organizaciones no-lucrativas son un poco diferentes a los requerimientos para negocios. Si usted está siendo desplazado de una granja o usted representa una organización no-lucrativa y está interesado en un pago fijo, por favor consulte con su consejero de reubicación para información adicional.

La computación de Su Pago Fijo

El pago fijo para un negocio desplazado o una operación agrícola es basado en el promedio anual neto de ganancias de la operación por los dos años immediatamente precedentes al año en el cual fue desplazado. Caltrans puede usar un período de dos años diferentes, si se determina que los dos últimos años no reflejan con certeza las ganacias de la operación.

EJEMPLO: Caltrans adquiere su propiedad y usted se mueve en el 2001:

1999 Ganancias Netas Anuales	$10,500
2000 Ganancias Netas Anuales	$12,500
TOTAL	$23,000
Promedio de los dos años	$11,500

Este podría ser la cantidad de su pago fijo. Recuerde – esto es “en vez de” todos los otros beneficios de mudanza. Usted tendrá que proveer Caltrans pruebas de las ganacias netas para verificar su reclamo.

Prueba de las ganancias netas pueden ser documentas con sus declaraciones de impuestos, cartas financieras certificadas, u otra evidencia razonable de las ganancias netas aceptables por Caltrans.

Nota: *La computación de las organizaciones no-lucrativas difiere en que los pagos son computados en la base del promedio anual grueso de las ganancias menos los gastos administrativos por el período de los dos años especificados arriba.*

Antes de que se Mueva:

A. Complete una forma de “Aplicación para Determinación de sus Derechos” que la puede obtener de su Agente de Reubicación, y devuélvala con la mayor prontitud posible.

B. Incluya una declaración escrita de las razones por las cuales su negocio no puede ser reubicado sin una pérdida substancial en la ganancias netas.

C. Provea una copia certificada de su declaración de impuestos de los dos años immediatamente precedentes al año en el que se va a mover. (Si usted se mueve en cualquier momento en el año 2001, sin importar de cuando comenzaron las negociaciones o cuando el Estado tomó título de su propiedad, los años serán el de 1999 y el 2000.

D. Usted deberá ser notificado de la cantidad a la que tiene derecho después que la aplicación es recibida y aprobada.

E. Usted no puede recibir un pago hasta que se haya movido de la propiedad, Y que haya entregado un reclamo de pago dentro de los 18 meses de la fecha de mudanza.

Asistencia de Asesoría de Reubicación

A cualquier negocio, operación agrícola, u organización no-lucrativa, desplazado por Caltrans debe de ofrecerle los servicios de asistencia de reubicación con el propósito de localizar una propiedad de reemplazamiento. Los servicios de reubicación deben de ser proveídos por un empleado de Caltrans. Es la meta y el deseo de nosotros de servirle y asistirle en cualquier manera posible para ayudarle a reubicarse exitosamente.

Un Agente de Reubicación de Caltrans se comunicará con usted personalmente. Los servicios de reubicación y los pagos deberán ser explicados a usted de acuerdo con su elegibilidad. Durante la entrevista inicial con usted, sus necesidades y deseos deberán determinarse así como su necesidad de asistencia.

Usted puede esperar recibir los siguientes servicios, consejos, y asistencia de su Agente de Reubicación quien le:

- Determinará sus necesidades y preferencias.
- Explicará los beneficios de reubicación y su elegibilidad.
- Proveerá información en las propiedades de reemplazo para su consideración.
- Proveerá información en aconsejarle como puede obtener ayuda para minimizar la adversidad en ajustarse a su nuevo local.
- Asistirá en completar los documentos de préstamos, aplicaciones de rentas o Formas de Reclamos de Reubicación.

Y puede proveerle información en:

- Depósitos de seguridad.
- Taza de intereses y términos.
- Pagos típicos de enganches.
- Permisos, honorarios, y ordenanzas locales.
- Requirimientos de préstamos SBA
- Impuestos de bienes raíces.
- Literatura de educación al consumidor.

Si usted desea, su Agente de Reubicación le dará una lista actual de otras propiedades de reemplazamiento que esten disponibles. Se le proveerá transportación para inspeccionar la propiedad disponible, especialmente si usted es anciano o desabilitado. Aunque usted puede usar los servicios de un vendedor de bienes raíces, Caltrans no lo puede referir a un agente específico.

Su Agente de Reubicación está familiarizado con los servicios proveído por otros en su comunidad y le proveerá información de otros programas federales, estatales y locales que ofrecen asistencia a las personas desplazadas. Si usted tiene necesidades especiales, su Agente de Reubicación hará un esfuerzo para asegurar los servicios del personal entrenado de estas agencias que tienen la experiencia para ayudarle.

Si el proyecto de carreteras requiere que un número considerable de personas sean reubicadas, Caltrans establecerá Oficinas temporales de Reubicación en o cerca del proyecto. Las oficinas de projectos de reubicación serán abiertas durante las horas convenientes y hasta horas de la noche si es necesario.

Además de estos servicios, Caltrans será requerido a coordinar las actividades de reubicación con otras agencias causantes de desplazamiento para asegurar que todas las personas desplazadas reciban beneficios de reubicación iguales y consistentes.

Recuerde – Su Agente de Reubicación está ahí para ofrecer consejos y asistencia. No tenga dudas en preguntar. Y esté seguro que usted entiende completamente todos los derechos y beneficios disponibles.

SUS DERECHOS COMO UNA PERSONA DESPLAZADA

Es importante que recuerde que los beneficios de reubicación no tendrán un efecto adverson en su:

- Elegibilidad para Seguro Social
- Elegibilidad para Asistencia Social
- Declaración de Impuestos.

Además, el **Título VIII del Acta de Derechos Civiles de 1968**, y las actas anteriores y sus enmiendas hacen ilegal las prácticas en la venta y renta de las unidades residenciales que estén basadas en la raza, color, religion, sexo, u origen nacional.

Los Procedimientos No-Descriminatorios de Caltrans aseguran que todos los servicios y/o beneficios sean administrados al público en general sin diferencia de raza, color, origen nacional, o sexo en cumplimiento con el Título VI del Acta de Derechos Civiles de 1964. (42 USC 2000 (d.) et seq.).

Y usted siempre tiene el **Derecho de Apelar** una decisión de Caltrans en relación a sus beneficios de reubicación y elegibilidad.

Su Derecho de Apelación es garantizado en la “Ley Uniforme” que establece que una persona puede apelar con el responsible de la agencia si esta persona cree que la agencia ha fallado en determinar apropiadamente la elegibilidad de la persona o la cantidad de un pago autorizado por la Ley.

Si usted indica su disatisfacción, ya sea verbalmente o por escrito, Caltrans puede asistirle en entregar su caso y explicar los procedimientos a seguir. A usted le darán la oportunidad de ser oído pronta y totalmente. Usted tiene el derecho de ser representado por un consejero legal u otro representante en conección con la apelación (pero solamente a su propio costo.)

Caltrans puede considerar todas las justificaciones pertinentes y materiales entregadas por usted y cualquier otra información disponible que sea necesaria para asegurar una revisión justa. Caltrans le proveerá con una determinación de la apelación por escrito con una explicación de la base de la decisión. Si usted todavía no está satisfecho con la asistencia prestada, Caltrans le aconsejará que usted puede buscar una revisión judicial.

Noticiero de la Ley para Americanos con Incapacidades Físicas (ADA):

Para personas con incapacidades físicas, este documento es disponible en formatos alternativos. Para Información llame al número (916) 654-5413 Voz, CRS: 1-800-735-2929, o escriba a Derecho de Vía, MS 37, 1120 N Street, Sacramento, CA 95814.

ADDITIONAL INFORMATION

No relocation payment received will be considered as income for the purpose of the Internal Revenue Code of 1954 or for the purposes of determining eligibility or the extent of eligibility of any person for assistance under the Social Security Act or any other federal law (except for any federal law providing low-income housing assistance).

Persons who are eligible for relocation payments and who are legally occupying the property required for the project will not be asked to move without being given at least 90 days advance notice, in writing. Occupants of any type of dwelling eligible for relocation payments will not be required to move unless at least one comparable "decent, safe and sanitary" replacement residence, open to all persons regardless of race, color, religion, sex or national origin, is available or has been made available to them by the City.

The information above is not intended to be a complete statement of all of Yuba City's laws and regulations. At the time of the first written offer to purchase, owner-occupants are given a more detailed explanation of the City's relocation services. Tenant occupants of properties to be acquired are contacted immediately after the first written offer to purchase, and also given a more detailed explanation of Yuba City's relocation programs.

Appendix E **Environmental Commitment Record**

Yuba City, as the lead agency under the California Environmental Quality Act (CEQA), has developed an Environmental Commitment Record for the 5th Street Bridge Replacement Project. This list is designed to ensure that the mitigation measures identified in the project's Initial Study/Environmental Assessment are implemented prior to, during, and after completion of construction.

The following table contains a list of the avoidance, minimization, and/or mitigation measures. For each measure, the table identifies timing of implementation, party responsible for implementation, completion check box, and space for initials.

Yuba City is responsible for ensuring the implementation of all measures in this Environmental Commitment Record.

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Parks and Recreational Facilities					
Measure PRF-1: Construction activities that temporarily impact the adjacent soccer field and associated parking spaces will be limited to one season of the Yuba Sutter Youth Soccer League fall season (August through November). Project construction will be staged to ensure that no area of the park's recreational features is impacted for more than 6 months total.	Prior to construction	Yuba City	☐	_____	
Measure PRF-2: The City of Yuba City and the City of Marysville will coordinate with the Yuba Sutter Youth Soccer League prior to construction to ensure that construction activities and closure of one soccer field will minimally affect the main soccer season scheduled in the fall.	Prior to construction	Yuba City / Marysville	☐	_____	
Measure PRF-3: Temporary, and, if necessary, permanent replacement parking will be provided at an alternative location to ensure adequate parking is provided for all major organized park activities. No permanent loss of parking would occur in the park as a result of construction of this project. The City of Marysville will coordinate to organize and direct parking through the use of signage.	During construction	Resident Engineer	☐	_____	
Measure PRF-4: A temporary chain link fence will be installed by the construction contractor to provide a safety barrier between construction activities and recreational activities.	During construction	Resident Engineer	☐	_____	
Measure PRF-5: After construction activities that would affect the soccer fields have been completed, the City of Marysville will relocate the one soccer field that was temporarily closed during construction to the north approximately 10 feet. This relocation is to provide adequate safety for soccer players in terms of the field's proximity to the new bridge column.	During construction	Resident Engineer	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure PRF-6: During construction activities that take place in or nearby the live Feather River Channel, the following measures shall be implemented to improve safety for the public engaged in recreation along the Feather River: • Buoys and signage shall be implemented both on the bridge and in the river to alert watercraft users of construction activities and to help watercraft navigate safe passage. • Nighttime navigational lighting shall be used as necessary to alert watercraft of changed in the river conditions during construction. • Containment or a protective cover (netting) shall be installed along the live channel used to ensure that falling debris does not endanger the public during construction activities.	During construction	Resident Engineer	☐	_____	
Community Character and Cohesion					
Measure CCC-1: Where feasible, temporary signage will be installed notifying the public of closures or detours and the expected duration of the closure.	Prior to construction	Yuba City	☐	_____	
Measure CCC-2: Temporary disruptions to access for businesses in the project area will be minimized by coordinating construction to provide alternative access points and by ensuring that all businesses have at least one open driveway during construction.	During construction	Resident Engineer	☐	_____	
Measure CCC-3: Pedestrian and bicycle access will be maintained, where facilities are currently present, on at least one side of the roadway through the project area during construction.	During construction	Resident Engineer	☐	_____	
Relocation					
Measure RLC-1: Property owners shall be compensated in accordance with fair market values based on appraisals. The City of Yuba City will use the Caltrans standard Relocation Assistance Program to provide relocation advisory assistance to any person, business, farm or non-profit organization displaced as a result of acquisition of real property for public use.	Prior to construction	Yuba City	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure RLC-2: All efforts would be made to identify relocation opportunities for affected businesses. Wherever feasible, assistance would be made available in identifying suitable relocation sites within the service area of existing businesses.	Prior to construction	Yuba City	☐	_____	
Utilities/Emergency Services					
Measure UTL/ES-1: To minimize interruptions of service to utility customers, a series of coordination letters shall be sent to all impacted utility companies to identify utilities within the proposed project. Letters will indicate where utility relocations are to be performed and the required time to relocate them. Design plans will be sent to involved utility owners during the project development phase. Meetings will be arranged with utility companies as necessary to discuss impacts and relocation plans.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	
Measure UTL/ES-2: A Transportation Management Plan shall be prepared. It will ensure that there is appropriately designed access for emergency services onto all roads involved in the proposed project. The transportation coordination plan will be provided to emergency public services (including fire, police, and hospital facilities).	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	
Measure UTL/ES-3: Emergency public services, local law enforcement agencies, and local businesses will be notified of the proposed project and of any temporary lane closures one month before construction begins.	Prior to construction	Yuba City	☐	_____	
Traffic and Transportation/Pedestrian and Bicycle Facilities					
Measure TRAF-1: All existing non-motorized facilities shall be maintained to ADA standards.	During construction	Resident Engineer	☐	_____	
Measure TRAF-2: To minimize the temporary effects to travelers, a Traffic Management Plan will be prepared. Such strategies might include public information campaigns, motorist information, incident management, and inclusion of night work for construction activities.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Water Quality and Stormwater Runoff					
Measure SWR-1: For project areas exceeding one acre, NPDES guidelines necessitate the development of a SWPPP by the contractor prior to construction to establish project-specific permanent and temporary BMPs. During the design phase, a SWPPP will be prepared to determine the minimum control requirements to be included in the project. A Notice of Intent or Notice of Construction will be submitted to the SWRCB along with the completed SWPPP.	Prior to construction	Yuba City	☐	_____	
Measure SWR-2: BMPs include any facilities and methods used to remove, reduce, or prevent storm water runoff pollutants from entering receiving waters. Erosion control methods, temporary and permanent BMPs, and improvement of drainage facilities along the roadway would minimize impacts from storm water runoff. The SWPPP and NPDES compliance measures would ensure no adverse impacts would occur to water quality associated with the Build Alternative.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	
Hazardous Waste or Materials					
Measure HW-1: Prior to the start of construction, asbestos surveys shall be conducted to identify presence of asbestos related materials within the project area. Surveys will include the 5th Street Bridge and any other buildings or structures that would be modified or demolished during construction.	Prior to construction	Yuba City	☐	_____	
Measure HW-2: Pavement striping within the project area shall be removed in accordance with Caltrans Standard Special Provision 15-300 REMOVE TRAFFIC AND PAVEMENT MARKINGS.	During construction	Resident Engineer	☐	_____	
Measure HW-3: Prior to the start of construction, lead based paint surveys shall be conducted to identify presence of lead related materials within the project area. Surveys will include the 5th Street Bridge and any other buildings or structures that would be modified or demolished during construction.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure HW-4: Any leaking transformers observed during the course of the project should be considered a potential polychlorinated biphenyl (PCB) hazard. Should leaks from electrical transformers (that will either remain within the construction limits or will require removal and/or relocation) be encountered during construction, the transformer fluid should be sampled and analyzed by qualified personnel for detectable levels of PCB's. Should PCBs be detected, the transformer should be removed and disposed of in accordance with the appropriate regulatory agency. Any stained soil encountered below electrical transformers with detectable levels of PCB's should also be handled and disposed of in accordance with the appropriate regulatory agency.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	
Measure HW-5: Prior to the start of construction, a review of the most current results of the groundwater monitoring wells associated with the existing NTG, GasMax and Chevron gas stations for potentially elevated levels of petroleum hydrocarbons and MTBE contamination shall be conducted. Based on review of the groundwater monitoring well data results, if elevated levels of petroleum hydrocarbons or MTBE are detected in groundwater monitoring wells that are within or immediately adjacent to the project limits a limited Phase II Site Assessment should be performed at those locations. The Phase II Site Assessment should consist of subsurface sampling and laboratory analysis and be of sufficient quantity to define the extent and concentration of contamination within the areal extent and depths of planned construction activities adjacent to the NTG, GasMax and/or Chevron gas stations. The Phase II Site Assessment should also provide both a Health and Safety Plan for worker safety and a Work Plan for handling and disposing contaminated soil during construction.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	
Measure HW-6: Prior to the start of construction, a preliminary investigation and screening for potentially elevated levels of petroleum hydrocarbon contamination, grease and oils, in the surface and near-surface soils along the project segments within 50 feet of the existing Union Pacific Railroad and former Sacramento Northern Railroad alignments shall be conducted. The investigation should include a remediation plan for handling and/or removal/disposal of contaminated soil, if encountered.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure HW-7: As is the case for any project that proposes excavation, the potential exists for unknown hazardous contamination to be revealed during project construction (such as previously undetected petroleum hydrocarbon contamination from nearby sources or potential explosive threat if a gas pipeline is ruptured during construction). For any previously unknown hazardous waste/material encountered during construction, Yuba City will follow the procedures outlined in the Caltrans Hazards Procedures for Construction.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	
Air Quality					
Measure AQ-1: The construction contractor shall comply with Caltrans' Standard Specifications in Section 14 (2010). • Section 14-9.01 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances. • Section 14-9.02 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are contained in Section 18.	During construction	Resident Engineer	☐	_____	
Noise					
Measure NOI-1: Yuba City intends to incorporate noise abatement in the form of (a) barrier(s) at R24, a property located southwest of 5th Street and J Street in Marysville, with respective lengths and average heights of 170 feet length and 10 feet height. Calculations based on preliminary design data indicate that the barrier(s) would reduce noise levels by at least 7 dBA for five residences at a cost of $78,029. If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision of the noise abatement will be made upon completion of the project design and the public involvement processes.	During construction	Resident Engineer	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure NOI-2: Yuba City will ensure that the construction contractor shall comply with Caltrans Standard Specifications Section 14-8.02, "Noise Control". Section 14-8.02 provides information that can be considered in determining whether construction would result in adverse noise impacts. The specification states: • Do not exceed 86 dBA at 50 feet from the job site activities from 9 p.m. to 6 a.m. • Use an alternative warning method instead of a sound signal unless required by safety laws. • Construction vehicles shall equip internal combustion engines with the manufacturer recommended muffler.	During construction	Resident Engineer	☐	_____	
Measure NOI-3: Substantial noise-generating construction activities, such as pile driving, shall be limited to daytime hours.	During construction	Resident Engineer	☐	_____	
Measure NOI-4: Substantial noise-generating construction activities during periods of intensive park usage (concerts, soccer tournaments, etc.), shall be avoided.	During construction	Resident Engineer	☐	_____	
Biological Environment					
Natural Communities					
Measure BIO-1: Prior to the start of construction, Environmentally Sensitive Area (ESA) fencing shall be installed along the construction limits to protect riparian habitat associated with the Feather River from construction activities.	Prior to construction	Yuba City	☐	_____	
Measure BIO-2: All trees to remain in place within and adjacent to proposed ground disturbances shall be designated as ESA and shall be temporarily fenced with orange plastic construction (exclusion) fencing throughout all grading and construction activities. To the extent feasible, the exclusion fencing shall be installed along the dripline of trees greater than 6 inches diameter at breast height. The fencing is intended to prevent equipment operations in the proximity of protected trees that may compact soil, crush roots, or collide with the tree trunk and/or overhanging branches.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure BIO-3: In order to ensure that vegetated areas are restored to their pre-construction conditions, a landscaping plan will be prepared during design of the project. This plan will include all necessary landscaping to ensure that the Riverfront Park grasses are replaced and that any other landscaping areas impacted by construction will be restored.	During construction	Resident Engineer	☐	_____	
Wetlands and Other Waters					
Measures BIO-4: Prior to initiating construction, Environmentally Sensitive Area (ESA) fence shall be installed along the construction limits to prevent encroachment into the riparian areas adjacent to the construction site.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	
Measures BIO-5: Prior to start of construction activities, the City of Yuba City will obtain all necessary regulatory permits for this project. These permits are expected to include a CWA Section 401 Water Quality Certification from the RWQCB, a CWA Section 402 NPDES Compliance Permit from the SWRCB, a CWA Section 404 Nationwide 14 Permit from the USACE, a Fish and Wildlife Code Section 1602 Streambed Alteration Agreement from the CDFW, and an Floodplain Encroachment Permit from the Central Valley Flood Protection Board. These permits will require appropriate mitigation for impacts to waters of the U. S. and State.	During construction	Resident Engineer	☐	_____	
Animal Species					
Measures BIO-6: To ensure compliance with MBTA and CFG code, vegetation removal and initiation of construction activities should not occur during the nesting season (defined as February 15 – August 31). If this is not possible and vegetation removal or initiation of work is to occur during the nesting season, a pre-construction survey will be required. The pre-construction survey shall be performed by a qualified biologist, to determine the presence of nesting birds and ensure active nests are not directly or indirectly impacted during construction. The pre-construction survey area will include the limits of the project impact area plus a 500-foot buffer. If work is planned to begin during the nesting season (February 15 – August 31), all vegetation removal shall be completed within two weeks of the nesting survey where the survey determines no active nests are present. If the nest of a protected bird is found, the perimeter shall be flagged and a qualified biologist will	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
coordinate with USFWS and CDFW to determine an appropriate buffer distance from construction to ensure protection of the nest. The contractor shall stop work in the nesting area and is prohibited from conducting work that could disturb the nesting birds until the buffer is established (as determined by the project biologist in coordination with wildlife agencies). The buffer shall remain in the protected area until the biologist has determined that nesting activities are complete.					
Measures BIO-7: Construction activities shall not disturb nesting swallows. A qualified biologist shall coordinate with CDFW and USFWS to determine what construction activities, if any, can occur once nesting activities commence.	During construction	Resident Engineer	☐	_____	
Measures BIO-8: If demolition of the existing 5th Street Bridge is planned to occur during the nesting season, measures shall be taken to avoid impacts to migratory swallows. To protect migratory swallows, unoccupied nests will be removed from the existing bridge structure prior to the nesting season (February 15 – August 31). During the nesting season, the bridge structure shall be maintained free from nests either through use of exclusion devices and/or the active removal of partially constructed nests. After a nest is completed, it can no longer be removed until an approved biologist has determined that all birds have fledged and the nest is no longer being used.	During construction	Resident Engineer	☐	_____	
Measures BIO-9: An environmental awareness training shall be conducted prior to the onset of construction activities with construction personnel to brief them on how to recognize western pond turtle and whom to contact should any turtles be found in the work area.	During construction	Resident Engineer	☐	_____	
Measures BIO-10: A preconstruction survey for western pond turtle shall be conducted by a qualified biologist within 24 hours of the start of construction activities. If western pond turtles are located within the construction area, the turtles shall be relocated out of the area and exclusion fencing shall be installed to prevent the movement of turtles back into the construction area.	During construction	Resident Engineer	☐	_____	
Measure BIO-11: If any western pond turtles are found at any time during project work, construction shall stop and the animal allowed to leave the project area, or would be actively relocated by CDFW approved biologist.	Prior to construction	Yuba City	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Threatened or Endangered Species					
Measure BIO-12: All construction work that will take place in the live channel shall occur between June 1-October 1 during the summer low-flow period to minimize potential exposure of juveniles to pile driving noise/vibration, and to minimize fish entrapment within cofferdams.	During construction	Resident Engineer	☐	_____	
Measure BIO-13: A qualified biologist shall prepare and implement a fish salvage plan to recover any individuals entrapped in cofferdams. The fish salvage plan shall receive approval from NMFS prior to initiating any in-channel work. At a minimum, the plan will incorporate the following: • Provide for the collection, transfer, and release of all entrapped sensitive fish by a qualified biologist to a designated location downstream of project activities; • A record of the electrical conductivity, temperature (water and air), and pH within both the enclosure and within the free flowing river; and, • Ensure all rescued sensitive fish be kept in aerated water and at appropriate temperatures at all times prior to release. At a minimum, four fish rescues will be implemented as described in the prepared fish salvage plan above, and must be provided during the following activities: • Season 1 – After partial dewatering, a rescue event following construction of each temporary encasement at Pier 2 (to include each column, three total, at Pier 2) and a rescue event at Pier 3 (to include each column, 3 total, at Pier 3); and • Season 2 – After partial dewatering, a rescue for each of the temporary water diversions (Phase 1 and Phase 2)	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	
Measure BIO-14: To minimize the potential for accidental spills of materials hazardous to the aquatic environment, a Spill Prevention Control and Countermeasure Plan shall be prepared.	Prior to construction	Yuba City	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure BIO-15: Any piles driven into the river channel for use as a temporary construction trestle shall be installed using vibratory driving to the greatest extent possible. If use of an impact hammer cannot be avoided, a hydraulic hammer shall be used. The force of the hammer blow can be controlled with hydraulic hammers, and reducing the impact force would reduce the intensity of the resulting sound.	During construction	Resident Engineer	☐	_____	
Measure BIO-16: Prior to construction, an acoustical monitoring plan shall be prepared by a qualified biologist. The acoustical monitoring plan shall receive approval from NMFS prior to in-channel work and shall be implemented during all vibratory and impact pile driving activities. At a minimum, the plan will incorporate the following: • Daily acoustical monitoring by a qualified biologist during all pile driving activities; • Measurement of underwater background levels using current NMFS methodology; • Require equipment for underwater sound monitoring (hydrophone, signal amplifier, and calibrator) to utilize current National Institute of Standards and Technology traceable calibration methodology; • Require a minimum recordation distance of 10 meters from each pile being monitored; and, • The monitoring biologist may stop work if observed migrating fish are stunned or otherwise directly impacted by noise and vibration from pile driving. Work shall not resume until the fish clears the construction area under its own power, or through collection and release by the qualified fish biologist.	Prior to construction	Yuba City	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure BIO-17: Contract specifications will include the following BMPs, where applicable, to reduce erosion during construction. • Implementation of the Project will also require approval of a site-specific SWPPP that would implement effective measures to protect water quality, which may include a hazardous spill prevention plan and additional erosion prevention techniques. • Scheduling. A specific work schedule will be implemented to coordinate the timing of land disturbing activities and the installation of erosion and sedimentation control practices to reduce on-site erosion and off-site sedimentation. • Preservation of Existing Vegetation. In addition to measures #5 above, existing vegetation shall be protected in place where feasible to provide an effective form of erosion and sediment control, as well as watershed protection, landscape beautification, dust control, pollution control, noise reduction, and shade. • Mulching. Loose bulk materials shall be applied to the soil surface as a temporary cover to reduce erosion by protecting bare soil from rainfall impact, increasing infiltration, and reducing runoff. • Soil Stabilizers. Stabilizing materials shall be applied to the soil surface to prevent the movement of dust from exposed soil surfaces on construction sites as a result of wind, traffic, and grading activities. • Slope Roughening/Terracing/Rounding. Roughening and terracing will be implemented to create unevenness on bare soil through the construction of furrows running across a slope, creation of stair steps, or by utilization of construction equipment to track the soil surface. Surface roughening or terracing reduces erosion potential by decreasing runoff velocities, trapping sediment, and increasing infiltration of water into the soil, aiding in the establishment of vegetative cover from seed.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure BIO-18: The City shall prepare a riparian restoration plan to be reviewed and approved by CDFW, the CVFPB, and any other applicable agencies. This plan will include restoration of areas impacted by the proposed project, as well as areas that have been disturbed from previous activities or events.	Prior to construction	Yuba City	☐	_____	
Measure BIO-19: In-channel work shall not be conducted at night to afford fish quiet, unobstructed passage during night time migratory hours.	During construction	Resident Engineer	☐	_____	
Measure BIO-20: The number and size of piles will be limited to the minimum necessary to meet the engineering and design requirements of the project.	Prior to construction	Yuba City	☐	_____	
Measure BIO-21: Prior to initiating construction, environmentally sensitive area fencing will be installed along the construction limits to prevent encroachment into the riparian areas adjacent to the construction site.	Prior to construction	Yuba City	☐	_____	
Measure BIO-22: Project activities that may affect the flow of the river through placement of fill, bridge construction, or dewatering of the channel must comply with the 2001 *NMFS Guidelines for Salmonid Passage at Stream Crossings*, where applicable. The guidelines include but are not limited to: • A minimum water depth (12 inches for adults and six inches for juveniles) at low fish passage; • A maximum hydraulic drop of one foot for adults and six inches for juveniles; • Avoidance of abrupt changes in water surface and velocities; and, • Structures shall be aligned with the stream, with no abrupt changes in flow direction upstream or downstream of the crossing.	During construction	Resident Engineer	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure BIO-23: All water pumped or otherwise withdrawn from the river must comply with *1997 NMFS Fish Screening Criteria for Anadromous Salmonids*, where applicable, to avoid entrapment of the fish. The criteria include but are not limited to the following: • Screen design must provide for uniform flow distribution over the surface of the screen; • Screen material openings must not exceed 3/32 inch for fry sized salmonids and shall not exceed ¼ inch for fingerling sized salmonids; • Where physically practical, the screen must be constructed at the diversion entrance. The screen face should be generally parallel to river flow and aligned with the adjacent bankline; and, • The design approach velocity must not exceed 0.33 feet per second for fry sized salmonids or 0.8 feet per second for fingerling sized salmonids; and the screen design must provide for uniform flow distribution over the surface of the screen. It is anticipated that the exact specification requirements for fish screening equipment will be determined by the on-site fish biologist monitor in accordance with the 1997 NMFS criteria described above.	During construction	Resident Engineer	☐	_____	
Measure BIO-24: A bubble curtain shall be utilized to attenuate noise and vibration when other, more effective attenuation cannot be provided (such as a dewatered coffer dam).	During construction	Resident Engineer	☐	_____	
Measure BIO-25: The City of Yuba City will compensate for the effects of the proposed project on the beetle by transplanting 12 elderberry shrubs during the recommended transplant window, November 1 to February 15. The shrubs will be transplanted to the River Ranch Conservation Bank, or another USFWS approved conservation bank, and a total of 10 VELB mitigation credits will be purchased.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	
Measure BIO-26: If any of the 12 elderberry shrubs that are proposed for transplantation are unlikely to survive transplantation because of poor condition or if any of the shrubs cannot be safely removed due to access problems since they are in such close association with the existing 5th Street Bridge, the proposed compensation ratios will be doubled (for that individual shrub) to offset the additional habitat loss.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	

Task and Brief Description	Timing	Responsible Party	Completed	Initials	Notes (optional)
Measure BIO-27: Due to the proximity of the 13 avoided elderberry shrubs to the existing bridge and railroad structure, a 20-foot construction zone will not be feasible during demolition activities. Therefore, a modified construction zone will be installed by placing fencing around each elderberry shrub. The fencing will be placed at the drip line of each shrub in closest proximity to the existing bridge or railroad structure and will taper out to the 20-foot zone recommended for the remainder. A USFWS approved biologist will be present during the installation of fencing.	During construction	Resident Engineer	☐	_____	
Measure BIO-28: Prior to the commencement of construction activities, fencing will be installed along Environmentally Sensitive Area (ESA) boundaries to prevent encroachment into the riparian areas adjacent to the construction site.	Prior to construction	Yuba City	☐	_____	
Measure BIO-29: Contractors will be provided with environmental awareness training, which will brief them on the need to avoid damage to the elderberry shrubs and the possible penalties for not complying with these requirements.	Prior to construction	Yuba City	☐	_____	
Measure BIO-30: A USFWS approved biologist will periodically monitor construction activities to ensure elderberry shrubs within the action area are not disturbed.	During construction	Resident Engineer	☐	_____	
Measure BIO-31: Elderberry shrubs within 100 feet of construction activities will be rinsed with clean water once each week, or when necessary to remove dust caused by construction activities.	During construction	Resident Engineer	☐	_____	
Invasive Species					
Measures BIO-32: All landscaping and revegetation shall consist of Yuba City approved plants or seed mixes from native, locally adapted species.	Prior to construction (prepare) / During restoration (implement)	Yuba City	☐	_____	
Measures BIO-33: Prior to arrival at the project site and prior to leaving the project site, construction equipment that may contain invasive plants and/or seeds shall be cleaned to reduce the spreading of noxious weeds.	During Construction	Yuba City	☐	_____	
Climate Change under the California Environmental Quality Act					
Measure GHG-1: Energy efficient lighting, such as LED traffic signals and street lights, will be used when possible.	Prior to construction (prepare) / During construction (implement)	Yuba City / Resident Engineer	☐	_____	

Appendix F Regional Transportation Plan / Regional Transportation Improvement Plan

SACOG ID **SUT10828** **Sutter County** Lead Agency **City of Yuba City Dept of Public Works**

SACOG ID #	EA Number	Last Revised	Completion Year
SUT10828	n/a	11-00	**2017**

Project Title
Feather River Bridge at 5th St

Project Description
From SR 99, east along Bridge St in Yuba City, crossing the Feather River and along 5th/3rd St in Marysville to SR 65/70: Reconstruct or modify the existing 2-lane 5th Street Bridge and Railroad Trestle to provide a 4-lane crossing of the Feather River between Yuba City and Marysville as well as providing improvements to connector roads from east to west. (HPP# 3631)

Bridge Number: 18C0012

Fiscal Year	Revenue Source	Engineering	Right of Way	Construction	Total Revenue
<11		$1,504,912			$1,504,912
2012	Demo HPP - Demonstration - SAFETEA-LU	$3,000,000			$3,000,000
2012	Demo HPP - Demonstration - SAFETEA-LU		$599,600		$599,600
2012	Highway Bridge Program		$177,060		$177,060
2012	Loc Funds - Local Agency Funds (AC)		$3,300,000		$3,300,000
2012	Local Agency Funds	$750,000	$600,390		$1,350,390
2014	Loc Funds - Local Agency Funds (AC)		$-3,300,000		$-3,300,000
2014	Regional Surface Transportation Program		$3,300,000		$3,300,000
>14				$68,000,000	$68,000,000
		$5,254,912	**$4,677,050**	**$68,000,000**	**$77,931,962**

Federal Project
Regionally Significant

Total Cost **$77,931,962**

SACOG ID **SUT10530** **Sutter County** Lead Agency **City of Yuba City Dept of Public Works**

SACOG ID #	EA Number	Last Revised	Completion Year
SUT10530	n/a	11-00	**2020**

Project Title
Franklin Avenue

Project Description
Widen Franklin Avenue from 2 to 4 lanes from Route 99 to Clark Avenue.

Fiscal Year	Revenue Source	Engineering	Right of Way	Construction	Total Revenue
>14		$1,834,900	$730,400	$2,659,200	$5,224,500
		$1,834,900	**$730,400**	**$2,659,200**	**$5,224,500**

Other

Total Cost **$5,224,500**

2008/9-2013/14 Highway Bridge Program

See the appropriate FTIP/FSTIP for current funding commitments. This listing provides the backup project information to support the lump sum amounts programmed in the FTIP.

District: 03 County: Sutter

Responsible Agency

Yuba City

BRIDGE NO. 18C0012, 5TH ST/BRIDGE ST, OVER FEATHER RIVER/2ND STREET, 03-SUT-003-0-YC. Seismic Retrofit

Fed Proj: BHLVS-5918(062)

Phase Summary:	Prior	8/9	9/10	10/11	11/12	12/13	13/14	Beyond	Total
PE	279,000		1,000,000						1,279,000
R/W					200,000				200,000
CON								40,000,000	40,000,000
Total	279,000		1,000,000		200,000			40,000,000	41,479,000

Fund Source Summary:	Prior	8/9	9/10	10/11	11/12	12/13	13/14	Beyond	Total
Fed $	223,200		885,300		177,060			35,412,000	36,697,560
Local Match	55,800		114,700		22,940			4,588,000	4,781,440
LSSRP Bond									
Local AC									
Total	279,000		1,000,000		200,000			40,000,000	41,479,000

PE Summary:	Prior	8/9	9/10	10/11	11/12	12/13	13/14	Beyond	Total
Fed $	223,200		885,300						1,108,500
Local Match	55,800		114,700						170,500
LSSRP Bond									
Local AC									
Total	279,000		1,000,000						1,279,000

R/W Summary:	Prior	8/9	9/10	10/11	11/12	12/13	13/14	Beyond	Total
Fed $					177,060				177,060
Local Match					22,940				22,940
LSSRP Bond									
Local AC									
Total					200,000				200,000

CON Summary:	Prior	8/9	9/10	10/11	11/12	12/13	13/14	Beyond	Total
Fed $								35,412,000	35,412,000
Local Match								4,588,000	4,588,000
LSSRP Bond									
Local AC									
Total								40,000,000	40,000,000

Appendix G Section 7 Consultation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
08ESMF00-2012-F-0158

MAY 10 2013

Ms. Susan D. Bauer
Chief, Environmental Management, M-1 Branch
California Department of Transportation, District 3
703 B Street
Marysville, California 95901-0911

Subject: Formal Consultation on the Proposed 5th Street Bridge Replacement Project, Sutter and Yuba Counties, California (Caltrans Fed. ID#: BHLS-5162[025])

Dear Ms. Bauer:

This letter is in response to your January 9, 2012, letter for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed 5th Street Bridge Replacement Project (proposed project) in Sutter and Yuba Counties, California. We received your request on January 10, 2012. However, the supporting documentation you provided regarding the proposed project was insufficient for the Service to concur with your determination. On January 20, 2012, the Service requested additional information before consultation could be initiated. The additional information was received in our office on July 6, 2012. The Service has reviewed the biological information submitted by the California Department of Transportation (Caltrans) describing the effects of the proposed project on the federally-listed as threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (beetle) and concurs with your determination that the proposed project is likely to adversely affect the beetle. Although you did not request that the proposed project be appended to the Service's March 11, 1997, *Formal Programmatic Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle Within the Jurisdiction of the Sacramento Field Office, California* (1-1-96-F-0156) (beetle programmatic); the Service believes it is appropriate to append the proposed project to the beetle programmatic. The proposed project is not located within critical habitat for the beetle; therefore, none will be affected. This response is in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

The findings and recommendations in this consultation are based on: (1) your January 9, 2012, letter requesting formal consultation; (2) your December 2011, *Biological Assessment, 5th Street Bridge Replacement Project* (Biological Assessment), prepared by Caltrans and Dokken Engineering (consultant); (3) your June 2012, revised Biological Assessment, received by the Service on July 6, 2012; (4) electronic mail (email) exchanges between the Service and Caltrans; and (5) additional information available to the Service.

Consultation History

January 10, 2012	The Service received the initiation request from Caltrans with the attached December 2011 Biological Assessment for the 5th Street Bridge Replacement Project.
January 20, 2012	The Service sent an email to Caltrans requesting additional information regarding the effects of the proposed project on the beetle.
July 6, 2012	The Service received a revised June 2012 Biological Assessment from Caltrans with the requested additional information on the proposed project's effects to the beetle.
August 2, 2012	The Service notified Caltrans via email that all of the necessary information was received to commence consultation.
September 24, 2012	The Service received an email from Caltrans with the revised Table 5 from the Biological Assessment which clarified the calculations used to derive the amount of seedlings and associated native plants to be planted.

BIOLOGICAL OPINION

Description of the Proposed Action

The cities of Yuba City and Marysville (applicants) propose to replace the 5th Street Bridge which spans over the Feather River, connecting Bridge Street in Yuba City to 5th Street in Marysville. The bridge is a major arterial connector between the two cities serving local, commercial, commuter, pedestrian, and bicycle traffic. The existing bridge was built in 1958, and is 1,865-feet long, 42-feet wide, and carries two 12-foot lanes of traffic across the river. A 10-foot Class I pedestrian and bicycle path is located next to the two vehicle lanes on the north side of the bridge deck.

In 2008, the bridge was found to be seismically vulnerable to soil liquefaction and was recommended for replacement. The proposed project will replace the existing bridge over the Feather River in order to resolve seismic safety concerns and to improve traffic operations.

The proposed project includes the following actions.

- Construction of a new four-lane bridge that spans over the Feather River;
- Construction of a new four-lane bridge over 2nd Street in Yuba City;
- Expand 5th Street from two lanes to four lanes between the bridge spanning the Feather River and the bridge spanning 2nd Street;
- Widen the 5th Street approach between 2nd Street and Shasta Street from two lanes to four lanes;

- Realignment of 2nd Street under the bridge, construction of a raised median, and extend the left turn lane from 2nd Street to westbound Bridge Street;
- Reconstruct the eastbound approach to the bridge and remove the abandoned Union Pacific Railroad overpass that is currently above the on-ramps;
- Installation of traffic signals at the intersection of 2nd and Bridge Streets and at the westbound ramps at the intersection of Sutter and 2nd Streets;
- Expand 5th Street from two lanes to four lanes between the new bridge and J Street in Marysville, including the portion of 5th Street under the Union Pacific Railroad overpass;
- Improvements to the 5th and J Street intersections in Marysville, including a new eastbound dedicated right turn lane from 5th to J Street and reconstruction of sidewalks and curb ramps to meet current American with Disabilities Act standards; and
- Remove stop logs on the top of the Marysville levee, install a cut-off wall through the central portion of the levee, and construct a 3-foot floodwall extension from the bridge.

Installation of a Class I multi-use trail over the Feather River would provide pedestrian and bicycle access between Yuba City and Marysville. The Class I trail will be constructed with a flatter profile than the roadway and will be separated from 5th Street by a barrier.

The proposed project design may require phasing of construction. Dependent on the timing of construction funds, the project will be split into two phases, the first phase will include construction of a two lane bridge crossing and the second phase would widen the two lane crossing into a four lane crossing.

Surveys for elderberry shrubs (*Sambucus sp.*) within the proposed project site were conducted on April 27 and July 19, 2011. Elderberry shrubs are the sole host plant for the beetle and stems greater than one inch in diameter at ground level are required for completion of the beetle's life cycle. A total of 25 elderberry shrubs were identified growing beneath the existing bridge and railroad structures on the eastern bank of the Feather River. During construction, 13 elderberry shrubs will be avoided. However, the proposed project will require the removal of 12 shrubs with 26 stems greater than one inch in diameter at ground level. Caltrans has proposed compensation for all 12 elderberry shrubs as recommended in the Service's 1999, *Conservation Guidelines for Valley Elderberry Longhorn Beetle* (Guidelines) (Table 1).

Conservation Measures

To the maximum extent practicable, projects appended to the beetle programmatic shall be designed and implemented in such a way as to minimize adverse effects to the beetle and/or their habitat. In addition to the conservation measures specified in the beetle programmatic, the conservation measures proposed by Caltrans in the Biological Assessment are considered part of the proposed action evaluated by the Service in this biological opinion. The following conservation measures will be implemented in addition to the measures described in the beetle programmatic to further reduce adverse effects to the beetle.

1. The applicants will compensate for the effects of the proposed project on the beetle by transplanting 12 elderberry shrubs during the recommended transplant window, November 1 to February 15. The shrubs will be transplanted to the River Ranch Conservation Bank, or another Service-approved conservation bank, and a total of 10 credits will be purchased as outlined in Table 1.

Table 1: Proposed compensation ratios for the beetle for the 5th Street Bridge Replacement Project

Habitat Type	Stem Diameter	Number of Stems	Exit Holes (Y/N)	Seedling Ratio	Native Plant Ratio	Total Seedlings	Total Native Plants	Minimum Acreage	Credits
Non-Riparian	≥ 1" to ≤ 3"	14	N	1:1	1:1	14	14		
Non-Riparian	> 3" to < 5"	2	N	2:1	1:1	4	4		
Non-Riparian	≥ 5"	1	Y	6:1	2:1	6	12		
Riparian	≥ 1" to ≤ 3"	7	N	2:1	1:1	14	14		
Riparian	> 3" to < 5"	1	N	3:1	1:1	3	3		
Riparian	≥ 5"	1	N	4:1	1:1	4	4		
TOTAL		**26**				**45**	**51**	**0.4**	**10**

2. If any of the 12 elderberry shrubs that are proposed for transplantation are unlikely to survive transplantation because of poor condition or if any of the shrubs cannot be safely removed due to access problems since they are in such close association with the bridge, the proposed compensation ratios will be doubled to offset the additional habitat loss.

3. Due to the proximity of the 13 avoided elderberry shrubs to the existing bridge and railroad structure, a 20-foot construction zone will not be feasible during demolition activities. Therefore, a modified construction zone will be installed by placing fencing around each elderberry shrub. The fencing will be placed directly at the drip-line of each shrub in closest proximity to the existing bridge or railroad structure and will taper out to the 20-foot zone recommended for the remainder. A Service-approved biologist will be present during the installation of fencing.

4. Prior to the commencement of construction activities, fencing will be installed along Environmentally Sensitive Area (ESA) boundaries to prevent encroachment into the riparian areas adjacent to the construction site.

5. Contractors will be provided with environmental awareness training, which will brief them on the need to avoid damage to the elderberry shrubs and the possible penalties for not complying with these requirements.

6. A Service-approved biologist will periodically monitor construction activities to ensure elderberry shrubs within the action area are not disturbed.

7. Elderberry shrubs within 100-feet of construction activities will be rinsed with clean water once each week when necessary.

Evaluation under the Programmatic Consultation

The Service has determined that it is appropriate to append the proposed 5th Street Bridge Replacement Project to the beetle programmatic. This letter is an agreement by the Service to append the proposed project to the beetle programmatic and represents the Service's biological opinion on the effects of the proposed action. Compensation for projects appended to the beetle programmatic involves adhering to the Service's Guidelines, except as approved by the Service.

Action Area

The action area is defined in 50 CFR §402.02, as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." For the proposed action, the Service considers the action area to be the footprint for construction of the new bridge and all areas described for the road improvements. In Yuba City, the project limits for road improvements include the roadway along 2nd Street, small portions of Sutter, Yolo, and Boyd Streets to the south, and the expanse of Bridge Street from the intersection of 2nd Street to the intersection with Shasta Street. Potential staging areas in Yuba City are an empty lot on the corner of Shasta and Bridge Streets, and the area encircled by the off-ramp from the 5th Street Bridge on to Sutter Street. Project limits for road improvements in Marysville span from the intersection at 5th and I Streets in the east, the intersection of I and 3rd Streets to the south, the intersection of J and 5th Streets in the north, and portions of River Front Park. Potential staging areas in Marysville include two paved parking areas north and south of the bridge in River Front Park. For the purposes of the effects analysis, the action area also includes all areas that will be temporarily impacted by dust during project activities.

Effects of the Proposed Action

Direct effects are expected for 12 of the 25 elderberry shrubs within the proposed project area. Beetle larvae may be killed or the beetle's life cycle may be interrupted during or after the transplanting process. Transplantation of elderberry shrubs that are, or could be, used by beetle larvae is expected to adversely affect the beetle because shrubs may experience stress or become unhealthy due to changes in soil, hydrology, microclimate, or associated vegetation; shrubs may die as a result of transplantation; and branches containing larvae may be cut, broken, or crushed as a result of the transplantation process.

The proposed project will adversely affect the beetle; however, the proposed conservation and minimization measures should limit effects to the beetle. Compensation for the proposed project will occur at a Service-approved bank, which will contribute to the long-term preservation and management of the beetle and its habitat that is critical for the species' survival and recovery.

The proposed compensation is the transplantation of all 12 elderberry shrubs into the River Ranch Conservation Bank or another Service-approved conservation bank. In addition to the 12 elderberry transplants, 45 elderberry seedlings and/or cuttings, and 51 native associate plantings also will be planted (Table 1).

Temporal loss of beetle habitat may occur. Although compensation for impacts to the beetle involves the creation of habitat, it may take several years for the shrubs to grow to a size suitable for use by the beetle. Temporal loss of habitat will temporarily reduce the amount of habitat available to beetles.

Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed project are not considered in this section because they require separate consultation pursuant to section 7 of the Act. There are no cumulative effects from non-federal actions that are reasonably certain to occur within the action area at this time.

Conclusion

After reviewing the current status of the beetle, the environmental baseline for the action area, the effects of proposed project, and the cumulative effects, it is the Service's biological opinion that the 5th Street Bridge Replacement Project, as proposed, is not likely to jeopardize the continued existence of the beetle. The proposed project, as described, fits within the parameters of the level of take anticipated in the beetle programmatic and is not likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the beetle in the wild.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by Caltrans so that they become binding conditions of any grant or permit issued to the applicants, as appropriate, for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans (1) fails to assume and implement the terms and conditions or (2) fails to require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Caltrans or the applicants must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

Amount or Extent of Take

The Service cannot quantify the total number of individuals that will be taken as a result of the proposed action because it is impossible to know how many beetles may inhabit the elderberry stems. The life cycle of the beetle takes one or two years to complete. The beetle spends most of its life in the larval stage, living within the stems of an elderberry plant. So in instances in which the number of individuals that may be taken cannot be determined, the Service quantifies take as the number of affected stems greater than one inch in diameter at ground level. Since take is expected to result from these impacts to the beetles' habitat, the quantification of stems becomes a direct surrogate for the species that will be taken. Therefore, the Service anticipates take incidental to this project as the 12 effected elderberry shrubs with 26 stems one inch or greater in diameter at ground level that will be transplanted to a conservation area prior to construction. Upon implementation of the *Reasonable and Prudent Measures*, and the *Terms and Conditions* outlined in the beetle programmatic, and the *Proposed Conservation Measures* considered herein, incidental take to the beetle as a result of the proposed 5th Street Bridge Replacement Project, will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the beetle.

REINITIATION NOTICE – CLOSING STATEMENT

This concludes the Service's review of the 5th Street Bridge Replacement Project. As provided for in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been maintained (or is authorized by law), and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent that was not considered in this opinion; (3) the proposed action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action.

If you have any questions regarding the proposed 5th Street Bridge Replacement Project, please contact Amber Aguilera, Fish and Wildlife Biologist, or Kellie Berry, Chief, Sacramento Valley Division at (916) 414-6600.

Sincerely,

Daniel Russell

For

Kenneth D. Sanchez
Assistant Field Supervisor

LITERATURE CITED

U.S. Fish and Wildlife Service (Service). 1999. Conservation Guidelines for the Valley Elderberry Longhorn Beetle. U.S. Fish and Wildlife Service, Ecological Services Office; Sacramento, California. Revised July 9, 1999.

DEPARTMENT OF TRANSPORTATION
DISTRICT 3
703 B STREET
MARYSVILLE, CA 95901-0911
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Flex your power!
Be energy efficient!

January 9, 2012

03-Sut
City of Yuba City
BHLS 5163 (025)
5th Street Bridge Replacement Project

Ms. Kellie Berry
United States Department of the Interior
Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Subject: Request Formal Consultation for Project Effects To Federally Threatened Valley Elderberry Longhorn Beetle (VELB)(*Desmocerus californicus dimorphus*)

Dear Ms. Berry:

The City of Yuba City is proposing the replacement of the 5th Street bridge over the Feather River (Bridge No. 18C-0012). On behalf of the City of Yuba City, Caltrans is initiating Section 7, formal consultation for project effects to federally threatened valley elderberry longhorn beetle (VELB)(*Desmocerus californicus dimorphus*). Caltrans is considered the federal agency, following the provisions of the *Memorandum of Understanding (MOU) between the Federal Highway Administration, California Division and the California Department of Transportation State Assumption of Responsibility for Categorical Exclusions*, which became effective on June 7, 2007 and renewed on June 7, 2010. The MOU was signed pursuant to Section 6004 of the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) which allows the Secretary of Transportation to assign, and the State of California to assume, responsibility for most NEPA Categorical Exclusion determinations. For those projects, the State may also be assigned FHWA's responsibilities for environmental consultation and coordination under other federal environmental laws. By statute, the State is deemed to be a Federal agency for these assigned responsibilities. As this project is covered by the Section 6004 MOU, FHWA has assigned and Caltrans has assumed FHWA responsibility for environmental review, consultation, and coordination on this project. Please direct all future correspondence on this project to Caltrans.

The City of Yuba City is proposing replacement of the existing substandard, two-lane 5th Street Bridge over the Feather River with a four-lane structure and improvement of approach roadways to the bridge. Improvements are designed to resolve seismic safety concerns and improve traffic operations. A detailed project description of the proposed project is provided on pages 1 – 8 of the attached Biological Assessment (BA).

Within the project footprint and study area, a total of 25 elderberry shrubs containing one or more stems one inch or greater at ground level were observed. The elderberry shrubs were observed growing beneath both

the existing bridge and railroad structures, most often adjacent to cement piers from the existing 5th Street Bridge. Figure 5 of the BA provides elderberry shrub locations within the Biological Study Area (BSA). The project will require the removal of 12 elderberry shrubs with stems greater than or equal to 1 inch currently growing beneath the 5th Street Bridge (See Table 3, Impacted Elderberry Shrubs on page 19 of the attached BA).

In compliance with USFWS 1999 guidelines, elderberry shrubs beneath the existing 5th Street Bridge structure with direct impacts shall be relocated/transplanted. All transplants shall occur between November and early February when elderberry shrubs are dormant. Additionally, 9 VELB credits will be purchased at River Ranch Conservation Bank, or at another USFWS-approved VELB mitigation bank to offset total affects to the elderberry shrubs in accordance with the USFWS 1999 Guidelines. The credits will be purchased when they become available, or alternately, payments will be made to the USFWS in-lieu fee program.

The project proponent also proposes avoidance and minimization measures for the remaining 13 elderberry shrubs in the project area that will experience indirect impacts. These measures, designed to offset potential indirect impacts to VELB, can be viewed on pages 19 and 20 of the enclosed BA.

If, after reviewing the enclosed BA, you have any questions, please contact the Caltrans Project biologist Maureen Doyle at (530) 741- 4470 or the Project Coordinator Cara Lambirth at (530) 741-4109. If you have no further questions, please provide a Biological Opinion for project effects to VELB.

Sincerely,

Susan D. Bauer

Susan D. Bauer, Chief
Environmental Management, M-1 Branch

Enclosure: Biological Assessment

Cc: Michael McCollum
Chris Collison

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4700

MAY 19 2014

In Response Refer To:
2012-9267

Ms. Susan D. Bauer
Chief, Department of Transportation
District 3
Environmental Management, M-1
703 B Street, P.O. Box 911
Marysville, California 95901-0911

Dear Ms. Bauer:

This document transmits NOAA's National Marine Fisheries Service's (NMFS) biological opinion (BO) (Enclosure 1) based on our review of the California Department of Transportation's (Caltrans) proposed 5th Street Bridge Replacement Project (project) located between Sutter and Yuba Counties, California, and its effects on the federally listed threatened Central Valley (CV) spring-run Chinook salmon Evolutionary Significant Unit (*Oncorhynchus tshawytscha*), threatened California Central Valley (CCV) steelhead Distinct population segment (DPS) (*O. mykiss*), threatened North American green sturgeon southern DPS (*Acipenser medirostris*) and their respective designated critical habitats in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Your request for initiation of formal section 7 consultation on this Project was received on July 22, 2013. On July 23, 2013, formal consultation was initiated by NMFS' California Central Valley Office.

This BO is based on the biological assessment provided on July 22, 2013. Based on the best available scientific and commercial information, the BO concludes that the project is not likely to jeopardize the continued existence of the federally listed threatened CV spring-run Chinook salmon evolutionarily significant unit (*Oncorhynchus tshawytscha*), threatened CCV steelhead DPS (*O. mykiss*), or threatened Southern DPS of North American green sturgeon (*Acipenser medirostris*), and is not likely to destroy or adversely modify their designated critical habitats. NMFS has also included an incidental take statement with reasonable and prudent measures and non-discretionary terms and conditions that are necessary and appropriate to avoid, minimize, or monitor incidental take of listed species associated with the project.

This letter also transmits NMFS's essential fish habitat (EFH) conservation recommendations for Pacific salmon as required by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as amended (16 U.S.C. 1801 *et seq.*; Enclosure 2). The document concludes that the project will adversely affect the EFH of Pacific salmon in the action area and adopts the ESA reasonable and prudent measures and associated terms and conditions from the BO as the EFH conservation recommendations.

Caltrans has a statutory requirement under section 305(b)(4)(B) of the MSA to submit a detailed written response to NMFS within 30 days of receipt of these conservation recommendations, and 10 days in advance of any action, that includes a description of measures for avoiding, minimizing, or mitigating the impact of the project on EFH (50 CFR 600.920(j)). If unable to complete a final response within 30 days, Caltrans should provide an interim written response within 30 days before submitting its final response. In the case of a response that is inconsistent with our recommendations, Caltrans must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the proposed action and the measures needed to avoid, minimize, or mitigate such effects.

Please contact Dylan Van Dyne at (916) 930-3725, or via e-mail at Dylan.VanDyne@noaa.gov, if you have any questions regarding this response or require additional information.

Sincerely,

Maria C. Rea

Maria C. Rea
Assistant Regional Administrator
California Central Valley Office

Enclosures (2)

cc: Copy to File: 151422SWR2012SA01888

Enclosure 1

BIOLOGICAL OPINION

ACTION AGENCY: California Department of Transportation

ACTION: 5th Street Bridge Replacement Project

CONSULTATION CONDUCTED BY: National Marine Fisheries Service, West Coast Region

FILE TRACKING NUMBER: 151422SWR2012SA01888 (T/N 2012/9267)

DATE ISSUED: MAY 19 2014

I. CONSULTATION HISTORY

On October 22, 2012, the California Department of Transportation (Caltrans) requested formal consultation with NOAA's National Marine Fisheries Service (NMFS) for the 5th Street Bridge Replacement Project (project) located between Sutter and Butte Counties, California.

On November 26, 2012, Caltrans notified NMFS on behalf of the consultant to redact the original biological assessment (BA) so necessary revisions could be made prior to resubmittal to NMFS.

On February 20, 2013, NMFS received the revised BA from Caltrans.

On April 3, 2013, NMFS sent an insufficiency letter to Caltrans requesting additional information which effectively closed out the consultation.

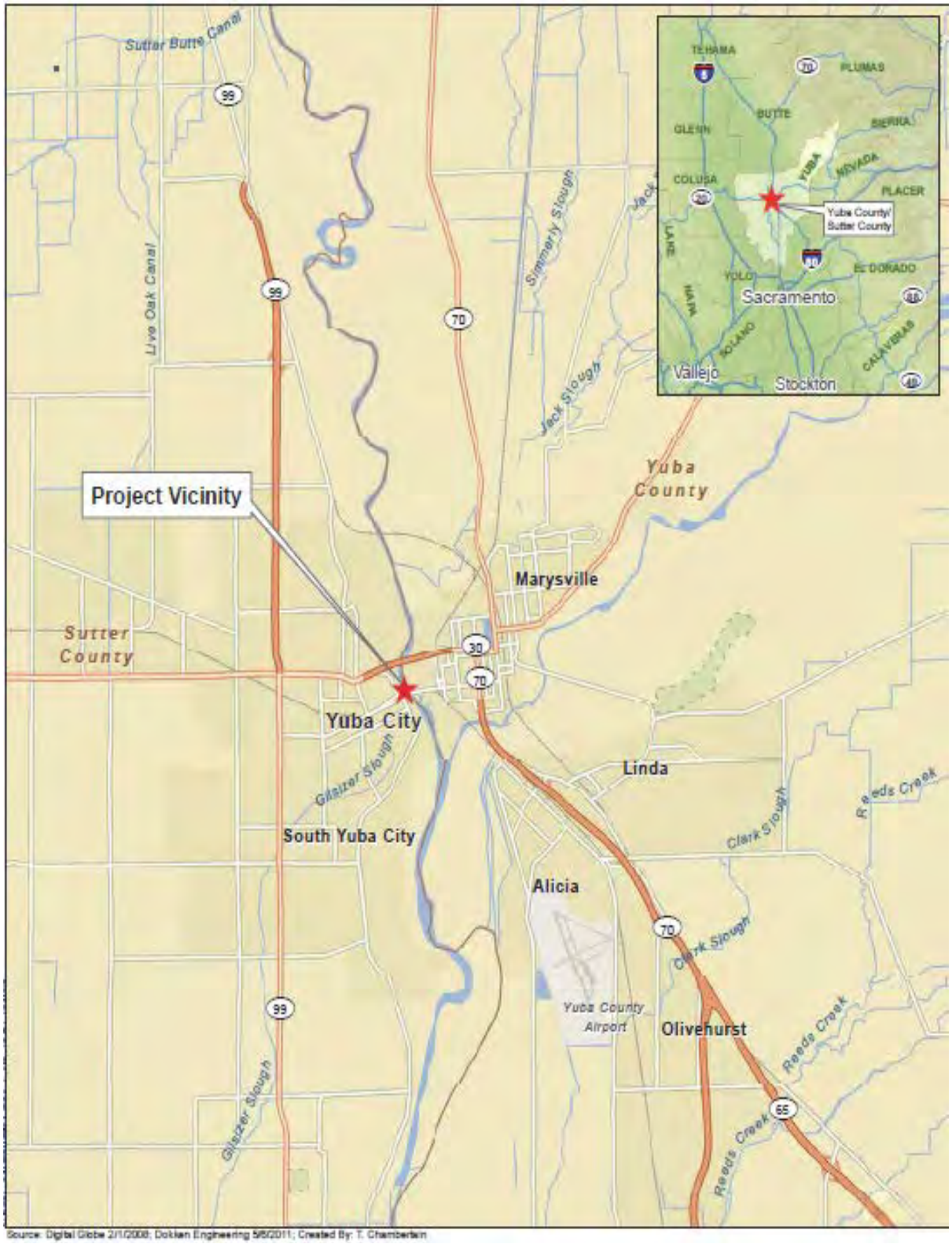
On July 22, 2013, NMFS received an amended BA and letter from Caltrans requesting initiation of section 7 formal consultation under the Endangered Species Act (ESA).

On July 23, 2013, NMFS deemed the formal consultation package from Caltrans complete, and initiated formal consultation.

A complete administrative record of this consultation is on file at the NMFS' West Coast Region (WCR) California Central Valley Office (CCVO).

II. DESCRIPTION OF THE PROPOSED ACTION

The purpose of the project is to replace the functionally-obsolete and seismically deficient existing bridge structure over the Feather River. The proposed project vicinity is between Sutter



Source: Digital Globe 2/1/2008; Dokken Engineering 5/6/2011; Created By: T. Chamberlain

Figure 1—Project Vicinity Map

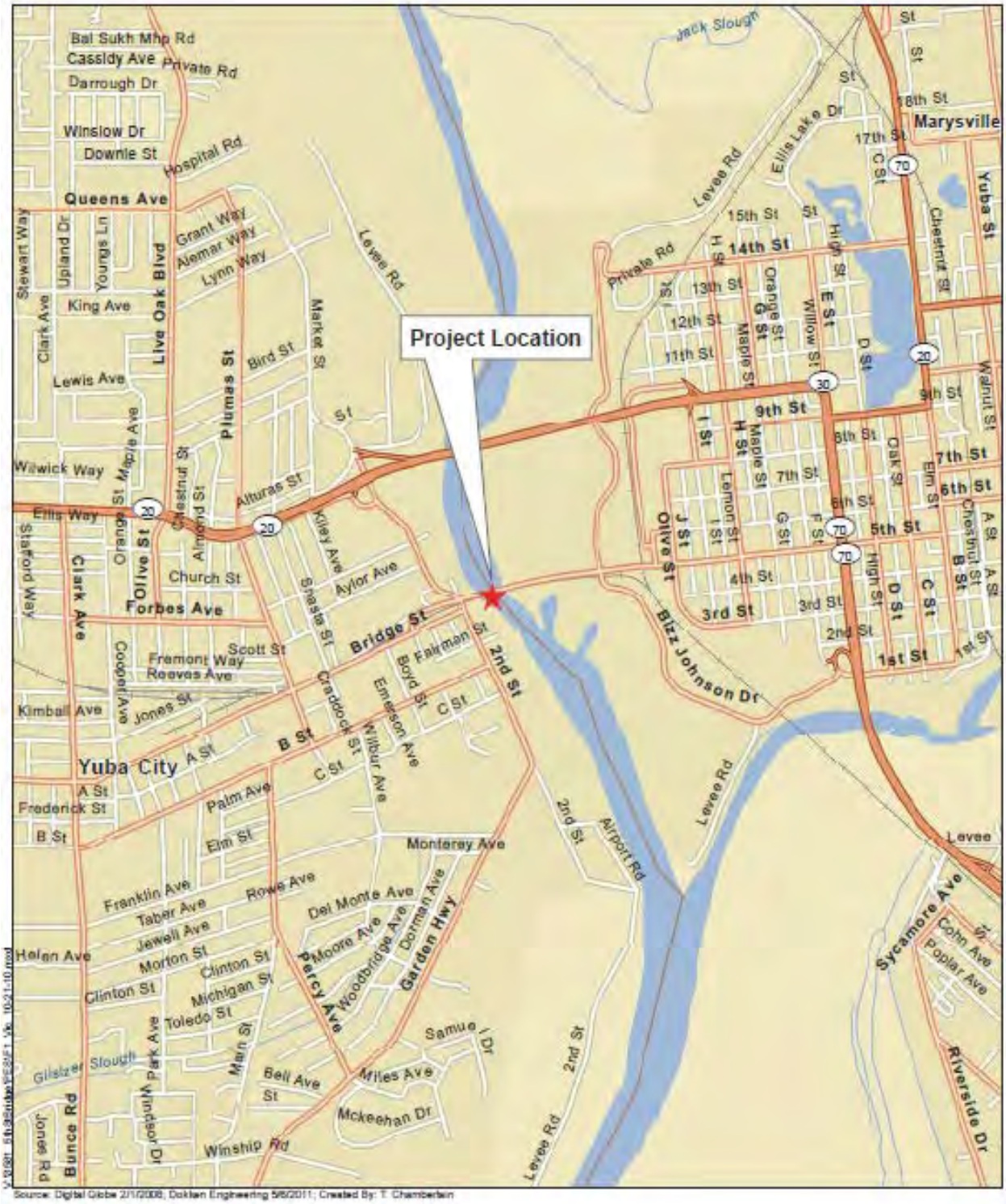


Figure 2—Project location map

and Yuba Counties in California (Figure 1). The existing facility location connects Bridge Street in Yuba City to 5th Street in Marysville over the Feather River (Figure 2).

A description of work to be done includes construction of a new four-lane bridge over the Feather River, construction of a new four-lane bridge over 2nd Street, expansion of 5th Street from two lanes to four lanes between the new bridge and J Street in Marysville, including four lanes under the Union Pacific Railroad (UPR), improvements to the 5th Street and J Street intersection in Marysville including a new eastbound dedicated right turn lane on to J Street and reconstruction of sidewalks and curb ramps to current Americans with Disabilities Act standards, removal of stop logs on the top of the Marysville levee and construction of a short three foot floodwall extension from the bridge (with installation of a levee cut-off wall through the central portion of the levee), widening of the 5th Street approach roadway between 2nd Street and Shasta Street from two lanes to four lanes, realignment of 2nd Street under the bridge, construction of raised median, and extension of the left turn lane from 2nd Street to westbound Bridge Street, reconstruction of the eastbound approach to the bridge and removal of the abandoned UPR overpass above the on-ramps, and the addition of signalized intersections at the 2nd Street intersections with Bridge Street and the westbound ramps at the intersection of Sutter Street and 2nd Street in Yuba City.

A. Construction Activities

Although two bridges are being constructed (one over the Feather River and one over 2nd Street), only the bridge over the Feather River may impact fish species or their critical habitat. The bridge over 2nd Street is approximately 200 feet west of the river and the Yuba City levee separates the construction site from fish habitat. Construction impacts considered include any drilling, placement of cofferdams and dewatering activities, pile driving activities, access, earthwork, culvert work, building of trestles, and demolition work. Construction activities resulting in permanent impacts to the channel are estimated to require two seasons and will occur during the summer low-flow period (June 1 - October 1). Construction is expected to begin in the spring of 2016 and will occur for 18-24 months.

Season one (June 1 through October 1)

1. Trestles - It is anticipated approximately 22 inch diameter temporary trestle steel pipe piles (estimated 273 total) will be vibrated and driven into the live channel. Approximately 20 temporary trestle piles will be vibrated per day to the greatest extent practicable followed by adequate driving (up to approximately 60 strikes) per pile with an impact hammer to achieve the requisite depth (Table 1). Pile driving with a vibratory hammer will occur throughout the day and will last up to 12 hours per day. The impact hammer will be used sporadically throughout the day (only if necessary) and is not expected to last longer than one hour in total. To minimize disturbance to the channel, temporary trestles will be constructed in sections, where the preceding sections provide construction access for pile installation of subsequent trestle portions. Temporary trestle installation is anticipated to utilize cranes, drivers and similar equipment.

2. Pier Locations-Construction of the three piers in and adjacent to the ordinary high water mark (OHWM) will occur both during and after the installation of the temporary trestle. Each pier includes three 7-foot diameter columns and each column is founded on a 10-foot diameter cast-in-steel-shell (CISS) concrete pile (9 total, 6 of which occur within the wetted channel). The piers are located as follows: Pier 4 occurs on the eastern bank of the Feather River, outside the OHWM (naturally dry during the construction window); "Pier 3" occurs within the live Feather River channel; "Pier 2" occurs on the western bank within the OHWM.

3. Install Temporary 12-foot Encasements- Prior to construction of the 10-foot diameter CISS, approximately 12-foot diameter part-length steel casings will be temporarily installed to a depth of about 25 feet below the top of pile as needed to accommodate the pile construction (nine total: three outside the OHWM at Pier 4, and six within the live channel at Pier 3 and at Pier 2). These temporary casings assist in the pile construction by serving as a cofferdam for dewatering, by reducing ground vibration and noise during pile driving and by reducing the length of driving for the pile shell. These temporary steel casings will be oscillated into the ground using an oscillating construction method; earth would be removed from within the casing during oscillation using a large spherical clamshell type bucket or other oscillated pile construction method. All soils excavated during work within the encasements will be disposed outside the live channel with use of earth movers and dump trucks to prevent soils from impacting water quality. Once installed, at the Pier 2 and Pier 3 locations, the temporary 12-foot diameter steel casings will serve as a cofferdam and will be de-watered following the contractor prepared dewatering plan identified in Item 5 below. Pier 4 is already dry and will not require dewatering of surface waters. A fish monitor and fish relocation plan will be utilized during the installation of the temporary 12-foot shaft encasements at the Pier 2 and Pier 3 locations.

4. Install 10-foot Pile Steel Shell- Drive or vibrate a 10-foot diameter steel shell (shell for the 10-foot CISS) to the specified pile tip elevation within the temporary steel casing. The 10-foot steel shell will be vibrated in to the greatest extent possible. Impact driving will be used if necessary (up to approximately 100 strikes per pile with an impact hammer) to reach the requisite depth. As the pile is driven or upon completion of pile driving, soil within the steel shell shall be excavated in a similar manner to that performed for the temporary steel casing. Soil will be removed for most of the length of the piles shell. A depth of soil at the bottom of the steel shell equal to about two times the pile diameter will be left in the bottom of the shaft. The remaining soil within the bottom of the steel shell will serve as a soil plug to allow dewatering. If groundwater seeps excessively through the soil plug, then seal course concrete will be placed inside of the pile shell on top of the soil plug. The seal course is poured using a tremie pipe that deposits the concrete below water in the pipe. The seal course, if needed, must be allowed to set for at least five days before dewatering the pile.

5. Dewatering at Pier 2 and Pier 3 -Waters within the confines of both the 12-foot temporary casing and the 10-foot pile shell (for the 10-foot CISS) will be dewatered as the pile shaft is constructed using a prepared dewatering plan. The dewatering plan

Table 1. Pile driving assumptions for the project.

Activity	Pile Type	Pile Size	Hammer Methodology[1]	No. of Piles Driven	Piles driven per day	Strikes per Pile	Total driving period
Temporary trestle installation	steel pipe piles	22-inch	Vibratory & impact hammer	273	20	60	14 days[2]
Permanent cast-in-steel-shell (CISS)[3]	steel shell	10-foot	Impact hammer	9	1[4]	100	9 days

[1]To be vibrated to the greatest extent practical followed by adequate driving.

[2] Daily driving not expected to last longer than 1 hour.

[3] Driving to be done within dewatered cofferdam; bubble curtains will be utilized during both vibratory and impact driving outside the cofferdam.

[4]Estimate to install one CISS every 8 days.

will ultimately provide for the discharge of water into the Feather River, downstream from the project site. Prior to discharge, the plan would require pumping water out of the confines of the pile encasements, piping it to a temporary treatment/holding facility adjacent to the river and returning the water to the Feather River after treatment. At a minimum, the temporary treatment/holding facility will consist of several on-site settling FRAC tanks used to remove suspended sediments, settleable substances and turbidity to acceptable levels. Discharged water will be in compliance with all applicable Clean Water Act and Central Valley Regional Water Quality Control Board (CVRWQCB) regulations. The contractor will obtain all necessary permits, approvals, and agreements to discharge water in this manner.

6. Install Pile Reinforcement and Concrete- Immediately after dewatering the pile steel shell, pile reinforcement is installed within the shell and concrete is poured for the 10 foot diameter CISS concrete permanent pile (9 total: 3 at Pier 4, 3 at Pier 3 and 3 at Pier 2) up to a construction joint located at the bottom of the column reinforcement that is to be embedded into the pile. After installing the column reinforcement within the pile, concrete will be poured for the remainder of the pile up to the pile cut-off elevation. As this final lift of pile concrete is poured, the temporary 12 foot steel casing will be back oscillated out to 5 feet below the pile cut-off elevation. Any voids between the temporary casing and the column may be filled with grout through grout injection tubes. It is anticipated one 10 foot diameter CISS foundation encasement will be installed every eight days. At Pier 3 and Pier 2 work will be conducted above the live river channel supported on the temporary trestle. No additional foundation pier work is anticipated.

7. Install Columns–At the completion of the CISS pile foundations, 7 foot diameter corrugated metal pipe (CMP) casings (nine total: three at Pier 4, three at Pier 3 and three at Pier 2) will be installed from the construction joint to just below ground level, followed

by temporary column forms from the top edge of CMP upward for the remaining column height. Work will consist of filling both the CMP and formed casings with concrete reinforced with rebar. Once installation of columns is complete, the void between the casing and column below ground will be backfilled with pea gravel and the temporary 12-foot pile encasements will be back oscillated out of the ground. All work within the live river channel will be limited to the four month work window from June 1 through October 1.

Off Season one (*October 2 through May 31)*

1. Bridge Spans-No work in the active channel will take place below the trestle. Once installed, the temporary trestle supports construction of the bridge spans and will remain in place through the rainy season and into the second construction season. Work is anticipated to continue on the bridge spans above the live river channel. All bridge span work is to be supported on the temporary trestle. Prior to the second season, two lanes of the bridge are anticipated to be completed.

Season two (June 1 through October 1)

1. Temporary Water Diversion-A two part water diversion will be installed using temporary water-inflated dams or portable dams within the live river channel where water flows will be directed between the existing fourth and fifth bridge piers (diversion part 1) and subsequently between the third and fourth piers (diversion part 2) to facilitate existing bridge removal. Each temporary water diversion, diversion part 1 and diversion part 2, is anticipated to remain in place for no more than two to three weeks. Although the described diversion technique is the most likely construction action, if the river conditions make a temporary diversion infeasible to implement, sheet piles will be used to create a cofferdam around the existing bridge piers to allow for their removal. All sheet piles would be installed using vibratory driving methods. Fish relocation and salvage will be prepared by a qualified biologist for whichever plan is implemented during construction.

2. Bridge demolition- Bridge demolition will follow the water diversion installation. Diversion one is necessary for the removal of existing bridge pier footings 3 and 4 as well as the removal of spans 1, 2 and 3. Diversion two would facilitate the removal of pier footings 4 and 5 as well as the removal of the remaining bridge spans. To remove the bridge spans and columns, hoe rams will break up the concrete onto mats placed at ground level. The concrete will be hauled to an off-site disposal location. The mats will be removed as demolition of a span is completed. Bridge demolition is anticipated to take approximately six weeks. Demolition activities are anticipated to utilize haul trucks, cranes, dozers, and Cat 235 excavators with hydraulic hoe rams. Hoe rams are anticipated to be used three (8 hour) days per pier, for a total of 27 days.

3. Remove Trestle- Once the bridge demolition is complete the temporary trestle will be removed. The trestle will be removed no later than October 1. Temporary trestle pipe

Table 2. Project effects to critical habitat and Pacific salmon EFH

	Temporary (acres)	Permanent (acres)
Effects to Waters	3.62	0.01
Effects to Riparian Vegetation	0.65	0.30
Total Effects	4.27	0.31

piles will be extracted by vibratory methods. The trestle will be removed by starting near the middle and working back toward the bank, removing decking and piles along the way. Temporary trestle removal is anticipated to utilize cranes, haul trucks, and similar equipment.

4. Completion -At the conclusion of the second work season, all permanent impacts to the river channel will be completed.

The installation of six 12-foot diameter temporary encasements equates to a 678 square feet (sq ft) area of project impacts. The installation of the two part temporary water diversion equates to 73,616 sq ft. Therefore, the total square foot area project footprint estimate for in-water work during construction is 74,294 sq ft.

The Project will permanently affect an approximate 0.01 acre of steelhead critical habitat from the installation and permanent placement of the piles in the live river channel of the Feather River. Construction of the bridge will require construction of a temporary work trestle, temporary dewatering and temporary water diversions, resulting in an approximate 3.62 acre temporary affect to critical habitat waters. Best management practices (BMPs) incorporated into the project will minimize turbidity effects to critical habitat. Temporary dewatering will occur at the pile locations discussed above and during the Season 2 diversions. The temporary diversions (approximately 1.69 acres of the total 3.62 acres) will be necessary for bridge demolition.

However, the temporary diversion of waters will only occur during season 2 within the designated work window (June 1 - October 1) and the water diversion will allow continuous unobstructed flows. Each temporary water diversion, diversion part 1 and diversion part 2, is anticipated to remain in place for no more than two to three weeks. The diversion will allow bridge demolition work to occur in dry areas separate from the water.

Approximately 0.30 total acre of riparian vegetation will be permanently impacted and approximately 0.65 acres temporarily impacted during bridge replacement activities, including the demolition of the existing facility and the requisite temporary access routes.
However, the expanded bridge deck will provide additional shade over the Feather River (approximately 0.47 acre) which will compensate for the loss of riparian vegetation and associated shading removed by the Project. The project will restore temporarily disturbed sites with native species commonly found in the project area. Project temporary and permanent effects to critical habitat are outlined in Table 2.

The construction of temporary trestles will also result in a temporary loss of critical habitat waters. Trestles will be constructed adjacent to the existing bridge prior to demolition of the existing facility. The trestles will be constructed of steel and timber and will be supported by 22-inch steel pipe piles driven into the river bottom. The trestles will span the Feather River and will touch down on each bank. The trestles will remain in place until construction is completed.

B. Avoidance, Minimization and Conservation Measures

The following measures will be implemented to ensure impacts to spring-run Central Valley (CV) Chinook salmon, California Central Valley (CCV) steelhead, and North American green sturgeon are minimized to the greatest extent possible:

1) All construction work that will take place in the live channel must occur between June 1 and October 1 during the summer low-flow period to minimize potential exposure of juveniles to pile driving noise and vibration, and to minimize fish entrapment within cofferdams.

2) In-channel work will not be conducted at night to allow listed fish quiet, unobstructed passage during night time migratory hours.

3) A qualified biologist will prepare and implement a fish salvage plan to recover any individuals entrapped in cofferdams and dewatered areas. The fish salvage plan will receive approval from NMFS prior to initiating any in-channel work. At a minimum the plan will incorporate the following:

- Provide for the collection, transfer and release of all entrapped sensitive fish by a qualified biologist to a designated location downstream of project activities;

- A record of the electrical conductivity, temperature (water and air), and pH within both the enclosure and within the free flowing river; and

- Ensure all rescued sensitive fish be kept in aerated water and at appropriate temperatures at all times prior to release.

4) At a minimum, four fish rescues will be implemented as described in the prepared fish salvage plan above, and must be provided during the following activities:

- Season 1--After partial dewatering, a rescue event following construction of each temporary encasement at Pier 2 (to include each column, three total, at Pier 2) and a rescue event at Pier 3 (to include each column, three total, at Pier 3); and

- Season 2--After partial dewatering, a rescue for each of the temporary water diversions (Phase 1and Phase 2).

Additional fish rescues will be required for any new locations or actions not specified above requiring diversions or dewatering to prevent entrapment of sensitive fish.

5) To minimize the potential for accidental spills of materials hazardous to the aquatic environment, a Spill Prevention Control and Countermeasure Plan (SPCCP) will be prepared.

6) The number and size of piles will be limited to the minimum necessary to meet the engineering and design requirements.

7) Any piles driven into the river channel will be installed using vibratory method to the greatest extent possible. If use of an impact hammer cannot be avoided, a hydraulic hammer will be used. The force of the hammer blow can be controlled with hydraulic hammers, and reducing the impact force will reduce the intensity of the resulting sound.

8) Prior to initiating construction, environmentally sensitive area (ESA) fencing will be installed along the construction limits to prevent encroachment into the riparian areas adjacent to the construction site.

9) Prior to construction, an acoustic monitoring plan to evaluate the sound levels during pile driving activities will be prepared by a qualified biologist. The acoustic monitoring plan must receive approval from NMFS prior to in-channel work and will be implemented during all vibratory and impact pile driving activities. At a minimum the plan will incorporate the following:

- Daily acoustical monitoring by a qualified biologist during all pile driving activities;

- Require equipment for underwater sound monitoring (hydrophone, signal amplifier, and calibrator) to utilize current National Institute of Standards and Technology traceable calibration methodology;

- Require a minimum recordation distance of 10 meters from each pile being monitored; and

- The monitoring biologist may stop work if observed migrating fish are stunned or otherwise directly impacted by noise and vibration from pile driving. Work shall not resume until the fish clears the construction area or fish salvage work is performed by the qualified fish biologist described in measure 3) above.

10) Contract specifications will include the following BMPs, where applicable, to reduce erosion during construction:

- Implementation of the project will require approval of a site-specific Storm Water Pollution Prevention Plan (SWPPP) that will implement effective measures to protect water quality, which may include a hazardous spill prevention plan and additional erosion prevention techniques;

- Scheduling. A specific work schedule will be implemented to coordinate the timing of land disturbing activities and the installation of erosion and sedimentation control practices to reduce on-site erosion and off-site sedimentation;

- Preservation of Existing Vegetation. In addition to measure 8) above, existing vegetation will be protected in place where feasible to provide an effective form of erosion and sediment control, as well as watershed protection, landscape beautification, dust control, pollution control, noise reduction, and shade;

- Mulching. Loose bulk materials will be applied to the soil surface as a temporary cover to reduce erosion by protecting bare soil from rainfall impact, increasing infiltration, and reducing runoff;

- Soil Stabilizers. Stabilizing materials will be applied to the soil surface to prevent the movement of dust from exposed soil surfaces on construction sites as a result of wind, traffic, and grading activities; and

- Slope Roughening and Terracing/Rounding. Roughening and terracing will be implemented to create unevenness on bare soil through the construction of furrows running across a slope, creation of stair steps, or by utilization of construction equipment to track the soil surface. Surface roughening or terracing reduces erosion potential by decreasing runoff velocities, trapping sediment, and increasing infiltration of water into the soil, aiding in the establishment of vegetative cover from seed.

11) Project activities that may affect the flow of the river through placement of fill, bridge construction, or dewatering of the channel must comply with the 2001 *NMFS Guidelines for Salmonid Passage at Stream Crossings*, where applicable. The guidelines include but are not limited to:

- A minimum water depth (12 inches for adults and 6 inches for juveniles) at low fish passage;

- A maximum hydraulic drop of 1 foot for adults and 6 inches for juveniles;

- Avoidance of abrupt changes in water surface and velocities; and

- Structures shall be aligned with the stream, with no abrupt changes inflow direction upstream or downstream of the crossing.

12) All water pumped or otherwise withdrawn from the river must comply with 1997 NMFS *Fish Screening Criteria for Anadromous Salmonids*, where applicable, to avoid entrainment of fish. The criteria include but are not limited to the following:

- Screen design must provide for uniform flow distribution over the surface of the screen;

- Screen material openings must not exceed 3/32 inch for fry sized salmonids and shall not exceed 1/4 inch for fingerling sized salmonids;

- Where physically practical, the screen must be constructed at the diversion entrance. The screen face should be generally parallel to river flow and aligned with the adjacent bankline; and

- The design approach velocity must not exceed 0.33 feet per second for fry sized salmonids or 0.8 feet per second for fingerling sized salmonids; and the screen design must provide for uniform flow distribution over the surface of the screen.

It is anticipated that the exact specification requirements for fish screening equipment will be determined by the on-site fish biologist monitor in accordance with the 1997 NMFS criteria described above.

13) A bubble curtain shall be utilized to attenuate pile driving noise and vibration when other, more effective attenuation cannot be provided (such as a dewatered coffer dam).

14) To control invasive species, all landscaping and re-vegetation must consist of Caltrans approved plants or seed mixes from native, locally adapted species. Prior to arrival at the project site and prior to leaving the project site, construction equipment that may contain invasive plants and/or seeds must be cleaned to reduce the spreading of noxious weeds.

15) The City will prepare a riparian restoration plan to be reviewed and approved by the California Department of Fish and Wildlife (CDFW), the Central Valley Flood Protection Board (CVFPB), NMFS, and any other applicable agencies prior to construction. This plan will include restoration of areas impacted by the proposed project, and will aim to establish a healthy riparian corridor along this span of the Feather River.

C. Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR § 402.02). Direct effects include those resulting from interdependent or interrelated actions. Indirect effects are defined as those effects that are caused by or will result from the proposed action and are later in time, but still reasonably certain to occur (50 CFR §402.02). The action area is not the same as the project boundary area because the action area must delineate all areas where federally-listed populations of salmon, steelhead and green sturgeon may be affected by the implementation of the proposed action.

The proposed project action area consists of two components:

1. The terrestrial component of the action area is defined by:

    a. The project footprint, including all cleared areas, and staging areas; and
    b. The area where construction noise levels are in excess of ambient conditions.

2. The aquatic component of the action area is defined by:

    a. The segment of the Feather River upstream and downstream of bridge construction sites where pile driving sound noise levels in water are expected to exceed current threshold criteria (maximum zone of impact distance is 386 meters, or 772 meters in diameter);

    b. Construction-related water quality impacts in excess of ambient conditions; and

    c. Operational stormwater quality impacts in excess of ambient conditions.

The proposed project action area includes the Feather River (at river mile (RM) 28) and associated floodplains and riparian areas that could be affected directly or indirectly by the project. The action area is within the immediate construction area that extends 79 meters upstream and 79 meters downstream to the outer limits of vibratory effects for the Project. For construction activities, the study area is defined as the entire width of the river.

The Feather River flowing through the project area retains its natural banks and potentially supports a large range of aquatic wildlife and associated species. The riverbed is wide and varied, composed of disturbed riparian vegetation, and is located within Yuba City levee system. The Feather River is inhabited by aquatic species that use the river for foraging, migration, and breeding.

The action area of the entire project is approximately 64 acres. The proposed action area located within the OHWM of the Feather River is approximately 6.8 acres and represents the area within and adjacent to the Feather River that is used by CCV steelhead, spring-run CV Chinook salmon, and green sturgeon where these fish could potentially be exposed to construction related effects including changes in water turbidity, near shore impacts to riparian habitat, the acoustic sounds of pile driving within the water column and the area of potential fish rescue actions.

III. STATUS OF THE SPECIES AND CRITICAL HABITAT

The following federally listed species ESUs or DPS' and designated critical habitat occur in the action area and may be affected by the proposed action:

CV spring-run Chinook salmon ESU (*O. tshawytscha*)
Listed as threatened (70 FR 37160, June 28, 2005)

CV spring-run Chinook salmon designated critical habitat (70 FR 52488, September 2, 2005)

CCV steelhead DPS (*O. mykiss*)
Listed as threatened (71 FR 834, January 5, 2006)

CCV steelhead designated critical habitat
(70 FR 52488, September 2, 2005)

Southern DPS of North American green sturgeon (*Acipenser medirostris*)
Listed as threatened (71 FR 17757, April 7, 2006)

Southern DPS of North American green sturgeon designated critical habitat (74 FR 52300, October 9, 2009)

A. Species and Critical Habitat Listing Status

NMFS has recently completed an updated status review of 16 salmon ESUs, including Sacramento River winter-run Chinook salmon and CV spring-run Chinook salmon, and concluded that the species' status should remain as previously listed (70 FR 37160, June 28, 2005). On January 5, 2006, NMFS published a final listing determination for 10 steelhead DPSs, including CCV steelhead, concluding that CCV steelhead will remain listed as threatened (71 FR 834).

CV spring-run Chinook salmon were listed as threatened on September 16, 1999 (64 FR 50394). This ESU consists of spring-run Chinook salmon occurring in the Sacramento River basin. The Feather River Hatchery (FRH) spring-run Chinook salmon population has been included as part of the Central Valley spring-run Chinook salmon ESU in the most recent modification of the CV spring-run Chinook salmon listing status (70 FR 37160, June 28, 2005). Critical habitat was designated for CV spring-run Chinook salmon on September 2, 2005 (70 FR 52488), and includes the action area for the proposed study.

CCV steelhead were listed as threatened under the ESA on March 19, 1998 (63 FR 13347). This DPS consists of steelhead populations in the Sacramento River and San Joaquin River (inclusive of and downstream of the Merced River) basins in California's CV. The Coleman National Fish Hatchery and FRFH steelhead populations have been included as part of the CCV steelhead DPS in the most recent modification of the CCV steelhead listing status (71 FR 834, January 5, 2006). These populations were previously included in the DPS but were not deemed essential for conservation and thus not part of the listed steelhead population. Critical habitat was designated for steelhead in the CV on September 2, 2005 (70 FR 52488). Critical habitat includes the stream channels to the ordinary high water line within designated stream reaches such as those of the American, Feather, and Yuba rivers, and Deer, Mill, Battle, Antelope, and Clear creeks in the Sacramento River basin; the Calaveras, Mokelumne, Stanislaus, and Tuolumne rivers in the San Joaquin River basin; and, the Sacramento and San Joaquin rivers and Delta. Designated critical habitat for CCV steelhead is found within the action area.

The Southern DPS of North American green sturgeon was listed as threatened on April 7, 2006, (71 FR 17757). Aside from recent confirmations of spawning in the Feather River (DWR 2011), the Southern DPS contains only a single spawning population in the Sacramento River, and rearing individuals may occur within the action area year round. Critical habitat was designated for the Southern DPS of green sturgeon on October 9, 2009, (74 FR 52300). Critical habitat includes the stream channels and waterways in the Delta to the ordinary high water line except for certain excluded areas. Critical habitat also includes the main stem Sacramento River upstream from the I Street Bridge to Keswick Dam, and the Feather River upstream to the fish barrier dam adjacent to the Feather River Fish Hatchery. Coastal Marine areas include waters out to a depth of 60 meters from Monterey Bay, California, to the Juan De Fuca Straits in Washington. Coastal estuaries designated as critical habitat include San Francisco Bay, Suisun Bay, San Pablo Bay, and the lower Columbia River estuary. Certain coastal bays and estuaries in California (Humboldt Bay), Oregon (Coos Bay, Winchester Bay, Yaquina Bay, and Nehalem Bay), and Washington (Willapa Bay and Grays Harbor) are also included as critical habitat for Southern DPS green sturgeon.

B. Species Life History and Population Dynamics

1. Chinook Salmon

a. General Life History

Chinook salmon exhibit two generalized freshwater life history types (Healey 1991). "Stream-type" Chinook salmon, enter freshwater months before spawning and reside in freshwater for a year or more following emergence, whereas "ocean-type" Chinook salmon spawn soon after entering freshwater and migrate to the ocean as fry or parr within their first year. Spring-run Chinook salmon exhibit a stream-type life history. Adults enter freshwater in the spring, hold over summer, spawn in fall, and the juveniles typically spend a year or more in freshwater before emigrating. Winter-run Chinook salmon are somewhat anomalous in that they have characteristics of both stream- and ocean-type races (Healey 1991). Adults enter freshwater in winter or early spring, and delay spawning until spring or early summer (stream-type). However, juvenile winter-run Chinook salmon migrate to sea after only 4 to 7 months of river life (ocean-type). Adequate instream flows and cool water temperatures are more critical for the survival of Chinook salmon exhibiting a stream-type life history due to over summering by adults and/or juveniles.

Chinook salmon typically mature between 2 and 6 years of age (Myers *et al.* 1998). Freshwater entry and spawning timing generally are thought to be related to local water temperature and flow regimes. Runs are designated on the basis of adult migration timing; however, distinct runs also differ in the degree of maturation at the time of river entry, thermal regime and flow characteristics of their spawning site, and the actual time of spawning (Myers *et al.* 1998). Both spring-run and winter-run Chinook salmon tend to enter freshwater as immature fish, migrate far upriver, and delay spawning for weeks or months. For comparison, fall-run Chinook salmon enter freshwater at an advanced stage of maturity, move rapidly to their spawning areas on the

main stem or lower tributaries of the rivers, and spawn within a few days or weeks of freshwater entry (Healey 1991).

During their upstream migration, adult Chinook salmon require stream flows sufficient to provide olfactory and other orientation cues used to locate their natal streams. Adequate stream flows are necessary to allow adult passage to upstream holding habitat. The preferred temperature range for upstream migration is 38° Fahrenheit (F) to 56°F (Bell 1991, CDFG 1998). Boles *et al.* (1988) recommends water temperatures below 65°F for adult Chinook salmon migration, and Lindley *et al.* (2004) report that adult migration is blocked when temperatures reach 70°F, and that fish can become stressed as temperatures approach 70°F. Spring-run Chinook salmon holding in upper watershed locations prefer water temperatures below 60°F; although Chinook salmon can tolerate temperatures up to 65°F before they experience an increased susceptibility to disease.

Information on the migration rates of adult Chinook salmon in freshwater is scant and primarily comes from the Columbia River basin where information regarding migration behavior is needed to assess the effects of dams on travel times and passage (Matter *et al*. 2003). Keefer *et al.* (2004) found migration rates of Chinook salmon ranging from approximately 10 kilometers (km) per day to greater than 35 km per day and to be primarily correlated with date, and secondarily with discharge, year, and reach, in the Columbia River basin. Matter *et al*. (2003) documented migration rates of adult Chinook salmon ranging from 29 to 32 km per day in the Snake River. Adult Chinook salmon inserted with sonic tags and tracked throughout the Delta and lower Sacramento and San Joaquin rivers were observed exhibiting substantial upstream and downstream movement in a random fashion while migrating upstream over the course of several days at a time (CALFED 2001). Adult salmonids migrating upstream are assumed to make greater use of pool and mid-channel habitat than channel margins (Stillwater Sciences 2004), particularly larger salmon such as Chinook salmon, as described by Hughes (2004). Adults are thought to exhibit crepuscular behavior during their upstream migrations; meaning that they primarily are active during twilight hours. Recent hydroacoustic monitoring showed peak upstream movement of adult CV spring-run Chinook salmon in lower Mill Creek, a tributary to the Sacramento River, occurring in the 4-hour period before sunrise and again after sunset.

Spawning Chinook salmon require clean, loose gravel in swift, relatively shallow riffles or along the margins of deeper runs, and suitable water temperatures, depths, and velocities for redd construction and adequate oxygenation of incubating eggs. Chinook salmon spawning typically occurs in gravel beds that are located at the tails of holding pools (USFWS 1995a). The range of water depths and velocities in spawning beds that Chinook salmon find acceptable is very broad. The upper preferred water temperature for spawning Chinook salmon is 55°F to 57°F (Chambers 1956, Smith 1973, Bjornn and Reiser 1991, and Snider 2001).

Incubating eggs are vulnerable to adverse effects from floods, siltation, desiccation, disease, predation, poor gravel percolation, and poor water quality. Studies of Chinook salmon egg survival to hatching conducted by Shelton (1995) indicated 87 percent of fry emerged successfully from large gravel with adequate subgravel flow. A significant reduction in egg viability occurs at water temperatures above 57.5^{o}F and total embryo mortality can occur at temperatures above 62°F (NMFS 1997). Alderdice and Velsen (1978) found that the upper and

lower temperatures resulting in 50 percent pre-hatch mortality were 61°F and 37°F, respectively, when the incubation temperature was held constant. As water temperatures increase, the rate of embryo malformations also increases, as well as the susceptibility to fungus and bacterial infestations. The length of development for Chinook salmon embryos is dependent on the ambient water temperature surrounding the egg pocket in the redd. Colder water necessitates longer development times as metabolic processes are slowed. Within the appropriate water temperature range for embryo incubation, embryos hatch in 40 to 60 days, and the alevins (yolk-sac fry) remain in the gravel for an additional 4 to 6 weeks before emerging from the gravel.

During the 4 to 6 week period when alevins remain in the gravel, they utilize their yolk-sac to nourish their bodies. As their yolk-sac is depleted, fry begin to emerge from the gravel to begin exogenous feeding in their natal stream. The post-emergent fry disperse to the margins of their natal stream, seeking out shallow waters with slower currents, finer sediments, and bank cover such as overhanging and submerged vegetation, root wads, and fallen woody debris, and begin feeding on zooplankton, small insects, and other micro-crustaceans. As they switch from endogenous nourishment to exogenous feeding, the fry's yolk-sac is reabsorbed, and the belly suture closes over the former location of the yolk-sac (button-up fry). Fry typically range from 25 mm to 40 mm during this stage. Some fry may take up residence in their natal stream for several weeks to a year or more, while others are displaced downstream by the stream's current. Once started downstream, fry may continue downstream to the estuary and rear, or may take up residence in other river reaches for a period of time ranging from weeks to a year (Healey 1991). Fry then seek near-shore habitats containing beneficial aspects such as riparian vegetation and associated substrates important for providing aquatic and terrestrial invertebrates, predator avoidance, and slower velocities for resting (NMFS 1996a). The benefits of shallow water habitats for salmonid rearing also have recently been realized as shallow water habitat has been found to be more productive than the main river channels, supporting higher growth rates, partially due to higher prey consumption rates, as well as favorable environmental temperatures (Sommer *et al.* 2001).

When juvenile Chinook salmon reach a length of 50 to 57 mm, they move into deeper water with higher current velocities, but still seek shelter and velocity refugia to minimize energy expenditures. In the mainstems of larger rivers, juveniles tend to migrate along the margins and avoid the elevated water velocities found in the thalweg of the channel. When the channel of the river is greater than 9 to 10 feet in depth, juvenile salmon tend to inhabit the surface waters (Healey 1982). Migrational cues, such as increasing turbidity from runoff, increased flows, changes in day length, or intraspecific competition from other fish in their natal streams may spur outmigration of juveniles when they have reached the appropriate stage of maturation (Kjelson *et al.* 1982, Brandes and McLain 2001).

As fish begin their emigration, they are displaced by the river's current downstream of their natal reaches. Similar to adult movement, juvenile salmonid downstream movement is crepuscular. Documents and data provided to NMFS in support of ESA section 10 research permit applications depicts that the daily migration of juveniles passing Red Bluff Diversion Dam (RBDD) is highest in the four hour period prior to sunrise (Martin *et al.* 2001). Juvenile Chinook salmon migration rates vary considerably presumably depending on the physiological stage of the juvenile and hydrologic conditions. Kjelson *et al*. (1982) found fry Chinook salmon

to travel as fast as 30 km per day in the Sacramento River and Sommer *et al.* (2001) found rates ranging from approximately 0.5 miles up to more than 6 miles per day in the Yolo Bypass. As Chinook salmon begin the smoltification stage, they prefer to rear further downstream where ambient salinity is up to 1.5 to 2.5 parts per thousand (Healey 1980, Levy and Northcote 1981).

Fry and parr may rear within riverine or estuarine habitats of the Sacramento River, the Delta, and their tributaries. In addition, Central Valley spring-run Chinook salmon juveniles have been observed rearing in the lower reaches of non-natal tributaries and intermittent streams in the Sacramento Valley during the winter months (Maslin *et al.* 1997, Snider 2001). Within the Delta, juvenile Chinook salmon forage in shallow areas with protective cover, such as intertidal and subtidal mudflats, marshes, channels, and sloughs (McDonald 1960, Dunford 1975). Cladocerans, copepods, amphipods, and larvae of diptera, as well as small arachnids and ants are common prey items (Kjelson *et al.* 1982, Sommer *et al.* 2001, MacFarlane and Norton 2002). Shallow water habitats are more productive than the main river channels, supporting higher growth rates, partially due to higher prey consumption rates, as well as favorable environmental temperatures (Sommer *et al.* 2001). Optimal water temperatures for the growth of juvenile Chinook salmon in the Delta are between 54°F to 57°F (Brett 1952). In Suisun and San Pablo bays water temperatures reach 54°F by February in a typical year. Other portions of the Delta (*i.e.*, South Delta and Central Delta) can reach 70°F by February in a dry year. However, cooler temperatures are usually the norm until after the spring runoff has ended.

Within the estuarine habitat, juvenile Chinook salmon movements are dictated by the tidal cycles, following the rising tide into shallow water habitats from the deeper main channels, and returning to the main channels when the tide recedes (Levy and Northcote 1982, Levings 1982, Levings *et al.* 1986, Healey 1991). As juvenile Chinook salmon increase in length, they tend to school in the surface waters of the main and secondary channels and sloughs, following the tides into shallow water habitats to feed (Allen and Hassler 1986). In Suisun Marsh, Moyle *et al.* (1989) reported that Chinook salmon fry tend to remain close to the banks and vegetation, near protective cover, and in dead-end tidal channels. Kjelson *et al.* (1982) reported that juvenile Chinook salmon demonstrated a diel migration pattern, orienting themselves to nearshore cover and structure during the day, but moving into more open, offshore waters at night. The fish also distributed themselves vertically in relation to ambient light. During the night, juveniles were distributed randomly in the water column, but would school up during the day into the upper 3 meters of the water column. Available data indicates that juvenile Chinook salmon use Suisun Marsh extensively both as a migratory pathway and rearing area as they move downstream to the Pacific Ocean. Juvenile Chinook salmon were found to spend about 40 days migrating through the Delta to the mouth of San Francisco Bay and grew little in length or weight until they reached the Gulf of the Farallones (MacFarlane and Norton 2002). Based on the mainly ocean-type life history observed (*i.e.*, fall-run Chinook salmon) MacFarlane and Norton (2002) concluded that unlike other salmonid populations in the Pacific Northwest, Central Valley Chinook salmon show little estuarine dependence and may benefit from expedited ocean entry.

b. CV Spring-Run Chinook salmon

Historically the CV spring-run Chinook salmon were the second most abundant salmon run in the Central Valley (CDFG 1998). These fish occupied the upper and middle reaches (1,000 to

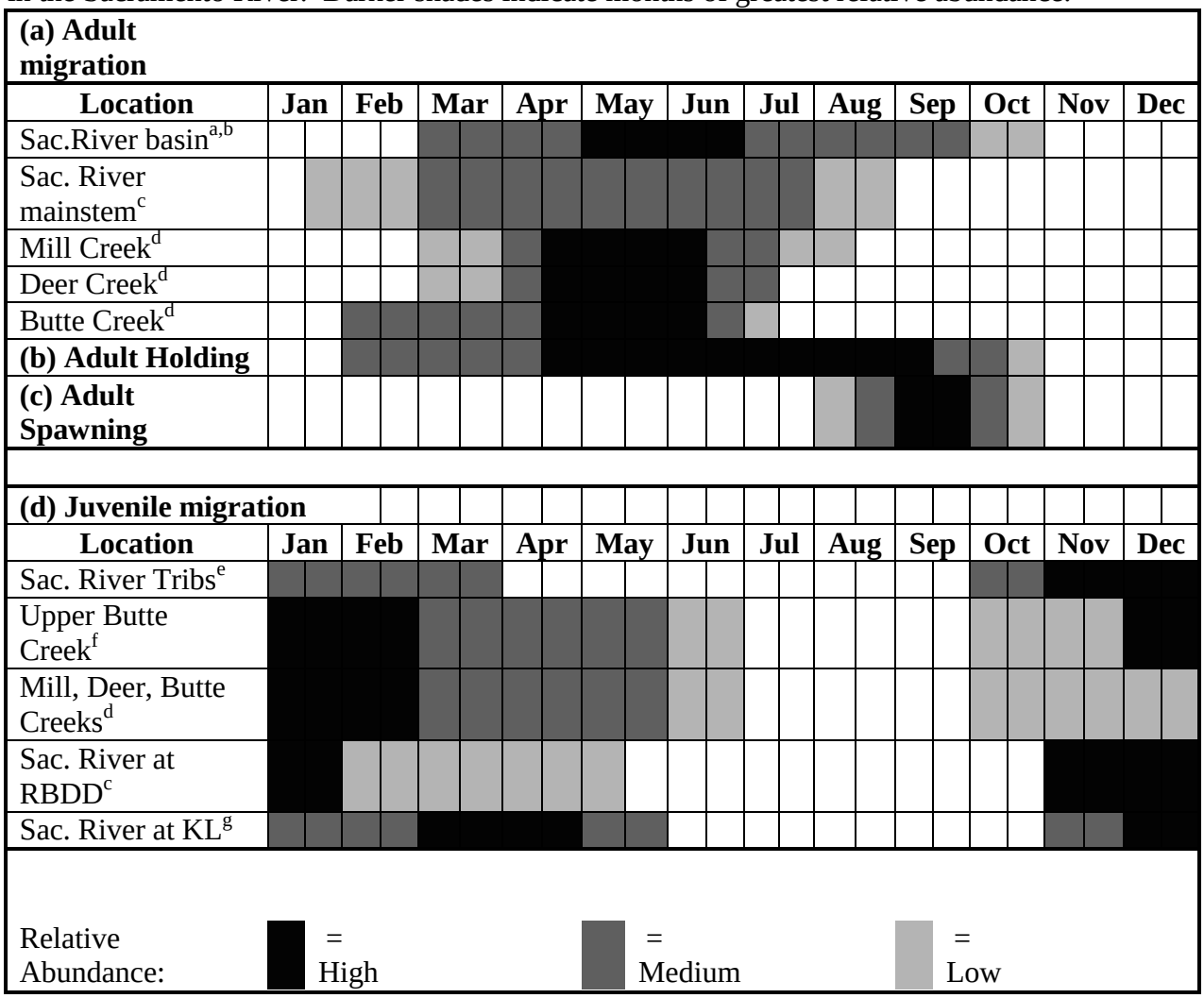
6,000 feet elevation) of the San Joaquin, American, Yuba, Feather, Sacramento, McCloud and Pit rivers, with smaller populations in most tributaries with sufficient habitat for over-summering adults (Stone 1874, Rutter 1904, Clark 1929). The Central Valley drainage as a whole is estimated to have supported spring-run Chinook salmon runs as large as 600,000 fish between the late 1880s and 1940s (CDFG 1998). Before the construction of Friant Dam, nearly 50,000 adults were counted in the San Joaquin River alone (Fry 1961). Construction of other low elevation dams in the foothills of the Sierras on the American, Mokelumne, Stanislaus, Tuolumne, and Merced rivers extirpated Central Valley spring-run Chinook salmon from these watersheds. Naturally-spawning populations of Central Valley spring-run Chinook salmon currently are restricted to accessible reaches of the upper Sacramento River, Antelope Creek, Battle Creek, Beegum Creek, Big Chico Creek, Butte Creek, Clear Creek, Deer Creek, Feather River, Mill Creek, and Yuba River (CDFG 1998).

Adult CV spring-run Chinook salmon leave the ocean to begin their upstream migration in late January and early February (CDFG 1998) and enter the Sacramento River between March and September, primarily in May and June (see Table 3 in text; Yoshiyama *et al*. 1998, Moyle 2002). Lindley *et al*. (2004) indicates adult CV spring-run Chinook salmon enter native tributaries from the Sacramento River primarily between mid-April and mid-June. Typically, spring-run Chinook salmon utilize mid- to high-elevation streams that provide appropriate temperatures and sufficient flow, cover, and pool depth to allow over-summering while conserving energy and allowing their gonadal tissue to mature (Yoshiyama *et al*. 1998). Spring-run Chinook salmon spawning occurs between September and October depending on water temperatures. Between 56 and 87 percent of adult spring-run Chinook salmon that enter the Sacramento River basin to spawn are 3 years old (Calkins *et al.* 1940, Fisher 1994).

Spring-run Chinook salmon fry emerge from the gravel from November to March (Moyle 2002) and the emigration timing is highly variable, as they may migrate downstream as young-of-the-year or as juveniles or yearlings. The modal size of fry migrants at approximately 40 mm between December and April in Mill, Butte, and Deer creeks reflects a prolonged emergence of fry from the gravel (Lindley *et al*. 2004). Studies in Butte Creek (Ward *et al*. 2002, 2003, McReynolds *et al*. 2005) found the majority of CV spring-run Chinook salmon migrants to be fry occurring primarily during December, January, and February; and that these movements appeared to be influenced by flow. Small numbers of CV spring-run Chinook salmon remained in Butte Creek to rear and migrated as yearlings later in the spring. Juvenile emigration patterns in Mill and Deer creeks are very similar to patterns observed in Butte Creek, with the exception that Mill and Deer creek juveniles typically exhibit a later young-of-the-year migration and an earlier yearling migration (Lindley *et al*. 2004).

Once juveniles emerge from the gravel they initially seek areas of shallow water and low velocities while they finish absorbing the yolk sac and transition to exogenous feeding (Moyle 2002). Many also will disperse downstream during high-flow events. As is the case in other salmonids, there is a shift in microhabitat use by juveniles to deeper faster water as they grow larger. Microhabitat use can be influenced by the presence of predators which can force fish to select areas of heavy cover and suppress foraging in open areas (Moyle 2002). The emigration period for spring-run Chinook salmon extends from November to early May, with up to 69 percent of the young-of-the-year fish outmigrating through the lower Sacramento River and

Table 3. The temporal occurrence of adult (a) and juvenile (b) CV spring-run Chinook salmon in the Sacramento River. Darker shades indicate months of greatest relative abundance.



Note: Yearling spring-run Chinook salmon rear in their natal streams through the first summer following their birth. Downstream emigration generally occurs the following fall and winter. Young of the year spring-run Chinook salmon emigrate during the first spring after they hatch.

Sources: [a]Yoshiyama *et al*. (1998); [b]Moyle (2002); [c]Myers *et al*. (1998); [d]Lindley *et al*. (2007); CDFG (1998); [f]McReynolds *et al*. (2005); Ward *et al*. (2002, 2003); [g]Snider and Titus (2000)

Delta during this period (CDFG 1998). Peak movement of juvenile CV spring-run Chinook salmon in the Sacramento River at Knights Landing occurs in December, and again in March and April. However, juveniles also are observed between November and the end of May (Snider and Titus 2000). Based on the available information, the emigration timing of CV spring-run Chinook salmon appears highly variable (CDFG 1998) (Table 3). Some fish may begin

emigrating soon after emergence from the gravel, whereas others over summer and emigrate as yearlings with the onset of intense fall storms (CDFG 1998).

On the Feather River, significant numbers of CV spring-run Chinook salmon, as identified by run timing, return to the FRFH. In 2002, the FRFH reported 4,189 returning spring-run Chinook salmon, which is 22 percent below the 10-year average of 4,727 fish. However, coded-wire tag (CWT) information from these hatchery returns indicates substantial introgression has occurred between fall-run and spring-run Chinook salmon populations within the Feather River system due to hatchery practices. Because Chinook salmon have not always been temporally separated in the hatchery, spring-run and fall-run Chinook salmon have been spawned together, thus compromising the genetic integrity of the spring-run Chinook salmon stock. The number of naturally spawning spring-run Chinook salmon in the Feather River has been estimated only periodically since the 1960s, with estimates ranging from 2 fish in 1978 to 2,908 in 1964. However, the genetic integrity of this population is questionable because of the significant temporal and spatial overlap between spawning populations of spring-run and fall-run Chinook salmon (Good *et al*. 2005). Because the Feather River spring-run Chinook salmon population is not genetically distinct from fall-run, the Feather River spring-run Chinook population numbers are typically not included in discussions of ESU abundance when referring to CV spring-run Chinook salmon population discussions, and therefore will be excluded from the following discussion.

The CV spring-run Chinook salmon ESU has displayed broad fluctuations in adult abundance, ranging from 1,403 in 1993 to 24,903 in 1998 (Table 4). Sacramento River tributary populations in Mill, Deer, and Butte creeks are probably the best trend indicators for the CV spring-run Chinook salmon ESU as a whole because these streams contain the primary independent populations within the ESU. Generally, these streams have shown a positive escapement trend since 1991. Escapement numbers are dominated by Butte Creek returns, which have averaged over 7,000 fish since 1995. During this same period, adult returns on Mill Creek have averaged 778 fish, and 1,463 fish on Deer Creek. Although recent trends are positive, annual abundance estimates display a high level of fluctuation, and the overall number of CV spring-run Chinook salmon remains well below estimates of historic abundance. Additionally, in 2002 and 2003, mean water temperatures in Butte Creek exceeded 21° Celsius (C) for 10 or more days in July (reviewed by Williams 2006). These persistent high water temperatures, coupled with high fish densities, precipitated an outbreak of Columnaris Disease (*Flexibacter columnaris*) and Ichthyophthiriasis (*Ichthyophthirius multifiis*) in the adult spring-run Chinook salmon over-summering in Butte Creek. In 2002, this contributed to the pre-spawning mortality of approximately 20 to 30 percent of the adults. In 2003, approximately 65 percent of the adults succumbed, resulting in a loss of an estimated 11,231 adult spring-run Chinook salmon in Butte Creek.

Lindley *et al*. (2007) indicated that the spring-run population of Chinook salmon in the Central Valley had a low risk of extinction in Butte and Deer creek, according to their PVA model and the other population viability criteria (*i.e.*, population size, population decline, catastrophic events, and hatchery influence). The Mill Creek population of spring-run Chinook salmon is at moderate extinction risk according to the PVA model, but appears to satisfy the other viability

criteria for low-risk status. However, like the winter-run Chinook salmon population, the CV spring-run Chinook salmon population fails to meet the "representation and redundancy rule" since there is only one demonstrably viable population out of the three diversity groups that historically contained them. The spring-run population is only represented by the group that

Table 4. CV Spring-run Chinook salmon population estimates from CDFG Grand Tab (2013) with corresponding cohort replacement rates for years since 1986.

Year	Sacramento River Basin Escapement Run Size[a]	FRFH Population	Tributary Populations	5-Year Moving Average Tributary Population Estimate	Trib CRR[b]	5-Year Moving Average of Trib CRR	5-Year Moving Average of Basin Population Estimate	Basin CRR	5-Year Moving Average of Basin CRR
1986	3,638	1,433	2,205						
1987	1,517	1,213	304						
1988	9,066	6,833	2,233						
1989	7,032	5,078	1,954		0.89			1.93	
1990	3,485	1,893	1,592	1,658	5.24		4,948	2.30	
1991	5,101	4,303	798	1,376	0.36		5,240	0.56	
1992	2,673	1,497	1,176	1,551	0.60		5,471	0.38	
1993	5,685	4,672	1,013	1,307	0.64	1.54	4,795	1.63	1.36
1994	5,325	3,641	1,684	1,253	2.11	1.79	4,454	1.04	1.18
1995	14,812	5,414	9,398	2,814	7.99	2.34	6,719	5.54	1.83
1996	8,705	6,381	2,324	3,119	2.29	2.73	7,440	1.53	2.03
1997	5,065	3,653	1,412	3,166	0.84	2.77	7,918	0.95	2.14
1998	30,534	6,746	23,788	7,721	2.53	3.15	12,888	2.06	2.23
1999	9,838	3,731	6,107	8,606	2.63	3.26	13,791	1.13	2.24
2000	9,201	3,657	5,544	7,835	3.93	2.44	12,669	1.82	1.50
2001	16,869	4,135	12,734	9,917	0.54	2.09	14,301	0.55	1.30
2002	17,224	4,189	13,035	12,242	2.13	2.35	16,733	1.75	1.46
2003	17,691	8,662	9,029	9,290	1.63	2.17	14,165	1.92	1.43
2004	13,612	4,212	9,400	9,948	0.74	1.79	14,919	0.81	1.37
2005	16,096	1,774	14,322	11,704	1.10	1.23	16,298	0.93	1.19
2006	10,948	2,181	8,767	10,911	0.97	1.31	15,114	0.62	1.21
2007	9,726	2,674	7,052	9,714	0.75	1.04	13,615	0.71	1.00
2008	6,368	1,624	4,744	8,857	0.33	0.78	11,350	0.40	0.69
2009	3,801	989	2,812	7,539	0.32	0.69	9,388	0.35	0.60
2010	3,792	1,661	2,131	5,101	0.30	0.54	6,927	0.39	0.49
2011	4,967	1,969	3,067	3,961	0.65	0.47	5,731	0.78	0.53
2012	18,275	7,465	10,810	4,713	3.84	1.09	7,441	4.81	1.34
2013	38,556	20,057	18,499	7,464	8.68	2.76	13,878	2.00	0.86
Median	10,962	4,456	6,508	6,324	2.08	1.83	10,258	1.00	1.29

[a] NMFS included both the escapement numbers from the Feather River Fish Hatchery (FRFH) and the Sacramento River and its tributaries in this table. Sacramento River Basin run size is the sum of the escapement numbers from the FRFH and the tributaries.

[b] Abbreviations: CRR = Cohort Replacement Rate, Trib = tributary

currently occurs in the northern Sierra Nevada. The spring-run Chinook salmon populations that formerly occurred in the basalt and porous-lava region and southern Sierra Nevada region have been extirpated. The northwestern California region contains a few ephemeral populations of spring-run Chinook salmon that are likely dependent on the Northern Sierra populations for their continued existence. Over the long term, these remaining populations are considered to be vulnerable to catastrophic events, such as volcanic eruptions from Mount Lassen or large forest fires due to the close proximity of their headwaters to each other. Drought is also considered to pose a significant threat to the viability of the spring-run Chinook salmon populations in these three watersheds due to their close proximity to each other. One large event could eliminate all three populations.

c. Viability of CV Spring-Run Chinook Salmon ESU

The abundance of spawners is just one of several criteria that must be met for a population to be considered viable. McElhany *et al*. (2000) acknowledged that a viable salmonid population at the ESU scale is not merely a quantitative number that needs to be attained. Rather, for an ESU to persist, populations within the ESU must be able to spread risk and maximize future potential for adaptation. ESU viability depends on the number of populations and subunits within the ESU, their individual status, their spatial arrangement with respect to each other and sources of catastrophic disturbance, and diversity of the populations and their habitats (Lindley *et al*. 2007). Populations comprise subunits, which are intended to capture important components of habitat, life history or genetic diversity that contribute to the viability of the ESU (Hilborn et al. 2003 *op. cit*. Lindley *et al.* 2007, Bottom *et al*. 2005 *op. cit*. Lindley *et al*. 2007). Lindley *et al*. (2007) concludes that at least two viable populations within each subunit are required to ensure the viability of the subunit, and hence, the ESU. The current Draft Recovery Plan criteria for achieving ESU recovery includes four viable populations in the Northern Sierra Nevada Diversity Group. The watersheds identified as having the highest likelihood of success for achieving viability/low risk of extinction include, Butte, Deer and Mill creeks as well as the upper Yuba River (NMFS 2011a).

In order to determine the current likelihood of viability of Central Valley spring-run Chinook salmon, we used the historical population structure presented in Lindley *et al*. (2004) and the concept of VSP for evaluating populations described by McElhany *et al.* (2000). While McElhany *et al.* (2000) introduced and described the concept of VSP, Lindley *et al*. (2007) applied the concept to the Central Valley spring-run Chinook salmon ESU.

Lindley *et al*. (2004) identified 26 historical populations within the spring-run Chinook salmon ESU; 19 were independent populations, and 7 were dependent populations. There is an additional extant population in the Feather River downstream of Oroville Dam. This population became restricted to the lower reaches of the Feather River following the construction of Oroville Dam and is essentially maintained by the FRFH. Of the 19 independent populations of spring-run Chinook salmon that occurred historically, only three independent populations remain, in Deer, Mill, and Butte Creeks. Dependent populations of spring-run Chinook salmon

continue to occur in Battle, Big Chico, Antelope, Clear, Thomes, and Beegum creeks, and the Yuba River, but rely on the three extant independent populations for their continued survival.

Although Lindley *et al*. (2007) did not provide numerical goals for each population of Pacific salmonid to be categorized at low risk for extinction, they did provide various quantitative criteria to evaluate the risk of extinction (Table IV-c). A population must meet all the low-risk thresholds to be considered viable. The following provides the evaluation of the likelihood of viability of the Central Valley spring-run Chinook salmon ESU based on the viable salmonid population parameters of population size, population growth rate, spatial structure, and diversity. These specific parameters are important to consider because they are predictors of extinction risk, and the parameters reflect general biological and ecological processes that are critical to the growth and survival of salmon (McElhany *et al.* 2000).

1. Population Size

Information about population size provides an indication of the type of extinction risk that a population faces. For instance, smaller populations are at a greater risk of extinction than large populations because the processes that affect populations operate differently in small populations than in large populations (McElhany *et al.* 2000). One risk of low population sizes is depensation. Depensation occurs when populations are reduced to very low densities and per capita growth rates decrease as a result of a variety of mechanisms [*e.g.,* failure to find mates and therefore reduced probability of fertilization, failure to saturate predator populations (Liermann and Hilborn 2001)].

2. Population Growth Rate

The productivity of a population (*i.e.,* production over the entire life cycle) can reflect conditions (*e.g.,* environmental conditions) that influence the dynamics of a population and determine abundance. In turn, the productivity of a population allows an understanding of the performance of a population across the landscape and habitats in which it exists and its response to those habitats (McElhany *et al.* 2000). In general, declining productivity equates to declining population abundance. McElhany *et al.* (2000) suggested a population's natural productivity should be sufficient to maintain its abundance above the viable level (a stable or increasing population growth rate). In the absence of numeric abundance targets, this guideline is used.

Cohort replacement rates are indications of whether a cohort is replacing itself in the next generation. As mentioned in the previous subsection, until recently the cohort replacement rate since the late 1990s has fluctuated, and has not appeared to have a pattern. Since the cohort replacement rate is a reflection of population growth rate, there did not appear to be an increasing or decreasing trend. However, the five-year moving average cohort replacement rate of tributary population estimate over the last five years has decreased to low of 0.47.

3. Spatial Structure

In general, there is less information available on how spatial processes relate to salmonid viability than there is for the other VSP parameters (McElhany *et al.* 2000). Understanding the

spatial structure of a population is important because the population structure can affect evolutionary processes and, therefore, alter the ability of a population to adapt to spatial or temporal changes in the species' environment (McElhany *et al*. 2000).
Lindley *et al*. (2007) indicated that of the 19 independent populations of spring-run Chinook salmon that occurred historically, only three (Butte, Mill, and Deer creeks) remain, and their current distribution makes the spring-run Chinook salmon ESU vulnerable to catastrophic disturbance. Butte, Mill, and Deer Creeks all occur in the same biogeographic region (diversity group), whereas historically, independent spring-run Chinook salmon populations were distributed throughout the Central Valley among at least three diversity groups (*i.e*., basalt and porous lava, northern Sierra Nevada, and southern Sierra Nevada). In addition, dependent spring-run Chinook salmon populations historically persisted in the Northwestern California diversity group (Lindley *et al*. 2004). Currently, there are dependent populations of spring-run Chinook salmon in the Big Chico, Antelope, Clear, Thomes, Battle, and Beegum creeks, and in the Sacramento, Feather, and Yuba rivers (Lindley *et al*. 2007).

4. Diversity

Diversity, both genetic and behavioral, is critical to success in a changing environment. Salmonids express variation in a suite of traits, such as anadromy, morphology, fecundity, run timing, spawn timing, juvenile behavior, age at smolting, age at maturity, egg size, developmental rate, ocean distribution patterns, male and female spawning behavior, and physiology and molecular genetic characteristics. The more diverse these traits (or the more these traits are not restricted), the more adaptable a population is, and the more likely that individuals, and therefore the species, would survive and reproduce in the face of environmental variation (McElhany *et al.* 2000). However, when this diversity is reduced due to loss of entire life history strategies or to loss of habitat used by fish exhibiting variation in life history traits, the species is in all probability less able to survive and reproduce given environmental variation.

Diversity provides a species the opportunity to track environmental changes. As a species' abundance decreases, and spatial structure of the ESU is reduced, a species has less flexibility to track changes in the environment. Historical populations of spring-run Chinook salmon have been entirely extirpated from the basalt and porous lava region and the southern Sierra Nevada region. The only viable and independent populations (*i.e*., Mill, Deer, and Butte creeks) of spring-run Chinook salmon are limited to the northern Sierra Nevada region, although some smaller dependent populations are currently found in the Northwestern California, Basalt and Porous lava, and Northern Sierra Nevada regions. A single catastrophe, for example, the eruption of Mount Lassen, a large wildland fire at the headwaters of Mill, Deer, and Butte creeks, or a drought, poses a significant threat to the extinction risk of the ESU that otherwise would not be there if the ESU's spatial structure and diversity were greater. Spring-run Chinook salmon do however reserve some genetic and behavioral variation in that in any given year, at least two cohorts are in the marine environment, and therefore, not exposed to the same environmental stressors as their freshwater cohorts.

Although spring-run Chinook salmon produced at the FRFH are part of the Central Valley spring-run Chinook salmon ESU (June 28, 2005, 70 FR 37160), since they have been introgressed with fall-run Chinook salmon, they may compromise the genetic diversity of the rest

of the ESU. More than 523,000 FRFH spring-run Chinook salmon fry were planted at the base of Whiskeytown Dam during the 3-year period 1991–1993 (CDFG 1998 *op. cit*. CVP/SWP operations BA), and thousands are trucked to the San Pablo Bay every year instead of being released in-river, which has been shown to increase straying. The fact that these hatchery fish behave more like fall-run Chinook salmon (spawn later than spring-run Chinook salmon in Deer, Mill, and Butte creeks), likely increases the rate of introgression of the spring- and fall- runs, and reduces diversity. The Yuba River population is heavily impacted by FRFH fish straying into the Yuba River.

d. Summary of Central Valley Spring-Run Chinook Salmon ESU Viability

Lindley *et al*. (2007) concluded that the Butte Creek and Deer Creek spring-run Chinook salmon populations are at low risk of extinction, satisfying both the population viability analysis (PVA) and other viability criteria. Mill Creek is at moderate extinction risk according to the PVA, but appears to satisfy the other viability criteria for low-risk status (Lindley *et al*. 2007). Spring-run Chinook salmon failed to meet the representation and redundancy rule for ESU viability, as distribution of independent populations has been constricted to only one of their former geographic diversity groups. Therefore Lindley *et al*. (2007) reported that the spring-run Chinook salmon ESU was at moderate risk of extinction.

The most recent viability assessment of Central Valley spring-run Chinook salmon was conducted during NMFS' 2011 status review (NMFS 2011a). This review found that the biological status of the ESU has worsened since the last status review recommend that its status be reassessed in two to three years as opposed to waiting another five years, if it does not respond positively to improvements in environmental conditions and management actions.

2. <u>CCV Steelhead</u>

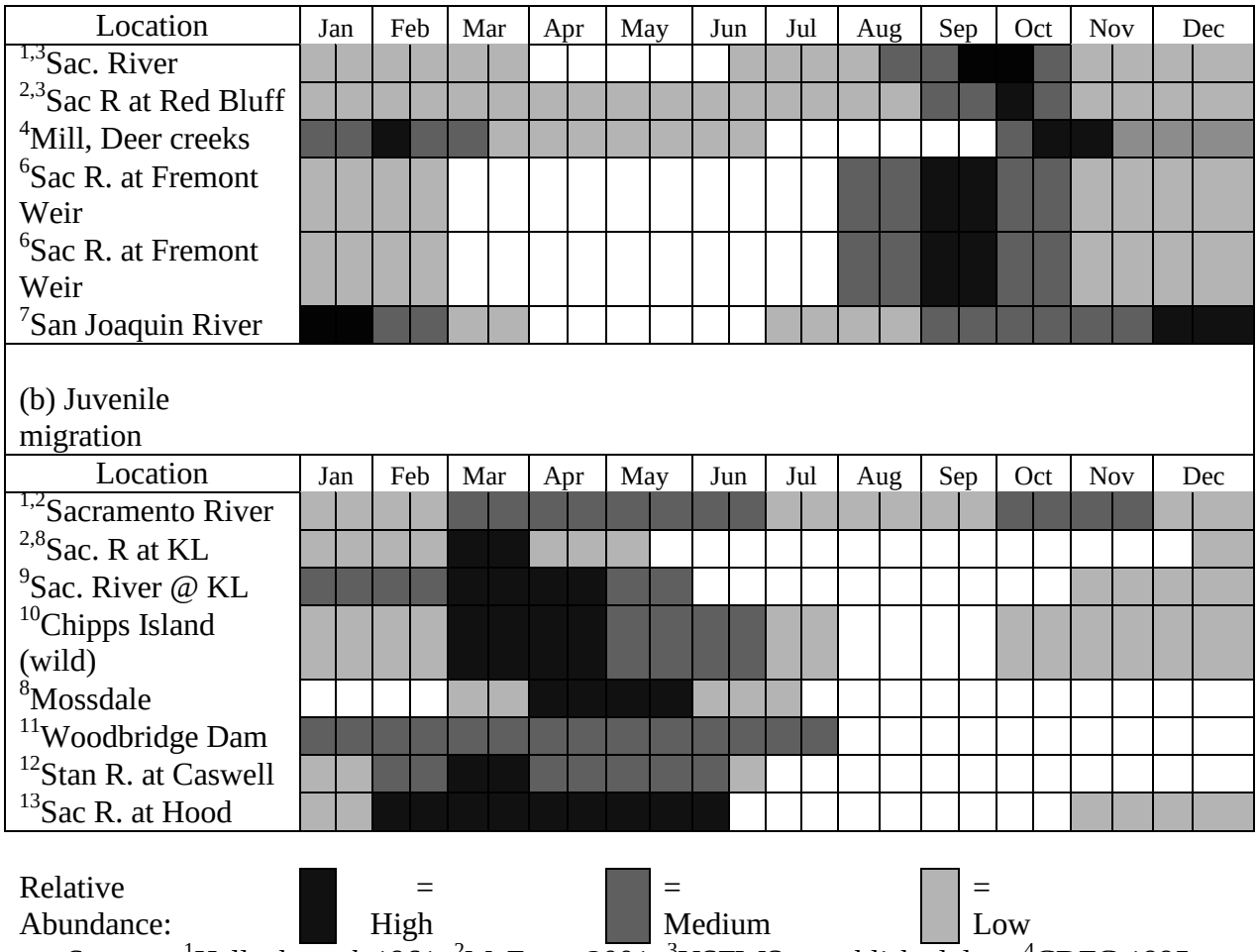
a. Life history

Steelhead can be divided into two life history types, summer-run steelhead and winter-run steelhead, based on their state of sexual maturity at the time of river entry and the duration of their spawning migration. Only winter steelhead currently are found in Central Valley rivers and streams (McEwan and Jackson 1996), although there are indications that summer steelhead were present in the Sacramento river system prior to the commencement of large-scale dam construction in the 1940s [Interagency Ecological Program (IEP) Steelhead Project Work Team 1999]. At present, summer steelhead are found only in North Coast drainages, mostly in tributaries of the Eel, Klamath, and Trinity river systems (McEwan and Jackson 1996).

CCV steelhead generally leave the ocean from August through April (Busby *et al.* 1996), and spawn from December through April with peaks from January though March in small streams and tributaries where cool, well oxygenated water is available year-round (Table 5; Hallock *et al.* 1961, McEwan and Jackson 1996). Timing of upstream migration is correlated with higher flow events, such as freshets or sand bar breaches at river mouths, and associated lower water temperatures. Unlike Pacific salmon, steelhead are iteroparous, or capable of spawning more than once before death (Barnhart 1986, Busby *et al.* 1996). However, it is rare for steelhead to

spawn more than twice before dying; most that do so are females (Busby *et al.* 1996). Iteroparity is more common among southern steelhead populations than northern populations (Busby *et al.*

Table 5. The temporal occurrence of adult (a) and juvenile (b) Central Valley steelhead in the Central Valley. Darker shades indicate months of greatest relative abundance.



Sources: [1]Hallock *et al*. 1961; [2]McEwan 2001; [3]USFWS unpublished data; [4]CDFG 1995; [5]Hallock *et al*. 1957; [6]Bailey 1954; [7]CDFG Steelhead Report Card Data; [8]CDFG unpublished data; [9]Snider and Titus 2000; [10]Nobriga and Cadrett 2003; [11]Jones & Stokes Associates, Inc. 2002; [12]S.P. Cramer and Associates, Inc. 2000,2001; [13]Schaffter 1980.

1996). Although one-time spawners are the great majority, Shapovalov and Taft (1954) reported that repeat spawners are relatively numerous (17.2 percent) in California streams.

Spawning occurs during winter and spring months. The length of time it takes for eggs to hatch depends mostly on water temperature. Hatching of steelhead eggs in hatcheries takes about 30 days at 51°F. Fry emerge from the gravel usually about 4 to 6 weeks after hatching, but factors such as redd depth, gravel size, siltation, and temperature can speed or retard this time (Shapovalov and Taft 1954). Newly emerged fry move to the shallow, protected areas associated with the stream margin (McEwan and Jackson 1996) and they soon move to other areas of the

stream and establish feeding locations, which they defend (Shapovalov and Taft 1954).

Steelhead rearing during the summer takes place primarily in higher velocity areas in pools, although young-of-the-year also are abundant in glides and riffles. Productive steelhead habitat is characterized by complexity, primarily in the form of large and small woody debris. Cover is an important habitat component for juvenile steelhead both as velocity refugia and as a means of avoiding predation (Meehan and Bjornn 1991).

Juvenile steelhead emigrate episodically from natal streams during fall, winter, and spring high flows. Emigrating CCV steelhead use the lower reaches of the Sacramento River and the Delta for rearing and as a migration corridor to the ocean. Juvenile CCV steelhead feed mostly on drifting aquatic organisms and terrestrial insects and will also take active bottom invertebrates (Moyle 2002).

Some may utilize tidal marsh areas, non-tidal freshwater marshes, and other shallow water areas in the Delta as rearing areas for short periods prior to their final emigration to the sea. Hallock *et al.* (1961) found that juvenile steelhead in the Sacramento River basin migrate downstream during most months of the year, but the peak period of emigration occurred in the spring, with a much smaller peak in the fall. Nobriga and Cadrett (2003) also have verified these temporal findings based on analysis of captures at Chipps Island.

Historic CCV steelhead run sizes are difficult to estimate given the paucity of data, but may have approached 1 to 2 million adults annually (McEwan 2001). By the early 1960s the steelhead run size had declined to about 40,000 adults (McEwan 2001). Over the past 30 years, the naturally-spawned steelhead populations in the upper Sacramento River have declined substantially. Hallock *et al.* (1961) estimated an average of 20,540 adult steelhead through the 1960s in the Sacramento River, upstream of the Feather River. Steelhead counts at the RBDD declined from an average of 11,187 for the period of 1967 to 1977, to an average of approximately 2,000 through the early 1990s, with an estimated total annual run size for the entire Sacramento-San Joaquin system, based on RBDD counts, to be no more than 10,000 adults (McEwan and Jackson 1996, McEwan 2001). Steelhead escapement surveys at RBDD ended in 1993 due to changes in dam operations.

Nobriga and Cadrett (2003) compared CWT and untagged (wild) steelhead smolt catch ratios at Chipps Island trawl from 1998 through 2001 to estimate that about 100,000 to 300,000 steelhead juveniles are produced naturally each year in the Central Valley. In the *Updated Status Review of West Coast Salmon and Steelhead* (Good *et al.* 2005), the Biological Review Team (BRT) made the following conclusion based on the Chipps Island data:

> "If we make the fairly generous assumptions (in the sense of generating large estimates of spawners) that average fecundity is 5,000 eggs per female, 1 percent of eggs survive to reach Chipps Island, and 181,000 smolts are produced (the 1998-2000 average), about 3,628 female steelhead spawn naturally in the entire Central Valley. This can be compared with McEwan's (2001) estimate of 1 million to 2 million spawners before 1850, and 40,000 spawners in the 1960s".

Existing wild steelhead stocks in the Central Valley are mostly confined to the upper Sacramento River and its tributaries, including Antelope, Deer, and Mill creeks and the Yuba river. Populations may exist in Big Chico and Butte creeks and a few wild steelhead are produced in the American and Feather rivers (McEwan and Jackson 1996). Recent snorkel surveys (1999 to 2008) indicate that steelhead are present in Clear Creek (Giovannetti and Brown 2008, Good *et al.* 2005) as well as monitoring from 2005 to 2009 in Battle Creek (Newton and Stafford 2011). Until recently, CCV steelhead were thought to be extirpated from the San Joaquin River system. Recent monitoring has detected small self-sustaining populations of steelhead in the Stanislaus, Mokelumne, and Calaveras rivers, and other streams previously thought to be devoid of steelhead (McEwan 2001). On the Stanislaus River, steelhead smolts have been captured in rotary screw traps (RSTs) at Caswell State Park and Oakdale each year since 1995 (S.P. Cramer and Associates Inc. 2000, 2001). Zimmerman *et al.* (2008) has documented Central Valley steelhead in the Stanislaus, Tuolumne and Merced rivers based on otilith microchemistry.

It is possible that naturally-spawning populations exist in many other streams but are undetected due to lack of monitoring programs (IEP Steelhead Project Work Team 1999). Incidental catches and observations of steelhead juveniles also have occurred on the Tuolumne and Merced rivers during fall-run Chinook salmon monitoring activities, indicating that steelhead are widespread, throughout accessible streams and rivers in the CV (Good *et al*. 2005). CDFG staff has prepared catch summaries for juvenile migrant CCV steelhead on the San Joaquin River near Mossdale which represents migrants from the Stanislaus, Tuolumne, and Merced rivers. Based on trawl recoveries at Mossdale between 1988 and 2002, as well as RST efforts in all three tributaries, CDFG staff stated that it is "clear from this data that rainbow trout do occur in all the tributaries as migrants and that the vast majority of them occur on the Stanislaus River" (Letter from Dean Marston, CDFG, to Michael Aceituno, NMFS, 2004). The documented returns on the order of single fish in these tributaries suggest that existing populations of CCV steelhead on the Tuolumne, Merced, and lower San Joaquin rivers are severely depressed.

Good *et al.* (2005) indicated that prior population census estimates completed in the 1990s found the CCV steelhead spawning population above RBDD had a fairly strong negative population growth rate and small population size. Good *et al.* (2005) indicated the decline was continuing as evidenced by new information (Chipps Island trawl data). CCV steelhead populations generally show a continuing decline, an overall low abundance, and fluctuating return rates. The future of CCV steelhead is uncertain due to limited data concerning their status. However, Lindley *et al.* (2007), citing evidence presented by Yoshiyama *et al.* (1996); McEwan (2001); and Lindley *et al.* (2006), concluded that there is sufficient evidence to suggest that the DPS is at moderate to high risk of extinction.

b. Viability of the Central Valley Steelhead DPS

The earlier analysis to determine the likelihood of spring-run Chinook salmon becoming viable described the process that NMFS uses to apply the VSP concept in McElhany *et al*. (2000). In order to determine the current likelihood of the Central Valley steelhead DPS becoming viable, we used the historical population structure of Central Valley steelhead presented in Lindley *et al*. (2006, 2007) and the concept of VSP for evaluating populations described by McElhany *et al.*

(2000). While McElhany *et al.* (2000) introduced and described the concept of VSP, Lindley *et al*. (2007) applied the concept to the Central Valley steelhead DPS.

1. Population Size

All indications are that the naturally produced California Central Valley steelhead population has continued to decrease in abundance and in the proportion of naturally spawned fish to hatchery produced fish over the past 25 years (Good *et al.* 2005, NMFS 2011b); the long-term abundance trend remains negative. There has been little comprehensive steelhead population monitoring, despite 100 percent marking of hatchery steelhead since 1998. Efforts are underway to improve this deficiency, and a long term adult escapement monitoring plan is being considered (NMFS 2011b). Hatchery production and returns are dominant over natural fish and include significant numbers of non-DPS-origin Eel River steelhead stock. Hatcheries affect productivity of wild populations (Chilcote 2003). Continued decline in the ratio between wild juvenile steelhead to hatchery juvenile steelhead in fish monitoring efforts indicates that the wild population abundance is declining. Hatchery releases have remained relatively constant over the past decade, yet the proportion of ad-clipped fish to wild adipose fin bearing fish has steadily increased over the past several years.

2. Population Growth Rate

An estimated 100,000 to 300,000 natural juvenile steelhead are estimated to leave the Central Valley annually, based on rough calculations from sporadic catches in trawl gear (Good *et al.* 2005). Concurrently, one million in-DPS hatchery steelhead smolts and another half million out-of-DPS hatchery steelhead smolts are released annually in the Central Valley. The estimated ratio of nonclipped to clipped steelhead has decreased from 0.3 percent to less than 0.1 percent, with a net decrease to one-third of wild female spawners from 1998 to 2000 (Good *et al.* 2005). Recent data from the Chipps Island fish monitoring trawls indicates that in recent years over 90 percent of captured steelhead smolts have been of hatchery origin. In 2010, the data indicated hatchery fish made up 95 percent of the catch.

3. Spatial Structure

Lindley *et al*. (2006) identified 81 historical and independent populations within the Central Valley steelhead DPS. These populations form eight clusters, or diversity groups, based on the similarity of the habitats they occupied for spawning and rearing. About 80 percent of the habitat that was historically available to Central Valley steelhead is now behind impassable dams, and 38 percent of the populations have lost all of their habitats. Although much of the habitat has been blocked by impassable dams, or degraded, small populations of Central Valley steelhead are still found throughout habitat available in the Sacramento River and many of the tributaries, and some of the tributaries to the San Joaquin River (Good *et al.* 2005, NMFS 2011b, Zimmerman *et al.* 2009). Until recently, there was very little documented evidence of steelhead due to the lack of monitoring efforts. The efforts to provide passage of salmonids over impassable dams may increase the spatial diversity of Central Valley Steelhead.

4. Diversity

Diversity, both genetic and behavioral, provides a species the opportunity to track environmental changes. Central Valley steelhead naturally experience the most diverse life history strategies of the listed Central Valley anadromous salmonid species. In addition to being iteroparous, they reside in freshwater for two to four years before emigrating to the ocean. However, as the species' abundance decreases, and spatial structure of the DPS is reduced, it has less flexibility to track changes in the environment. Central Valley steelhead abundance and growth rate continue to decline, largely the result of a significant reduction in the diversity of habitats available to Central Valley steelhead (Lindley *et al*. 2006). Consistent with the life-history strategy of spring-run Chinook salmon, some genetic and behavioral variation is conserved when there are spawning-year cohorts in the marine and freshwater environment. This allows spawning-year cohorts in the marine environment to be exposed to different environmental conditions and stressors than their freshwater cohorts.

Analysis of natural and hatchery steelhead stocks in the Central Valley reveal genetic structure remaining in the DPS (Nielsen *et al.* 2003). There appears to be a great amount of gene flow among upper Sacramento River basin stocks, due to the post-dam, lower basin distribution of steelhead and management of stocks. Recent reductions in natural population sizes have created genetic bottlenecks in several Central Valley steelhead stocks (Good *et al.* 2005; Nielsen *et al.* 2003). The out-of-basin steelhead stocks of the Nimbus and Mokelumne river hatcheries are currently not included in the Central Valley steelhead DPS. However, recent work (Garza and Pearse 2008) has identified introgression of stray domestic rainbow trout genes with steelhead, which may be occurring either during egg taking practices in hatcheries or in-river spawning between domesticated strains of rainbow trout and steelhead. Garza and Pearse (2008) also found that all below-dam steelhead populations in the Central Valley were genetically closely related and that these populations had a high level of genetic similarity to populations of steelhead in the Klamath and Eel river basins. This genetic data suggests that the progeny of out-of basin steelhead reared in the Nimbus and Mokelumne river hatcheries have become widely introgressed with natural steelhead populations throughout the anadromous sections of rivers and streams in the Central Valley, including the tail-water sections downstream of impassable dams. This suggests the potential for the loss of local genetic diversity and population structure over time in these waters. Their work also indicates that in contrast to the similarity of the steelhead genetics downstream of dams in the Central Valley, the ancestral genetic structure is still relatively intact upstream of the impassable barriers. This would indicate that extra precautions should be included in restoration plans before above-dam access is provided to the steelhead from the below-dam populations in order to maintain genetic heritage and structure in *O. mykiss* populations upstream of dams.

c. *Summary of Central Valley Steelhead DPS Viability*

Good *et al*. (2005) indicated that prior population census estimates completed in the 1990s found the Central Valley steelhead spawning population upstream of RBDD had a fairly strong negative population growth rate and small population size. Good *et al.* (2005) also indicated the decline was continuing as evidenced by new information from Chipps Island trawl data. Central Valley steelhead populations generally show a continuing decline, an overall low abundance, and

fluctuating return rates, and the future of Central Valley steelhead is tentative due to limited data concerning their status. Lindley *et al.* (2007) concluded that there is sufficient evidence to suggest that the DPS is at moderate to high risk of extinction.

NMFS (2011b) completed a five-year species status reviews for Central Valley steelhead and recommend that the Central Valley steelhead DPS remain classified as a threatened species. However, the most recent biological information that was evaluated during NMFS' 2011 status review suggests that the extinction risk of Central Valley steelhead has increased since the last status review and that several of the listing factors have contributed to the decline, including recent years of drought and poor ocean conditions. There continue to be ongoing threats to the genetic integrity of natural or wild steelhead from hatchery steelhead programs in the Central Valley, but it is unclear if or how this factor has influenced the overall viability of the DPS.

3. Southern DPS of North American Green Sturgeon

a. Life History

In North America, spawning populations of green sturgeon are currently found in only three river systems: the Sacramento and Klamath rivers in California and the Rogue River in southern Oregon. Green sturgeon are known to range from Baja California to the Bering Sea along the North American continental shelf. Data from commercial trawl fisheries and tagging studies indicate that the green sturgeon occupy waters within the 110 meter contour (Erickson and Hightower 2007). During the late summer and early fall, subadults and nonspawning adult green sturgeon frequently can be found aggregating in estuaries along the Pacific coast (Emmett *et al.* 1991, Moser and Lindley 2007). Particularly large concentrations of green sturgeon from both the northern and southern populations occur in the Columbia River estuary, Willapa Bay, Grays Harbor and Winchester Bay, with smaller aggregations in Humboldt Bay, Tillamook Bay, Nehalem Bay,and San Francisco and San Pablo Bays (Emmett *et al* 1991, Moyle *et al.* 1992, and Beamesderfer *et al.* 2007). Lindley *et al.* (2008) reported that green sturgeon make seasonal migratory movements along the west coast of North America, overwintering north of Vancouver Island and south of Cape Spencer, Alaska. Individual fish from the Southern DPS of green sturgeon have been detected in these seasonal aggregations. Information regarding the migration and habitat use of the Southern DPS of green sturgeon has only recently emerged. Lindley *et al.* (2006) presented preliminary results of large-scale green sturgeon migration studies, and verified past population structure delineations based on genetic work and found frequent large-scale migrations of green sturgeon along the Pacific Coast. This work was further expanded by recent tagging studies of green sturgeon conducted by Erickson and Hightower (2007) and Lindley *et al.* (2008). To date, the data indicates that North American green sturgeon are migrating considerable distances up the Pacific Coast into other estuaries, particularly the Columbia River estuary. This information also agrees with the results of previous green sturgeon tagging studies (CDFG 2002), where CDFG tagged a total of 233 green sturgeon in the San Pablo Bay estuary between 1954 and 2001. A total of 17 tagged fish were recovered: 3 in the Sacramento-San Joaquin Estuary, 2 in the Pacific Ocean off of California, and 12 from commercial fisheries off of the Oregon and Washington coasts. Eight of the 12 recoveries were in the Columbia River estuary (CDFG 2002).

The Southern DPS of green sturgeon includes all green sturgeon populations south of the Eel River, with the only known spawning population being in the Sacramento River and recent confirmed spawning in the Feather River (DWR 2011). Green sturgeon life history can be broken down into four main stages: eggs and larvae, juveniles, sub-adults, and sexually mature adults. Sexually mature adults are those fish that have fully developed gonads and are capable of spawning. Female green sturgeon are typically 13 to 27 years old when sexually mature and have a total body length (TL) ranging between 145 and 205 cm at sexual maturity (Nakamoto *et al. 1995*, Van Eenennaam *et al.* 2006). Male green sturgeon become sexually mature at a younger age and smaller size than females. Typically, male green sturgeon reach sexual maturity between 8 and 18 years of age and have a TL ranging between 120 cm to 185 cm (Nakamoto *et al. 1995*, Van Eenennaam *et al.* 2006). The variation in the size and age of fish upon reaching sexual maturity is a reflection of their growth and nutritional history, genetics, and the environmental conditions they were exposed to during their early growth years. Adult green sturgeon are believed to feed primarily upon benthic invertebrates such as clams, mysid shrimp, grass shrimp, and amphipods (Radtke 1966). Adult sturgeon caught in Washington state waters were found to have fed on Pacific sand lance (*Ammodytes hexapterus*) and callianassid shrimp (Moyle *et al.* 1992). It is unknown what forage species are consumed by adults in the Sacramento River upstream of the Delta.

Adult green sturgeon are gonochoristic (sex genetically fixed), oviparous and iteroparous. They are believed to spawn every 2 to 5 years (Beamesderfer *et al.* 2007). Upon maturation of their gonadal tissue, but prior to ovulation or spermiation, the sexually mature fish enter freshwater and migrate upriver to their spawning grounds. The remainder of the adult's life is generally spent in the ocean or near-shore environment (bays and estuaries) without venturing upriver into freshwater. Younger females may not spawn the first time they undergo oogenesis and subsequently they reabsorb their gametes without spawning. Adult female green sturgeon produce between 60,000 and 140,000 eggs, depending on body size, with a mean egg diameter of 4.3 mm (Moyle *et al.* 1992, Van Eenennaam *et al*. 2001). They have the largest egg size of any sturgeon, and the volume of yolk ensures an ample supply of energy for the developing embryo. The outside of the eggs are adhesive, and are more dense than than those of white sturgeon (Kynard *et al.* 2005, Van Eenennaam *et al.* 2009). Adults begin their upstream spawning migrations into freshwater in late February with spawning occuring between March and July (CDFG 2002. Heublin 2006, Heublin *et al.* 2009, Vogel 2008). Peak spawning is believed to occur between April and June in deep, turbulent, mainstem channels over large cobble and rocky substrates with crevices and interstices. Females broadcast spawn their eggs over this substrate, while the male releases its milt (sperm) into the water column. Fertilization occurs externally in the water column and the fertilized eggs sink into the interstices of the substrate where they develop further (Kynard *et al.* 2005, Heublin *et al.* 2009).

Known historic and current spawning occurs in the Sacramento River (Adams *et al.* 2002, Beamesderfer *et al.* 2004, Adams *et al*. 2007). Currently, Keswick and Shasta dams on the mainstem of the Sacramento River block passage to the upper river. Although no historical accounts exist for identified green sturgeon spawning occuring above the current dam sites, suitable spawning habitat existed and the geographic extent of available suitable spawning habitat has been reduced due to the impassable barriers constructed on the river.

Spawning on the Feather River is suspected to have occurred in the past due to the continued presence of adult green sturgeon in the river below Oroville Dam. This continued presence of adults below the dam suggests that fish are trying to migrate to upstream spawning areas now blocked by the dam, which was constructed in 1968.

Spawning in the San Joaquin River system has not been recorded historically or observed recently, but alterations of the San Joaquin River and its tributaries (Stanislaus, Tuolumne, and Merced rivers) occurred early in the European settlement of the region. During the latter half of the 1800s, impassable barriers were built on these tributaries where the water courses left the foothills and entered the valley floor. Therefore, these low elevation dams have blocked potentially suitable spawning habitats located further upstream for approximately a century. Additional destruction of riparian and stream channel habitat by industrialized gold dredging further disturbed any valley floor habitat that was still available for sturgeon spawning. Additional impacts to the watershed include the increased loads of selenium entering the system through agricultural practices in the western side of the San Joaquin Valley. Green sturgeon have recently been identified by University of California at Davis (UC Davis) researchers as being highly sensitive to selenium levels. Currently, only white sturgeon have been encountered in the San Joaquin River system upstream of the Delta, and adults have been captured by sport anglers as far upstream on the San Joaquin River as Hills Ferry and Mud Slough which are near the confluence of the Merced River with the mainstem San Joaquin River (2007 sturgeon report card, CDFG 2008)

Kelly *et al.* (2007) indicated that green sturgeon enter the San Francisco Estuary during the spring and remain until autumn (Table 6). The authors studied the movement of adults in the San Francisco Estuary and found them to make significant long-distance movements with distinct directionality. The movements were not found to be related to salinity, current, or temperature, and Kelly *et al*. (2007) surmised that they are related to resource availability and foraging behavior. Recent acoustical tagging studies on the Rogue River (Erickson *et al*. 2002) have shown that adult green sturgeon will hold for as much as 6 months in deep (> 5m), low gradient reaches or off channel sloughs or coves of the river during summer months when water

temperatures were between 15°C and 23°C. When ambient temperatures in the river dropped in autumn and early winter (<10°C) and flows increased, fish moved downstream and into the ocean. Erickson *et al.* (2002) surmised that this holding in deep pools was to conserve energy and utilize abundant food resources. Benson *et al.* (2007) found similar behaviour on the Klamath and Trinity River systems with adult sturgeon acoustically tagged during their spawning migrations. Most fish held over the summer in discrete locations characterized by deep, low velocity pools until late fall or early winter when river flows increased with the first storms of the rainy season. Fish then moved rapidly downstream and out of the system. Recent data gathered from acoustically tagged adult green sturgeon revealed comparable behavior by adult fish on the Sacramento River based on the positioning of adult green sturgeon in holding pools on the Sacramento River above the Glenn Colusa Irrigation District (GCID) diversion (river mile [RM] 205). Studies by Heublin *et al.* (2006, 2009) and Vogel (2008) have documented the presence of adults in the Sacramento River during the spring and through the fall into the early winter months. These fish hold in upstream locations prior to their emigration from the system later in the year. Like the Rogue and Klamath river systems, downstream migration appears to

be triggered by increased flows, decreasing water temperatures, and occurs rapidly once initiated. It should also be noted that some adults rapidly leave the system following their suspected spawning activity and enter the ocean only in early summer (Heublin 2006). This behaviour has also been observed on the other spawning rivers (Benson *et al*. 2007*)* but may have been an artifact of the stress of the tagging procedure in that study.

Table 6. The temporal occurrence of (a) adult, (b) larval (c) juvenile and (d) subadult coastal migrant Southern DPS of green sturgeon. Locations emphasize the Central Valley of California. Darker shades indicate months of greatest relative abundance.

(a) Adult-sexually mature (≥145 – 205 cm TL for females and ≥ 120 – 185 cm TL old for males)

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Upper Sac. River[a,b,c.i]												
SF Bay Estuary[d,h,i]												

(b) Larval and juvenile (≤10 months old)

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
RBDD, Sac River[e]												
GCID, Sac River[e]												

1.

(c) Older Juvenile (> 10 months old and ≤3 years old)

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
South Delta*[f]												
Sac-SJ Delta[f]												
Sac-SJ Delta[e]												
Suisun Bay[e]												

(d) Sub-Adult/non-sexually mature (approx. 75 cm to 145 cm for females and 75 to 120 cm for males)

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pacific Coast[c,g]												

Relative Abundance: = High = Medium = Low

* Fish Facility salvage operations

Sources: [a]USFWS (2002); [b]Moyle *et al*. (1992); [c]Adams *et al*. (2002) and NMFS (2005); [d]Kelly *et al*. (2007); [e]CDFG (2002); [f]IEP Relational Database, fall midwater trawl green sturgeon captures from 1969 to 2003; [g]Nakamoto *et al*. (1995); [h]Heublein (2006); [i]CDFG Draft Sturgeon Report Card (2008)

Eggs and Larvae. Currently spawning appears to occur primarily above RBDD, based on the recovery of eggs and larvae at the dam in monitoring studies (Gaines and Martin 2001, Brown 2007). Green sturgeon larvae hatch from fertilized eggs after approximately 169 hours at a water temperature of 59°F (Van Eenennaam *et al.* 2001, Deng *et al.* 2002), which is similar to the sympatric white sturgeon development rate (176 hours). Studies conducted at the University of California, Davis by Van Eenennaam *et al.* (2005) indicated that an optimum range of water

temperature for egg development ranged between 57.2^{o}F and 62.6^{o}F. Temperatures over 73.4^{o}F resulted in 100 percent mortality of fertilized eggs before hatching. Eggs incubated at water temperatures between 63.5^{o}F and 71.6^{o}F resulted in elevated mortalities and an increased occurrence of morphological abnormalities in those eggs that did hatch. At incubation temperatures below 57.2^{o}F, hatching mortality also increased significantly, and morphological abnormalities increased slightly, but not statistically so.

Newly hatched green sturgeon are approximately 12.5 to 14.5 mm in length and have a large ovoid yolk sac that supplies nutritional energy until exogenous feeding occurs. These yolksac larvae are less developed in their morphology than older juveniles and external morphology resembles a "tadpole" with a continuous fin fold on both the dorsal and ventral sides of the caudal trunk. The eyes are well developed with differentiated lenses and pigmentation.

Olfactory and auditory vesicles are present while the mouth and respiratory structures are only shallow clefts on the head. At 10 days of age, the yolk sac has become greatly reduced in size and the larvae initiates exogenous feeding through a functional mouth. The fin folds have become more developed and formation of fin rays begins to occur in all fin tissues. By 45 days of age, the green sturgeon larvae have completed their metamorphosis, which is characterized by the development of dorsal, lateral, and ventral scutes, elongation of the barbels, rostrum, and caudal peduncle, reabsorption of the caudal and ventral fin folds, and the development of fin rays. The juvenile fish resembles the adult form, including the dark olive coloring, with a dark mid-ventral stripe (Deng *et al*. 2002) and are approximately 75 mm TL. At this stage of development, the fish are considered juveniles and are no longer larvae.

Green sturgeon larvae do not exhibit the initial pelagic swim–up behavior characteristic of other Acipenseridae. The are strongly oriented to the bottom and exhibit nocturnal activity patterns. After 6 days, the larvae exhibit nocturnal swim-up activity (Deng *et al*. 2002) and nocturnal downstream migrational movements (Kynard *et al.* 2005). Juvenile fish continue to exhibit nocturnal behavioral beyond the metamorphosis from larvae to juvenile stages. Kynard *et al*.'s (2005) laboratory studies indicated that juvenile fish continued to migrate downstream at night for the first 6 months of life. When ambient water temperatures reached 46.4^{o}F, downstream migrational behavior diminished and holding behavior increased. This data suggests that 9 to 10 month old fish would hold over in their natal rivers during the ensuing winter following hatching, but at a location downstream of their spawning grounds.

Green sturgeon juveniles tested under laboratory conditions had optimal bioenergetic performance (*i.e.* growth, food conversion, swimming ability) between 59°F and 66.2^{o}F under either full or reduced rations (Mayfield and Cech 2004). This temperature range overlaps the egg incubation temperature range for peak hatching success previously discussed. Ambient water temperature conditions in the Rogue and Klamath river systems range from 39°F to approximately 75.2^{o}F. The Sacramento River has similar temperature profiles, and, like the previous two rivers, is a regulated system with several dams controlling flows on its mainstem (Shasta and Keswick dams), and its tributaries (Whiskeytown, Oroville, Folsom, and Nimbus dams).

Larval and juvenile green sturgeon are subject to predation by both native and introduced fish species. Prickly sculpin (*Cottus asper*) have been shown to be an effective predator on the larvae of sympatric white sturgeon (Gadomski and Parsley 2005). This study also indicated that the lowered turbidity found in tailwater streams and rivers due to dams increased the effectiveness of sculpin predation on sturgeon larvae under laboratory conditions.

Larval and juvenile sturgeons have been caught in traps at two sites in the upper Sacramento River: below the RBDD (rm 243) and from the GCID pumping plant (rm 205) (CDFG 2002). Larvae captured at the RBDD site are typically only a few days to a few weeks old, with lengths ranging from 24 to 31 mm. This body length is equivalent to 15 to 28 days post hatch as determined by Deng *et al.* (2002). Recoveries of larvae at the RBDD RSTs occur between late April/early May and late August with the peak of recoveries occurring in June (1995-1999 and 2003–2008 data). The mean yearly total length of post-larval green sturgeon captured in the GCID rotary screw trap, approximately 30 miles downstream of RBDD, ranged from 33 mm to 44 mm between 1997 and 2005 (CDFG 2002) indicating they are approximately 3-4 weeks old (Van Eenennaam *et al.* 2001, Deng *et al.* 2002). Taken together, the average length of larvae captured at the two monitoring sites indicate that fish were hatched upriver of the monitoring site and drifted downstream over the course of 2 to 4 weeks of growth. According to the CDFG document commenting on the NMFS proposal to list the southern DPS (CDFG 2002), some green sturgeon rear to larger sizes above RBDD, or move back to this location after spending time downstream. Two sturgeon between 180 and 400 mm tail length were captured in the RST during 1999 and green sturgeon within this size range have been impinged on diffuser screens associated with a fish ladder at RBDD (CDFG 2002).

Juvenile green sturgeon have been salvaged at the Harvey O. Banks Pumping Plant and the John E. Skinner Fish Collection Facility (Fish Facilities) in the South Delta, and captured in trawling studies by CDFG during all months of the year (CDFG 2002). The majority of these fish were between 200 and 500 mm, indicating they were from 2 to 3 years of age based on Klamath River age distribution work by Nakamoto *et al.* (1995). The lack of a significant proportion of juveniles smaller than approximately 200 mm in Delta captures indicates that juveniles of the Southern DPS of green sturgeon likely hold in the mainstem Sacramento River, as suggested by Kynard *et al.* (2005).

Population abundance information concerning the Southern DPS green sturgeon is described in the NMFS status reviews (Adams *et al*. 2002, NMFS 2005). Limited population abundance information comes from incidental captures of North American green sturgeon from the white sturgeon monitoring program by the CDFG sturgeon tagging program (CDFG 2002). By comparing ratios of white sturgeon to green sturgeon captures, CDFG provides estimates of adult and sub-adult North American green sturgeon abundance. Estimated abundance between 1954 and 2001 ranged from 175 fish to more than 8,000 per year and averaged 1,509 fish per year. Unfortunately, there are many biases and errors associated with these data, and CDFG does not consider these estimates reliable. Fish monitoring efforts at RBDD and GCID on the upper Sacramento River have captured between zero and 2,068 juvenile North American green sturgeon per year (Adams *et al*. 2002). The only existing information regarding changes in the abundance of the Southern DPS of green sturgeon includes changes in abundance at the John E. Skinner Fish Facility between 1968 and 2001. The average number of North American green

sturgeon taken per year at the State Facility prior to 1986 was 732; from 1986 on, the average per year was 47 (70 FR 17386, April 6, 2005). For the Harvey O. Banks Pumping Plant, the average number prior to 1986 was 889; from 1986 to 2001 the average was 32 (70 FR 17386, April 6, 2005). In light of the increased water exports, particularly during the previous 10 years, it is clear that the abundance of the Southern DPS green sturgeon is dropping. Additional analysis of North American green and white sturgeon taken at the Fish Facilities indicates that take of both North American green and white sturgeon per acre-foot of water exported has decreased substantially since the 1960s (70 FR 17386, April 6, 2005). Catches of sub-adult and adult North American green sturgeon by the IEP between 1996 and 2004 ranged from 1 to 212 green sturgeon per year (212 occurred in 2001), however, the portion of the Southern DPS of North American green sturgeon is unknown as these captures were primarily located in San Pablo Bay which is known to consist of a mixture of Northern and Southern DPS North American green sturgeon. Recent spawning population estimates using sibling based genetics by Israel (2006) indicates spawning populations of 32 spawners in 2002, 64 in 2003, 44 in 2004, 92 in 2005, and 124 in 2006 above RBDD (with an average of 71).

As described previously, the majority of spawning by green sturgeon in the Sacramento River system appears to take place above the location of RBDD. This is based on the length and estimated age of larvae captured at RBDD (approximately 2-3 weeks of age) and GCID (downstream, approximately 3-4 weeks of age) indicating that hatching occurred above the sampling location. Note that there are many assumptions with this interpretation (*i.e.*, equal sampling efficiency and distribution of larvae across channels) and this information should be considered cautiously.

Available information on green sturgeon indicates that, as with winter-run, the mainstem Sacramento River may be the last viable spawning habitat (Good *et al.* 2005) for the Southern DPS of green sturgeon. Lindley *et al.* (2007) pointed out that an ESU represented by a single population at moderate risk is at a high risk of extinction over the long term. Although the extinction risk of the Southern DPS of green sturgeon has not been assessed, NMFS believes that the extinction risk has increased because there is only one known population.

b. Current Viability of the Green Sturgeon Southern DPS

Viability parameters have not been established for North American green sturgeon. NMFS assumes that the general categories for assessing salmonid population viability will also be useful in assessing the viability of the green sturgeon Southern DPS. The following summary has been compiled from the best available data and information on North American green sturgeon to provide a general synopsis of the viability parameters for this DPS.

1. Population Size

The current population status of green sturgeon Southern DPS is unknown (Beamesderfer *et al.* 2007, Adams *et al.* 2007). It is believed, based on captures of green sturgeon during surveys for the sympatric white sturgeon in the San Francisco Bay estuary that the population is relatively small (USFWS 1995), ranging from several hundred to a few thousand adults. The sole population of green sturgeon Southern DPS spawns within the Sacramento River basin and is

believed to spawn primarily in the mainstem of the Sacramento River between Keswick Dam (RM 302) and Hamilton City (RM 200). Israel (2006) indicated that between 2002 and 2005, a range of 18 to 42 adult green sturgeon were estimated to have bred upstream of RBDD, based on genetic analysis of captured larvae in the Sacramento River.

2. *Population Growth Rate*

Recruitment data for the green sturgeon Southern DPS are essentially nonexistent. Incidental catches of larval green sturgeon in the mainstem Sacramento River and juvenile fish at the CVP and SWP pumping facilities in the South Delta suggest that green sturgeon are successful at spawning, but that annual year class strength may be highly variable (Beamesderfer *et al*. 2007, Adams *et al*. 2007). Recent declines in the number of larvae captured in the RSTs near the RBDD may indicate a reduction in spawning success in the past several years, with resulting depressions in the year class strengths for those years. Green sturgeon are iteroparous and long-lived, so that spawning failure in any 1 year may be rectified in a succeeding spawning year. This would give the potential for a succesion of multiple, strong year classes, interspersed with weaker year classes.

3. Spatial Structure

Green sturgeon are found throughout the Sacramento – San Joaquin Delta and the San Francisco Bay estuary. Coastal migrants, which include both adult and subadult life stages, are found from approximately Central California to southeastern Alaska with aggregations of green sturgeon Southern DPS occurring in several estuaries along the West Coast from California northwards to Washington during the late summer and early fall. An aggregation of green sturgeon has also recently been identified off of the northwestern tip of Vancouver Island. Although both northern and southern populations mix in the ocean and coastal estuaries, it is believed that each DPS maintains a high fidelity to their natal watershed and little straying occurs between the two DPSs.

Until 2011, green sturgeon Southern DPS spawning had only been confirmed in one principle spawning area in the Sacramento River. In 2011 confirmed green sturgeon spawning occurred in the Feather River (DWR 2011). In 2011 in the Yuba River there were documented observations of green sturgeon exhibiting spawning behavior. Remaining spawning sites are, for the most part, outside of its historical spawning area. The recent habitat evaluations conducted in the upper Sacramento River for salmonid recovery suggest that significant spawning habitat was made inaccessible or altered by dams (Lindley *et al.* 2004, 2006; Adams *et al.* 2007). The historical spawning habitat may have extended up into the three major branches of the upper Sacramento upstream of the current location of Shasta Dam; the Little Sacramento River, the Pitt River, and the McCloud River. Additional spawning habitat is believed to have once existed upstream of the current location of Oroville Dam on the Feather River. Other watersheds, including the San Joaquin River basin may also have supported opportunistic green sturgeon spawning in the past (Adams *et al.* 2007, Beamesderfer *et al.* 2007)

The reduction of the green sturgeon Southern DPS spawning habitat into one reach on the Sacramento River between Keswick Dam and Hamilton City increases the vulnerability of this spawning population to catastrophic events. The necessary water temperatures required for

normal egg development in the spawning reach is reliant on the cold-water releases in place for winter-run Chinook salmon. Extended drought conditions could imperil the spawning success for green sturgeon, particularly those that are restricted to the river reaches downstream of RBDD.

4. Diversity

Diversity, both genetic and behavioral, provides a species the opportunity to track and adapt to environmental changes. As a species' abundance decreases, and spatial structure of the ESU/DPS is reduced, a species has less flexibility to track changes in the environment. The reduction of the green sturgeon Southern DPS to one extant population reduces the potential variation of life history expression and genetic diversity within this population. The Southern DPS of green sturgeon faces greater risks to long term persistence of the population due to the lack of this flexibilty in their current condition.

c. Summary of Green Sturgeon Southern DPS Viability

The green sturgeon Southern DPS is at substantial risk of future population declines (Adams *et al*. 2007). The potential threats faced by the green sturgeon include enhanced vulnerability due to the reduction of spawning habitat into one concentrated area on the Sacramento River, lack of good empirical population data, vulnerability of long-term cold water supply for egg incubation and larval survival, loss of juvenile green sturgeon due to entrainment at the project fish collection facilities in the South Delta and agricultural diversions within the Sacramento River and Delta systems, alterations of food resources due to changes in the Sacramento River and Delta habitats, and exposure to various sources of contaminants throughout the basin to juvenile, sub-adult, and adult life stages. Available information on green sturgeon indicates that the mainstem Sacramento River may be the last viable spawning habitat (Good *et al.* 2005) for the green sturgeon Southern DPS.

Ongoing improvements at RBDD are likely to improve upstream migration of green sturgeon and contribute to greater spawning success and possibly population abundance, however no restoration strategies exist for expanding the current range of the species. Lindley *et al.* (2007) pointed out that a salmon or steelhead ESU or DPS represented by a single population at moderate risk is at a high risk of extinction over the long term; this is also true for green sturgeon (Anderson *et al*. 2009). For these reasons, the extinction risk of the green sturgeon Southern DPS is high.

C. Critical Habitat Condition and Function for Species' Conservation

1. <u>Critical Habitat for CV Spring-run Chinook Salmon and CCV Steelhead</u>

Critical habitat was designated for CV spring-run Chinook salmon and CCV steelhead on September 2, 2005 (70 FR 52488). Critical habitat for CV spring-run Chinook salmon includes stream reaches such as those of the Feather and Yuba rivers, Big Chico, Butte, Deer, Mill, Battle, Antelope, and Clear creeks, the Sacramento River, as well as portions of the northern Delta. Critical habitat for CCV steelhead includes stream reaches such as those of the Sacramento,

Feather, and Yuba rivers, and Deer, Mill, Battle, and Antelope creeks in the Sacramento River basin; the San Joaquin River, including its tributaries, and the waterways of the Delta. Critical habitat includes the stream channels in the designated stream reaches and the lateral extent as defined by the ordinary high-water line. In areas where the ordinary high-water line has not been defined, the lateral extent will be defined by the bankfull elevation (defined as the level at which water begins to leave the channel and move into the floodplain; it is reached at a discharge that generally has a recurrence interval of 1 to 2 years on the annual flood series) (Bain and Stevenson 1999; 70 FR 52488). Critical habitat for CV spring-run Chinook salmon and steelhead is defined as 50 C.F.R. 226.211(c), wherein primary constituent elements (PCE's) are identified for the species. Following are the relevant inland habitat types used as PCEs for CV spring-run Chinook salmon and CCV steelhead.

2. PCEs for CV Spring-run Chinook salmon and CCV Steelhead

a. Spawning Habitat

Freshwater spawning sites are those with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development. Most spawning habitat in the Central Valley for Chinook salmon and steelhead is located in areas directly downstream of dams containing suitable environmental conditions for spawning and incubation. Spawning habitat for Sacramento River winter-run Chinook salmon is restricted to the Sacramento River primarily between RBDD and Keswick Dam. CV spring-run Chinook salmon also spawn on the mainstem Sacramento River between RBDD and Keswick Dam and in tributaries such as Mill, Deer, and Butte creeks (however, little spawning activity has been recorded in recent years on the Sacramento River mainstem for spring-run Chinook salmon). Spawning habitat for CCV steelhead is similar in nature to the requirements of Chinook salmon, primarily occurring in reaches directly below dams (*i.e.*, above RBDD on the Sacramento River) on perennial watersheds throughout the Central Valley. These reaches can be subjected to variations in flows and temperatures, particularly over the summer months, which can have adverse effects upon salmonids spawning below them. Even in degraded reaches, spawning habitat has a high conservation value as its function directly affects the spawning success and reproductive potential of listed salmonids.

b. Freshwater Rearing Habitat

Freshwater rearing sites are those with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large woody material, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. Both spawning areas and migratory corridors comprise rearing habitat for juveniles, which feed and grow before and during their outmigration. Non-natal, intermittent tributaries also may be used for juvenile rearing. Rearing habitat condition is strongly affected by habitat complexity, food supply, and the presence of predators of juvenile salmonids. Some complex, productive habitats with floodplains remain in the system (*e.g.*, the lower Cosumnes River, Sacramento River reaches with setback levees [*i.e.*, primarily located upstream of the City of Colusa]) and flood bypasses (*i.e.*, Yolo and Sutter

bypasses). However, the channelized, leveed, and riprapped river reaches and sloughs that are common in the Sacramento-San Joaquin system typically have low habitat complexity, low abundance of food organisms, and offer little protection from either fish or avian predators. Freshwater rearing habitat also has a high conservation value even if the current conditions are significantly degraded from their natural state. Juvenile life stages of salmonids are dependent on the function of this habitat for successful survival and recruitment.

c. Freshwater Migration Corridors

Ideal freshwater migration corridors are free of migratory obstructions, with water quantity and quality conditions that enhance migratory movements. They contain natural cover such as riparian canopy structure, submerged and overhanging large woody objects, aquatic vegetation, large rocks, and boulders, side channels, and undercut banks which augment juvenile and adult mobility, survival, and food supply. Migratory corridors are downstream of the spawning areas and include the lower main-stems of the Sacramento and San Joaquin rivers and the Delta. These corridors allow the upstream passage of adults, and the downstream emigration of outmigrant juveniles. Migratory habitat condition is strongly affected by the presence of barriers, which can include dams (*i.e.*, hydropower, flood control, and irrigation flashboard dams), unscreened or poorly screened diversions, degraded water quality, or behavioral impediments to migration. For successful survival and recruitment of salmonids, freshwater migration corridors must function sufficiently to provide adequate passage. For this reason, freshwater migration corridors are considered to have a high conservation value even if the migration corridors are significantly degraded compared to their natural state.

3. Critical Habitat for the Southern DPS of North American Green Sturgeon

Critical habitat was designated for the Southern DPS of North American green sturgeon on October 9, 2009 (74 FR 52300). Critical habitat for Southern DPS green sturgeon includes the stream channels and waterways in the Delta to the ordinary high water line except for certain excluded areas. Critical habitat also includes the main stem Sacramento River upstream from the I Street Bridge to Keswick Dam, and the Feather River upstream to the fish barrier dam adjacent to the Feather River Fish Hatchery. Coastal Marine areas include waters out to a depth of 60 meters from Monterey Bay, California, to the Juan De Fuca Straits in Washington. Coastal estuaries designated as critical habitat include San Francisco Bay, Suisun Bay, San Pablo Bay, and the lower Columbia River estuary. Certain coastal bays and estuaries in California (Humboldt Bay), Oregon (Coos Bay, Winchester Bay, Yaquina Bay, and Nehalem Bay), and Washington (Willapa Bay and Grays Harbor) are also included as critical habitat for Southern DPS green sturgeon.

a. Critical Habitat and Primary Constituent Elements

The critical habitat for the Southern DPS of green sturgeon includes principal biological or physical constituent elements within the defined area that are essential to the conservation of the species. PCEs for green sturgeon have been designated for freshwater riverine systems, estuarine habitats, and nearshore coastal areas.

Freshwater Riverine Systems

Water Flow - An adequate flow regime (*i.e.*, magnitude, frequency, duration, seasonality, and groundwater recharge) is necessary for normal behavior, growth, and survival of all life stages in the upper Sacramento River. Such a flow regime should include sufficient water flow rates in spawning and rearing reaches to maintain water temperatures within the optimal range for egg, larval, and juvenile survival and development (11 - 19°C) (Cech *et al.* 2000, Mayfield and Cech 2004, Van Eenennaam *et al.* 2005, Allen *et al.* 2006). Sufficient flow is also needed to reduce the incidence of fungal infestations of the eggs, and to flush silt and debris from cobble, gravel, and other substrate surfaces to prevent crevices from being filled in and to maintain surfaces for feeding. Successful migration of adult green sturgeon to and from spawning grounds is also dependent on sufficient water flow. Spawning success is associated with water flow and water temperature compared to other variables. Spawning in the Sacramento River is believed to be triggered by increases in water flow to about 14,000 cfs (average daily water flow during spawning months: 6,900 – 10,800 cfs; Brown 2007). Post-spawning downstream migrations are triggered by increased flows, ranging from 6,150 – 14,725 cfs in the late summer (Vogel 2008) and greater than 3,550 cfs in the winter (Erickson *et al.* 2002; Benson *et al.* 2007). The current suitability of these flow requirements is almost entirely dependent on releases from Shasta Dam. High winter flows associated with the natural hydrograph do not occur within the section of the river utilized by green sturgeon with the frequency and duration that was seen in pre-dam conditions. Continued operations of Shasta Dam and the CVP are likely to further attenuate these high flow events. Rearrangement of the river channel and the formation of new pools and holes are unlikely to occur given the management of the river's discharge to prevent flooding downstream of Shasta Dam.

Food Resources - Abundant food items for larval, juvenile, subadult, and adult life stages should be present in sufficient amounts to sustain growth (larvae, juveniles, and subadults) or support basic metabolism (adults). Although we lack specific data on food resources for green sturgeon within freshwater riverine systems, nutritional studies on white sturgeon suggest that juvenile green sturgeon most likely feed on macro benthic invertebrates, which can include plecoptera (stoneflies), ephemeroptera (mayflies), trichoptera (caddis flies), chironomid (dipteran fly larvae), oligochaetes (tubifex worms) or decapods (crayfish). These food resources are important for juvenile foraging, growth, and development during their downstream migration to the Delta and bays. In addition, subadult and adult green sturgeon may forage during their downstream post-spawning migration or on non-spawning migrations within freshwater rivers. Subadult and adult green sturgeon in freshwater rivers most likely feed on benthic invertebrates similar to those fed on in bays and estuaries, including freshwater shrimp and amphipods. Many of these different invertebrate groups are endemic to and readily available in the Sacramento River from Keswick Dam downstream to the Delta. Heavy hatches of mayflies, caddis flies, and chironomids occur in the upper Sacramento River, indicating that these groups of invertebrates are present in the river system. NMFS anticipates that the aquatic life stages of these insects (nymphs, larvae) would provide adequate nutritional resources for green sturgeon rearing in the river.

Substrate Type or Size - Suitable critical *habitat* in the freshwater riverine system should include substrate suitable for egg deposition and development (*e.g.*, bedrock sills and shelves,

cobble and gravel, or hard clean sand, with interstices or irregular surfaces to "collect" eggs and provide protection from predators, and free of excessive silt and debris that could smother eggs during incubation), larval development (*e.g*., substrates with interstices or voids providing refuge from predators and from high flow conditions), and subadults and adult life stages (*e.g*., substrates for holding and spawning). For example, spawning is believed to occur over substrates ranging from clean sand to bedrock, with preferences for cobble (Emmett *et al.*, 1991, Moyle *et al.* 1995). Eggs likely adhere to substrates, or settle into crevices between substrates (Van Eenennaam *et al.* 2001, and Deng *et al.* 2002). Both embryos and larvae exhibited a strong affinity for benthic structure during laboratory studies (Van Eenennaam *et al.* 2001, Deng *et al.* 2002, Kynard *et al.* 2005), and may seek refuge within crevices, but use flat-surfaced substrates for foraging (Nguyen and Crocker 2007). Recent stream surveys by USFWS and Reclamation biologists have identified approximately 54 suitable holes and pools between Keswick Dam and approximately GCID that would support spawning or holding activities for green sturgeon based on the identified physical criteria. Many of these locations are at the confluence of tributaries with the mainstem Sacramento River or at bend pools. Observations of channel type and substrate compositions during these surveys indicate that appropriate substrate is available in the Sacramento River between GCID and Keswick Dam. Ongoing surveys are anticipated to further identify river reaches with suitable substrate characteristics in the upper river and their utilization by green sturgeon.

Water Quality - Adequate water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages are required for the properly functioning of the freshwater habitat. Suitable water temperatures would include: stable water temperatures within spawning reaches (wide fluctuations could increase egg mortality or deformities in developing embryos); temperatures within 11 - 17°C (optimal range = 14 - 16°C) in spawning reaches for egg incubation (March-August) (Van Eenennaam *et al.* 2005); temperatures below 20°C for larval development (Werner *et al.* 2007); and temperatures below 24°C for juveniles (Mayfield and Cech 2004, Allen *et al.* 2006). Due to the temperature management of the releases from Keswick Dam for winter-run in the upper Sacramento River, water temperatures in the river reaches utilized currently by green sturgeon appear to be suitable for proper egg development and larval and juvenile rearing. Suitable salinity levels range from fresh water (< 3 ppt) for larvae and early juveniles [about 100 days post hatch (dph)] to brackish water (10 ppt) for juveniles prior to their transition to salt water. Prolonged exposure to higher salinities may result in decreased growth and activity levels and even mortality (Allen and Cech 2007). Salinity levels are suitable for green sturgeon in the Sacramento River and freshwater portions of the Delta for early life history stages. Adequate levels of DO are needed to support oxygen consumption by early life stages (ranging from 61.78 to 76.06 mg O_2 hr^{-1} kg^{-1} for juveniles, Allen and Cech 2007). Current mainstem DO levels are suitable to support the growth and migration of green sturgeon in the Sacramento River. Suitable water quality would also include water free of contaminants (*i.e*., pesticides, organochlorines, elevated levels of heavy metals, *etc*.) that may disrupt normal development of embryonic, larval, and juvenile stages of green sturgeon. Water free of such contaminants would protect green sturgeon from adverse impacts on growth, reproductive development, and reproductive success (*e.g*., reduced egg size and abnormal gonadal development, abnormal embryo development during early cleavage stages and organogenesis) likely to result from exposure to contaminants (Fairey *et al.* 1997, Foster *et al.* 2001, Kruse and Scarnecchia 2002, Feist *et al.* 2005, and

Greenfield *et al.* 2005). Legacy contaminants such as mercury still persist in the watershed and pulses of pesticides have been identified in winter storm discharges throughout the Sacramento River basin.

Migratory Corridor - Safe and unobstructed migratory pathways are necessary for passage within riverine habitats and between riverine and estuarine habitats (*e.g.*, an unobstructed river or dammed river that still allows for passage). Safe and unobstructed migratory pathways are necessary for adult green sturgeon to migrate to and from spawning habitats, and for larval and juvenile green sturgeon to migrate downstream from spawning/rearing habitats within freshwater rivers to rearing habitats within the estuaries. Unobstructed passage throughout the Sacramento River up to Keswick Dam (RM 302) is important, because optimal spawning habitats for green sturgeon are believed to be located upstream of the RBDD (RM 242). Recent improvements at RBDD have replaced to gate operation and a new fish screen will be operational in 2012. These improvements will abate the upstream fish passage threat historically faced by sturgeon.

Depth - Deep pools of ≥ 5 m depth are critical for adult green sturgeon spawning and for summer holding within the Sacramento River. Summer aggregations of green sturgeon are observed in these pools in the upper Sacramento River above Glenn Colusa Irrigation District (GCID). The significance and purpose of these aggregations are unknown at the present time, although it is likely that they are the result of an intrinsic behavioral characteristic of green sturgeon. Adult green sturgeon in the Klamath and Rogue rivers also occupy deep holding pools for extended periods of time, presumably for feeding, energy conservation, and/or refuge from high water temperatures (Erickson *et al.* 2002, Benson *et al.* 2007). As described above approximately 54 pools with adequate depth have been identified in the Sacramento River above the GCID location.

Sediment Quality - Sediment should be of the appropriate quality and characteristics necessary for normal behavior, growth, and viability of all life stages. This includes sediments free of contaminants [*e.g.*, elevated levels of heavy metals (*e.g.*, mercury, copper, zinc, cadmium, and chromium), PAHs, and organochlorine pesticides] that can result in negative effects on any life stages of green sturgeon. Based on studies of white sturgeon, bioaccumulation of contaminants from feeding on benthic species may negatively affect the growth, reproductive development, and reproductive success of green sturgeon. The Sacramento River and its tributaries have a long history of contaminant exposure from abandoned mines, separation of gold ore from mine tailings using mercury, and agricultural practices with pesticides and fertilizers which result in deposition of these materials in the sediment horizons in the river channel. Disturbance of these sediment horizons by natural or anthropogenic actions can liberate the sequestered contaminants into the river. This is a continuing concern throughout the watershed.

<u>For Estuarine Habitats</u>

Food Resources - Abundant food items within estuarine habitats and substrates for juvenile, subadult, and adult life stages are required for the proper functioning of this PCE for green sturgeon. Prey species for juvenile, subadult, and adult green sturgeon within bays and estuaries primarily consist of benthic invertebrates and fish, including crangonid shrimp, callianassid shrimp, burrowing thalassinidean shrimp, amphipods, isopods, clams, annelid worms, crabs,

sand lances, and anchovies. These prey species are critical for the rearing, foraging, growth, and development of juvenile, subadult, and adult green sturgeon within the bays and estuaries. Currently, the estuary provides these food resources, although annual fluctuations in the population levels of these food resources may diminish the contribution of one group to the diet of green sturgeon relative to another food source. The recent spread of the Asian overbite clam has shifted the diet profile of white sturgeon to this invasive species. The overbite clam now makes up a substantial proportion of the white sturgeon's diet in the estuary. NMFS assumes that green sturgeon have also altered their diet to include this new food source based on its increased prevalence in the benthic invertebrate community.

Water Flow - Within bays and estuaries adjacent to the Sacramento River (*i.e.*, the Sacramento-San Joaquin Delta and the Suisun, San Pablo, and San Francisco bays), sufficient flow into the bay and estuary to allow adults to successfully orient to the incoming flow and migrate upstream to spawning grounds is required. Sufficient flows are needed to attract adult green sturgeon to the Sacramento River from the bay and to initiate the upstream spawning migration into the upper river. Currently, flows provide the necessary attraction to green sturgeon to enter the Sacramento River. Nevertheless, these flows are substantially less than what would have been available historically to stimulate the spawning migration.

Water Quality - Adequate water quality, including temperature, salinity, oxygen content, and other chemical characteristics, is necessary for normal behavior, growth and viability of all life stages. Suitable water temperatures for juvenile green sturgeon should be below 24°C (75°F). At temperatures above 24°C, juvenile green sturgeon exhibit decreased swimming performance (Mayfield and Cech 2004) and increased cellular stress (Allen *et al.* 2006). Suitable salinities in the estuary range from brackish water (10 ppt) to salt water (33 ppt). Juveniles transitioning from brackish to salt water can tolerate prolonged exposure to salt water salinities, but may exhibit decreased growth and activity levels (Allen and Cech 2007), whereas subadults and adults tolerate a wide range of salinities (Kelly *et al.* 2007). Subadult and adult green sturgeon occupy a wide range of DO levels, but may need a minimum DO level of at least 6.54 mg O_2/l (Kelly *et al.* 2007, Moser and Lindley 2007). As described above, adequate levels of DO are also required to support oxygen consumption by juveniles (ranging from 61.78 to 76.06 mg O_2 hr^{-1} kg^{-1}, Allen and Cech 2007). Suitable water quality also includes water free of contaminants (*e.g.*, pesticides, organochlorines, elevated levels of heavy metals) that may disrupt the normal development of juvenile life stages, or the growth, survival, or reproduction of subadult or adult stages. In general, water quality in the Delta and estuary meets these criteria, but local areas of the Delta and downstream bays have been identified as having deficiencies. Water quality in the areas such as the Stockton turning basin and Port of Stockton routinely have depletions of DO and episodes of first flush contaminants from the surrounding industrial and urban watershed. Discharges of agricultural drain water have also been implicated in local elevations of pesticides and other related agricultural compounds within the Delta and the tributaries and sloughs feeding into the Delta. Discharges from petroleum refineries in Suisun and San Pablo Bay have been identified as sources of selenium to the local aquatic ecosystem (Linville *et al.* 2002).

Migratory Corridor - Safe and unobstructed migratory pathways are necessary for the safe and timely passage of adult, sub-adult, and juvenile fish within the region's different estuarine habitats and between the upstream riverine habitat and the marine habitats. Within the

waterways comprising the Delta, and bays downstream of the Sacramento River, safe and unobstructed passage is needed for juvenile green sturgeon during the rearing phase of their life cycle. Rearing fish need the ability to freely migrate from the river through the estuarine waterways of the delta and bays and eventually out into the ocean. Passage within the bays and the Delta is also critical for adults and subadults for feeding and summer holding, as well as to access the Sacramento River for their upstream spawning migrations and to make their outmigration back into the ocean. Within bays and estuaries outside of the Delta and the areas comprised by Suisun, San Pablo, and San Francisco bays, safe and unobstructed passage is necessary for adult and subadult green sturgeon to access feeding areas, holding areas, and thermal refugia, and to ensure passage back out into the ocean. Currently, safe and unobstructed passage has been diminished by human actions in the Delta and bays. The CVP and SWP water projects alter flow patterns in the Delta due to export pumping and create entrainment issues in the Delta at the pumping and Fish Facilities. Power generation facilities in Suisun Bay create risks of entrainment and thermal barriers through their operations of cooling water diversions and discharges. Installation of seasonal barriers in the South Delta and operations of the radial gates in the DCC facilities alter migration corridors available to green sturgeon. Actions such as the hydraulic dredging of ship channels and operations of large ocean going vessels create additional sources of risk to green sturgeon within the estuary. Hydraulic dredging can result in the entrainment of fish into the dredger's hydraulic cutterhead intake. Commercial shipping traffic can result in the loss of fish, particularly adult fish, through ship and propeller strikes.

Water Depth - A diversity of depths is necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages. Subadult and adult green sturgeon occupy deep (≥ 5 m) holding pools within bays and estuaries as well as within freshwater rivers. These deep holding pools may be important for feeding and energy conservation, or may serve as thermal refugia for subadult and adult green sturgeon (Benson *et al*. 2007). Tagged adults and subadults within the San Francisco Bay estuary primarily occupied waters over shallow depths of less than 10 m, either swimming near the surface or foraging along the bottom (Kelly *et al*. 2007). In a study of juvenile green sturgeon in the Delta, relatively large numbers of juveniles were captured primarily in shallow waters from 3 – 8 feet deep, indicating juveniles may require shallower depths for rearing and foraging (Radtke 1966). Thus, a diversity of depths is important to support different life stages and habitat uses for green sturgeon within estuarine areas.

Currently, there is a diversity of water depths found throughout the San Francisco Bay estuary and Delta waterways. Most of the deeper waters, however, are comprised of artificially maintained shipping channels, which do not migrate or fluctuate in response to the hydrology in the estuary in a natural manner. The channels are simplified trapezoidal shapes with little topographical variation along the channel alignment. Shallow waters occur throughout the Delta and San Francisco Bay. Extensive "flats" occur in the lower reaches of the Sacramento and San Joaquin River systems as they leave the Delta region and are even more extensive in Suisun and San Pablo bays. In most of the region, variations in water depth in these shallow water areas occur due to natural processes, with only localized navigation channels being dredged (*e.g.*, the Napa River and Petaluma River channels in San Pablo Bay).

Sediment Quality - Sediment quality (*i.e.*, chemical characteristics) is necessary for normal behavior, growth, and viability of all life stages. This includes sediments free of contaminants

(*e.g*., elevated levels of selenium, PAHs, and organochlorine pesticides) that can cause negative effects on all life stages of green sturgeon (see description of *Sediment quality* above).

b. Green Sturgeon Critical Habitat Summary

The current condition of critical habitat for the Southern DPS of green sturgeon is degraded over its historical conditions. It does not provide the full extent of conservation values necessary for the survival and recovery of the species, particularly in the upstream riverine habitat. In particular, passage and water flow PCEs have been impacted by human actions, substantially altering the historical river characteristics in which the Southern DPS of green sturgeon evolved. The habitat values proposed for green sturgeon critical habitat have suffered similar types of degradation as already described for winter-run critical habitat. In addition, the alterations to the Sacramento-San Joaquin River Delta, as part of critical habitat, may have a particularly strong impact on the survival and recruitment of juvenile green sturgeon due to the protracted rearing time in the delta and estuary. Loss of individuals during this phase of the life history of green sturgeon represents losses to multiple year classes rearing in the Delta, which can ultimately impact the potential population structure for decades to come.

D. Factors Impacting Listed Species

1. Habitat Blockage

Hydropower, flood control, and water supply dams of the Central Valley Project (CVP and SWP), and other municipal and private entities have permanently blocked or hindered salmonid access to historical spawning and rearing grounds. Clark (1929) estimated that originally there were 6,000 linear miles of salmon habitat in the CV system and that 80 percent of this habitat had been lost by 1928. Yoshiyama *et al.* (1996) calculated that roughly 2,000 linear miles of salmon habitat was actually available before dam construction and mining, and concluded that 82 percent is not accessible today.

As a result of migrational barriers, winter-run Chinook salmon, spring-run Chinook salmon, and steelhead populations have been confined to lower elevation mainstems that historically only were used for migration. Population abundances have declined in these streams due to decreased quantity and quality of spawning and rearing habitat. Higher temperatures at these lower elevations during late-summer and fall are also a major stressor to adult and juvenile salmonids. Similarly, of the 18 independent populations of CV spring-run Chinook salmon that occurred historically, only three independent populations remain in Deer, Mill, and Butte creeks. Dependent populations of CV spring-run Chinook salmon continue to occur in Big Chico, Antelope, Clear, Thomes, Beegum, and Stony creeks, but rely on the three extant independent populations for their continued survival. CCV steelhead historically had at least 81 independent populations based on Lindley *et al.*'s (2006) analysis of potential habitat in the CV. However, due to dam construction, access to 38 percent of all spawning habitat has been lost as well as access to 80 percent of the historically available habitat. Green sturgeon populations would be similarly affected by these barriers and alterations to the natural hydrology. In particular, RBDD blocks access to a significant portion of the adult spawning run under current operational procedures.

The Suisun Marsh Salinity Control Gates (SMSCG), located on Montezuma Slough, were installed in 1988, and are operated with gates and flashboards to decrease the salinity levels of managed wetlands in Suisun Marsh. The SMSCG have delayed or blocked passage of adult Chinook salmon migrating upstream (Edwards *et al.* 1996, Tillman *et al.* 1996,). The effects of the SMSCG on sturgeon are unknown at this time.

2. Water Development

The diversion and storage of natural flows by dams and diversion structures on CV waterways have depleted stream flows and altered the natural cycles by which juvenile and adult salmonids base their migrations. As much as 60 percent of the natural historical inflow to Central Valley watersheds and the Delta have been diverted for human uses. Depleted flows have contributed to higher temperatures, lower DO levels, and decreased recruitment of gravel and large woody material (LWM). More uniform flows year round have resulted in diminished natural channel formation, altered food web processes, and slower regeneration of riparian vegetation. These stable flow patterns have reduced bed load movement (Mount 1995, Ayers and Associates 2001), caused spawning gravels to become embedded, and decreased channel widths due to channel incision, all of which has decreased the available spawning and rearing habitat below dams. The storage of unimpeded runoff in these large reservoirs also has altered the normal hydrograph for the Sacramento and San Joaquin river watersheds. Rather than seeing peak flows in these river systems following winter rain events (Sacramento River) or spring snow melt (San Joaquin River), the current hydrology has truncated peaks with a prolonged period of elevated flows (compared to historical levels) continuing into the summer dry season.

Water withdrawals, for agricultural and municipal purposes have reduced river flows and increased temperatures during the critical summer months, and in some cases, have been of a sufficient magnitude to result in reverse flows in the lower San Joaquin River (Reynolds *et al*. 1993). Direct relationships exist between water temperature, water flow, and juvenile salmonid survival (Brandes and McLain 2001). Elevated water temperatures in the Sacramento River have limited the survival of young salmon in those waters. Juvenile fall-run Chinook salmon survival in the Sacramento River is also directly related with June streamflow and June and July Delta outflow (Dettman *et al*. 1987).

Water diversions for irrigated agriculture, municipal and industrial use, and managed wetlands are found throughout the Central Valley. Thousands of small and medium-size water diversions exist along the Sacramento River, San Joaquin River, and their tributaries. Although efforts have been made in recent years to screen some of these diversions, many remain unscreened. Depending on the size, location, and season of operation, these unscreened diversions entrain and kill many life stages of aquatic species, including juvenile salmonids. For example, as of 1997, 98.5 percent of the 3,356 diversions included in a Central Valley database were either unscreened or screened insufficiently to prevent fish entrainment (Herren and Kawasaki 2001). Most of the 370 water diversions operating in Suisun Marsh are unscreened (Herren and Kawasaki 2001).

Outmigrant juvenile salmonids in the Delta have been subjected to adverse environmental conditions created by water export operations at the CVP and SWP facilities. Specifically, juvenile salmonid survival has been reduced by the following: (1) water diversion from the mainstem Sacramento River into the Central Delta via the Delta Cross Channel; (2) upstream or reverse flows of water in the lower San Joaquin River and southern Delta waterways; (3) entrainment at the CVP/SWP export facilities and associated problems at Clifton Court Forebay; and (4) increased exposure to introduced, non-native predators such as striped bass (*Morone saxatilis*), largemouth bass (*Micropterus salmoides*), and sunfishes (Centrarchidae). On June 4, 2009, NMFS issued a biological and conference opinion on the long-term operations of the CVP and SWP (NMFS 2009a). As a result of the jeopardy and adverse modification determinations, NMFS provided a reasonable and prudent alternative that reduces many of the adverse effects of the CVP and SWP resulting from the stressors described above.

3. Water Conveyance and Flood Control

The development of the water conveyance system in the Delta has resulted in the construction of more than 1,100 miles of channels and diversions to increase channel elevations and flow capacity of the channels (Mount 1995). Levee development in the Central Valley affects spawning habitat, freshwater rearing habitat, freshwater migration corridors, and estuarine habitat PCEs. As Mount (1995) indicates, there is an "underlying, fundamental conflict inherent in this channelization." Natural rivers strive to achieve dynamic equilibrium to handle a watersheds supply of discharge and sediment (Mount 1995). The construction of levees disrupts the natural processes of the river, resulting in a multitude of habitat-related effects.

Many of these levees use angular rock (riprap) to armor the bank from erosive forces. The effects of channelization, and riprapping, include the alteration of river hydraulics and cover along the bank as a result of changes in bank configuration and structural features (Stillwater Sciences 2006). These changes affect the quantity and quality of near shore habitat for juvenile salmonids and have been thoroughly studied (USFWS 2000, Schmetterling *et al.* 2001, Garland *et al*. 2002). Simple slopes protected with rock revetment generally create near shore hydraulic conditions characterized by greater depths and faster, more homogeneous water velocities than occur along natural banks. Higher water velocities typically inhibit deposition and retention of sediment and woody debris. These changes generally reduce the range of habitat conditions typically found along natural shorelines, especially by eliminating the shallow, slow-velocity river margins used by juvenile fish as refuge and escape from fast currents, deep water, and predators (Stillwater Sciences 2006).

Prior to the 1970s, there was so much debris resulting from poor logging practices that many streams were completely clogged and were thought to have been total barriers to fish migration. As a result, in the 1960s and early 1970s it was common practice among fishery management agencies to remove woody material thought to be a barrier to fish migration (NMFS 1996b). However, it is now recognized that too much LWM was removed from the streams resulting in a loss of salmonid habitat and it is thought that the large scale removal of woody debris prior to 1980 had major, long-term negative effects on rearing habitats for salmonids in northern California (NMFS 1996b). Areas that were subjected to this removal of LWM are still limited in

the recovery of salmonid stocks; this limitation could be expected to persist for 50 to 100 years following removal of debris.

Large quantities of downed trees are a functionally important component of many streams (NMFS 1996b). LWM influences stream morphology by affecting channel pattern, position, and geometry, as well as pool formation (Keller and Swanson 1979, Bilby 1984, Robison and Beschta 1990). Reduction of wood in the stream channel, either from past or present activities, generally reduces pool quantity and quality, alters stream shading which can affect water temperature regimes and nutrient input, and can eliminate critical stream habitat needed for both vertebrate and invertebrate populations. Removal of vegetation also can destabilize marginally stable slopes by increasing the subsurface water load, lowering root strength, and altering water flow patterns in the slope.

In addition, the armoring and revetment of stream banks tends to narrow rivers, reducing the amount of habitat per unit channel length (Sweeney *et al*. 2004). As a result of river narrowing, benthic habitat decreases and the number of macroinvertebrates, such as stoneflies and mayflies, per unit channel length decreases affecting salmonid food supply.

4. Land Use Activities

Land use activities continue to have large impacts on salmonid habitat in the Central Valley watershed. Until about 150 years ago, the Sacramento River was bordered by up to 500,000 acres of riparian forest, with bands of vegetation extending outward for 4 or 5 miles (California Resources Agency 1989). Starting with the gold rush, these vast riparian forests were cleared for building materials, fuel, and to clear land for farms on the raised natural levee banks. The degradation and fragmentation of riparian habitat continued with extensive flood control and bank protection projects, together with the conversion of the fertile riparian lands to agriculture outside of the natural levee belt. By 1979, riparian habitat along the Sacramento River diminished to 11,000 to 12,000 acres, or about 2 percent of historic levels (McGill 1987). The clearing of the riparian forests removed a vital source of snags and driftwood in the Sacramento and San Joaquin river basins. This has reduced the volume of LWM input needed to form and maintain stream habitat that salmon depend on in their various life stages. In addition to this loss of LWM sources, removal of snags and obstructions from the active river channel for navigational safety has further reduced the presence of LWM in the Sacramento and San Joaquin rivers, as well as the Delta.

Increased sedimentation resulting from agricultural and urban practices within the Central Valley is one of the primary causes of salmonid habitat degradation (NMFS 1996a). Sedimentation can adversely affect salmonids during all freshwater life stages by: clogging or abrading gill surfaces, adhering to eggs, hampering fry emergence (Phillips and Campbell 1961), burying eggs or alevins, scouring and filling in pools and riffles, reducing primary productivity and photosynthesis activity (Cordone and Kelley 1961), and affecting intergravel permeability and DO levels. Excessive sedimentation over time can cause substrates to become embedded, which reduces successful salmonid spawning and egg and fry survival (Waters 1995).

Land use activities associated with road construction, urban development, logging, mining, agriculture, and recreation have significantly altered fish habitat quantity and quality through the alteration of stream bank and channel morphology; alteration of ambient water temperatures; degradation of water quality; elimination of spawning and rearing habitat; fragmentation of available habitats; elimination of downstream recruitment of LWM; and removal of riparian vegetation, resulting in increased stream bank erosion (Meehan and Bjornn 1991). Urban stormwater and agricultural runoff may be contaminated with herbicides and pesticides, petroleum products, sediment, *etc.* Agricultural practices in the Central Valley have eliminated large trees and logs and other woody material that would otherwise be recruited into the stream channel (NMFS 1998).

Since the 1850s, wetlands reclamation for urban and agricultural development has caused the cumulative loss of 79 and 94 percent of the tidal marsh habitat in the Delta downstream and upstream of Chipps Island, respectively (Conomos *et al.* 1985, Nichols *et al.* 1986, Wright and Phillips 1988, Monroe *et al.* 1992, Goals Project 1999). Prior to 1850, approximately 1400 km^2 of freshwater marsh surrounded the confluence of the Sacramento and San Joaquin rivers, and another 800 km^2 of saltwater marsh fringed San Francisco Bay's margins. Of the original 2,200 km^2 of tidally influenced marsh, only about 125 km^2 of undiked marsh remains today. In Suisun Marsh, saltwater intrusion and land subsidence gradually has led to the decline of agricultural production. Presently, Suisun Marsh consists largely of tidal sloughs and managed wetlands for duck clubs, which first were established in the 1870s in western Suisun Marsh (Goals Project 1999). Even more extensive losses of wetland marshes occurred in the Sacramento and San Joaquin river basins. Little of the extensive tracts of wetland marshes that existed prior to 1850 along the valley's river systems and within the natural flood basins exist today. Most has been "reclaimed" for agricultural purposes, leaving only small remnant patches.

Dredging of river channels to enhance inland maritime trade and to provide raw material for levee construction has significantly and detrimentally altered the natural hydrology and function of the river systems in the Central Valley. Starting in the mid-1800s, the Corps and private consortiums began straightening river channels and artificially deepening them to enhance shipping commerce. This has led to declines in the natural meandering of river channels and the formation of pool and riffle segments. The deepening of channels beyond their natural depth also has led to a significant alteration in the transport of bed load in the riverine system as well as the local flow velocity in the channel (Mount 1995). The Sacramento Flood Control Project at the turn of the nineteenth century ushered in the start of large scale Corps actions in the Delta and along the rivers of California for reclamation and flood control. The creation of levees and the deep shipping channels reduced the natural tendency of the San Joaquin and Sacramento rivers to create floodplains along their banks with seasonal inundations during the wet winter season and the spring snow melt periods. These annual inundations provided necessary habitat for rearing and foraging of juvenile native fish that evolved with this flooding process. The armored riprapped levee banks and active maintenance actions of Reclamation Districts precluded the establishment of ecologically important riparian vegetation, introduction of valuable LWM from these riparian corridors, and the productive intertidal mudflats characteristic of the undisturbed Delta habitat.

Urban storm water and agricultural runoff may be contaminated with pesticides, oil, grease, heavy metals, polycyclic aromatic hydrocarbons (PAHs), and other organics and nutrients (California Regional Water Quality Control Board-Central Valley Region [Regional Board] 1998) that can potentially destroy aquatic life necessary for salmonid survival (NMFS 1996a, b). Point source (PS) and non-point source (NPS) pollution occurs at almost every point that urbanization activity influences the watershed. Impervious surfaces (*i.e.*, concrete, asphalt, and buildings) reduce water infiltration and increase runoff, thus creating greater flood hazard (NMFS 1996a, b). Flood control and land drainage schemes may increase the flood risk downstream by concentrating runoff. A flashy discharge pattern results in increased bank erosion with subsequent loss of riparian vegetation, undercut banks and stream channel widening. In addition to the PS and NPS inputs from urban runoff, juvenile salmonids are exposed to increased water temperatures as a result of thermal inputs from municipal, industrial, and agricultural discharges.

Past mining activities routinely resulted in the removal of spawning gravels from streams, the straightening and channelization of the stream corridor from dredging activities, and the leaching of toxic effluents into streams from mining operations. Many of the effects of past mining operations continue to impact salmonid habitat today. Current mining practices include suction dredging (sand and gravel mining), placer mining, lode mining and gravel mining. Present day mining practices are typically less intrusive than historic operations (hydraulic mining); however, adverse impacts to salmonid habitat still occur as a result of present-day mining activities. Sand and gravel are used for a large variety of construction activities including base material and asphalt, road bedding, drain rock for leach fields, and aggregate mix for concrete to construct buildings and highways.

Most aggregate is derived principally from pits in active floodplains, pits in inactive river terrace deposits, or directly from the active channel. Other sources include hard rock quarries and mining from deposits within reservoirs. Extraction sites located along or in active floodplains present particular problems for anadromous salmonids. Physical alteration of the stream channel may result in the destruction of existing riparian vegetation and the reduction of available area for seedling establishment (Stillwater Sciences 2002). Loss of vegetation impacts riparian and aquatic habitat by causing a loss of the temperature moderating effects of shade and cover, and habitat diversity. Extensive degradation may induce a decline in the alluvial water table, as the banks are effectively drained to a lowered level, affecting riparian vegetation and water supply (NMFS 1996b). Altering the natural channel configuration will reduce salmonid habitat diversity by creating a wide, shallow channel lacking in the pools and cover necessary for all life stages of anadromous salmonids. In addition, waste products resulting from past and present mining activities, include cyanide (an agent used to extract gold from ore), copper, zinc, cadmium, mercury, asbestos, nickel, chromium, and lead.

Juvenile salmonids are exposed to increased water temperatures in the Delta during the late spring and summer due to the loss of riparian shading, and by thermal inputs from municipal, industrial, and agricultural discharges. Studies by DWR on water quality in the Delta over the last 30 years show a steady decline in the food sources available for juvenile salmonids and sturgeon and an increase in the clarity of the water due to a reduction in phytoplankton and

zooplankton. These conditions have contributed to increased mortality of juvenile Chinook salmon, steelhead, and sturgeon as they move through the Delta.

5. Water Quality

The water quality of the Delta has been negatively impacted over the last 150 years. Increased water temperatures, decreased DO levels, and increased turbidity and contaminant loads have degraded the quality of the aquatic habitat for the rearing and migration of salmonids. The Regional Board, in its 1998 Clean Water Act §303(d) list characterized the Delta as an impaired waterbody having elevated levels of chlorpyrifos, dichlorodiphenyltrichlor (*i.e.* DDT), diazinon, electrical conductivity, Group A pesticides (aldrin, dieldrin, chlordane, endrin, heptachlor, heptachlor epoxide, hexachlorocyclohexanes [including lindane], endosulfan and toxaphene), mercury, low DO, organic enrichment, and unknown toxicities (California Regional Water Quality Control Board-Central Valley Region [Regional Board] 1998, 2001).

In general, water degradation or contamination can lead to either acute toxicity, resulting in death when concentrations are sufficiently elevated, or more typically, when concentrations are lower, to chronic or sublethal effects that reduce the physical health of the organism, and lessens its survival over an extended period of time. Mortality may become a secondary effect due to compromised physiology or behavioral changes that lessen the organism's ability to carry out its normal activities. For example, increased levels of heavy metals are detrimental to the health of an organism because they interfere with metabolic functions by inhibiting key enzyme activity in metabolic pathways, decrease neurological function, degrade cardiovascular output, and act as mutagens, teratogens or carcinogens in exposed organisms (Rand *et al*. 1995, Goyer 1996). For listed species, these effects may occur directly to the listed fish or to its prey base, which reduces the forage base available to the listed species.

In the aquatic environment, most anthropogenic chemicals and waste materials including toxic organic and inorganic chemicals eventually accumulate in sediment (Ingersoll 1995). Direct exposure to contaminated sediments may cause deleterious effects to listed salmonids or the threatened green sturgeon. This may occur if a fish swims through a plume of the resuspended sediments or rests on contaminated substrate and absorbs the toxic compounds through one of several routes: dermal contact, ingestion, or uptake across the gills. Elevated contaminant levels may be found in localized “hot spots” where discharge occurs or where river currents deposit sediment loads. Sediment contaminant levels can thus be significantly higher than the overlying water column concentrations (EPA 1994). However, the more likely route of exposure to salmonids or sturgeon is through the food chain, when the fish feed on organisms that are contaminated with toxic compounds. Prey species become contaminated either by feeding on the detritus associated with the sediments or dwelling in the sediment itself. Therefore, the degree of exposure to the salmonids and green sturgeon depends on their trophic level and the amount of contaminated forage base they consume. Response of salmonids and green sturgeon to contaminated sediments is similar to water borne exposures.

Low DO levels frequently are observed in the portion of the Stockton deep water ship channel (DWSC) extending from Channel Point, downstream to Turner and Columbia Cuts. Over a 5-year period, starting in August 2000, a DO meter has recorded channel DO levels at Rough and

Ready Island (Dock 20 of the West Complex). Over the course of this time period, there have been 297 days in which violations of the 5 mg/L DO criteria for the protection of aquatic life in the San Joaquin River between Channel Point and Turner and Columbia Cuts have occurred during the September through May migratory period for salmonids in the San Joaquin River. The data derived from the California Data Exchange Center files indicate that DO depressions occur during all migratory months, with significant events occurring from November through March when listed Central Valley steelhead adults and smolts would be utilizing this portion of the San Joaquin River as a migratory corridor.

Potential factors that contribute to these DO depressions are reduced river flows through the ship channel, released ammonia from the City of Stockton Wastewater Treatment Plant, upstream contributions of organic materials (*e.g.*, algal loads, nutrients, agricultural discharges) and the increased volume of the dredged ship channel. During the winter and early spring emigration period, increased ammonia concentrations in the discharges from the City of Stockton Waste Water Treatment Facility lowers the DO in the adjacent DWSC near the West Complex. In addition to the adverse effects of the lowered DO on salmonid physiology, ammonia is in itself toxic to salmonids at low concentrations. Likewise, adult fish migrating upstream will encounter lowered DO in the DWSC as they move upstream in the fall and early winter due to low flows and excessive algal and nutrient loads coming downstream from the upper San Joaquin River watershed. Levels of DO below 5 mg/L have been reported as delaying or blocking fall-run Chinook salmon in studies conducted by Hallock *et al.* (1970).

6. Hatchery Operations and Practices

Five hatcheries currently produce Chinook salmon in the Central Valley and four of these also produce steelhead. Releasing large numbers of hatchery fish can pose a threat to wild Chinook salmon and steelhead stocks through genetic impacts, competition for food and other resources between hatchery and wild fish, predation of hatchery fish on wild fish, and increased fishing pressure on wild stocks as a result of hatchery production (Waples 1991). The genetic impacts of artificial propagation programs in the Central Valley primarily are caused by straying of hatchery fish and the subsequent interbreeding of hatchery fish with wild fish. In the CV, practices such as transferring eggs between hatcheries and trucking smolts to distant sites for release contribute to elevated straying levels (US Department of the Interior 1999). For example, the primary steelhead broodstock at Nimbus Hatchery on the American River originated from the Eel River basin. One of the recommendations in the Joint Hatchery Review Report (NMFS and CDFG 2001) was to identify and designate new sources of steelhead brood stock to replace the current Eel River origin brood stock.

Hatchery practices as well as spatial and temporal overlaps of habitat use and spawning activity between spring- and fall-run fish have led to the hybridization and homogenization of some subpopulations (CDFG 1998). As early as the 1960s, Slater (1963) observed that early fall- and spring-run Chinook salmon were competing for spawning sites in the Sacramento River below Keswick Dam, and speculated that the two runs may have hybridized. The FRFH spring-run Chinook salmon have been documented as straying throughout the Central Valley for many years (CDFG 1998), and in many cases have been recovered from the spawning grounds of fall-run Chinook salmon, an indication that FRFH spring-run Chinook salmon may exhibit fall-run

life history characteristics. Although the degree of hybridization has not been comprehensively determined, it is clear that the populations of spring-run Chinook salmon spawning in the Feather River and counted at RBDD contain hybridized fish.

The management of hatcheries, such as Nimbus Hatchery and FRFH, can directly impact spring-run Chinook salmon and steelhead populations by oversaturating the natural carrying capacity of the limited habitat available below dams. In the case of the Feather River, significant redd superimposition occurs in-river due to hatchery overproduction and the inability to physically separate spring- and fall-run Chinook salmon adults. This concurrent spawning has led to hybridization between the spring- and fall-run Chinook salmon in the Feather River. At Nimbus Hatchery, operating Folsom Dam to meet temperature requirements for returning hatchery fall-run Chinook salmon often limits the amount of water available for steelhead spawning and rearing the rest of the year.

The increase in Central Valley hatchery production has reversed the composition of the steelhead population, from 88 percent naturally-produced fish in the 1950s (McEwan 2001) to an estimated 23 to 37 percent naturally-produced fish currently (Nobriga and Cadrett 2003). The increase in hatchery steelhead production proportionate to the wild population has reduced the viability of the wild steelhead populations, increased the use of out-of-basin stocks for hatchery production, and increased straying (NMFS and CDFG 2001). Thus, the ability of natural populations to successfully reproduce and continue their genetic integrity likely has been diminished.

The relatively low number of spawners needed to sustain a hatchery population can result in high harvest-to-escapements ratios in waters where fishing regulations are set according to hatchery population. This can lead to over-exploitation and reduction in the size of wild populations existing in the same system as hatchery populations due to incidental bycatch (McEwan 2001).

Hatcheries also can have some positive effects on salmonid populations. Artificial propagation has been shown to be effective in bolstering the numbers of naturally spawning fish in the short term under specific scenarios. Artificial propagation programs can also aid in conserving genetic resources and guarding against catastrophic loss of naturally spawned populations at critically low abundance levels, as was the case with the Sacramento River winter-run Chinook salmon population during the 1990s. However, relative abundance is only one component of a viable salmonid population.

7. Over Utilization

a. Ocean Commercial and Sport Harvest – Chinook Salmon and Steelhead

Extensive ocean recreational and commercial troll fisheries for Chinook salmon exist along the Northern and Central California coast, and an inland recreational fishery exists in the Central Valley for Chinook salmon and steelhead. Ocean harvest of Central Valley Chinook salmon is estimated using an abundance index, called the Central Valley Index (CVI) harvest index. The CVI is the sum of the ocean fishery Chinook salmon harvested south of Point Arena (where 85 percent of Central Valley Chinook salmon are caught), plus the Central Valley adult Chinook salmon escapement. The CVI harvest index is the ocean harvest landed south of Point Arena

divided by the CVI. CWT returns indicate that Central Valley salmon congregate off the California coast between Point Arena and Morro Bay.

Ocean fisheries have affected the age structure of CV spring-run Chinook salmon through targeting large fish for many years and reducing the numbers of 4- and 5-year-old fish (CDFG 1998). As a result of very low returns of fall-run Chinook salmon to the Central Valley in 2007 and 2008, there was a complete closure of commercial and recreational ocean Chinook salmon fishery in 2008 and 2009, respectively. However, contrary to expectations, even with the 2 years of ocean fishery closures, the CV spring-run Chinook salmon population continues to decline. Ocean harvest rates of CV spring-run Chinook salmon are thought to be a function of the CVI (Good *et al*. 2005). Harvest rates of CV spring-run Chinook salmon ranged from 0.55 to nearly 0.80 between 1970 and 1995 when harvest rates were adjusted for the protection of Sacramento River winter-run Chinook salmon. The drop in the CVI in 2001 as a result of high fall-run escapement to 0.27 also reduced harvest of CV spring-run Chinook salmon. There is essentially no ocean harvest of CCV steelhead.

b. Inland Sport Harvest –Chinook Salmon and Steelhead

In-river recreational fisheries historically have taken CV spring-run Chinook salmon throughout the species' range. During the summer, holding adult CV spring-run Chinook salmon are easily targeted by anglers when they congregate in large pools. Poaching also occurs at fish ladders, and other areas where adults congregate; however, the significance of poaching on the adult population is unknown. Specific regulations for the protection of CV spring-run Chinook salmon in Mill, Deer, Butte, and Big Chico creeks and the Yuba River have been added to the existing CDFG regulations. The current regulations, including those developed for Sacramento River winter-run Chinook salmon provide some level of protection for spring-run fish (CDFG 1998).

There is little information on CCV steelhead harvest rates in California. Hallock *et al.* (1961) estimated that harvest rates for Sacramento River steelhead from the 1953-1954 through 1958-1959 seasons ranged from 25.1 percent to 45.6 percent assuming a 20 percent non-return rate of tags. The average annual harvest rate of adult steelhead above RBDD for the 3-year period from 1991-1992 through 1993-1994 was 16 percent (McEwan and Jackson 1996). Since 1998, all hatchery steelhead have been marked with an adipose fin clip allowing anglers to distinguish hatchery and wild steelhead. Current regulations restrict anglers from keeping unmarked steelhead in Central Valley streams. Overall, this regulation has greatly increased protection of naturally produced adult steelhead; however, the total number of CCV steelhead contacted might be a significant fraction of basin-wide escapement, and even low catch-and-release mortality may pose a problem for wild populations (Good *et al*. 2005).

c. Commercial harvest of White Sturgeon and Bycatch of Green Sturgeon

Commercial harvest of white sturgeon results in the incidental bycatch of green sturgeon primarily along the Oregon and Washington coasts and within their coastal estuaries. Oregon and Washington have recently prohibited the retention of green sturgeon in their waters for commercial and recreational fisheries. Adams *et al*. (2002) reported harvest of green sturgeon

from California, Oregon, and Washington between 1985 and 2001. Total captures of green sturgeon in the Columbia River Estuary by commercial means ranged from 240 fish per year to 6,000. Catches in Willapa Bay and Grays Harbor by commercial means combined ranged from 9 fish to 2,494 fish per year. Emmett *et al*. (1991) indicated that averages of 4.7 to 15.9 tons of green sturgeon were landed annually in Grays Harbor and Willapa Bay respectively. Overall, captures appeared to be dropping through the years; however, this could be related to changing fishing regulations. Adams *et al*. (2002) also reported sport fishing captures in California, Oregon, and Washington. Within the San Francisco Estuary, green sturgeon are captured by sport fisherman targeting the more desirable white sturgeon, particularly in San Pablo and Suisun bays (Emmett *et al*. 1991). Sport fishing in the Columbia River, Willapa Bay, and Grays Harbor captured from 22 to 553 fish per year between 1985 and 2001. Again, it appears sport fishing captures are dropping through time; however, it is not known if this is a result of abundance, changed fishing regulations, or other factors. Based on new research by Israel (2006) and past tagged fish returns reported by CDFG (2002), a high proportion of green sturgeon present in the Columbia River, Willapa Bay, and Grays Harbor (as much as 80 percent in the Columbia River) may be Southern DPS North American green sturgeon. This indicates a potential threat to the Southern DPS North American green sturgeon population. Beamesderfer *et al.* (2007) estimated that green sturgeon will be vulnerable to slot limits (outside of California) for approximately 14 years of their life span. Fishing gear mortality presents an additional risk to the long-lived sturgeon species such as the green sturgeon (Boreman 1997). Although sturgeon are relatively hardy and generally survive being hooked, their long life makes them vulnerable to repeated hooking encounters, which leads to an overall significant hooking mortality rate over their lifetime. An adult green sturgeon may not become sexually mature until they are 13 to 18 years of age for males (152-185cm), and 16 to 27 years of age for females (165-202 cm, Van Eenennaam *et al.* 2006). Even though slot limits "protect" a significant proportion of the life history of green sturgeon from harvest, they do not protect them from fishing pressure.

Green sturgeon are caught incidentally by sport fisherman targeting the more highly desired white sturgeon within the Delta waterways and the Sacramento River. New regulations which went into effect in March 2007, reduced the slot limit of sturgeon from 72 inches to 66 inches, and limit the retention of white sturgeon to one fish per day with a total of 3 fish retained per year. In addition, a non-transferable sturgeon punch card with tags must be obtained by each angler fishing for sturgeon. All sturgeon caught must be recorded on the card, including those released. All green sturgeon must be released unharmed and recorded on the sturgeon punch card by the angler.

Poaching rates of green sturgeon in the Central Valley are unknown; however, catches of sturgeon occur during all years, especially during wet years. Unfortunately, there is no catch, effort, and stock size data for this fishery which precludes making exploitation estimates (USFWS 1995a). Areas just downstream of Thermalito Afterbay outlet and Cox's Spillway, and several barriers impeding migration on the Feather River may be areas of high adult mortality from increased fishing effort and poaching. The small population of sturgeon inhabiting the San Joaquin River (believed to be currently comprised of only white sturgeon) experiences heavy fishing pressure, particularly regarding illegal snagging and it may be more than the population can support (USFWS 1995a).

8. Disease and Predation

Infectious disease is one of many factors that influence adult and juvenile salmonid survival. Salmonids are exposed to numerous bacterial, protozoan, viral, and parasitic organisms in spawning and rearing areas, hatcheries, migratory routes, and the marine environment (NMFS 1996a,b, 1998). Specific diseases such as bacterial kidney disease, C*eratomyxosis shasta* (C-shasta), Columnaris Disease, furunculosis, infectious hematopoietic necrosis, redmouth and black spot disease, whirling disease, and erythrocytic inclusion body syndrome are known, among others, to affect steelhead and Chinook salmon (NMFS 1996a,b, 1998). Very little current or historical information exists to quantify changes in infection levels and mortality rates attributable to these diseases; however, studies have shown that wild fish tend to be less susceptible to pathogens than are hatchery-reared fish. Nevertheless, wild salmonids may contract diseases that are spread through the water column (*i.e.*, waterborne pathogens) as well as through interbreeding with infected hatchery fish. The stress of being released into the wild from a controlled hatchery environment frequently causes latent infections to convert into a more pathological state, and increases the potential of transmission from hatchery reared fish to wild stocks within the same waters.

Accelerated predation also may be a factor in the decline of Sacramento River winter-run Chinook salmon and CV spring-run Chinook salmon, and to a lesser degree CCV steelhead. Human-induced habitat changes such as alteration of natural flow regimes and installation of bank revetment and structures such as dams, bridges, water diversions, piers, and wharves often provide conditions that both disorient juvenile salmonids and attract predators (Stevens 1961, Decato 1978, Vogel *et al.* 1988, Garcia 1989).

On the mainstem Sacramento River, high rates of predation were known to occur at the RBDD, Anderson-Cottonwood Irrigation District's (ACID) diversion dam, GCID's diversion facility, areas where rock revetment has replaced natural river bank vegetation, and at South Delta water diversion structures (*e*.g., Clifton Court Forebay; CDFG 1998). Predation at RBDD on juvenile winter-run Chinook salmon was believed to be higher than normal due to flow dynamics associated with the operation of this structure. Due to their small size, early emigrating winter-run Chinook salmon were very susceptible to predation in Lake Red Bluff when the RBDD gates remain closed in summer and early fall. In passing the dam, juveniles are subject to conditions which greatly disorient them, making them highly susceptible to predation by fish or birds. Sacramento pikeminnow (*Ptychocheilus grandis*) and striped bass congregate below the dam and prey on juvenile salmon in the tail waters. The Sacramento pikeminnow is a species native to the Sacramento River basin and has co-evolved with the anadromous salmonids in this system. However, rearing conditions in the Sacramento River today (*e.g.*, warm water, low-irregular flow, standing water, and water diversions) compared to its natural state and function decades ago in the pre-dam era, are more conducive to warm water species such as Sacramento pikeminnow and striped bass than to native salmonids. Tucker *et al.* (1998) reported that predation during the summer months by Sacramento pikeminnow on juvenile salmonids increased to 66 percent of the total weight of stomach contents in the predatory pikeminnow. Striped bass showed a strong preference for juvenile salmonids as prey during this study. This research also indicated that the percent frequency of occurrence for juvenile salmonids nearly equaled other fish species in the stomach contents of the predatory fish. Tucker *et al.* (2003)

showed the temporal distribution for these two predators in the RBDD area were directly related to RBDD operations (predators congregated when the dam gates were in, and dispersed when the gates were removed). As of 2012, with the construction of the pumping plant, the RBDD will no longer operate with the gates down, and predation at this site is expected to no longer be a problem area.

USFWS found that more predatory fish were found at rock revetment bank protection sites between Chico Landing and Red Bluff than at sites with naturally eroding banks (Michny and Hampton 1984). From October 1976 to November 1993, CDFG conducted 10 mark/recapture studies at the SWP's Clifton Court Forebay to estimate pre-screen losses using hatchery-reared juvenile Chinook salmon. Pre-screen losses ranged from 69 percent to 99 percent. Predation by striped bass is thought to be the primary cause of the loss (Gingras 1997, DWR 2009).

Predation on juvenile salmonids has increased as a result of water development activities which have created ideal habitats for predators and non-native invasive species (NIS). Turbulent conditions near dam bypasses, turbine outfalls, water conveyances, and spillways disorient juvenile salmonid migrants and increase their predator avoidance response time, thus improving predator success. Increased exposure to predators has also resulted from reduced water flow through reservoirs; a condition which has increased juvenile travel time. Other locations in the Central Valley where predation is of concern include flood bypasses, post-release sites for salmonids salvaged at the CVP and SWP Fish Facilities, and the SMSCG. Predation on salmon by striped bass and Sacramento pikeminnow at salvage release sites in the Delta and lower Sacramento River has been documented (Orsi 1967, Pickard *et al.* 1982); however, accurate predation rates at these sites are difficult to determine. CDFG conducted predation studies from 1987 to 1993 at the SMSCG to determine if the structure attracts and concentrates predators. The dominant predator species at the SMSCG was striped bass, and the remains of juvenile Chinook salmon were identified in their stomach contents (Edwards *et al.* 1996, Tillman *et al.* 1996, NMFS 1997).

Avian predation on fish contributes to the loss of migrating juvenile salmonids by constraining natural and artificial production. Fish-eating birds that occur in the CV include great blue herons (*Ardea herodias*), gulls (*Larus* spp.), osprey (*Pandion haliaetus*), common mergansers (*Mergus merganser*), American white pelicans (*Pelecanus erythrorhynchos*), double-crested cormorants (*Phalacrocorax* spp.), Caspian terns (*Sterna caspia*), belted kingfishers (*Ceryle alcyon*), black-crowned night herons (*Nycticorax nycticorax*), Forster's terns (*Sterna forsteri*), hooded mergansers (*Lophodytes cucullatus*), and bald eagles (*Haliaeetus leucocephalus*) (Stephenson and Fast 2005). These birds have high metabolic rates and require large quantities of food relative to their body size.

Mammals can also be an important source of predation on salmonids within the California Central Valley. Predators such as river otters (*Lontra canadensis*), raccoons (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and western spotted skunk (*Spilogale gracilis*) are common. Other mammals that take salmonid include: badger (*Taxidea taxus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), long-tailed weasel (*Mustela frenata*), mink (*Mustela vison*), mountain lion (*Felis concolor*), red fox (*Vulpes vulpes*), and ringtail (*Bassariscus astutus*). These animals, especially river otters, are capable of removing large

numbers of salmon and trout from the aquatic habitat (Dolloff 1993). Mammals have the potential to consume large numbers of salmonids, but generally scavenge post-spawned salmon. In the marine environment, pinnipeds, including harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), and Steller's sea lions (*Eumetopia jubatus*) are the primary marine mammals preying on salmonids (Spence *et al*. 1996). Pacific striped dolphin (*Lagenorhynchus obliquidens*) and killer whale (*Orcinus orca*) can also prey on adult salmonids in the nearshore marine environment, and at times become locally important. Although harbor seal and sea lion predation primarily is confined to the marine and estuarine environments, they are known to travel well into freshwater after migrating fish and have frequently been encountered in the Delta and the lower portions of the Sacramento and San Joaquin rivers. All of these predators are opportunists, searching out locations where juveniles and adults are most vulnerable, such as the large water diversions in the South Delta.

9. Environmental Variation

Natural changes in the freshwater and marine environments play a major role in salmonid abundance. Recent evidence suggests that marine survival among salmonids fluctuates in response to 20- to 30-year cycles of climatic conditions and ocean productivity (Hare *et al*. 1999, Mantua and Hare 2002). This phenomenon has been referred to as the Pacific Decadal Oscillation. In addition, large-scale climatic regime shifts, such as the El Nino condition, appear to change productivity levels over large expanses of the Pacific Ocean. A further confounding effect is the fluctuation between drought and wet conditions in the basins of the American west. During the first part of the 1990s, much of the Pacific Coast was subject to a series of very dry years, which reduced inflows to watersheds up and down the west coast.

"El Niño" is an environmental condition often cited as a cause for the decline of West Coast salmonids (NMFS 1996b). El Niño is an unusual warming of the Pacific Ocean off South America and is caused by atmospheric changes in the tropical Pacific Ocean (Southern Oscillation-ENSO) resulting in reductions or reversals of the normal trade wind circulation patterns. The El Niño ocean conditions are characterized by anomalous warm sea surface temperatures and changes to coastal currents and upwelling patterns. Principal ecosystem alterations include decreased primary and secondary productivity in affected regions and changes in prey and predator species distributions. Cold-water species are displaced towards higher latitudes or move into deeper, cooler water, and their habitat niches occupied by species tolerant of warmer water that move upwards from the lower latitudes with the warm water tongue.

A key factor affecting many West Coast stocks has been a general 30-year decline in ocean productivity. The mechanism whereby stocks are affected is not well understood, partially because the pattern of response to these changing ocean conditions has differed among stocks, presumably due to differences in their ocean timing and distribution. It is presumed that survival in the ocean is driven largely by events occurring between ocean entry and recruitment to a sub-adult life stage.

10. Ecosystem Restoration

In 2010, the California legislature created the Delta Stewardship Council made up of diverse community representatives and water interests. The Delta Stewardship Council is the successor to the California Bay-Delta Authority and CALFED Bay-Delta Program. The Delta Stewardship Council must adopt and implement a comprehensive management plan for the Sacramento-San Joaquin Delta, which is called "The Delta Plan" and must be implemented by January 2012 as mandated by the Delta Reform Act of 2009.

Two programs included under the Delta Stewardship Council ; the Ecosystem Restoration Program (ERP) and the EWA, were created to improve conditions for fish, including listed salmonids, in the Central Valley (CALFED 2000). Restoration actions implemented by the ERP include the installation of fish screens, modification of barriers to improve fish passage, habitat acquisition, and instream habitat restoration. The majority of these actions address key factors affecting listed salmonids and emphasis has been placed in tributary drainages with high potential for steelhead and spring-run Chinook salmon production. Additional ongoing actions include new efforts to enhance fisheries monitoring and directly support salmonid production through hatchery releases. Recent habitat restoration initiatives sponsored and funded primarily by the CBDA-ERP Program have resulted in plans to restore ecological function to 9,543 acres of shallow-water tidal and marsh habitats within the Delta. Restoration of these areas primarily involves flooding lands previously used for agriculture, thereby creating additional rearing habitat for juvenile salmonids. Similar habitat restoration is imminent adjacent to Suisun Marsh (*i.e.*, at the confluence of Montezuma Slough and the Sacramento River) as part of the Montezuma Wetlands project, which is intended to provide for commercial disposal of material dredged from San Francisco Bay in conjunction with tidal wetland restoration.

A sub-program of the ERP called the Environmental Water Program (EWP) has been established to support ERP projects through enhancement of instream flows that are biologically and ecologically significant in anadromous reaches of priority streams controlled by dams. This program is in the development stage and the benefits to listed salmonids are not yet clear.

The EWA is designed to provide water at critical times to meet ESA requirements and incidental take limits without water supply impacts to other users, particularly South of Delta water users. In early 2001, the EWA released 290 thousand acre feet of water from San Luis Reservoir at key times to offset reductions in South Delta pumping implemented to protect winter-run Chinook salmon, delta smelt, and splittail. However, the benefit derived by this action to winter-run Chinook salmon in terms of number of fish saved was very small. The anticipated benefits to other Delta fisheries from the use of the EWA water are much higher than those benefits ascribed to listed salmonids by the EWA release. Under the long term operations of the CVP and SWP, EWA assets have declined to 48 thousand acre feet after carriage water costs.

a. Central Valley Project Improvement Act

The Central Valley Project Improvement Act (CVPIA), implemented in 1992, requires that fish and wildlife get equal consideration with other demands for water allocations derived from the CVP. From this act arose several programs that have benefited listed salmonids: the

Anadromous Fish Restoration Program (AFRP), the Anadromous Fish Screen Program (AFSP), and the Water Acquisition Program (WAP). The AFRP is engaged in monitoring, education, and restoration projects geared toward recovery of all anadromous fish species residing in the Central Valley. Restoration projects funded through the AFRP include fish passage, fish screening, riparian easement and land acquisition, development of watershed planning groups, instream and riparian habitat improvement, and gravel replenishment. The AFSP combines Federal funding with State and private funds to prioritize and construct fish screens on major water diversions mainly in the upper Sacramento River. The goal of the WAP is to acquire water supplies to meet the habitat restoration and enhancement goals of the CVPIA and to improve the Department of the Interior's ability to meet regulatory water quality requirements. Water has been used successfully to improve fish habitat for spring-run Chinook salmon and steelhead by maintaining or increasing instream flows in Butte and Mill creeks and the San Joaquin River at critical times.

b. Iron Mountain Mine Remediation

Environmental Protection Agency's Iron Mountain Mine remediation involves the removal of toxic metals in acidic mine drainage from the Spring Creek Watershed with a state-of-the-art lime neutralization plant. Contaminant loading into the Sacramento River from Iron Mountain Mine has shown measurable reductions since the early 1990s (US Bureau of Reclamation 2004). Decreasing the heavy metal contaminants that enter the Sacramento River should increase the survival of salmonid eggs and juveniles. However, during periods of heavy rainfall upstream of the Iron Mountain Mine, the US Bureau of Reclamation substantially increases Sacramento River flows in order to dilute heavy metal contaminants being spilled from the Spring Creek debris dam. This rapid change in flows can cause juvenile salmonids to become stranded or isolated in side channels below Keswick Dam.

c. State Water Project Delta Pumping Plant Fish Protection Agreement (Four-Pumps Agreement)

The Four Pumps Agreement Program has approved about $49 million for projects that benefit salmon and steelhead production in the Sacramento-San Joaquin basins and Delta since the agreement inception in 1986. Four Pumps projects that benefit spring-run Chinook salmon and steelhead include water exchange programs on Mill and Deer creeks; enhanced law enforcement efforts from San Francisco Bay upstream to the Sacramento and San Joaquin rivers and their tributaries; design and construction of fish screens and ladders on Butte Creek; and screening of diversions in Suisun Marsh and San Joaquin tributaries. Predator habitat isolation and removal, and spawning habitat enhancement projects on the San Joaquin tributaries benefit steelhead (US Bureau of Reclamation 2004).

11. Non-Native Invasive Species

As currently seen in the San Francisco estuary, non-invasive species (NIS) can alter the natural food webs that existed prior to their introduction. Perhaps the most significant example is illustrated by the Asiatic freshwater clams *Corbicula fluminea* and *Potamocorbula amurensis*. The arrival of these clams in the estuary disrupted the normal benthic community structure and depressed phytoplankton levels in the estuary due to the highly efficient filter feeding of the introduced clams (Cohen and Moyle 2004). The decline in the levels of phytoplankton reduces

the population levels of zooplankton that feed upon them, and hence reduces the forage base available to salmonids transiting the Delta and San Francisco estuary which feed either upon the zooplankton directly or their mature forms. This lack of forage base can adversely impact the health and physiological condition of these salmonids as they emigrate through the Delta region to the Pacific Ocean.

Attempts to control the NIS also can adversely impact the health and well-being of salmonids within the affected water systems. For example, the control programs for the invasive water hyacinth (*Eichhornia crassipes*) and Brazilian waterweed (*Egeria densa*) plants in the Delta must balance the toxicity of the herbicides applied to control the plants to the probability of exposure to listed salmonids during herbicide application. In addition, the control of the nuisance plants have certain physical parameters that must be accounted for in the treatment protocols, particularly the decrease in DO resulting from the decomposing vegetable matter left by plants that have died.

12. Summary

For CV spring-run Chinook salmon, and CCV steelhead, the construction of high dams for hydropower, flood control, and water supply resulted in the loss of vast amounts of upstream habitat (*i.e.*, approximately 80 percent, or a minimum linear estimate of over 1,000 stream miles), and often resulted in precipitous declines in affected salmonid populations. For example, the completion of Friant Dam in 1947 has been linked with the extirpation of spring-run Chinook salmon in the San Joaquin River upstream of the Merced River within just a few years. The reduced populations that remain below Central Valley dams are forced to spawn in lower elevation tailwater habitats of the mainstem rivers and tributaries that were previously not used for this purpose. This habitat is entirely dependent on managing reservoir releases to maintain cool water temperatures suitable for spawning, and/or rearing of salmonids. This requirement has been difficult to achieve in all water year types and for all life stages of affected salmonid species. Steelhead, in particular, seem to require the qualities of small tributary habitat similar to what they historically used for spawning; habitat that is largely unavailable to them under the current water management scenario. All salmonid species considered in this consultation have been adversely affected by the production of hatchery fish associated with the mitigation for the habitat lost to dam construction (*e.g.*, from genetic impacts, increased competition, exposure to novel diseases, *etc*.).

Land-use activities such as road construction, urban development, logging, mining, agriculture, and recreation are pervasive and have significantly altered fish habitat quantity and quality for Chinook salmon and steelhead through alteration of streambank and channel morphology; alteration of ambient water temperatures; degradation of water quality; elimination of spawning and rearing habitat; fragmentation of available habitats; elimination of downstream recruitment of LWM; and removal of riparian vegetation resulting in increased streambank erosion. Human-induced habitat changes, such as: alteration of natural flow regimes; installation of bank revetment; and building structures such as dams, bridges, water diversions, piers, and wharves, often provide conditions that both disorient juvenile salmonids and attract predators. Harvest activities, ocean productivity, and drought conditions provide added stressors to listed salmonid populations. In contrast, various ecosystem restoration activities have contributed to improved

conditions for listed salmonids (*e.g.*, various fish screens). However, some important restoration activities (*e.g.*, Battle Creek Restoration Project) have not yet been completed and benefits to listed salmonids from the EWA have been less than anticipated.

Similar to the listed salmonids, the Southern DPS of North American green sturgeon have been negatively impacted by hydroelectric and water storage operations in the Central Valley which ultimately affect the hydrology and accesibility of Central Valley rivers and streams to anadromous fish. Anthropogenic manipulations of the aquatic habitat, such as dredging, bank stabilization, and waste water discharges have also degraded the quality of the Central Valley's waterways for green sturgeon.

IV. ENVIRONMENTAL BASELINE

The Environmental Baseline "includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process" (50 CFR §402.02).

A. Status of the Species in the Action Area

The action area, which encompasses the lower Feather River and associated floodplains and riparian areas at and adjacent to RM 28 (downstream of the FRFH) functions primarily as a rearing and spawning area for CV spring-run Chinook salmon and CCV steelhead. It also provides some use as a migratory habitat for each of these species; Southern DPS of North American green sturgeon use the area primarily as a migration corridor and secondarily for adult feeding.

1. <u>CV Spring-Run Chinook Salmon</u>

a. Status in the Action Area

Historically, CV spring-run Chinook salmon were reported to have ascended to the very highest streams and headwaters in the Feather River watershed while they completed their life cycle to spawn (CDFG 1998). Before construction of hydropower dams and diversions on the Feather River (including Oroville Dam), historical records indicate that Chinook salmon occurred in all four major tributaries of the Feather River upstream of the present location of Oroville Dam. Based on reports of salmon escapement, most spring-run Chinook salmon spawned in the Middle Fork, although a few used the North Fork, South Fork, and West Branch of the Feather River (Fry 1961). Historical (pre-European influence) run size estimates accounts were of 8,000 to 20,000 spring-run Chinook salmon in the Feather River upstream of Oroville Dam (DWR 2007, Moyle 2002). Available population estimates for spring-run Chinook salmon in the Feather River before construction of the Oroville facilities (1946 to 1963) range from 500 to 4,000 fish, averaging 2,200 fish per year (DWR 2007).

Currently, upstream migration of CV spring-run Chinook salmon to historical spawning and rearing areas within the Feather River are blocked by Oroville facilities as well as several Pacific Gas and Electric (PG&E) project facilities constructed before the Oroville facilities were constructed. Habitat surveys conducted upstream of Lake Oroville indicate that suitable habitat for spring-run Chinook salmon still exists (DWR 2004a). However, this habitat will remain unavailable to CV spring-run Chinook salmon until fish passage over Oroville Dam is implemented. FRFH was designed and operated to partially replace or mitigate for Chinook salmon production loss attributable to the construction of the Oroville facilities.

Between 1967 and 2010, population estimates for spring-run Chinook salmon in the Feather River have ranged from 146 fish in 1967 to 20,057 fish in 2013. Between 1967 and 2004, spring run were differentiated from fall-run Chinook salmon by opening the ladder at FRFH on September 1. Those fish ascending the ladder from September 1 through September 15 were assumed to be spring-run Chinook salmon (Kastner 2003). Subsequently, DWR documented there had been considerable mixing of fall- and spring-run Chinook salmon stocks in the hatchery (DWR 2004a), leading to introgression between spring- and fall-run Chinook salmon in the Feather River. At about the same time, the ladder to the FRFH was opened during the spring months to determine when steelhead and spring-run Chinook salmon might be holding in the Feather River. Investigators found substantial numbers of Chinook salmon ascended the fish ladder in May and June (DWR 2004a). Documentation of a phenotypic spring-run in the Feather River resulted in a new hatchery approach to collecting broodstock and minimizing introgression between early running ("spring-run") and later running ("fall-run") Chinook salmon. The new spring-run Chinook salmon hatchery operations went into effect with the 2004 brood year, and are designed to protect this important component of the CV spring-run Chinook salmon ESU.

Under new hatchery operations (2004-present), adult spring-run Chinook salmon are defined as Chinook salmon that have spent at least one winter in the ocean and express a migration behavior of entering the Feather River during the months of April, May, and June while sexually immature. Hatchery origin spring-run Chinook salmon are additionally identified by adipose fin clip, coded wire tag, Hallprint tag, genetic based tag or other marker indicating stock/hatchery of origin. Hatchery origin Chinook not meeting the above criteria will not be used for spring-run broodstock at the FRFH.

At this time there is no clear understanding of what controls spring-run Chinook salmon abundance on the Feather River, or the impact of proposed restoration and recovery actions on that abundance. The presence of several thousand phenotypic spring-run Chinook salmon during the past four decades (post-Oroville Dam) indicates that whatever the conditions are, they have been adequate to support one of the largest spring Chinook salmon runs in the Sacramento Valley. However, it is clear that FRFH production has a profound influence on patterns of Feather River spring-run Chinook salmon abundance. Recent and future changes in FRFH production levels, broodstock selection and release strategies will undoubtedly play a role in recovery.

Adult spring-run Chinook salmon enter the Feather River as immature adults from March to June (Painter *et al*. 1977, CDFG 1993, CDFG 1998, Yoshiyama *et al*. 1998, Sommer *et al.* 2001) and spawn in autumn, September and October (Sommer *et al*. 2001). Fish spawn in gravel beds that

are often located at the tails of holding pools (USFWS 1995a). Suitable water temperatures for spawning are 42 to 58°F (~5.6 to 14.4^{o}C). Incubation might extend through March with suitable incubation temperatures between 48 and 58°F (~8.8 to 14.4^{o}C) (DWR 2007). Studies have confirmed that juvenile rearing for CV spring-run Chinook salmon and most likely some adult spawning are associated with secondary channels within the Feather River LFC. The lower velocities, smaller substrate, and greater amount of cover (compared to that in the main river channel) most likely make these side channels more suitable for juvenile salmonid rearing than the main channel. Currently, this type of habitat comprises less than one percent of the available habitat in the LFC (DWR 2007).

The Sacramento-San Joaquin Delta is most often mentioned as the area in the emigration route having the greatest impact on naturally emigrating Central Valley Chinook salmon (OCAP BO 2009). However, juvenile CV spring-run Chinook salmon must migrate through 112 river kilometers of the lower Feather River, and additional distance in the Sacramento River before reaching the Delta. Little is known about pre-Delta habitat suitability or predation losses, but when flows are low and waters clear, predation losses in the Feather River are likely significant (Williams 2006). Facilities such as Sunset Pumps on the Feather River near Live Oak also present significant challenges for emigrating juveniles or smolts due to large cascading drops over large rip-rap associated with the rock weir structure.

Juvenile Chinook salmon in the Feather River have been reported to emigrate as young-of-the-year (Seesholtz *et al*. 2004) and most appear to migrate out of the Feather River within days of emergence (FERC 2007). Juvenile emigration from the Feather River is generally from mid-November through June, with peak emigration from January through March (DWR 2002; Painter 1977). RST data from 1998 to 2000 documented emigration of spring-run Chinook salmon from the Feather River peaking in December, followed by another pulse of juvenile young-of-the-year emigrants at Live Oak in April and May (Seesholtz *et al.* 2004). Movement of juvenile Central Valley spring-run Chinook salmon in the Sacramento River at Knights Landing peaks in December, and again in March and April; however, juveniles also are observed between November and the end of May (Snider and Titus 2000).

b. Factors Affecting the Status of CV Spring-Run Chinook Salmon and CCV Steelhead in the Action Area

As discussed below, the factors affecting CV spring-run Chinook salmon and CCV steelhead are common to both species and are treated together here, except as further specified in factors affecting steelhead. Existing conditions affecting listed species and critical habitat in the action area are influenced by result of SWP operations of the Oroville facilities (Lake Oroville, Thermalito Complex, FRFH, etc.), requirements of the existing FERC license, and other environmental commitments of DWR associated with water rights, temperature requirements, recreational programs, or fish and wildlife management programs.

c. Likelihood of Viability of Central Valley Spring-Run Chinook Salmon in the Action Area

The viability of CV spring-run Chinook salmon has been reduced because of habitat loss, 40 years of hatchery operations, and hybridization with fall-run Chinook salmon. Hatchery spring-

run Chinook salmon captured in the river form a homogeneous group with spring-run Chinook salmon captured in the hatchery, which suggests that the naturally spawning population is not independent from the hatchery spawners. In addition, the extant Feather River population most likely does not represent historical characteristics in terms of genetic composition and spatial distribution in the watershed (Lindley *et al*. 2007). Regardless, a distinct population of phenotypic spring-run Chinook salmon has persisted. Lindley *et al*. (2007) concluded that despite the genetic results, the capacity of salmonids to rapidly establish different run timings might make reestablishing discrete temporal runs possible if separate spawning habitats can be made available.

Improving habitat in the Feather River helps make it more likely that these species will continue to survive and recover within the action area. The draft Central Valley Recovery Plan (NMFS 2009b) has indicated that populations CV of spring-run Chinook salmon and CCV steelhead in the Feather River reaching a viable status is achievable and needed for recovery of the ESU.

2. CCV Steelhead

a. Status in the Action Area

The CCV steelhead DPS final listing determination was published on January 5, 2006, (71 FR 834), and included all naturally spawned populations of steelhead (and their progeny) below natural and human-made barriers in the Sacramento and San Joaquin rivers and their tributaries, including the Feather River below the Oroville facilities. FRFH steelhead are also included in this designation. The current Feather River steelhead population is nearly entirely supported by FRFH and is restricted to the river reaches downstream of the Fish Barrier Dam (RM 67).

Steelhead populations inhabiting the Feather River belong to the CCV steelhead DPS as defined by Good *et al*. (2005). These steelhead populations generally exhibit a life history pattern typical of a fall/winter run. Most of the steelhead in the Feather River spawn in the hatchery, although some spawn in the LFC. During 2003, spawning began in late December, peaked in late January, and was essentially complete by the end of March. In 2003, 48 percent of all redds were in the upper 1 mile of the river between the Table Mountain Bicycle Bridge and lower Auditorium Riffle (Kindopp and Kurth 2003). RST monitoring indicates steelhead fry are present in the river as early as March and young steelhead rear through summer at suitable locations throughout the LFC, primarily along the margins of the channels with riparian cover and in secondary channels with riparian cover (Cavallo *et al*. 2003; U.S. Bureau of Reclamation 2008). The highest densities of steelhead fry were observed at the upstream end of the LFC and in the Hatchery Side Channel fed by hatchery discharge.

Historically, the Feather River supported a large steelhead population (McEwan and Jackson 1996). Today, the run is supported nearly entirely by FRFH, which produces approximately 450,000 yearling steelhead each year to mitigate Oroville Dam operations and losses at the SWP Delta facilities. Because steelhead have spawning and rearing preferences similar to spring-run Chinook salmon, the two species are believed to have occupied the same areas with the exception that steelhead are thought to have migrated farther upstream in the watershed (DWR 2007). Because of the construction and operation of hydropower projects, including the Oroville

facilities (*i.e.*, Oroville Dam and the Fish Barrier Dam), the upper Feather River basin is no longer accessible to steelhead. FRFH was designed and is operated to replace steelhead production loss attributable to the construction of the Oroville facilities.

Adult steelhead migration within the Feather River generally follows a pattern similar to that found in the rest of the Sacramento basin, beginning in July–August and peaking in late September and October. Feather River counts indicate that migration might continue for 1 to 2 months later than observed elsewhere in the Sacramento system, into April and May (Painter *et al* 1997; Reclamation 2004). Based on the literature on water temperatures for migration and holding, the optimal range is from 46.0 to 52.0°F (7.8 to 11.1°C) (NMFS 2000; NMFS 2002). DWR (2007) provides that the preferred range for immigration is between 46°F and 56°F (~7.8 and 13.3ºC). Water temperatures greater than 69.8°F (~21ºC) create migration barriers to steelhead (McCullough *et al*. 2001).

In the Feather River, steelhead spawning and embryo incubation extends from December through May, with peak spawning occurring in January and February (Busby *et al*. 1996: Moyle 2002). Steelhead spawn in the Feather River between December and March, with peak spawning in late January (DWR 2007). Most of the naturally spawning steelhead in the Feather River spawn in the LFC, particularly in its upper reaches near Hatchery Ditch, a side channel located between RM 66 and 67 and between the Table Mountain Bicycle Bridge and lower Auditorium Riffle. Flows in Hatchery Ditch are fed by a natural spring and discharge from FRFH. Limited spawning has also been observed below the Thermalito Afterbay Outlet. The smaller substrate size and greater amount of cover (compared to that in the main river channel) also make these side channels more suitable for juvenile steelhead rearing (see below). Currently, this type ideal of habitat makes up less than 1 percent of the available habitat in the LFC (DWR 2007). Optimal water temperatures for spawning and egg incubation are between 45 and 53°F (~7.2 and 11.7ºC). Newly hatched steelhead alevins remain in the gravel from 2 to 6 weeks (Moyle 2002).

Juvenile steelhead rear within the secondary channels of the LFC of the Feather River (DWR 2005, DWR 2007). There is a lack of in-river steelhead density data for both first and second year steelhead juveniles. DWR has collected presence absence and habitat use data for juveniles (DWR 2010) and found that steelhead juveniles utilize the LFC for rearing, particularly the edge areas that area shaded more heavily. Lower velocities, smaller substrate size, and greater amount of cover (compared to that in the main river channel) make these side channels more suitable for juvenile steelhead rearing (FERC 2007). The optimal water temperature range for steelhead fry and juvenile development is 65°F (18.3°C) or less, although some researchers have reported preferred ranges as high as 68° F (20.09°C) (DWR 2007).

Most naturally produced CCV steelhead rear in fresh water for two years before emigration (McEwan and Jackson 1996). Feather River steelhead generally emigrate from about February through September, with peak emigration from March through mid-April; however, empirical and observational data show that juvenile steelhead potentially emigrate during all months of the year in the Feather River. Water temperatures of 54°F (12.2°C) or less are considered optimal for smolting and emigrating steelhead.

b. Factors Affecting the Status of California Central Valley Steelhead in the Action Area

As discussed below, the factors affecting CV spring-run Chinook salmon and CCV steelhead are common to both species and are treated together here, except as further specified in factors affecting steelhead. Existing conditions affecting listed species and critical habitat in the action area are influenced by result of SWP operations of the Oroville facilities (Lake Oroville, Thermalito Complex, FRFH, etc.), requirements of the existing FERC license, and other environmental commitments of DWR associated with water rights, temperature requirements, recreational programs, or fish and wildlife management programs.

c. Likelihood of Viability of California Central Valley Steelhead in the Action Area

The viability of CCV steelhead has been reduced because of habitat loss and 40 years of hatchery operations resulting in a loss of genetic diversity and fitness. Hatchery steelhead captured in the river form a homogeneous group with steelhead captured in the hatchery, which shows that the naturally spawning population is not independent of the hatchery spawners. The viability of this population will remain dependent on the hatchery until hatchery genetic management plans are fully implemented and additional spawning and rearing habitat are created in the LFC.

3. Southern DPS of North American Green Sturgeon

a. Status in the Action Area

Adult green sturgeon currently occupy the lower Feather River downstream from Oroville Dam (Beamesderfer *et al*. 2004). Based on observations of adults, new information is available that indicates that spawning may have occurred historically in the lower Feather River, however, since a substantial amount of potential habitat in the Feather River was lost with the construction of Oroville Dam (Beamesderfer 2009), it is unclear what if any spawning is occurring on the Feather River currently. Significant usable habitat, while modified, remains accessible downstream from the Thermalito After bay Outlet (DWR 2004a). USFWS (1995b) previously concluded that "evidence also suggests that sturgeon reproduction occurs in both the Feather and Bear rivers." The NMFS BRT (2005) assumed that a similar conclusion could be made for green sturgeon in the face of the paucity of data. During 2011, DWR confirmed green sturgeon spawn in the lower Feather River below the Thermalito Afterbay Outlet; fertilized eggs were collected at the Thermalito Afterbay Outlet using artificial substrates.

Habitat investigations by DWR on the lower Feather River indicate that that there are up to 12 deep holes and over 13 miles of habitat from the Thermalito Afterbay Outlet downstream to RM 54, with characteristics capable of attracting green sturgeon (Seesholtz 2003). Seven of these holes are greater than 5 meters deep, and five of the pools are between 3 and 5 meters (Figure 3). In the action area there is only one channel section that is deep enough to attract green sturgeon past the Thermalito Afterbay Outlet. Other areas are too shallow (< one meter deep) and green sturgeon would not utilize that habitat for rearing, spawning or feeding. In the past four years DWR has been running DIDSON sonar to locate green sturgeon in the Lower Feather River. Although adults have been documented, juveniles are not documented, so NMFS assumes, for the purposes of this BO, that while juveniles may be present in the system, that the action area is

not being utilized as rearing or as spawning habitat for juvenile green sturgeon. There are numerous accounts of adult sturgeon being captured or observed by anglers and DWR fisheries scientists throughout the Lower Feather River, including the LFC and the HFC below the action area. Within and above the action area, there has been only one account of green sturgeon by DWR scientists in the past twelve years (DWR 2012).

The earliest historical account known to NMFS is a 1910 newspaper report of two sturgeon captured in the Feather River near Oroville in August of that year and one from the year prior but also in August. The sturgeon were 60, 120 and 273 pounds; and the report of the largest fish was accompanied by a photograph which clearly shows the fish to be a post-spawn green sturgeon (David Woodbury, NMFS, pers. com., 2011). In the mid-70s, green sturgeon were caught each year on the Feather River, with the majority of catches occurring from March to May and a few additional catches occurring in July and August (USFWS 1995). In 1993, seven adult green

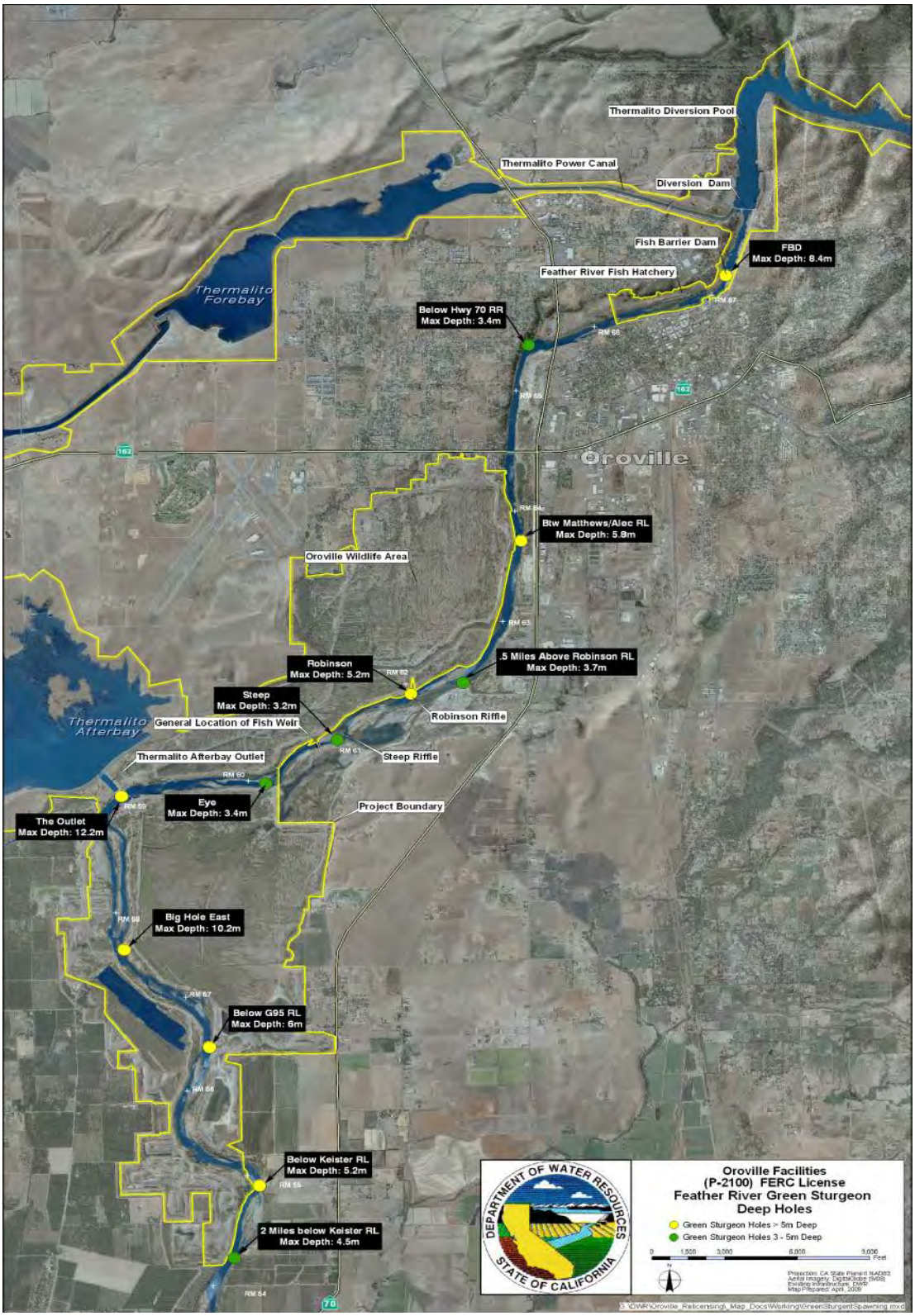


Figure 3. Map of deep holes in the Feather River capable of supporting green sturgeon**.**

sturgeon were captured at the Thermalito Afterbay outlet, ranging in size from 60.9 to more than 73.2 inches (USFWS 1995). In a broad scale survey from 1999 to 2001, green sturgeon were infrequently observed downstream of the Thermalito Afterbay Outlet (above the action area) and none observed upstream (DWR 2004d). There are also unconfirmed reports that green sturgeon may spawn in the Feather River at and below the Thermalito Afterbay Outlet during high flow years (CDFG 2002). In 2006, four green sturgeon were positively identified by DWR biologists at or below the Thermalito Afterbay Outlet. Eight additional sturgeon were also observed in the same area but could not be positively identified as green sturgeon (DWR 2007).

In recent years, as sturgeon monitoring has increased in the Central Valley, more information about sturgeon in the Feather River has become available (Seesholtz 2011). In 2008 and 2010, two green sturgeon tagged with VEMCO acoustic tags were detected in the river. The first was recorded at Beer Can Beach (River kilometer (Rkm) 14) from May 15-18, 2008. Discharge in this area was about 2,100 cfs. The female left the system and was detected in the Sacramento River among the spawning grounds. On February 4, 2010, the second fish was detected at Star Bend (Rkm 29), stayed for several hours, and then it also migrated to the Sacramento River. Discharge in this area was about 2,700 cfs. Previous studies suggested at least 5,100 cfs was needed at Shanghai Bench in order for sturgeon passage (Seesholtz 2010). However, Shanghai Bench was breached during the 2011-2012 winter months and no longer appears to be a fish passage issue.

DIDSON surveys were conducted February 22 through November 3, 2011. Initial analysis suggests 137 sturgeon were observed between April 11 and September 8. The majority of sightings (n = 75) occurred in April with a "population estimate" of 21-28 sturgeon. One white sturgeon DWR identified was captured by an angler just upstream of the confluence with the Bear River (Rkm 21). The majority of sturgeon identified by DWR staff have been green sturgeon. One sturgeon (species unknown) was located with the DIDSON in the pool downstream of the Fish Barrier Dam (Rkm 108) in the LFC. Discharge in the LFC was as high as 12,000 cfs in March. Approximately a dozen sturgeon were recorded around the Thermalito Afterbay Outlet Pool (Rkm 95). Another 20-25 sturgeon were located in the pool below Sunset Pumps (Rkm 61) which is downstream of the Oroville Facilities FERC Boundary about 25 river kilometers (Figure 3). Currently underwater video deployed in these areas to help determine species identification suggests the majority are green sturgeon; no whites have been identified with this method yet. Two green sturgeon were acoustically tagged (July 20 and August 18, respectively) at the Thermalito Afterbay Outlet. One green sturgeon emigrated on September 6 and the other on October 4. One white sturgeon was acoustically tagged on July 1 and emigrated on December 25.

Specific spawning locations for green sturgeon in the Feather River are unknown, but the most suitable habitat occurs in the area from Thermalito Afterbay Outlet downstream to near the Gridley Bridge (USFWS 1995b). In 2011, DWR detected successful green sturgeon spawning on artificial mats near the Thermalito Afterbay Outlet Pool:

> *"A total of 13 eggs were positively identified as green sturgeon, based on egg size, color and thickness of the egg chorion. The eggs collected are likely from 3 females, based on date/time of captures, water temperature, different stages of*

development and the assumption that it takes a female up to 20 hours to release all its eggs. The samples collected on 6/22 could have been from a female #4 but because it is not perfectly clear I would be conservative and say that these eggs came from at least 3 different females. There is a possibility that female #3 was large and spawned into 6/19 night time and that these eggs were moved around and stuck to the mat after being replaced on 6/20…" (Seesholtz 2011)

b. Factors Affecting the Status of North American Green Sturgeon in the Action Area

The baseline stress regime in the action area is reflective of the history of water development and habitat modification that has been in place since 1968 with the completion of the Oroville Facilities. The facilities block fish passage, regulate flows and water temperatures, and alter the geomorphic processes of physical habitat development and change. Other stressors are related to introduced predatory fish species which are present throughout the Lower Feather River, but more predominant downstream from Gridley, near RM 50; and sportfishing, which also occurs throughout the river, but can be very high at the Thermalito Afterbay Outlet pool, where most green sturgeon are encountered on the Feather River.

Fish Passage and Habitat Availability - The construction of Oroville Dam has blocked green sturgeon access to what were likely historic spawning grounds upstream (USFWS 1995b; Mora *et al*. 2009) and has altered habitat conditions below the dam for adult migration, spawning, and juvenile rearing.

Potential natural and man-made passage barriers in the lower Feather River may limit movement of sturgeon into the Feather River during low-flow years (Beamesderfer *et al.* 2004). Potential barriers include an artificial rock weir structure at Sunset Pumps (RM 39) and Steep Riffle (RM 61), a natural feature (CDWR 2003). At low flow conditions, the Sunset Pumps is likely a sturgeon passage barrier because of the height of their waterfalls, water velocities of the mid-channel chute, and/or lack of attraction flow within the potentially passable side channel. Steep Riffle represented the most reasonable passable potential barrier during representative low-flow and high-flow conditions. Passage determinations at each of the potential passage barriers in the lower Feather River would continue to be speculative without a greater understanding of sturgeon migration patterns and physiologic limitations (CDWR 2003), and changes in water elevations and bed load transport since dam construction (Beamesderfer 2009).

DWR has shown that while impoundments may prevent access to historical habitat, new habitat has also been created downstream of the dams, by the discharge of water that is colder than historical water temperatures, particularly during the summer months when early life stages would be present (DWR 2004b). The quantity and quality of this habitat is directly affected by river flows and water temperatures associated with the operation of the Oroville Facilities.

Flows - Low flow rates affect adult passage and migration and may cause fish to stop their upstream migration or may delay access to spawning habitats. Flow rates can affect survival by affecting the dispersal of larvae to areas of greater food availability, the dispersal of larvae to all available habitats, the transportation of larvae downstream of water diversions in the Delta, or nutrient supply to the nursery areas (CDFG 1992). Good recruitment of juvenile white sturgeon

in the Delta was observed during years where the mean monthly February through May flows ranged from 3,488 to 20,505 cfs at Gridley, and 7,028 to 35,234 cfs at Nicolaus (USFWS 1995b). These conditions correlate with wet and above average water year types; conditions that are known to be important to the production and abundance of green sturgeon.

Water Temperatures - Currently, water temperatures in the Lower Feather River are capable of supporting green sturgeon spawning during much of the spawning period, including what is considered the peak spawning period in April and May. From 1964 to 1994, water temperatures were within the optimal range for spawning 99 percent of the time from March through April from RM 67 downstream to RM 38.9 at the Sunset Pumps, a distance of approximately 28 RMs. During May, approximately 16 miles of habitat is within optimal ranges for 95 percent of days. Daily average water temperatures tend to be warmer in June, but are within optimal ranges for 88 percent of days at RM 54, and up to 82 percent of days at the Gridley Bridge (RM 51). During wet and above average, the conditions are much improved when optimal spawning temperatures in June are exceeded for only 11 to 15 percent of days downstream to RM 54 and 51, respectively (DWR 2009).

Non-native Species - Several non-native species that have been introduced into the system out-compete the native species, causing a replacement in the food sources available to green sturgeon. Green sturgeon juveniles and other juvenile fish may also experience predation by introduced species, including striped bass.

Sportfishing - Green sturgeon may be susceptible to sportfishing mortality. When harvest rates are high, population recovery is slow because of the green sturgeon's slow growth rate, long life span, and age at first spawn. Protective fishing regulations are now in place that prohibit green sturgeon harvest. In response to evidence of recent sturgeon declines, the CFGC approved CDFG proposed recreational fishing regulation changes for sturgeon on December 8, 2006. The regulations, effective March 1, 2007, prohibit retention of green sturgeon, alter the slot (size) limit and bag limit (three individuals) for white sturgeon, and require implementation of a sturgeon report card system.

Water Diversions and Exports - The threat of screened and unscreened agricultural, and municipal and industrial (M&I) water diversions below the action area are largely unknown since juvenile sturgeon are often not identified, and current NMFS and CDFG screen criteria have not been specifically formulated to protect sturgeon. Because of the temporal occurrence of juvenile green sturgeon and the high density of water diversion structures along rearing and migration routes, a potential threat exists to green sturgeon.

Climate Change – The anticipated effects of climate change were previously described in the *Factors Affecting the Status of Central Valley Spring-run Chinook Salmon and Central Valley Steelhead in the Action Area* in this section of the BO. The stressors are expected to affect green sturgeon in a similar manner by increasing water temperatures and decreasing the quantity and quality of cold water available to the species during critical life history periods such as spawning, larval development and early rearing.

c. *Likelihood of the Continued Existence of North American Green Sturgeon in the Action Area*

The best available information shows that green sturgeon habitat in the Feather River was lost with the construction of Oroville Dam (NMFS 2005), and green sturgeon have been displaced to downstream habitat, primarily below the Thermalito Afterbay Outlet (DWR 2007). There is uncertainty regarding the status of green sturgeon in the Feather River, but the limited available information shows that green sturgeon are present in the Feather River utilizing deep holes during the spawning period, and that the Lower Feather River contains pools of sufficient depth, velocity, and water temperature to support spawning, egg incubation and early juvenile rearing. This information shows that in spite of the habitat loss and exposure to a changed flow regime, suitable conditions exist in wet and above average water years, which are important water year types for green sturgeon reproduction and abundance, and that green sturgeon are likely to continue to exist in the Feather River. With regard to the action area itself, there is only one documented green sturgeon within the action area so it is possible that green sturgeon utilize the action area, on the south side of the Feather river, where the channel is deep enough for them to pass, for migration. NMFS the action area's value is its potential to provide a migratory area which would provide increased connectivity to other Feather River habitat which increases resiliency of the DPS.

d. Importance of the Action Area to the Survival and Recovery of the Southern DPS of North American Green Sturgeon

Much of the information that is available for the Southern DPS of North American green sturgeon indicates that the main stem Sacramento River provides the most valuable spawning and rearing habitat for this species (NMFS 2005). There is uncertainty regarding the status of North American green sturgeon population in the Feather River. In recent years there are numerous accounts of habitat utilization and spawning on artificial substrate below the action area. There is only one documented green sturgeon within the action area so it is possible that green sturgeon utilize the action area, on the south side of the Feather river, where the channel is deep enough for them to pass, for migration.

The lower Feather River below the action area is designated as having a high conservation value to the DPS because it is consistently occupied by the species, it most likely contains spawning habitat and other PCEs that support several freshwater life history stages, the lower Feather River is a potential second spawning area in addition to the Sacramento River, and future habitat improvements are likely to have added value to the conservation of the species. NMFS concludes that the value of the habitat in the action area is significant because it has the potential to provide a migratory area which would provide increased connectivity to other Feather River habitat which increases resiliency of the DPS.

B. Status of the Critical Habitat in the Action Area

1. <u>Baseline for the Project</u>

The lower Feather River flows about 72 miles (115.9 km) from Oroville Dam to the Sacramento River at Verona. In Oroville, the Feather River emerges from the Sierra Nevada into the

foothills of the Sacramento Valley. At about 0.75 mile (1.2 km) below the Diversion Dam, at the first major spawning riffle, bedrock is still exposed in the channel. Below Bedrock Park (just downstream of the action area), the river begins to flow in an incised alluvial channel through older alluvial uplands. The Oroville Wildlife Area, consisting of dredger tailings and borrow pits, spans from a few miles below Oroville to a few miles above Gridley. Downstream of the dredger tailings, the river meanders through hydraulic mining debris, floodplain deposits, and older terrace deposits.

Regionally, the topography trends downhill towards the center of the San Joaquin Valley (SJV) from the Sierra foothills to the east. The SJV generally trends downhill to the southwest towards the San Joaquin-Sacramento River Delta, approximately 60 miles to the southwest of the site.

In the action area, the project site topography is relatively level within the developed portions of the Cities of Marysville and Yuba City. However raised levees have been constructed along the Feather River to add flood protection for the developments within Marysville and Yuba City. The project also includes raised embankments for the 5th Street Bridge structure and adjacent railroad bridge, on the east and west banks of the Feather River within the biological study area.

The project elevations generally range between approximately 60- to 65-feet above mean sea level within the Cities of Marysville and Yuba City, with the levees and 5th Street Bridge embankments ranging up to approximately 15- to 20-feet above the surrounding areas.
The area has a Mediterranean climate with cool, wet winters and hot, dry summers. It rains approximately 28 inches (711 mm) annually, most of which falls between October and March.

2. Hydrology and Water Quality

The action area is on the Feather River downstream of Oroville Dam where flows are controlled by Oroville Dam, which is a major storage reservoir that is part of the SWP. The Oroville facilities were developed as part of the SWP and comprise a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants. The main purpose of the SWP is to store and distribute water to supplement the needs of urban and agricultural water users in northern California, the San Francisco Bay area, the SJV, and southern California. The Oroville facilities are also operated for flood management and power generation, to improve water quality in the Delta and provide recreation, and to enhance fish and wildlife (DWR 2004e).

An August 1983 agreement between DWR and CDFG entitled, “Agreement Concerning the Operation of the Oroville Division of the SWP for Management of Fish & Wildlife,” sets criteria and objectives for flow and temperatures in the LFC and the reach of the Feather River between Thermalito Afterbay and Verona. This agreement requires flow changes under 2,500 cfs to be reduced by no more than 200 cfs during any 24-hour period, except for flood management, failures, etc. and:

(1) requires flow stability during the peak of the fall-run Chinook spawning season;

(2) sets an objective of suitable temperature conditions during fall for salmon and during later spring/summer for shad and striped bass. In general, flows in the action area are strictly regulated and typically stable throughout the year; and

(3) establishes minimum flows between Thermalito Afterbay outlet and Verona, which vary by water-year type.

Water temperatures in the Feather River downstream of Oroville Dam are largely controlled by temperature requirements at FRFH. Water is released from Oroville Dam to meet these hatchery temperature requirements, as well as those of NMFS at Robinson's Riffle as per the SA for Oroville, while also conserving the cold water pool in Lake Oroville. Water is released from Lake Oroville that is as close as possible to the maximum temperature allowable under the 1983 agreement with CDFG to accommodate temperature requirements, as much as possible, for the warmer water needs of irrigation. Deliveries from the reservoir are governed by the water-year type. In drier years, deliveries to water contractors are reduced so that carryover storage is increased and water can be conserved for critical in-stream needs (DWR 2004e).

To protect CV spring-run Chinook salmon and CCV steelhead, DWR is required as part of their FERC license to maintain daily average water temperatures equal to or less than 65°F (18.3°C) at Feather River RM 61.6 from June 1 through September 30 (NMFS 2009c). The Diversion Pool provides the water supply for FRFH (both upstream of the action area). The hatchery objectives are 52°F (11.1°C) for September, 51°F (10.6°C) for October and November, 55°F (12.8°C) for December through March, 51°F (10.6°C) for April through May 15, 55°F (12.8°C) for the last half of May, 56°F (13.3°C) for June 1–15, 60°F (15.6°C) for June 16 through August 15, and 58°F (14.4°C) for August 16–31. A temperature range of plus or minus 4°F (±15.6°C) is allowed for objectives for April through November. There are also several seasonal temperature objectives for the Feather River downstream of the Afterbay outlet. Water temperatures in the Feather River typically meet objectives to protect salmonids; however, exceedance curves show that temperature objectives are periodically exceeded for short durations (DWR 2004g).

Construction and operation of the Oroville facilities affect the physical, chemical, and biological characteristics of water in the Feather River; however, data indicate that water quality in the action area is generally good (DWR 2004g). According to relicensing studies, DO, nutrients, and mineral levels in the Feather River were only infrequently found at levels unsuitable to maintain beneficial conditions for fish Turbidity levels in the river downstream of the dam are lower than those measured in tributaries to Lake Oroville. Farther downstream, accretions to the river from tributaries, storm drains, surface runoff, and other sources affect water quality in the river. Metals occasionally exceeding various criteria in the Feather River downstream of Fish Barrier Dam include aluminum, arsenic, cadmium, copper, iron, and mercury (DWR 2004g). The Feather River does have designated segments listed as water quality limited according to the Clean Water Act 303(d) for chlorpyrifos, Group A pesticides, mercury, and unknown toxicity (CVRWCQB 2008).

3. Central Valley Spring-run Chinook Salmon Critical Habitat

a. Delineation of Critical Habitat for Central Valley Spring-run Chinook Salmon in the Action Area

A final critical habitat designation for CV spring-run Chinook salmon was published on September 2, 2005, and became effective on January 2, 2006. The Feather River downstream of Oroville Dam is designated critical habitat for CV spring-run Chinook salmon; the area described above as the action area is included in this designation.

b. Status of Critical Habitat Primary Constituent Elements for CV Spring-run Chinook Salmon in the Action Area

The critical habitat designation also describes physical and biological PCEs which are essential for the conservation of CV spring-run Chinook salmon. Within the action area these PCE's are: (1) freshwater spawning areas; (2) freshwater rearing areas; and (3) a freshwater migration corridor.

Adult Migratory Corridors - The biological value of adult migration corridors from the Feather River downstream through the Delta is impaired by the alteration (reduction) of the natural hydrograph. The hydrograph may delay migration timing of adults through reductions in flow related stimuli, but probably does not prevent them from accessing upstream spawning areas.

Spawning Habitat - The biological value of spawning habitat is affected by water temperature, flow-related habitat availability, and bed load supply and transport characteristics associated with the past and present effects of Oroville Dam The habitat also is affected by the co-occurrence of fall-run Chinook salmon that utilize the same habitat and cause redd superimposition and egg mortality.

Rearing Habitat and Juvenile Migratory Corridors - The biological value of juvenile rearing corridors are affected by water temperature and flow-related habitat availability. Predation by introduced fish in the lower river also affects the value of critical habitat.

Although habitat conditions within the action area are degraded, the importance of this area for the conservation of CV spring-run Chinook salmon is considered to be high. This is mainly due to the fact that there is very little suitable spring-run Chinook salmon habitat remaining in the CV and any habitat that is currently available is essential for sustaining the ESU.

4. CCV steelhead Critical Habitat

a. Delineation of Critical Habitat for Central Valley Steelhead in the Action Area

Critical habitat for CCV steelhead includes the Feather River from its confluence with the Thermolito Afterbay outlet pool upstream to the Fish Barrier Dam at RM 67; the area described above as the action area is included in this designation. The critical habitat designation also describes physical and biological PCE's which are essential for the conservation of steelhead.

Within the Feather River these PCE's include: (1) freshwater spawning areas; (2) freshwater rearing areas; and (3) a freshwater migration corridor. Although habitat conditions within the action area are degraded, the importance of this area for the conservation of CCV steelhead is considered to be high due to the fact that there is very little suitable steelhead habitat remaining in the CV and any habitat that is currently available is essential for sustaining the DPS.

b. Status of Critical Habitat PCEs for CV Steelhead in the Action Area

Adult Migratory Corridors - The biological value of adult migration corridors from the Feather River downstream through the Delta is impaired by the alteration (reduction) of the natural hydrograph.

Spawning Habitat - The biological value of spawning habitat is affected by water temperature, flow-related habitat availability, and bed load supply and transport characteristics associated with the past and present effects of Oroville Dam.

Rearing Habitat and Juvenile Migratory Corridors - The biological value of juvenile rearing corridors are affected by water temperature and flow-related habitat availability. Predation by introduced fish in the lower river also affects the value of critical habitat.

c. Summary of Critical Habitat for CV Steelhead in the Action Area

Although habitat conditions within the action area are degraded, the importance of this area for the conservation of CCV steelhead is considered to be high.

5. North American Green Sturgeon Critical Habitat

a. Delineation of Critical Habitat for North American Green Sturgeon in the Action Area

Critical habitat has recently been designated for the Southern DPS of North American green sturgeon and includes riverine habitat from the Feather River's confluence with the Sacramento River, upstream to the furthest accessible point below Oroville Dam, the Fish Barrier Dam; the area described above as the action area is included in this designation. The riverine specific areas include areas that offer at least periodic passage of Southern DPS green sturgeon to upstream sites and include suitable habitat necessary for each riverine life stage (*e.g.*, spawning, egg incubation, larval rearing, juvenile feeding, passage throughout the river, and/or passage into and out of estuarine or marine habitat).

b. Status of Critical Habitat Primary Constituent Elements for North American Green Sturgeon in the Action Area

Food Resources - The food resource needs for green sturgeon were described in detail in the *Status of the Species* section of this BO. Strong hatches of mayflies, caddis flies, and chironomids occur in the lower Feather River, indicating that these groups of invertebrates are present in the river system. NMFS anticipates that the aquatic life stages of these insects

(nymphs, larvae) would provide adequate nutritional resources for green sturgeon rearing in the river.

Substrate Type or Size - The substrate requirement for green sturgeon were described in detail in the *Status of the Species* section of this BO. Observations of channel type and substrate compositions during these surveys indicate that appropriate substrate is available in the Feather River downstream from Oroville Dam.

Water Flow - The flow requirements for green sturgeon were described in detail in the *Status of the Species* section of this BO. The current suitability of these flow requirements in the Feather River is almost entirely dependent on releases from Oroville Dam and the Thermalito Afterbay. High spring flows associated with the natural hydrograph do not occur within the section of the river utilized by green sturgeon with the frequency and duration that was seen in pre-dam conditions, but sufficient flow conditions exist to allow green sturgeon to migrate upstream even in dry water year types, as evidenced by the observation of adult green sturgeon in the upper river reaches below the Fish Barrier Dam and at the Thermalito Afterbay Outlet.

Water Quality - The water quality needs of green sturgeon were described in detail in the *Status of the Species* section of this BO. Adequate water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages are required for the properly functioning of the freshwater habitat. Temperatures in the lower Feather River are colder than they were historically, but are now influenced by the operation of Oroville Dam.

Migratory Corridor - The migration needs of green sturgeon were described in detail in the *Status of the Species* section of this BO. Safe and unobstructed migratory pathways are necessary for passage within riverine habitats and between riverine and estuarine habitats (*e.g.*, an unobstructed river or dammed river that still allows for passage). Green sturgeon adults are blocked by Oroville dam, and may be impeded at other locations in the lower Feather River during low flows (USFWS 1995b). However, sufficient flow conditions that allow green sturgeon to pass these areas occur during the migration period as evidenced by the observation of adult green sturgeon in the upper river reaches below the Fish Barrier Dam and Thermalito Afterbay Outlet in different water year types, including dry years.

Depth - The depth requirement of green sturgeon were described in detail in the *Status of the Species* section of this BO. Pool depths of 3 m to greater than 5 m are critical for adult green sturgeon spawning and for summer holding. Specific spawning locations for green sturgeon in the Feather River are unknown, but are probably limited to the area from Thermalito Afterbay outlet, downstream to near the Gridley Bridge (USFWS 1995b, Seesholtz 2003). More recent investigations of suitable deep pools indicate that there are up to 12 deep holes over 13 miles of habitat from the Fish Barrier Dam at RM 67 downstream to RM 54, with characteristics capable of attracting green sturgeon. Seven of these holes are greater than 5 meters deep, and 5 of the pools are between 3 and 5 meters. The total area of the pools is greater than 164,500 m^2.

c. Summary of Critical Habitat for North American Green Sturgeon in the Action Area

The migratory corridor, spawning habitat, food resource, temperature, flow, and other PCEs appear suitable to support several life history stages of green sturgeon including adult migration and possibly juvenile rearing and development. The Feather River has a high conservation value for green sturgeon because it provides further habitat besides the Sacramento River as a refugia, holding and/or spawning area; within the action area, relevant value for green sturgeon relates to adult migratory corridor and adult feeding.

6. Key Factors Affecting Listed Species and Critical Habitat in the Action Area

Apart from the operation of the Oroville facilities under the current license and agreements, other factors contribute to the status of listed species and their critical habitat. These include: (1) fish passage (*e.g.* loss of access to historical habitats upstream); (2) susceptibility to disease; (3) minimum in-stream flows, ramping rates, and water temperature requirements in the Feather River below Oroville Dam; (4) water quality; (5) in-stream habitat availability and quality (specifically, limited spawning habitat below Fish Barrier Dam); (6) FRFH operations; (7) straying and genetic introgression; (8) water diversions; (9) commercial and sport harvest; and (10) ocean survival.

Fish Passage - Fish Barrier Dam just downstream of Thermalito Diversion Dam is currently the farthest point on the Feather River that Chinook salmon can migrate upstream. As a result, and because of the limited suitable spawning and rearing habitat currently available on the Feather River downstream of Fish Barrier Dam, spring- and fall-run Chinook salmon are forced to occupy the same locations. This results in: (1) competition for spawning and rearing habitats; and (2) genetic introgression between the two Chinook salmon races.

Even if fish passage were provided past the Oroville facilities, loss of access to historical spawning and rearing habitats upstream of them would be expected to continue into the foreseeable future because of the significant extent of upstream hydroelectric projects that begin at the upstream extent of the Project facilities at Lake Oroville, and extend into the upper watersheds of all main forks of the Feather River and their tributaries.

Susceptibility to Disease - A number of factors such as fish species, fish densities, the presence and amounts of pathogens in the environment, and water quality conditions (*e.g*., temperature, DO, and pH) relate to the susceptibility of listed species to disease within the action area. The Oroville facilities and associated programs have affected all of these factors since operations began and are expected to continue to do so into the foreseeable future.

There are several endemic salmonid pathogens in the Feather River basin, including *Ceratomyxa shasta* (salmonids ceratomyxosis), Columnaris Disease, the infectious hematopoietic necrosis (IHN) virus, *Renibacterium salmoninarum* (bacterial kidney disease [BKD]), and *F. psychrophilum* (cold water disease) (DWR 2004b). Although all of these pathogens occur naturally in the Feather River basin, the Oroville facilities might have produced environmental conditions that are more favorable than under historical conditions. Such conditions include: (1) impediments to upstream migration altering timing, frequency, and duration of exposure of

anadromous salmonids to certain pathogens; (2) inadvertent introduction of foreign diseases through out-of-basin transplants as part of the Lake Oroville Fishery Improvement Program; (3) the transmission of disease from FRFH fish to wild or natural populations of listed salmonids; and (4) water transfers, pump-back operations, and flow manipulation resulting in changes in water quality conditions (*e.g.*, temperatures, DO, pH, etc.).

FRFH has recently implemented disinfecting procedures as part of normal operations to minimize both the outbreak of disease in the hatchery and the possibility of disease transmission to wild or natural fish populations in the Feather River. Although 18 percent of the adult salmon returning to the Feather River were found to be infected with IHN, no clinical signs of disease were present. Field surveys found that IHN was not present in juvenile salmonids, or other fish, in the Feather River (DWR 2004b, 2007). CDFG pathologists hypothesized that recent IHN epizootics at FRFH were the result of planting Chinook salmon in Lake Oroville (which is the hatchery's water supply). No additional epizootics have occurred since planting Chinook salmon in Lake Oroville was stopped in 2002. In general, the cause of specific disease outbreaks in the Feather River is poorly understood.

Minimum Instream Flows - Minimum flows in the Feather River originally were set by an agreement between DWR and CDFG in 1983. The agreement, titled "Concerning the Operation of the Oroville Division of the State Water Project for Management of Fish and Wildlife," established criteria for flow and water temperature in the LFC and the reach of the Feather River downstream of the Thermalito Afterbay outlet to the confluence with the Sacramento River to preserve salmon spawning and rearing habitat. The agreement specifies a minimum release of 600 cfs into the Feather River from the Thermalito diversion dam for fisheries purposes when surface elevations of Lake Oroville are below 733 feet (223 m) msl. (This is the total volume of flows from the diversion dam outlet, the diversion dam power plant, and the FRFH outlet). When Lake Oroville surface elevation is greater than 733 feet (223 m) msl, the minimum instream flow requirements on the Feather River, downstream of the Thermalito Afterbay outlet, range from 1,000 to 1,700 cfs depending on unimpaired runoff. These flows are requirements of the existing project license.

Spawning flows - Under the DWR/CDFG agreement, if the hourly flow exceeds 2,500 cfs at any time between October 15 and November 30, DWR must maintain a flow equal to that hourly flow amount less 500 cfs until the following March, unless the high flow was a result of flood management operations or mechanical problems. This requirement ensures flow levels are high enough to keep the overbank areas submerged to protect any fish spawning that could occur. In practice, the flows are maintained at below 2,500 cfs from October 15 to November 30 to prevent fish from spawning in the overbank areas.

Ramping Rates - Ramping rates are not required by the existing FERC license, but the rates that are proposed as part of the new license have been maintained in practice since 2004.

Temperature - The operation of the Oroville facilities directly affects water temperatures in the lower Feather River where the project will occur. Water is released from Lake Oroville into the Feather River and FRFH. During summer months, water is released from the coldwater pool below the thermocline in Lake Oroville such that optimal temperatures supporting Chinook

salmon and steelhead are maintained. Water temperature objectives at FRFH and Robinson Riffle have been pursued since 2004. The diversion of water through the Thermalito complex can warm water as much as 6°F (14°C) and significantly reduces the amount of coldwater habitat available in the Feather River.

In addition, other FERC-licensed projects in the upper Feather River can influence the water temperature in FRFH and the LFC. The South Feather Power Project discharges water in the lower Feather River immediately downstream of Oroville Dam and affects water temperatures at FRFH and the LFC. Water is diverted from the south Feather River at Ponderosa Dam, and conveyed through a tunnel and conduit to Miner's Ranch Reservoir, and then through a tunnel and penstock to the Kelly Ridge Powerhouse, through which up to 260 cfs is discharged to the Feather River downstream of Oroville Dam. Data and analyses indicate the flows diverted at Ponderosa Dam experience heating in transit to Kelly Ridge Powerhouse, especially within Miner's Ranch Reservoir. The temperatures of the Kelly Ridge discharges are of greatest concern from summer through fall (August through October) because: (1) this interval is critical for anadromous fish holding, spawning, and incubation in the Feather River; (2) the intake of water to FRFH is from the Thermolito Diversion Pool, and cold water requirements must be maintained; (3) colder releases through Hyatt Powerhouse (Oroville Project) are reduced or periodically halted as Lake Oroville elevations fall in late summer and fall, and as consumptive needs and power demands decrease; and (4) late-summer or fall meteorological conditions (heat storms) might cause appreciable heating in FRFH and the LFC.

Water Quality - Water quality parameters that might affect fish species within the Feather River basin include: (1) DO and pH; (2) levels of turbidity and total suspended solids (TSS); (3) metals, petroleum byproducts; (4) pesticide concentrations; and (5) nutrient concentrations. The CVRWQCB has listed the lower Feather River as impaired by sources of mercury, certain pesticides, and toxins of unknown origin (DWR 2007).

Findings and other pertinent information related to monitored water quality parameters have been reported by DWR (2004c). For the most part, DO and pH levels were in compliance with objectives established by CVRWQCB. Turbidity and TSS levels were typically low in the upper watershed (above Lake Oroville), except during storm events. Because Lake Oroville acts as a sediment trap, turbidity and TSS levels are also generally low between Oroville Dam and the Thermalito Afterbay outlet. Downstream of the Thermalito Afterbay outlet, turbidity and TSS concentrations generally increase, presumably from inputs from downstream tributaries in the lower Feather River (DWR 2007).

Petroleum products and pesticides were largely undetected in water samples collected for DWR's studies (DWR 2007). Nutrient concentrations measured in the Feather River were consistently below most basin plan objectives for the protection of beneficial uses (which includes freshwater habitat, fish migration, and spawning) (DWR 2007). Exceedance of water quality objectives for aluminum, iron, and copper were observed in DWR's water quality studies (DWR 2004c), but could not be associated with Project operations or recreational activities.

Instream Habitat - Instream habitat within the action area includes the lower Feather River (from the fish barrier dam downstream to 100 feet (30.5 m) below the confluence with the

Thermalito Afterbay outlet). The lower Feather River can be further divided into the LFC (between Fish Barrier Dam and the Thermalito Afterbay outlet) and the 100 feet (30.5 m) of the high-flow channel (HFC) (from Thermalito Afterbay outlet downriver). It is anticipated that Oroville facilities operations will continue to block upstream fish passage and limit sediment recruitment and LWM contributions from upstream reaches of the Feather River.

Spawning Habitat Availability - Spawning and rearing habitat for anadromous salmonids in the action area is currently limited to those reaches of the Feather River below Fish Barrier Dam (RM 67). This habitat has been affected by changes in geomorphologic processes brought about by construction and operation of the Oroville facilities along with previous factors such as hydraulic mining, land use practices, flood control structures (levees), and regulated flows from upstream hydroelectric projects. Oroville Dam blocks sediment transport and eliminates the replenishment of spawning and rearing gravels from upstream tributaries to accessible areas in the lower Feather River. In addition, levees and bank armoring in the lower Feather River also prevent gravel recruitment necessary to replenish salmon and steelhead spawning riffles and rearing habitat. It is anticipated that Oroville facilities operations will continue to block sediment transport downstream and limit spawning and rearing gravel recruitment to the lower Feather River. Studies conducted by DWR concluded that: (1) streambed substrate in the lower Feather River was primarily composed of large gravel and cobble, in some cases too large for salmon and steelhead spawning redd construction; (2) gravel armoring is particularly evident in the LFC; (3) size distributions of subsurface gravel in the lower Feather River are similar between the LFC and HFC; and (4) fine sediments within gravels in the lower Feather River appeared suitable for incubating salmon and steelhead embryos and did not limit survival through emergence (DWR 2004d); however, the quantity of available gravel is limited, and is justification for Project activities to enhance spawning habitat in these reaches.

Large Woody Material (LWM) - The Oroville facilities prevent the recruitment of LWM from upstream reaches of the Feather River in the same way as described above for spawning gravel. In addition, modified flow patterns in the lower Feather River as a result of Oroville facilities operations reduce the recruitment of LWM. Because it enhances the complexity of fish habitat and affects geomorphic processes creating pools and other important habitat for holding adult and juvenile salmonids, LWM is important ecologically in streams and rivers. On large rivers such as the lower Feather River, the influence of LWM on stream geomorphic processes might be limited (Lassettre and Harris 2001, DWR 2007), but LWM is till important because it can provide refuge and cover for fish. It is anticipated that the Oroville facilities will continue to block the recruitment of LWM to the lower Feather River reaches.

Bank Modification and Riparian Habitat Loss - As mentioned above, bank modification (the construction of levees and bank armoring) changes the geomorphic processes affecting the lower Feather River. Continued deprivation of the sediment load in the lower Feather River is expected to result in reduced formation of sediment benches important to the colonization and succession of riparian vegetation (DWR 2007). Riparian vegetation is important to aquatic habitats because it provides overhanging cover for rearing fish, stream side shade, and a source of terrestrial and aquatic invertebrate contributions to the fish food base (DWR 2007). Riparian vegetation is also an important source of future LWM contributions to the aquatic system.

Feather River Hatchery Operations - FRFH was constructed in 1967 to compensate for Feather River salmonid production loss from the construction of Oroville Dam. FRFH facilities are operated by CDFG and include Fish Barrier Dam, a fish ladder, holding tanks, hatchery buildings, and raceways.

Both Chinook salmon and steelhead are raised in the hatchery. For many years, on or about September 1 each year, fish ladder gates were opened at the hatchery allowing adult Chinook salmon to enter. In the past, Chinook salmon entering the hatchery before September 15 were considered spring-run while those that entered after September 15 were considered fall-run. In recent years, the gates have been opened during spring months, adult fish are tagged as spring-run, and the tagged fish are reintroduced into the river system. Gates are subsequently opened again during September, and fish that are tagged as spring-run are spawned together in an effort to improve the genetic separation of spring- and fall-run Chinook salmon in FRFH. Between 9,000 and 18,000 salmon and 2,000 steelhead are artificially spawned at FRFH each year, producing 8 million fall-run Chinook salmon, 5 million spring-run Chinook salmon, and 400,000 steelhead (NMFS 2004). Chinook salmon have been released from the hatchery as young-of-the-year smolts into the Feather and Sacramento Rivers, Lake Oroville, other California reservoirs, and San Pablo Bay downstream of the Delta. Chinook salmon are no longer released into Lake Oroville. Steelhead are released from the hatchery into the Feather River as yearlings.

The source of water for FRFH is the Thermalito Afterbay diversion pool, which receives cold water from Lake Oroville. FRFH water intake temperature objectives were established in a 1983 agreement between the DWR and CDFG (CDFG 1983) and are listed in Table 7 below. Since 2004, DWR has targeted a mean daily water temperature objective of <65° F (18.3°C) from June 1 through September 30 at Robinson Riffle on the lower Feather River (RM 61.6). In critically dry water years, the cold-water pool in Lake Oroville might be exhausted or inaccessible, resulting in water warmer than desired (FERC 2007).

Straying and genetic introgression (hybridization) - Although data are limited, the general consensus is that there were once genetically distinct Chinook salmon runs in the Feather River system (DWR 2007; Lindley *et al.*, 2004; Yoshiyama *et al.*, 2000). It is commonly believed that spring- and fall-run Chinook salmon spawning was spatially and temporally separated in the Feather River basin before construction of dams (including Oroville Dam) (DWR 2007). Spring-run Chinook are believed to have spawned higher in the watershed and earlier in the year when compared to fall-run Chinook salmon historically in the Feather River.

Today, the Oroville facilities block upstream migration of both spring- and fall-run Chinook salmon beyond Fish Barrier Dam causing both runs to spawn in the same locations. In addition, there is overlap in the timing of spawning between the two runs. This combination of limited spawning area and overlap in timing of spawning has resulted in genetic introgression (hybridization) between the two races of salmon. Compounding the problem is the operation of FRFH. Three opportunities for genetic introgression (hybridization) between spring- and fall-run Chinook salmon exist on the Feather River today: (1) introgression between natural (or wild) spawners within the river itself; (2) introgression between natural (or wild) spawners and hatchery produced spawners in the river; and (3) introgression of Feather River spring-run Chinook salmon and those from other nearby river systems as a result of straying.

Based on data from tagged fish, it is believed that considerable cross fertilization might have occurred between spring- and fall-run Chinook salmon at FRFH since it began operation in 1967

Table 7. Feather River Hatchery Temperature Objectives (+4° F [15.6°C]) (CDFG, 1983)

Period	Temperature (^{o} F)
April 1–May 15	51
May 16–31	55
June 1–15	56
June 16–31	60
August 16– 31	58
September 1– 30	52
October 1– November 31	51
December 1– March 31	55

(DWR 2007). Compounding the issue are questions regarding the genetic integrity of Feather River spring-run Chinook salmon. Comparisons of genetic characteristics indicate that Feather River spring-run Chinook are more closely related to fall- and late-fall-run Chinook salmon than other spring-run populations in Butte, Mill and Deer creeks (Hedgecock 2002, DWR 2007). Furthermore, pre-Oroville facilities genetic data are not available to help ascertain the genetic identity of historical Feather River spring-run Chinook salmon. Naturally spawning (those spawning in the river as opposed to in FRFH) spring-run Chinook salmon in the Feather River are particularly susceptible to pre-spawning mortality from competition for space with the later arriving fall-run Chinook salmon adults (DWR 2007). In addition, spawning success by spring-run Chinook salmon adults may be significantly reduced because of redd superimposition by the later arriving fall-run Chinook salmon adults. The disruption of previously constructed redds might result in poor egg-to-fry survival (through increased egg and alevin mortality), leading to reduced spring-run Chinook salmon juvenile production (DWR 2007). This issue might be alleviated by a separation of the spring run and fall run as a result of DWR's new Oroville licensing agreement. Plans are currently underway by DWR to install a separation weir to accomplish this.

Studies conducted by CDFG indicate that 8 percent of FRFH produced fish returning to the Central Valley strayed to streams outside the Feather River Basin. Other studies suggest straying rates of between 4 and 10 percent (DWR 2007). To date, only a few FRFH produced Chinook salmon have been observed in Butte, Mill and Deer creeks, which have spring-run Chinook salmon populations distinct from the Feather River population. In addition, interbreeding between FRFH spring-run Chinook salmon and spring-run Chinook salmon in Butte, Mill and Deer creeks appears to have been minimal (DWR 2007).

Water Diversions - Water diversions within the Feather River system have historically occurred as a result of early water rights and riparian rights of landowners within the basin. Since construction of the Oroville Facilities, DWR has entered into contractual agreements or settlements with nine local water agencies in the Feather River service area (collectively referred

to as the Feather River service area water users). These settlements recognize the entitlements (or senior water rights) of these agencies and commit DWR to providing them water from storage in Lake Oroville. The amount of water that DWR is committed to providing these agencies varies from year to year, ranging from 611,000 to 1,057,000 acre-feet, but averages about 944,000 acre-feet per year. These entitlements are delivered at two locations in Lake Oroville, two locations in the Thermalito power canal, four locations in the Thermalito afterbay, and four locations on the HFC. Most diversions to the Feather River service area water users occur from April through October with peak demand generally occurring from May through August. Riparian landowners along the Feather River downstream of Oroville dam are also entitled to divert unimpaired flow for use on riparian land (FERC 2007).

Water Development Activities - As an integral part of the California SWP the Oroville Facilities are operated in coordination with the Federal CVP to support water delivery and development throughout California. Operationally, water development is constrained by the State/Federal Coordinated Operating Agreement (COA), the CVPIA, California State Water Resources Control Board (SWRCB) water quality control plans (which include Delta water quality standards to be met), previous salmon, steelhead, green sturgeon, and delta smelt (*Hypomesus transpacificus*) biological opinions issued by either NMFS or USFWS, the CALFED Record of Decision (CALFED 2000), and other agreements.

Many of the early restrictions placed on project operations primarily focused on Sacramento River winter-run Chinook salmon, since this was the first species to be listed in the action area. More recent restrictions on combined CVP/SWP operations and water development have also considered Central Valley spring-run Chinook salmon and Central Valley steelhead along with delta smelt and green sturgeon.

Flood Control - The Oroville Facilities are also operated as an integral component of the flood management system for areas along the Feather and Sacramento rivers downstream of Oroville Dam. This flood management system is called the Sacramento River Flood Control Project. From September to June, the Oroville Facilities are operated under flood control requirements specified by the Corps, the agency primarily responsible for flood control operations. Historically, flood control releases have not been necessary every year, however, when they are necessary they can be substantial. Peak flood control releases during major spill events between January of 1970 and December of 1996 ranged from 77,000 cfs to 160,000 cfs (FERC 2007). Flood control operations have simplified the hydrograph by reducing the frequency of bankfull and greater flows that shape and maintain the morphology of the river channel and associated fish habitats. This has simplified habitat conditions for fish and reduced the inundation of floodplain habitats that when inundated are known to improve the growth and survival of juvenile salmonids when compared to rearing conditions in the main channel (Jeffres *et al.* 2008).

Commercial and Sport Harvest - Historically, commercial and sport fisheries harvest large numbers of adult CV Chinook salmon annually. These fisheries are regulated primarily by the Pacific Fishery Management Commission (PFMC), within Pacific Ocean waters of the U.S. economic zone (3 – 200 miles from the coast), and the California Fish and Game Commission (CDFGC) for coastal (within 3 miles) and all inland waters of California. The PFMC establishes

commercial salmon fishing regulations (seasons, limits, etc.) in the U.S. economic zone through annual reviews of its Pacific Coast Salmon Fishery Management Plan (FMP). CDFGC establishes commercial and sport harvest regulations bi-annually or through emergency measures if necessary. CV Chinook salmon populations are generally managed to maintain a spawner escapement level of 122,000 to 180,000 fall-run Chinook salmon to the Sacramento River watershed. Major changes in ocean harvest regulations for Chinook salmon began in 1995, due to the federal listing of the Sacramento River winter-run Chinook salmon as endangered. In general, ocean and freshwater fishing regulations are designed to avoid open fishing in areas where Sacramento River winter-run Chinook salmon and CV spring-run Chinook salmon are concentrated (Reclamation 2008). In 2007, CV fall-run Chinook salmon escapement was estimated at 87,996 natural and hatchery adults returning to the Sacramento River, well below the escapement goal of 122,000 spawners for the first time since the early 1900's. In addition, low jack (immature adult) returns for all CV Chinook salmon (fall, late-fall, winter and spring) were only 5,939 fish (a record low level) in 2007 suggesting that 2008 escapement would be at least as low as observed in 2007. This recent sudden decline in fall-run Chinook salmon escapement prompted the PFMC and the CFGC to close all commercial salmon harvesting off California for 2008 and severely limit sport fishing by establishing a zero take limit for inland waters. Limited "take" of late fall-run Chinook salmon was allowed on the Sacramento River from Knights Landing to the RBDD from November 1 through December 31.

Since 1998, all hatchery CCV steelhead have been marked with an adipose fin clip, allowing anglers to tell the difference between hatchery and wild CCV steelhead. Current regulations restrict anglers from keeping unmarked steelhead in CV streams, except in the upper Sacramento River. Overall, marking has greatly increased protection of naturally-produced adult steelhead.

Current sport fishing regulations do not prevent wild steelhead from being caught and released many times over, while on the spawning grounds where they are more vulnerable to fishing pressure. Recent studies on hooking mortality based on spring-run Chinook salmon have found a 12 percent mortality rate for the Oregon in-river sport fishery (Lindsay et al. 2004). Applying a 30 percent contact rate for CV rivers (i.e., the average of estimated CV harvest rates), approximately 3.6 percent of adult steelhead die before spawning from being caught and released in the recreational fishery. Studies have consistently demonstrated that hooking mortality increases with water temperatures.

In addition, survival of steelhead eggs is reduced by fishermen walking on redds in spawning areas while targeting hatchery steelhead or salmon. There are no regulations protecting essential spawning areas for steelhead within the action area; however, recently DWR has taken steps by posting signs on the Feather River asking fishermen to avoid the area below the hatchery used by naturally spawning steelhead.

Climate Change - Climate change is neither a wholly current or wholly future phenomenon: some effects are already being observed, many more are committed to happening because of past anthropogenic actions. Anticipated climate change may affect spatial and temporal precipitation patterns along with the intensity and duration of precipitation within the Feather River watershed. Ambient air temperatures in California are projected to increase several degrees ^{o}C by the end of this century. As a result, it is possible that less precipitation will occur as snowfall

and more will occur as rain in future years. The effect of climate change is anticipated to be more winter and less spring and summer run-off within the watershed. In addition, expected run-off is anticipated to be warmer, possibly affecting the ability to meet downstream water temperature objectives to protect salmon, steelhead and green sturgeon. A reduction in snowpack combined with increased ambient air temperatures is expected to result in earlier melting of snow and less run-off from the snowpack than that which occurs today. This combined with more precipitation as rain will affect future operations of all reservoirs within the Feather River Basin, including Lake Oroville. A change in the run-off pattern within the Feather River watershed will likely affect reservoir storage and downstream river flows due to more frequent spillway releases. Currently, summer water temperatures often are close to the upper tolerance limits for salmon and steelhead and any increase in ambient air temperatures as a result of climate change is anticipated to make it more difficult at the very least, if not impossible, to meet established water temperature objectives on the lower Feather River. Reduced reservoir storage as a result of the anticipated change in run-off pattern may also affect the availability of a cold water supply necessary to maintain river temperatures downstream.

C. Importance of the Action Area to the Survival and Recovery of Listed Species

CV spring-run Chinook salmon, CCV steelhead, and the southern DPS of North American green sturgeon are expected to continue to utilize the action area as a migratory corridor and for salmonids for spawning and/or rearing. The value of the lower Feather River basin, as a migratory corridor, and its suitability as spawning and rearing habitat, make it an important habitat for the survival and recovery of local populations of these species. The continuity and connectivity of the Feather River is also important for the survival and recovery of these species.

While CV spring-run Chinook salmon populations in Butte, Deer and Mill creeks are considered at low to moderate risk of extinction, the introgression of early returning Chinook salmon which persists within the FRFH and spawn in the Feather River below Oroville Dam, makes it difficult to assess the overall risk of extinction of the entire CV spring-run Chinook salmon ESU. However the recovery potential for this species should improve with improvements in hatchery management practices at the FRFH.

CCV steelhead populations are currently classified as data deficient, meaning there is insufficient information to accurately determine their long-term viability, and, in all cases, hatchery-origin fish are likely to have adverse effects on the genetic composition of the natural spawning population, placing the natural spawning population at high risk of extinction (NMFS 2008). “Data are lacking to suggest that the CCV steelhead DPS is at low risk of extinction, or that there are viable populations of steelhead anywhere in the DPS.”

The information that is available for the Southern DPS of North American green sturgeon indicates that the mainstem Sacramento River may be the most valuable spawning and rearing habitat for green sturgeon (NMFS 2005). The Feather River is also being shown in recent studies to be an important habitat for green sturgeon for various life stages. Limited observations of green sturgeon within the action area indicate its possible importance for potential migration and feeding, making it an important area to provide continuity and connectivity to other green

sturgeon habitat and therefore makes this area important for the survival and recovery of this DPS.

V. EFFECTS OF THE ACTION

A. Approach to the Assessment

Pursuant to section 7(a)(2) of the ESA (16 U.S.C. §1536), Federal agencies are directed to ensure that their activities are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. This biological opinion assesses the effects of the proposed Project on threatened CV steelhead and their designated critical habitat (Caltrans 2013). The Project is likely to adversely affect threatened CV steelhead and their designated critical habitat through the removal and demolition of the existing bridge, removal of the temporary water bladder dam (to be used as a cofferdam), bypass pumping, fish rescue, and pile driving activities. In the *Description of the Proposed Action* section of this BO, NMFS provided an overview of the action. In the *Status of the Species* and *Environmental Baseline* sections of this BO, NMFS provided an overview of the threatened and endangered species and critical habitat that are likely to be adversely affected by the activity under consultation.

Regulations that implement section 7(b)(2) of the ESA require biological opinions to evaluate the direct and indirect effects of Federal actions and actions that are interrelated with or interdependent to the Federal action to determine if it would be reasonable to expect them to appreciably reduce listed species' likelihood of surviving and recovering in the wild by reducing their reproduction, numbers, or distribution (16 U.S.C. §1536; 50 CFR 402.02). Section 7 of the ESA and its implementing regulations also require biological opinions to determine if Federal actions would destroy or adversely modify the conservation value of critical habitat (16 U.S.C. §1536). This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

NMFS generally approaches "jeopardy" analyses in a series of steps. First, NMFS evaluates the available evidence to identify direct and indirect physical, chemical, and biotic effects of the proposed actions (these effects include direct impacts to a species habitat; modifications to something in the species' environment - such as reducing a species' prey base, enhancing populations of predators, altering its spawning substrate, altering its ambient temperature regimes; or adding something novel to a species' environment - such as introducing exotic competitors or disruptive noises). Once NMFS has identified the effects of the action, the available evidence is evaluated to identify a species' likelihood and extent of exposure to any adverse effects caused by the action (*i.e.* the extent of spatial and temporal overlap between the species and the effects of the action). Once NMFS has identified the level of exposure that a species will have to the effects of the action, the available evidence is evaluated to identify the species' probable response, including physical and behavioral reactions, to these effects. These responses then will be assessed to determine if they can reasonably be expected to reduce a

species' reproduction, numbers, or distribution (for example, by changing birth, death, immigration, or emigration rates; increasing the age at which individuals reach sexual maturity; or decreasing the age at which individuals stop reproducing). The available evidence is then used to determine if these reductions, if there are any, could reasonably be expected to appreciably reduce a species' likelihood of surviving and recovering in the wild.

1. Information Available for the Assessment

To conduct the assessment, NMFS examined an extensive amount of evidence from a variety of sources. Detailed background information on the status of the species and critical habitat has been published in a number of documents including peer reviewed scientific journals, primary reference materials, governmental and non-governmental reports, the biological assessment for this project, and project meeting notes. Additional information investigating the effects of the project's actions on the listed species in question, their anticipated response to these actions, and the environmental consequences of the actions as a whole was obtained from the aforementioned resources. For information that has been taken directly from published, citable documents, those citations have been referenced in the text and listed at the end of this document.

2. Assumptions Underlying This Assessment

In the absence of definitive data or conclusive evidence, NMFS must make a logical series of assumptions to overcome the limits of the available information. These assumptions will be made using sound, scientific reasoning that can be logically derived from the available information. The progression of the reasoning will be stated for each assumption, and supporting evidence cited.

B. Assessment

The proposed Project includes actions that may adversely affect several life stages of spring-run Chinook salmon, CCV steelhead, and green sturgeon. Adverse effects to these species and their habitat may result from changes in water quality from temporary water diversion construction, acoustic effects associated with pile driving, and handling of fish from fish rescue. The project includes integrated design features to avoid and minimize many of these potential impacts.

1. Presence of listed anadromous fish and habitat

The Feather River in the vicinity of the project area has been documented to contain hatchery raised fish, produced by the Feather River Fish Hatchery as well as wild populations of steelhead. Mature, breeding steelhead have utilized the river within the Project area as a migratory corridor, migrating to spawning habitat between September and March (Department of Water Resources. 2004a). Although juveniles are believed to be present and emigrating within the lower Feather River year round, data from previous fish surveys indicate the peak in juvenile emigration occurs from February to June (California Department of Water Resources 2003). Juvenile CCV steelhead migrate downstream through the lower Feather and Sacramento Rivers between February and early June as they make their way towards the Delta. Therefore, juvenile presence may occur during pile driving, temporary water diversion

removal, and fish rescue if these activities occur between March and early June (the in-water work window for this project is from June 1 to October 1).

The Feather River in the vicinity of the project area has been documented to contain adult and juvenile CV spring-run chinook salmon. Mature, breeding Chinook have utilized the river within the Project area as a migratory corridor between March and June, migrating to upstream summer spawning habitat (Department of Water Resources 2004b and Jones and Stokes 2009).

The Feather River in the project area provides suitable habitat for CCV steelhead and spring-run Chinook salmon (NMFS 2005) and critical habitat occurs within the project area for both species. Both species are known to occur in the Feather River and are present in the project vicinity on a seasonal basis. With the peak migration of juvenile spring-run chinook salmon and juvenile CCV steelhead occurring from November through January and from January through March, respectively, only the latter portions of these runs will be affected by in-water work conducted in early June. An overlap between the in-water work window and adult run timing also exists. The peak of the spring-run Chinook salmon run in late May or early June will overlap with the proposed in-water work period. The early portion of the CCV steelhead run in September and early October and the latter portion of the run in late May and early June will overlap with in-water work, but the two peaks of the run in fall and winter will not be affected.

The Feather River in the vicinity of the project area has been documented to contain adult green sturgeon, but with no records of juveniles. Mature, breeding green sturgeon have utilized the river within the project area as a migratory corridor and holding area prior to spawning (NMFS 2011, Jones and Stokes 2009).

The Feather River in the Project area provides suitable migration habitat for green sturgeon (NMFS 2009), and critical habitat occurs within the Project area. Depths of the Feather River within project limits are approximately 3m (10ft), too shallow for the species preferred deep holding pools (>5m). Adults are known to occur in the Feather River, and the species is presumed present in the project vicinity on a seasonal basis.

2. Sedimentation and Turbidity

Construction related disturbance to soils and vegetation within the Project limits will temporarily increase sedimentation and turbidity in the Feather River. A prolonged increase in sedimentation and turbidity affects the growth, survival, and reproductive success of aquatic species including steelhead. High levels of suspended sediment reduces the ability of listed fish to feed and respire, resulting in increased stress levels and reduced growth rates, and a reduced tolerance to fish diseases and toxicants (Waters 1995).

NMFS anticipates that some local increases in turbidity and suspended sediment above baseline levels will result from water diversion removal. NMFS expects these water quality impacts to be minor, short term increases in turbidity and sedimentation and only lasting the duration of the project. Water quality impacts are unlikely to affect migrating adults to the extent of injuring them, but may injure some juvenile fish, which are smaller and less mobile and actively feeding

and growing, by temporarily disrupting normal behaviors that are essential to growth and survival.

Increased sedimentation and turbidity resulting from project construction will be temporary and limited to a small portion of the river during construction activities. The BMPs incorporated into the project plans will further minimize turbidity effects to listed fish in the project construction area.

NMFS expects turbidity to affect steelhead in much the same way that it affects salmon in the studies mentioned below, due to similar physiological and life history requirements between these species. Therefore, NMFS will use these studies as a surrogate to CCV steelhead. Responses of salmonids to elevated levels of suspended sediments often fall into three major categories: physiological effects, behavioral effects, and habitat effects (Bash *et al.* 2001). The severity of the effect is a function of concentration and duration (Newcombe and MacDonald 1991; Newcombe and Jensen 1996) so that low concentrations and long exposure periods are frequently as deleterious as short exposures to high concentrations of suspended sediments. A review by Lloyd (1987) indicated that several behavioral characteristics of salmonids can be altered by even relatively small changes in turbidity (10 to 50 Nephelometric Turbidity Units [NTUs]). Salmonids exposed to slight to moderate increases in turbidity exhibited avoidance, loss of station in the stream, reduced feeding rates and reduced use of overhead cover. Short-term increases in turbidity and suspended sediment may disrupt feeding activities of fish or result in temporary displacement from preferred habitats. Numerous studies show that suspended sediment and turbidity levels moderately elevated above natural background values can result in non-lethal detrimental effects to salmonids. Suspended sediment affects salmonids by decreasing reproductive success, reducing feeding success and growth, causing avoidance of rearing habitats, and disrupting migration cues (Bash *et al.* 2001). Sigler *et al.* (1984 *in* Bjornn and Reiser 1991) found that prolonged turbidity between 25 and 50 NTUs reduced growth of juvenile coho salmon and steelhead. MacDonald *et al.* (1991) found that the ability of salmon to find and capture food is impaired at turbidities from 25 to 70 NTUs. Reaction distances of *O. mykiss* to prey were reduced with increases of turbidity of only 15 NTUs over an ambient level of 4 to 6 NTUs in experimental stream channels (Barrett *et al.* 1992). Bisson and Bilby (1982) reported that juvenile coho salmon avoid turbidities exceeding 70 NTUs. Increased turbidity, used as an indicator of increased suspended sediments, also is correlated with a decline in primary productivity, a decline in the abundance of periphyton, and reductions in the abundance and diversity of invertebrate fauna in the affected area (Lloyd 1987; Newcombe and MacDonald 1991). Increased sediment delivery can also fill interstitial substrate spaces and reduce cover for juvenile fish (Platts *et. al.* 1979) and abundance and availability of aquatic invertebrates for food (Bjornn and Reiser 1991).

3. <u>Fish Stranding</u>

    a. Cofferdams

    CCV steelhead have the potential to occur within the Project area during installation of the 12-foot temporary shaft encasements which will act as cofferdams. Closure of a cofferdam may trap fish that would be subjected to

stress, injury, and mortality caused by poor water quality, predation, dewatering, or construction activities within the cofferdam. Further, should juvenile steelhead occur within project limits, they would be most susceptible to entrapment due to a slower escape response and a tendency to occupy the low flow channel. The 12-foot temporary shaft encasements will enclose a proportionally very small area of the Feather River and the anticipated probability of entrapping a sensitive fish is low. In addition, the project work window (June 1- October 1) was designed to minimize the peak juvenile steelhead migration period (February – June). To further minimize potential effects to stranded fish in cofferdams, two fish rescue events will be conducted: one rescue event at Pier 2 (to include each column, three total, at Pier 2 and one rescue event at Pier 3 (to include each column, three total, at Pier 3. A qualified biologist will prepare and implement a NMFS approved fish salvage plan to recover any individuals entrapped in cofferdams. As determined appropriate by the qualified biologist, fish rescues would consist of netting and electroshocking the partially dewatered area followed by relocation of sensitive fish to a designated downstream location; all rescued sensitive fish would be kept in aerated water and at appropriate temperatures at all times prior to release. These dewatered coffer dams will provide effective noise and vibration attenuation to minimize those impacts to migrating fish in the Feather River channel. Implementation of avoidance and minimization measures will further minimize potential fish stranding effects.

Based on the proposed measures as well as the restriction of work in the live channel to June 1 through October 1, no direct mortalities to steelhead are expected due to stranding in coffer dams. The fish salvage efforts for the Emergency Feather River Bridge Project at State Route (SR) 20, just upstream of the 5th Street Bridge project area, found no evidence of any listed fish species (Caltrans 2013). The Feather River Bridge Project at SR 20 fish salvage was conducted in July 2011, within the middle of the current project's proposed work window. It is unlikely that any fish will be stranded due to the proposed restricted work window, and fish will be relocated if any are found.

b. Dewatered Diversions

Temporary diversions (approximately 1.69 acres of the total 3.62 acres temporary effects to waters) would be necessary for bridge demolition activities. Closure of a diverted area may trap fish that would be subjected to stress, injury, and mortality caused by poor water quality, predation and dewatering within the diverted areas. Should juvenile steelhead occur within project limits, they would be most susceptible to entrapment due to a slower escape response and a tendency to occupy the low flow channel. In addition, based on a hydraulic analysis of the proposed diversions, the changes in water velocities have some potential to effect migrating juvenile and adult steelhead (Table 8; Caltrans 2013).

However, the temporary diversion will only occur during the second work season within the designated work window (June 1 - October 1), which avoids the majority of adult (September – March) and peak juvenile (February –June)

Table 8—Channel Flow Velocities with Mean Summer Daily Flow (3,310 cfs)

	Existing Condition (ft/sec)	Temporary Diversion Part 1 (ft/sec)	Temporary Diversion Part 2 (ft/sec)
Immediately Upstream of the Bridge	1.2	3.7	2.6
Bridge Upstream Face	1.4	3.9	2.6
Bridge Downstream Face	1.4	3.3	2.2
Immediately Downstream of Bridge	1.2	2.6	2.2

steelhead migrations. Each temporary water diversion, diversion part 1 and diversion part 2, is anticipated to remain in place for no more than two to three weeks and will provide continuous unobstructed flows. In addition, a qualified biologist will prepare and implement a NMFS approved fish salvage plan to recover any individuals entrapped in diverted areas and will consist of two fish rescue events: one rescue for diversion part 1 and one rescue for diversion part 2. As determined appropriate by the qualified biologist, fish rescues will consist of netting and electroshocking the partially dewatered area followed by relocation of sensitive fish to a designated downstream location; all rescued sensitive fish will be kept in aerated water and at appropriate temperatures at all times prior to release. Implementation of avoidance and minimization measures described in Section II. of this BO will further minimize potential project effects to fish.

Based on the proposed measures as well as the restriction of work in the live channel to June 1 through October 1, no direct mortalities to steelhead are expected due to stranding in dewatered diversions. The fish salvage efforts for the Emergency Feather River Bridge Project at SR 20, just upstream of the 5th Street Bridge project area, found no evidence of any protected fish species. The Feather River Bridge project at SR 20 fish salvage was conducted in July 2011, within the middle of the current project's proposed work window. It is unlikely that any fish will be stranded due to the proposed restricted work window, and these fish will be relocated if any are found.

4. <u>Harm to Fish as a result of Accidental Hazardous Materials and Chemical Spills</u>

Construction related activities could potentially impair water quality should hazardous chemicals (e.g. fuels and petroleum-based lubricants) or other construction materials enter

the Feather River. Construction-related chemical spills could potentially affect fisheries and aquatic resources by causing physiological stress, reducing biodiversity, altering primary and secondary production, interfering with fish passage, and causing direct mortality. However, implementation of avoidance and minimization measures described in Section II. of this BO will minimize and avoid potential for exposure to hazardous chemicals.

5. Pile Driving and Underwater Sound Pressure

a. Impacts on Fish

The underwater sound pressure waves that have the potential to adversely affect listed anadromous fish species originate with the contact of the hammer with the top of the steel pile. The impact of the hammer on the top of the steel pile causes a wave to travel down the pile and causes the pile to resonate radially and longitudinally like a gigantic bell. Most of the acoustic energy is a result of the outward expansion and inward contraction of the walls of the steel pipe pile as the compression wave moves down the pile from the hammer to the end of the pile buried in the riverbed and/or floodplain. Water is virtually incompressible and the outward movement of the pipe pile (by a fraction of an inch) followed by the pile walls pulling back inward to their original shape, sends an underwater pressure wave propagating outward from the pile in all directions. The steel pipe pile resonates sending out a succession of waves even as it is pushed several inches deeper into the riverbed.

Fish may be injured or killed when exposed to high underwater sound pressure levels (SPL) generated by steel piles installed with impact hammers. Pathologies to fish tissue associated with very high SPLs are collectively known as *barotraumas*. Barotraumas may occur as a result of exposure to drastic changes in underwater pressure. A common type of barotrauma is rupturing of the swim bladder, other injuries may occur such as hemorrhaging and rupture of internal organs. Death can be instantaneous, occur within minutes after exposure, or occur several days later. Gisiner (1998) reports swim bladders of fish can perforate and hemorrhage when exposed to blast and high-energy impulse noise underwater. If the swim bladder bursts and the air escapes from the body cavity or is forced out of the pneumatic duct, the fish may sink to the bottom. If the swim bladder bursts but the air stays inside the body cavity, the fish is likely to stay afloat but have some difficulty in maneuvering or maintaining orientation in the water column. With salmonids, the swim bladder routinely expands and contracts as they swim near the surface or swim in deeper water near the bottom. At high sound pressure levels of pile driving, the swim bladder may rapidly and repeatedly expand and contract, hammering the internal organs that cannot move away since they are bound by the vertebral column above and the abdominal muscles and skin that hold the internal organs in place below the swim bladder (Gaspin 1975). This pneumatic pounding may result in the rupture of capillaries in the internal organs as indicated by observed blood in the abdominal cavity, and maceration of the kidney tissues. The pneumatic duct, which connects the swim bladder with the esophagus, may not make a significant difference in the vulnerability of the salmonids since it is so small relative to the volume of the swim bladder (Gaspin 1975). Green sturgeon are likely to suffer similar effects to those of salmonids since they possess similar anatomy and physiology (*e.g.*, physostomous swim bladder).

Fish can also die when exposed to lower sound pressure levels if exposed for longer periods of time. Hastings (1995) found death rates of 50 percent and 56 percent for gouramis (*Trichogaster sp*.) when exposed to continuous sounds at 192 dB (re: 1 μPa) at 400 Hz and 198 dB (re: 1 μPa) at 150 Hz, respectively, and 25 percent for goldfish (*Carassius auratus*) when exposed to sounds of 204 dB (re: 1 μPa) at 250 Hz for two hours or less. Hastings (1995) also reported that acoustic "stunning," a potentially lethal effect resulting in a physiological shutdown of body functions, immobilized gourami within eight to thirty minutes of exposure to the aforementioned sounds.

High SPLs can also result in a temporary threshold shift in hearing sensitivity or auditory damage to fish (Carslon *et al*. 2007). Structural damage to the fish inner ear by intense sound has been examined by Enger (1981) and Hastings *et al.* (1995, 1996) with scanning electron microscopy. Hastings *et al.* (1996) found destruction of sensory cells in the inner ears of oscars (*Astronotus ocellatus*) four days after being exposed to continuous sound for one hour at 180 dB (re:1 μPa) at 300 Hz. Hastings (1995) also reported that 13 out of 34 goldfish exposed for two hours to SPLs ranging from 192 to 204 dB (re:1 μPa) at either 250 or 500 Hz experienced equilibrium problems that included swimming backwards and/or upside down and wobbling from side to side. These fish recovered within one day suggesting that the damage was not permanent. This fish behavior could have been caused by post-traumatic vertigo (lack of balance and dizziness caused by a problem in the inner ear) similar to that experienced by humans after a severe blow to the body or head.

Additional detrimental effects on fish from loud sounds include stress, increasing risk of mortality by reducing predator avoidance capability, and interfering with communication necessary for navigation and reproduction. Scholik and Yan (2001) reported temporary threshold shifts for fathead minnows (*Pimephales promelas*) exposed to 24 hours of white noise with a bandwidth of 300 – 4000 Hz and overall sound pressure level of only 142 dB (re:1 μPa). Their results indicated that the effects could last longer than 14 days. Even if threshold shifts do not occur, loud sounds can mask the ability of aquatic animals to hear their environment, thus increasing their vulnerability to predators or ability avoid areas that may pose safety risks and possibly affect migration behavior.

Pile driving and the resulting underwater sound pressure may result in "agitation" of salmonids indicated by a change in swimming behavior detected by Shin (1995) with salmonids, or "alarm" detected by McCauley *et al.* (2003). Salmonids and may exhibit a startle response to the first few strikes of a pile. The startle response is a quick burst of swimming that may be involved in avoidance of predators (Popper 1997). A fish that exhibits a startle response may not necessarily be injured, but it is exhibiting behavior that suggests it perceives a stimulus indicating potential danger in its immediate environment. However, fish do not exhibit a startle response every time they experience a strong hydroacoustic stimulus. From the recent pile driving studies along the west coast, biologists have observed that fish may startle and swim away from the stimulus at the start of pile driving, but that they observed the fish to recover, and in some cases turn around and pass by the area of impact multiple times (M. Molnar, pers. comm. with J. Meyer NMFS 2011). Thus a ramping up of the hammer during the initial phase of pile driving is not necessarily a suitable or reliable fish avoidance or minimization measure as has been proposed in some pile driving projects.

A study in Puget Sound, Washington suggests that pile driving operations disrupt juvenile salmon behavior (Feist *et al*. 1992). Though no underwater sound measurements are available from that study, comparisons between juvenile salmon schooling behavior in areas subjected to pile driving/construction and other areas where there was no pile driving/construction indicate that there were fewer schools of fish in the pile-driving areas than in the non-pile driving areas. The results are not conclusive but there is a suggestion that pile-driving operations may result in a disruption in the normal migratory behavior of the salmon in that study, though the mechanisms salmon may use for avoiding the area are not understood at this time.

NMFS currently uses a dual metric criteria to assess onset of injury for fish exposed to pile driving sounds (FHWG 2008). Specifically, this includes a single strike peak SPL of 206 dB (re: 1 μPa) and an accumulated SEL of 187 dB (re: 1 μPa ^{2}-sec) for fish equal to or greater than 2 grams or 183 dB (re: 1 μPa ^{2}sec) for fish less than 2 grams. If either threshold is exceeded, then physical injury is assumed to occur. There is uncertainty as to the behavioral response of fish exposed to high levels of underwater sound produced when driving piles in or near water. Based on the information currently available, and until new data indicate otherwise, NMFS believes a 150 dB root-mean-square pressure (RMS) threshold for behavioral responses for salmonids and green sturgeon is appropriate.

b. Assessment of Project Pile Driving Effects

The results of the above pile driving projects and information available in the literature are helpful in assessment of the potential effects of pile driving associated with bridge demolition activities for the 5th Street Bridge Replacement Project, but considerable uncertainty remains. Effects on an individual fish during pile driving construction activities will be dependant on a number of variables associated with environmental conditions at the project site and variables associated with the specific construction schedule, including:

1. Size and force of the hammer strike;
2. Location of fish from the pile;
3. Site specific sound propagation characteristics;
4. Size of the fish;
5. Species of fish;
6. Presence and type of a swim bladder;
7. Physical condition of the fish; and
8. Effectiveness of bubble curtain and/or other sound pressure attenuation technology.

Studies researching the effectiveness of bubble curtains or other sound attenuation devices have indicated that in many cases, sound pressure levels can be decreased effectively by 10 dB or

more if properly implemented. Caltrans may use specially designed bubble curtains for sound attenuation during impact pile driving. Therefore, an estimation of sound pressure levels derived from current data for pile driving with the use of sound attenuation will be used to assess the potential area of impact during situations when the maximum sound pressure levels are anticipated to occur.

As stated above, a dual metric criteria of 206 dB (re: 1 μPa) peak SPL for any single strike and a cumulative sound exposure level (cSEL) of 187 dB (re: 1 μPa ^{2}-sec) and/or 183 dB (re: 1 μPa ^{2}-sec) are currently used by NMFS and Caltrans as thresholds to correlate physical injury to fish 2 grams or larger, and fish less than 2 grams (respectively) in size from underwater sound produced during the installation of piles with impact hammers. As distance from the pile increases, transmission loss reduces sound pressure levels and the potential harmful effects to fish also decrease. Disturbance and noise associated with construction at the pile driving site may also startle fish and result in some dispersion from the action area.

Water depth at the pile driving site (the lower reaches of the Feather River) will also influence the rate of sound attenuation. In deep water areas high sound pressure waves are likely to travel further out into water column than they would otherwise travel if encapsulated within an air bubble curtain, or conducted within a dewatered cofferdam, thereby resulting in adverse impacts to salmonids and green sturgeon over a larger area. In contrast, within shallow water, attenuation rates are likely to be higher thereby reducing the area where adverse effects are expected .

Based on proposed construction activities, the effects of noise on fish would be primarily limited to avoidance behavior in response to movements, vibrations, and noise caused by construction personnel and equipment operating in or adjacent to the Feather River. Additional effects may include physiological stress, physical injury (including hearing loss), and mortality. For the project, all of the structural piles for the temporary falsework/working trestle piles would be driven in place by a vibratory and impact hammer methodology (Table 9). Driving with a vibratory hammer will last up to 12 hours per day, and impact hammering (only when necessary) is not expected to last longer than one hour in total. Vibratory and drilling installation of piles assumes that no underwater noise impact is expected. The temporary trestle piles and permanent bridge foundation piles will require impact installation of 22-inch steel “H” piles and 10-foot CISS piles, respectively. Table 9 shows the expected underwater noise levels with attenuation. A 12-foot diameter steel shell cofferdam will be used in the dewatered area surrounding and isolating the existing piles within the project action area during construction activities.

Caltrans estimates the peak SPL calculated for a 22-inch pile is 208 dB in water and 197 dB on land for this project. They estimate a single-strike SEL of 176 dB in water and 169 dB on land, and an RMS of 187 dB in water and 175 dB on land. Estimation of the cumulative SEL requires an estimate of the duration of pile driving activities in a single day. The project estimates that 20 piles would be driven per day (12 hours) during in-water pile driving operations and on land.

Table 9. 5th Steet Bridge Replacement Project Pile Driving Data													
Pile Name/ Location	**Pile Type**	**Driver Type**	**Number of strikes/pile**	**Strikes/day**	**Reference Distance (m)**	**Attenuation (dB)**	**Peak (dB)**	**SEL (dB)**	**RMS (dB)**	**Distance (m) to threshold**			
										Peak dB	**Cumulative SEL dB**		**RMS dB**
											Fish >2 g	**Fish < 2 g**	
										206 dB	**187 dB**	**183 dB**	**150 dB**
Temporary Trestle piles/ In-water	22" steel	Impact	60	1200	10	0	208	176	187	14	209	386	2929
Temporary Trestle piles/ On-land	22" steel	Impact	60	1200	10	0	197	169	175	3	71	132	464
Permanent CISS piles/ In Dewatered Cofferdam	10-foot CISS	Impact	100	100	50	-10	179	166	158	1	43	79	171
Permanent CISS piles/ On-land	10-foot CISS	Impact	100	100	20	0	199	172	187	7	43	80	5857
Caltrans 2009. Technical guidance manual for the assessment of the hydroacoustic effects of pile driving on fish. Sacramento, CA.													

Caltrans estimates the peak SPL calculated for an attenuated 10-foot CISS pile is 179 dB and 199 dB on land for this project. They estimate a single-strike SEL of 166 dB for an attenuated pile and 172 dB on land, and an RMS of 158 dB for an attenuated pile and 187 dB on land. Estimation of the cumulative SEL requires an estimate of the duration of pile driving activities in a single day. The project estimates that 1 pile would be driven per day (over an eight day period) during attenuated pile driving operations and on land.

NMFS has analyzed the effects of the proposed pile driving for the permanent and temporary strucutures necessary for construction of the project, including the proposed avoidance and minimization measures. As a result, NMFS does not anticipate SPLs, SELs and RMS values to be exceeded beyond the following distances surrounding each pile during each construction phase, for fish greater than or equal to 2 grams and less than 2 grams:

- For un-attenuated temporary trestle piles (22-inch pipe piles) in water, 206 dB peak SPL at 14 m, 187 dB cSEL at 209 m, 183 cSEL at 386 m, and 150 dB RMS at 2929 m;

- For un-attenuated temporary trestle piles (22-inch pipe piles) on land, 206 dB peak SPL at 3 m, 187 dB cSEL at 71 m, 183 cSEL at 132 m, and 150 dB RMS at 464 m;

- For attenuated permanent bridge foundation piles (CISS piles) in water, 206 dB peak SPL at 1 m, 187 dB cSEL at 43 m, 183 cSEL at 79 m, and 150 dB RMS at 171 m; and

- For un-attenuated permanent bridge foundation piles (CISS piles) on land, 206 dB peak SPL at 7 m, 187 dB cSEL at 43 m, 183 cSEL at 80 m, and 150 dB RMS at 5857 m.

As distance from the pile increases, SPLs decrease and the potential harmful effects to fish also decrease. Hence the distance to reach the 150 dB RMS corresponding to sub-injurious sound levels (*i.e.* non-lethal, behavioral responses), is not expected to extend beyond a 5857 m radius from the action area for any pile driving event. This larger area defines the total area of impact expected from pile driving for the entire duration of bridge replacement activities.

Estimates were made based upon Caltrans data and the pile size and type anticipated to be used for this project during attenuated impact hammer pile driving. Assuming a 10 dB reduction per Caltrans' estimates, reference values of 179 dB peak (re: 1 µPa), 166 dB SEL (re: 1 μPa^2-sec) and 158 dB RMS measured at 50 meters, and estimating a maximum total of 100 strikes per day during installation of the permanent bridge foundations with a transmission loss (TL) of 15 dB[1]; results in the distance to reach the injury and sub-injury thresholds provided above for attenuated impact hammer installation of the piles.

The maximum area where fish may be injured or killed during impact hammering of the 22-inch piles in water is 386 m (772 m diameter), corresponding to the cumulative SEL threshold of 183 dB. Further away from the piles, to a distance of 2929 m (5858 m diameter), corresponding to the 150 dB RMS threshold, fish behavior may be adversely affected. Since no fish are expected to be holding within these areas during un-attenuated pile driving of the 22-inch piles (this reach of the lower Feather River is largely used by listed fish as a migratory corridor) no attenuation devices will be implemented.

Based on these computations, peak SPLs generated by pile driving activities will be nearly within established thresholds for the protection of fish. However, cumulative SPLs sufficient to cause injury to fish would occur within 79 meters and 386 meters of the of pile driving activities. These areas are considered the maximum radius of the potential impact zone for injury or mortality.

NMFS anticipates that juvenile salmonids and green sturgeon located within 79 and 386 meters (ensonified zones during construction during temporary trestles and permanent foundation piers, respectively) of piles driven with an impact hammer may suffer physical injury or mortality from exposure to high underwater sound levels. This is the distance expected to reach the cSEL threshold of 183 dB. Beyond 79 and 386 meters, extending 5857 meters from the pile corresponding with the 150 dB RMS, salmonids and sturgeon may exhibit behavioral responses. These disruptions to normal behavioral patterns could result in decreased feeding opportunities, loss of shelter from predators, or dispersal from suitable rearing habitat which may contribute to a reduced growth rate. Disruption of these behaviors may also lead to increased predation if fish become disoriented or concentrated in areas with high predator densities. However, the likelihood for these effects to occur is small, because pile driving will occur during the day, enabling unhindered fish passage at night per typical fish movement patterns. The June 1

1 NMFS recommends using the Practical Spreading Loss model ($TL = 15*\log(R_1/R_0)$), unless data are available to support a different model.

through October 1 work window will further minimize the extent of the impacts on listed anadromous fish by avoiding the peaks of adult and juvenile migration periods.

The startling or agitation of juvenile and adult salmonids and green sturgeon may temporarily disrupt normal behaviors (such as feeding, sheltering, and migrating) that are essential to growth and survival. Injury is caused when disrupting these behaviors increases the likelihood that individual fish will face increased competition for food and space, and experience reduced growth rates or possibly weight loss. Disruption of these behaviors may also result in the death of some individuals due to increased predation if fish are disoriented or concentrated in areas with high predator densities. Disruption of behaviors will occur between June 1 and October 1 of each construction year, during weekday daylight operation hours of the hydraulic hammer. Because of their nocturnal migratory behavior, daily migration delays are expected only to impact the portion of each ESU that migrates during daylight hours. Therefore, salmonids and sturgeon will still be exposed during the daytime. Adult CCV steelhead, CV spring-run Chinook, and green sturgeon that are migrating upstream in September and October may be startled or exhibit other behavioral responses during pile driving, resulting in daily migration delays of up to eight hours by holding downstream of the bridge until the pile driving stops. These migration delays are not expected to injure adults because adult fish commonly hold in deep pools while migrating upstream, and because they do not begin spawning until December or January, approximately three months after any migration delay might occur.

In summary, NMFS anticipates that pile driving will be detectable to salmonids up to 386 meters from the source, and that the sounds generated will harass juvenile salmonids and sturgeon by causing injury from temporary disruption of normal behaviors such as feeding, sheltering, and migrating that may contribute to reduced or negative growth. Disruption of these behaviors may also lead to increased predation if fish become disoriented or concentrated in areas with high predator densities. These effects should be small because pile driving will occur during the day, enabling unhindered fish passage at night during peak migration times. The June 1 through October 1 work window will further minimize the extent of the impacts on listed anadromous fish by avoiding the peaks of adult and juvenile migration periods.

5. Effects on Designated Critical Habitat Primary Constituent Elements (PCEs)

As described earlier, the removal of temporary water diversion construction from the Feather River will affect critical habitat for listed species migrating, rearing, and holding in the area.

The basic premise to the conservation value of an overall critical habitat designation is the sum of the values of the components that comprise the habitat. For example, the conservation value of listed salmonid critical habitat is determined by the conservation value of the watersheds that make up the designated area. In turn, the conservation value of the specific watershed is comprised of the sum of the value of the PCEs that make up the area. PCEs are specific areas or functions, such as spawning or rearing habitat, that support different life history stages or requirements of the species. The conservation value of the PCE is the sum of the quantity, quality, and availability of the essential features of that PCE. Essential features are the specific processes, variables or elements that comprise a PCE. Thus, an example of a PCE would be spawning habitat and the essential features of that PCE are conditions such as clean spawning

gravels, appropriate timing and duration of certain water temperatures, and water quality free of pollutants.

Therefore, reductions in the quantity, quality, or availability of one or more essential feature reduce the value of the PCE, which in turn reduces the function of the sub-area (*e.g.*, watersheds), which in turn reduces the function of the overall designation. In the strictest interpretation, reductions to any one essential feature or PCE would equate to a reduction in the value of the whole. However, there are other considerations. We look to various factors to determine if the reduction in the value of an essential feature or PCE would affect higher levels of organization. For example:

- The timing, duration and magnitude of the reduction;
- The permanent or temporary nature of the reduction; and
- Whether the essential feature or PCE is limiting (in the action area or across the designation) to the recovery of the species or supports a critical life stage in the recovery needs of the species (for example, juvenile survival is a limiting factor in recovery of the species and the habitat element supports juvenile survival).

In our assessment, we combine information about the contribution of constituent elements of critical habitat (or of the physical, chemical, or biotic phenomena that give the designated area value for the conservation of listed species) to the conservation value of those areas of critical habitat that occur in the action area, given the physical, chemical, biotic, and ecological processes that produce and maintain those constituent elements in the action area. We use the conservation value of those areas of designated critical habitat that occur in the action area as our point of reference for this comparison. For example, if the critical habitat in the action area has limited current value or potential value for the conservation of listed species, that limited value is our point of reference for our assessment of the consequences of the added effects of the proposed action on that conservation value.

The Project will improve spawning sites on the Lower Feather River below the FRFH. This spawning habitat improvement program by DWR was developed to address impacts from operation of the SWP's Oroville Facilities that have resulted in a decrease of habitat quality and quantity in the action area. These improvements will require active restoration in the stream channel to modify channel hydraulics through changes in channel elevations, gravel addition and loosening of the armored surface layers. The Project will have a benefit to spawning and rearing critical habitats of CV spring-run Chinook salmon, CCV steelhead, and green sturgeon.

Within the action area, the relevant PCEs for salmonids and sturgeon include food resources, water flow, water quality, migratory corridors, water depth, and streambed quality (related to spawning habitat). Within the action area, the relevant PCEs for green sturgeon are migratory corridors The Project is unlikely to demonstrably affect, within the action area, rearing habitat, migratory corridors or food resources or their availability for salmonids. The migratory pathway that green sturgeon utilize, found in the project action area, will not be compromised, therefore, this PCE will not be affected so migration or movement of green sturgeon could continue. The

Project will significantly improve hyporheic flows (these are flows that are found in river channels in the hyporheic zone, which is the flow of water in a region beneath and alongside a stream bed, where there is mixing of shallow groundwater and surface water) through loosening the embedded channel bottom.

a. Effects on Shaded Riverine Aquatic Habitat (SRA)

SRA habitat generally includes the woody vegetation and cover structures associated with "natural" banks that function to provide shade; sediment, nutrient, and chemical regulation; stream bank stability; input of woody debris and leaves that provide cover and serve as substrates for food-producing invertebrates. Approximately 0.30 total acre of riparian vegetation will be permanently impacted and approximately 0.65 acres temporarily impacted during bridge replacement activities, including the demolition of the existing facility and the requisite temporary access routes. However, the expanded bridge deck will provide additional shade over the Feather River (approximately 0.47 acre) which will compensate for the loss of riparian vegetation and associated shading removed by the Project. The project will restore temporarily disturbed sites with native species commonly found in the project area therefore the temporary loss of shade as a result of the construction of access areas will not have a measurable effect on water temperatures or a significant effect on natural cover in this section of the Feather River.

Any disturbances or impacts on woody vegetation will be offset by re-vegetation following the completion of construction. The City will prepare a riparian restoration plan to be reviewed and approved by CDFW, CVFPB, NMFS, and any other applicable agencies prior to construction. This plan will include restoration of areas impacted by the proposed project, and will aim to establish a healthy riparian corridor along this span of the Feather River.

b. Effects of Sediment on Critical Habitat

The Project will permanently affect an approximate 0.01 acre of CCV steelhead critical habitat from the installation and permanent placement of the piles in the live river channel of the Feather River. Construction of the bridge will require construction of a temporary work trestle, temporary dewatering and temporary water diversions, resulting in an approximate 3.62 acre temporary affect to critical habitat waters. BMPs are incorporated into the project to minimize turbidity effects to critical habitat.

Effects from TSS on critical habitats can also reduce fisheries habitat quality by increasing sedimentation. Sedimentation can decrease or reduce spawning habitat as well as rearing habitat. Increased sedimentation, especially in low valley streams, can smother incubating embryos and emergent fry. Increased sedimentation can seal gravel and decrease inter-gravel water flow reducing inter-gravel dissolved oxygen concentrations and result in high biological oxygen demand (BOD). Increased turbidity, especially caused by fine inorganic particles, increase drift of macroinvertebrates. Aquatic invertebrate communities may change as a result of sedimentation or turbidity, which in turn could affect salmonid prey items. In addition, suspended materials in slow moving waters can increase absorption of solar energy near the surface causing the heated upper layers to stratify reducing the dispersion of dissolved oxygen and nutrients to lower depths.

Due to the extended level of higher base flows in the lower Feather River, it is anticipated that, with regard to the potential effects described in this section, the effects of suspended sediment that may lead to sedimentation in the project action area will be insignificant because most, if not all of the suspended sediment will dissipate quickly or be diluted substantially by the high base flows (3,310 cfs mean summer flow; Table 8) in the lower Feather River and moved downstream making the effects insignificant.

c. Freshwater Migratory Corridor

Safe and unobstructed migratory pathways are necessary for adult salmonids and sturgeon to migrate to and from spawning habitats, and for larval and juveniles to migrate downstream from spawning/rearing habitats within freshwater rivers to rearing habitats within the estuaries. The main migratory corridor in the lower Feather River will not be blocked at any time during project implementation so CCV steelhead, CV spring-run Chinook salmon and green sturgeon using the area to migrate up to the upper end of the lower Feather River corridor to feed or rest, should not be affected and the effects of the project on the PCE of migratory corridors for all listed species is insignificant. Fish that use the action area as a migratory corridor will be able to continue using the channel during and after construction of the proposed action.

d. Freshwater spawning and rearing habitat

Freshwater rearing habitat provides water quantity, quality, and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility. Rearing habitat condition is strongly affected by habitat complexity, food supply, and presence of predators of juvenile salmonids and green sturgeon. Freshwater rearing habitats have a high intrinsic value to salmonids, as the juvenile life stages are dependent on the function of this habitat for successful survival and recruitment. The project would not result in a permanent direct loss of spawning habitat, but would temporarily make small areas unavailable for spawning during the in-water construction period; however, none of the listed species are expected to be spawning during the proposed work window.

CV spring-run Chinook salmon juveniles would have outmigrated by the time construction begins and during the in-channel construction period. The proposed action would not result in a permanent direct loss of CCV steelhead and green sturgeon rearing habitat, but would temporarily make small areas unavailable for rearing during construction. These short-term temporary instream disturbances (physical equipment, turbidity, etc.) would likely result in the displacement of fish from their habitat to downstream areas. However, there is suitable rearing habitat for salmonids and sturgeon below the action area and above the confluence of the Feather and Sacramento Rivers.

Based on the expected behavioral response of juveniles to relocate and the condition of the habitat there, any juveniles that are removed during potential fish salvage activities and displaced downstream, are expected to find adequate cover and food and not suffer any diminishment in their fitness from relocation. Through changes to the particle size distribution in the channel bed and increases to the mobility of the geomorphic landscape of the streambed through localized

changes in channel hydraulics; these actions will ultimately improve and increase the availability of suitable salmonid and sturgeon rearing habitat in the action area having a beneficial effect.

VI. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

A. Agricultural Practices

Agricultural practices may negatively affect riparian and wetland habitats through upland modifications that lead to increased siltation or reductions in water flow in stream channels flowing into the action area, including the Sacramento River and Delta. Grazing activities from livestock operations can degrade or reduce suitable critical habitat for listed salmonids by increasing erosion and sedimentation, as well as introducing nitrogen, ammonia, and other nutrients into the watershed, which then flow into receiving waters. Increased water temperatures can result when agricultural water exposed to warm summer air temperatures is returned to the Yuba River as agricultural return flow. Stormwater and irrigation discharges related to both agricultural and urban activities contain numerous pesticides and herbicides that may negatively affect salmonid reproductive success and survival rates (Dubrovsky *et al.* 1998, 2000; Daughton 2003).

B. Global Climate Change

The world is about 1.3°F warmer today than a century ago and the latest computer models predict that, without drastic cutbacks in emissions of carbon dioxide and other gases released by the burning of fossil fuels, the average global surface temperature may rise by two or more degrees in the 21st century (Intergovernmental Panel on Climate Change [IPCC] 2001). Much of that increase likely will occur in the oceans, and evidence suggests that the most dramatic changes in ocean temperature are now occurring in the Pacific (Noakes 1998). Using objectively analyzed data Huang and Liu (2000) estimated a warming of about 0.9°F per century in the Northern Pacific Ocean.

Sea levels are expected to rise by 0.5 to 1.0 meters in the northeastern Pacific coasts in the next century, mainly due to warmer ocean temperatures, which lead to thermal expansion much the same way that hot air expands. This will cause increased sedimentation, erosion, coastal flooding, and permanent inundation of low-lying natural ecosystems (*e.g.*, salt marsh, riverine, mud flats) affecting salmonid PCEs. Increased winter precipitation, decreased snow pack, permafrost degradation, and glacier retreat due to warmer temperatures will cause landslides in unstable mountainous regions, and destroy fish and wildlife habitat, including salmon-spawning streams. Glacier reduction could affect the flow and temperature of rivers and streams that depend on glacier water, with negative impacts on fish populations and the habitat that supports them.

Summer droughts along the South Coast and in the interior of the northwest Pacific coastlines will mean decreased stream flow in those areas, decreasing salmonid survival and reducing water supplies in the dry summer season when irrigation and domestic water use are greatest. Global warming may also change the chemical composition of the water that fish inhabit: the amount of oxygen in the water may decline, while pollution, acidity, and salinity levels may increase. This will allow for more invasive species to overtake native fish species and impact predator-prey relationships (Peterson and Kitchell 2001, Stachowicz *et al.* 2002).

An alarming prediction is that Sierra snow packs are expected to decrease with global warming and that the majority of runoff in California will be from rainfall in the winter rather than from melting snow pack in the mountains. This will alter river runoff patterns and transform the tributaries that feed the Central Valley from a spring/summer snowmelt dominated system to a winter rain dominated system. It can be hypothesized that summer temperatures and flow levels could become unsuitable for salmonid survival. The cold snowmelt that furnishes the late spring and early summer runoff will be replaced by warmer precipitation runoff. This should truncate the period of time that suitable cold-water conditions exist below existing reservoirs and dams due to the warmer inflow temperatures to the reservoir from rain runoff. Without the necessary cold water pool developed from melting snow pack filling reservoirs in the spring and early summer, late summer and fall temperatures below Oroville, it could potentially rise above thermal tolerances for juvenile and adult salmonids (*i.e.* Sacramento River winter-run Chinook salmon and CV steelhead) that must hold below the dam over the summer and fall periods. Within the context of the period over which the project is scheduled to take place, however, the effects of global climate change are unlikely to result in any perceptible declines to the overall health or distribution of the listed populations of anadromous fish within the action area that are the subject of this consultation; therefore, the project effects and climate change are not expected to aggregate.

VII. INTEGRATION AND SYNTHESIS

This section integrates the current conditions described in the *Environmental Baseline* section with the effects of the project and the cumulative effects of future actions. The purpose of this synthesis is to develop an understanding of the likely short-term and long-term responses of listed species and critical habitat to the proposed project.

A. Summary of Current Conditions and Environmental Baseline

The *Status of Species and Critical Habitat* and *Environmental Baseline* sections show that past and present impacts to the Feather River, Sacramento and San Joaquin River basins and the Delta have caused significant salmonid and green sturgeon habitat loss, fragmentation and degradation. This has reduced the quality and quantity of freshwater rearing sites and the migratory corridors within the lower valley floor reaches of the Sacramento and San Joaquin Rivers and the Delta region for these listed species. Additional loss of freshwater spawning sites, rearing sites, and migratory corridors have also occurred upstream in the upper main stem and tributaries of the Sacramento and San Joaquin River basins.

Anthropogenic activities in Central Valley watersheds have contributed substantially to declines in CV spring-run Chinook salmon, CCV steelhead and Southern DPS of Northern green sturgeon populations. Access to upper elevation watersheds in the Sacramento River basin have been severely curtailed for spring-run Chinook salmon and steelhead by the construction of large dams on the foothill sections of the valley's major tributaries. These rim dams effectively block access of anadromous fish, including salmonids and sturgeon to the entire watershed above the dams since effective fish ways and ladders are non-existent at this time. Construction of large dams on the major tributaries found in the San Joaquin River basin led to the extirpation of the CV spring-run Chinook salmon populations found in the basin's watersheds. The last self-sustaining population of spring-run Chinook salmon in the San Joaquin River basin was extirpated by the completion of Friant Dam and the Kern and Friant canals in the late 1940s. The populations of CV steelhead that historically inhabited these various watersheds have also been severely reduced in number, with only a few small populations remaining in the tailwaters below the dams. The operations of various hydropower projects have reduced the extent of suitable water temperatures for over summering steelhead juveniles to the tailwaters immediately below these dams. In some cases the water temperatures reach incipient lethal temperatures only a few miles downstream of the dams. Alterations in the geometry of the Delta channels, removal of riparian vegetation and shallow water habitat, construction of armored levees for flood protection, changes in river flow created by demands of water diverters (including pre-1914 riparian water right holders, CVP and SWP contractors, and municipal entities), and the influx of contaminants from agricultural and urban dischargers have substantially reduced the functionality of the Central Valley's suitable aquatic habitat.

B. Impacts of the Proposed Action on CV spring-run Chinook Salmon, CCV Steelhead, North American green sturgeon, and their Designated Critical Habitat

NMFS finds that the effects of the proposed action on CV spring-run Chinook salmon, CCV steelhead, North American green sturgeon, and their designated critical habitat will include a temporary increase in suspended sediment and turbidity, a short-term reduction of SRA habitat, harassment, injury, and possible predation-related mortality of individuals from pile driving, and harassment, injury and potential mortality of individuals entrained or salvaged from behind cofferdams. With the exception of loss of SRA habitat, the June 1 to October 1 in water work window will minimize project-related effects by avoiding the peak migration periods of adult and juvenile salmonid and sturgeon migrations.

The most likely effects to listed salmonids and sturgeon resulting from the proposed action are harassment of juvenile spring-run Chinook salmon, CCV steelhead, and green sturgeon resulting from the noise of pile driving, and entrainment of juveniles into cofferdams. Pile driving is expected to result in temporary disruptions in the feeding, sheltering, and migratory behavior of adult juvenile salmon and steelhead. This disruption may injure or kill juveniles by causing reduced growth and increased susceptibility to predation. Adults should not be injured because the disruptions should only include temporary migration delays that should not prevent successful spawning. Pile driving is also not expected to prevent salmonids and sturgeon from passing upstream or downstream because pile driving will not be continuous through the day, and will not occur at night, when the majority of fish migrate. Pile driving effects will be

minimized by avoiding the peak migration periods of listed anadromous salmonids. Death as a result of entrainment is expected to be minimized by salvaging and relocating fish away from the project site. A low mortality rate of juveniles (<10 percent) is expected to result from fish salvage.

Turbidity changes that are within the CVRWQCB standards may result in sudden localized turbidity increases that could injure juvenile salmonids and sturgeon by temporarily impairing their migration, rearing, feeding, or sheltering behavior. Project-related turbidity increases may also contribute to the susceptibility of juvenile salmonids and sturgeon to increased predation. Turbidity related injury and predation will be minimized by implementing the avoidance and contingency measures of the SWPPP, and by scheduling in-water work to avoid peak migration periods of listed anadromous salmonids and sturgeon.

The temporary loss of 0.65 ac of riparian vegetation will result in a small reduction of nearshore cover and food production until the vegetation in the disturbed areas is re-established (five to ten years). A riparian restoration plan will include restoration of areas impacted by the proposed project, and will establish a healthy riparian corridor along this span of the Feather River. Because of the diverse habitat conditions in the action area, and other forms of cover and food production available to salmon and steelhead within the action area, the loss of 0.65 ac of vegetation is not expected to significantly impair the essential behavioral patterns of listed anadromous fish and will, therefore, not result in a reduction in numbers. There will be a permanent loss of 0.30 riverine habitat from the increased size of the bridge columns. However, the expanded bridge deck will provide additional shade over the Feather River which will compensate for the loss of riparian vegetation and associated shading removed by the project.

C. Impacts of the Proposed Action on ESU Survival and Recovery

The adverse effects to spring-run Chinook salmon, CCV steelhead, and North American green sturgeon within the action area are not expected to affect the overall survival and recovery of the ESUs. This is largely due to the fact that although construction may cause adverse effects to some listed salmonids, the impacts will avoid the largest proportions of listed anadromous fish that migrate through the action area by limiting in-water work to months that do not coincide with peak migration periods. Additionally, most of the effects are not lethal. Construction-related harassment will be temporary and will not impede adult fish from reaching upstream spawning and holding habitat, or juvenile fish from migrating downstream. The project will compensate for temporary and permanent losses of critical habitat through the creation of a riparian restoration plan that will aid in the establishment of a healthy riparian corridor in the project action area.

D. Beneficial Aspects of the Project

The NMFS draft recovery plan (NMFS Draft Recovery Plan 2009b) recommends that the lower Feather River be improved through projects that improve habitat conditions for various life stages of listed salmonids.

Description of a recovery action: Restore the quality of the spawning habitats in the lower Feather River by implementing SRA restoration program in the project action area.

IX. CONCLUSION

After reviewing the best scientific and commercial data available, including current status of the species discussed above, the Environmental Baseline for the action area, the cumulative effects of the proposed project, it is NMFS' biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the aforementioned species.

After reviewing the best available scientific and commercial information, the current status of critical habitat, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is NMFS' biological opinion that the project is not likely to destroy or adversely modify designated critical habitat for the aforementioned species.

IX. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NMFS as an act which kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by Caltrans so that they become binding conditions of any contracts or permits, as appropriate, for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans: (1) fails to assume and implement the terms and conditions; or (2) fails to require the applicant and its contractor(s) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Caltrans or the applicant must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement (50 CFR §402.14(i)(3)).

A. Amount or Extent of Take

NMFS anticipates incidental take of CV spring-run Chinook salmon, CCV steelhead, and North American green sturgeon from impacts directly related to pile driving, dewatering, and impairment of essential behavior patterns as a result of these activities. The incidental take is expected to be in the form of harm, harassment, or mortality of CV spring-run Chinook salmon, CCV steelhead, and North American green sturgeon resulting from the installation and removal of temporary and permanent piles and cofferdam construction. Incidental take is expected to occur for any in-water work window seasons, from June 1 to October 1, when CV spring-run Chinook salmon, CCV steelhead, and North American green sturgeon individuals could potentially be in the action area. Take is expected on migrating adults, and migrating, rearing and smolting juveniles.

NMFS cannot, using the best available information, quantify the anticipated incidental take of individual CV spring-run Chinook salmon, CCV steelhead, and North American green sturgeon because of the variability and uncertainty associated with the population size of the species, annual variations in the timing of migration, and uncertainties regarding individual habitat use of the project area. However, it is possible to describe the ecological surrogates that will lead to the non-lethal and lethal estimates of take:

1. <u>Dewatering Activities</u>

Although abundance of juvenile CV spring-run Chinook, CCV steelhead, and North American green sturgeon is expected to be very low in the project action area, take of stranded juveniles during the dewatering activities from June 1 to October 1 will likely occur. Stranded juveniles will be captured and relocated directly downstream of the project site. There is potential for listed juvenile fish to be directly killed or injured as a result of handling during relocation. Due to the lack of information on juvenile salmonid and sturgeon use for this reach of the lower Feather River, it is difficult to estimate the number of fish that could potentially be taken by project actions.

DWR (2014) observed spring-run CV Chinook salmon pass through the Herringer RST (at RM 46) and Live Oak RST (at RM 42) in 2013 at a ratio of 1 individual per 100 square meters and arrive at the project location 2.3 and 1.8 days later, respectively. Since the total area to be dewatered is estimated at 74,087 sq ft, non-lethal take for this Project will be limited to less than 69 individuals and lethal take will be limited to less than seven individuals concerning spring-run CV Chinook salmon. The mortality rate (expected to be less than 10 percent if consistent with the results of fish handling in similar fish salvage efforts) is a standard expected from the capturing, handling, and relocation of fish.

Kindopp (2014) suggests that steelhead smolts are unlikely to use the project area during the in-water construction window time period. They almost never catch steelhead smolts in their RSTs past April. However, adult steelhead could migrate up through this portion of the river in September. This is likely a very small portion of the run though, or less than 10%. Kindopp (2014) confirmed that in a low flow year, steelhead migrating through the project area could likely be as low as 300 individuals, therefore non-lethal take for this project will be limited to

less than 30 individuals and lethal take will be limited to three individuals concerning CCV steelhead. See above for mortality rate expectation.

Seeholtz (2014) confirmed that one green sturgeon, out of the four they tracked in 2013, made three forays between Sunset Pumps (RM 39) and Shanghai Bend (RM 25). If there is another low flow year and green sturgeon can't make it past Sunset Pumps, then it is possible they will be migrating past the project site multiple times throughout the in-water construction work time period allowing for a very small amount of take. Seeholtz (2014) also stated that in low-flow conditions one green sturgeon migrated past the project area a total of 8 times. If the population is less than a dozen fish then approximately one quarter of the population might follow the same pattern (based on DWR 2013 data). Therefore, there could be the potential for green sturgeon to pass the project area a total of 24 times during the in-water work window. Non-lethal take for this project will be limited to less than 24 individuals and lethal take will be limited to less than three individuals concerning North American green sturgeon. See above for mortality rate expectation.

Water temperatures during the construction season are likely to reach over the maximum 7 day average lethal threshold (75.2 ºF) for steelhead especially in July and August (CDEC 2011). Due to the higher water temperatures, presence of juvenile steelhead in the project area is expected to be low. Take resulting from fish salvage after the installation of the cofferdam is also expected be minimal due to the high water temperatures anticipated in the area.

2. <u>Pile Driving</u>

The analysis of proposed project effects anticipates the installation of all of the structural piles for the temporary falsework/working trestle piles will be driven in place by a vibratory and impact hammer methodology (Table 9). Driving with a vibratory hammer will last up to 12 hours per day, and impact hammering (only when necessary) is not expected to last longer than one hour in total. Vibratory and drilling installation of piles assumes that no underwater noise impact is expected. The temporary trestle piles and permanent bridge foundation piles will require impact installation of 22-inch steel "H" piles and 10-foot CISS piles, respectively. All piles will be driven during the in-water work window between June 1 and October 1 during daylight hours.

Pile driving with an impact hammer is expected to result in incidental take in the form of injury and mortality to salmonids through exposure to temporary high SPLs (> 206 dB peak SPL and 183 or 187 dB SEL) within the water column during the installation of the permanent bridge foundation (pier and column activities). The number of salmonids that may be incidentally taken during activities is expected to be small. NMFS will use the area of sound pressure wave impacts extending into the water column from each pile, and the time period for pile driving as a surrogate for number of fish. Based on the sound pressure analysis (refer to Table 9), peak sound pressures are estimated to be below thresholds for injury and/or mortality of listed fish. Cumulative sound pressures are in excess of the 187 and 183 dB SEL for a distance of 43-386 meters surrounding the piles depending on temporary versus permanent construction.

For listed salmonids located within 386 m from the pile during unattenuated pile driving of the 22-inch steel temporary falsework/trestle piles, and within 80 m from the pile during

unattenuated pile driving of the 10-foot CISS permanent bridge foundation piles may be injured or killed. Beyond this distance, extending out to 5857 m corresponding with SPLs > 150 dB RMS, fish may exhibit behavioral responses such as agitation or rapid bursts in swimming speeds. If Caltrans' monitoring indicates that SPLs greater than 206 dB peak (re: 1 μPa), or 187 dB SEL (re: 1 $\mu Pa^2 sec$) and 183 dB SEL (re: 1 μPa 2sec), or 150 dB RMS (re: 1 μPa) extend beyond these distances the amount of incidental take may be exceeded.

The analysis of the effects of the proposed project anticipates that the turbidity levels produced by installation and removal of piles will not exceed those permitted under the project SWPPP and that if turbidity levels approach or exceed the acceptable criteria established by the CVWQRCB, construction activities will be halted until turbidity levels return to within acceptable levels.

If these ecological surrogates are not met and maintained, the proposed project will be considered to have exceeded anticipated take levels, thus requiring Caltrans to coordinate with NMFS within 24 hours on ways to reduce the amount of take down to anticipated levels. Anticipated incidental take will be exceeded if the criteria described above are not met, the Project is not implemented as described in the BA prepared for this project, all conservation measures are not implemented as described in the BA (including successful completion of monitoring and reporting criteria), or the project is not implemented in compliance with the terms and conditions of this incidental take statement. If take is exceeded formal consultation must be reinitiated (50 C.F.R. § 402.16(a)).

B. Effect of Take

NMFS has determined that the aforementioned level of take resulting from the 5th Street Bridge Replacement Project is not likely to jeopardize CV spring-run Chinook salmon, CCV steelhead, North American green sturgeon and is not likely to destroy or adversely modify designated critical habitat.

C. Reasonable and Prudent Measures

NMFS has determined that the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize the incidental take of listed CV spring-run Chinook salmon, CCV steelhead, and North American green sturgeon resulting from the Project. These reasonable and prudent measures also would minimize adverse effects on designated critical habitat:

1. Measures shall be taken to minimize incidental take of listed anadromous fish by restricting the in-water work to avoid vulnerable life stages;

2. Measures shall be taken to minimize incidental take of listed anadromous fish during water diversion construction;

3. Measures shall be taken to validate that erosion, sediment, and turbidity controls and contingency measures are effective;

4. Measures shall be taken to minimize the effect of temporary habitat loss of riverine and riparian habitat;

5. Measures shall be taken to maintain fish passage for salmonids through the project site;

6. Caltrans shall provide a report of project activities to NMFS by December 31 of each construction year;

7. Caltrans shall report any incidence of take to NMFS; and

8. Measures shall be taken to minimize the number of piles used and duration of pile driving and its potential impacts on listed salmonids, and to monitor the range and distance of high underwater sound levels generated by pile driving operations.

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, Caltrans must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary and must be incorporated as binding conditions of any contracts or permits between Caltrans and their contractors:

(1) Measures shall be taken to minimize incidental take of listed anadromous fish by restricting the in-water work to avoid vulnerable life stages;

Conditions: Any construction work occurring below the OHWM will occur from June 1 to October 1 of each construction year. This is a time when listed species are least likely to be impacted.

(2) Measures shall be taken to minimize incidental take of listed anadromous fish during water diversion construction;

Conditions: Caltrans will have a fish biologist prepare a fish salvage plan to recover any individual salmonids entrapped or entrained during the temporary water diversion construction process. In addition, Caltrans will submit the plan to NMFS prior to project initiation.

(3) Measures shall be taken to validate that erosion, sediment, and turbidity controls and contingency measures are effective;

Conditions: Caltrans shall ensure that proper sediment control and retention structures are effective and in place throughout the rainy season. Also, Caltrans shall obtain all appropriate permits through the CVWQRCB and have on file a SWPPP.

(4) Measures shall be taken to minimize the effect of temporary habitat loss of riverine and riparian habitat;

Conditions: Caltrans will prepare a riparian restoration plan to include restoration of areas impacted by the project, and will establish a healthy riparian corridor along this reach of the Feather River.

a. Existing vegetation will be protected in place where feasible to provide an effective form of erosion and sediment control as well as watershed protection, landscape beautification, dust control, pollution control, noise reduction, and shade;

b. To control invasive species, all landscaping and re-vegetation will consist of Caltrans approved plants or seed mixes from native, locally adapted species. Prior to arrival at the project site and prior to leaving the project site, construction equipment that may contain invasive plants and/or seeds must be cleaned to reduce the spreading of noxious weeds;

c. Caltrans shall monitor and maintain all riparian plantings for five years, and provide irrigation, fertilization and replacement plantings as necessary to ensure full and rapid recovery of disturbed riparian habitat features;

d. Caltrans shall provide NMFS a post-construction field review and yearly field reviews for five years of the proposed project site, to assure conservation measures were adequately implemented and whether additional plantings are needed to establish adequate riparian vegetation. The first review should occur the year following construction completion. The field review shall include the following elements:

    i. Seasonal surveys to determine adequate cover and plant survival throughout the year is being met;

    ii. A survival ratio to ensure planting of new vegetation is implemented during the first five years when necessary; and

    iii. Photo point monitoring shots at the established repair site to be used as a tool to determine success and survival rates. The photos shall be taken annually on the same date, as much as practicable.

(5) Measures shall be taken to maintain fish passage for salmonids and sturgeon through the project site;

Conditions: Cofferdams will affect no more of the stream channel than is necessary to support completion of the construction activity. Flow will be diverted the minimum distance necessary to isolate the construction area. Water will be released downstream at an appropriate rate to maintain downstream flows at all times. Immediately upon completion of in-channel work, temporary fills (as needed), cofferdams, and other in-channel structures will be removed in a manner that minimizes disturbance to downstream flows and water quality. In addition, Caltrans shall establish non-work

periods of at least eight hours at night to allow for quiet migration conditions for listed salmonids and sturgeon. Absence of in-water work during the night time will allow for unimpeded movement through the action area by listed salmonids and sturgeon.

(6) Caltrans shall provide a report of project activities to NMFS by December 31 of each construction year;

Conditions: This report shall include a summary description of in-water constraint activities, avoidance and minimization measures taken, and any observed take incidents.

(7) Caltrans shall report any incidence of take to NMFS; and

Conditions: Caltrans shall record the date, number, and specific location of all listed fish that are relocated for each construction-related activity in the project area in addition to any direct mortalities observed during dewatering and relocation. If a listed species is observed injured or killed by project activities, Caltrans shall contact NMFS within 48 hours at 650 Capitol Mall, Suite 5-100, Sacramento, CA 95814. Notification shall include species identification, the number of fish, and a description of the action that resulted in take. If possible, dead individuals shall be collected, placed in an airtight bag, and refrigerated with the aforementioned information until further direction is received from NMFS.

(8) Measures shall be taken to minimize the number of piles used and duration of pile driving and its potential impacts on listed salmonids and sturgeon, and to monitor the range and distance of high underwater sound levels generated by pile driving operations.

Conditions:

a. Real-time monitoring shall be conducted to ensure that underwater sound levels analyzed in this BO do not exceed the established distances described for pile driving construction. Monitoring shall follow NMFS standard practices of 1-2 hydrophones used, the first being placed at 10 m from the pile, mid-depth in the water column, and the second being placed further away near the isopleth estimated for the cumulative SEL distance;

    i. Un-attenuated 22-inch steel temporary trestle piles in water: 206 dB peak SPL at 14 m (28 m diameter), 187 dB cumulative SEL at 209 m (418 m diameter), 183 dB cumulative SEL at 386 m (772 m diameter), and 150 dB RMS at 2929 m (5858 m diameter).

    ii. Un-attenuated 22-inch steel temporary trestle piles on land: 206 dB peak SPL at 3 m (6 m diameter), 187 dB cumulative SEL at 71 m (142 m diameter), 183 dB cumulative SEL at 132 m (264 m diameter), and 150 dB RMS at 464 m (928 m diameter).

    iii. Attenuated 10-foot CISS permanent piles in water: 206 dB peak SPL at 1 m (2 m diameter), 187 dB cumulative SEL at 43 m (86 m diameter), 183 dB

cumulative SEL at 79 m (158 m diameter), and 150 dB RMS at 171 m (342 m diameter).

iv. Un-attenuated 10-foot CISS permanent piles on land: 206 dB peak SPL at 7 m (14 m diameter), 187 dB cumulative SEL at 43 m (86 m diameter), 183 dB cumulative SEL at 80 m (160 m diameter), and 150 dB RMS at 5857 m (11,714 m diameter).

b. Caltrans shall monitor underwater sound during all impact hammer pile driving activities. If underwater sound exceeds the established thresholds at the distances provided above from the piles being driven, then NMFS must be contacted within 24 hours before continuing to drive additional piles.

c. Caltrans shall submit to NMFS a hydroacoustic monitoring report plan for approval at least 60 days prior to the start of construction activities (FHWG 2013). In addition, Caltrans shall submit to NMFS a daily hydroacoustic monitoring report (by close of business of the day following the pile driving activities) that provides real-time data regarding the distance (actual or estimated using propagation models) to the thresholds (187 dB accumulated SEL and 150 dB RMS) stated in this BO to determine adverse effects to listed species. Specifically, the reports shall:

    i. Describe the locations of hydroacoustic monitoring stations that were used to document the extent of the underwater sound footprint during pile-driving activities, including the number, location, distances, and depths of hydrophones and associated monitoring equipment;

    ii. Include the total number of pile strikes per pile, the interval between strikes, the peak SPL and SEL per strike, and accumulated SEL and 150 dB RMS per day for each hydroacoustic monitor deployed; and

    iii. Include a monitoring and reporting plan that will incorporate provisions to provide daily, monthly, and seasonal summaries of the hydroacoustic monitoring results (real-time data) to NMFS during the pile-driving season.

d. Pile driving shall occur only during restricted weekday working hours. This is to ensure that pile driving does not occur at dawn or dusk, during peak salmonid and sturgeon migration and feeding times.

e. Caltrans shall submit to NMFS a final hydroacoustic monitoring summary due 30 days following pile driving events for each temporary and permanent structure required for bridge construction (see Condition (8)(c)(iii) above). The reports must provide a review of the daily monitoring data and process, as well as any problems that were encountered.

Additionally, Caltrans shall maintain, monitor, and adaptively manage all conservation measures throughout the life of the project to ensure their effectiveness. For example, assurances shall be

taken to ensure the success of re-vegetation efforts. Caltrans, for the purposes of agency review and approval, shall provide the finalized project plans to NMFS at least 14 days prior to implementation, which will include the following:

(1) Confirmation of in-water work window from June 1 to October 1;

(2) Use details for any chemically-treated substances that will be used during the in-stream construction window;

(3) Compliance to SWPPP and other CVRWQCB requirements;

(4) Compliance with all pile driving requirements; and

(5) Notification strategy for informing NMFS upon initiation and conclusion of in-water, stream bank, and/or floodplain work.

Caltrans shall provide a project summary and compliance report to NMFS within 60 days of completion of construction. This report shall describe construction dates, implementation of proposed project conservation measures, and the terms and conditions of the final biological opinion; observed or other known effects on CV spring-run Chinook salmon, CCV steelhead, North American green sturgeon, and any occurrences of incidental take.

Updates and reports required by these terms and conditions shall be submitted by December 31 of each year during the construction period to:

Assistant Regional Administrator
California Central Valley Office
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814-4607
FAX: (916) 930-3629
Phone: (916) 930-3600

X. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. NMFS proposes the following conservation recommendations that would avoid or reduce adverse impacts to listed anadromous fish species:

(1) Caltrans should support and promote aquatic and riparian habitat restoration within California's Central Valley, and implement practices that avoid or minimize negative

impacts to salmon, steelhead, and sturgeon on all of their project sites within critical habitat.

(2) Caltrans should continue to work cooperatively with other State and Federal agencies, private landowners, governments, and local watershed groups to identify opportunities for cooperative analysis and funding to support salmonid and sturgeon habitat restoration projects within the Lower Feather River.

(3) Caltrans should provide fiscal and staffing support to anadromous salmonid and sturgeon monitoring programs throughout the Delta to improve the understanding of migration and habitat utilization by salmonids and sturgeon in this region.

(4) Caltrans and other local, state, and Federal agencies should provide training for Caltrans environmental and engineering staff that will assist in avoiding or minimizing the impacts of transportation projects on ESA-listed salmonids, green sturgeon and their habitats.

(5) Caltrans and other local, state, and Federal agencies should include in bid packages to contractors specific requirements for scheduling construction activities that adhere to seasonal work windows in order to avoid principal migration times for listed anadromous fish species.

(6) Caltrans should include in their permit, a condition that the applicant purchase salmonid and steelhead habitat restoration credits at a NFMS-approved anadromous fish conservation bank at a 3:1 ratio for the footprint of the project area. The purchase of credits is consistent with 7(a)(l) because it would result in the restoration and long-term preservation of valuable habitat attributes that will improve the survival and recovery of the species.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, NMFS requests notification of the implementation of any conservation recommendations.

XI. REINITIATION NOTICE

This concludes formal consultation on the 5th Street Bridge Replacement project. As provided in 50 CFR §402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

XII. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are The California Department of Transportation (Caltrans). Other interested users could include the city of Yuba City, the city of Marysville, Sutter County, Yuba County, permit or license applicants, citizens of affected areas, and others interested in the conservation of the affected ESUs/DPS. Individual copies of this opinion were provided to the Caltrans. This opinion will be posted on the Public Consultation Tracking System web site (https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts). The format and naming adheres to conventional standards for style.

Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01, et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the Literature Cited section. The analyses in this opinion and EFH consultation (Enclosure 2) contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, and are consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA

implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

XIII. LITERATURE CITED

Adams, P.B., C.B. Grimes, J.E. Hightower, S.T. Lindley, and M.L. Moser. 2002. Status review for North American green sturgeon, *Acipenser medirostris*. National Marine Fisheries Service. 58 pages.

Adams ,P.B., C. B. Grimes, J.E. Hightower, S.T. Lindley, M.L. Moser, M.J. Parsley. 2007. Population status of North American green sturgeon *Acipenser medirostris*. Environmental Biology of Fish. 79(3-4): 339-356.

Alderdice, D.F. and F.P.J. Velsen**.** 1978. Relation between temperature and incubation time for eggs of chinook salmon (*Oncorhynchus tshawytscha*) J. Fish. Res. Brd. Can. 35:69-75.

Allen, M.A., and T.J. Hassler. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates. (Pacific Southwest) Chinook salmon. U.S. Fish and Wildlife Report 82 (11.49). April 1986.

Allen, P. J., B. Hodge, I. Werner, and J. J. Cech. 2006. Effects of ontogeny, season, and temperature on the swimming performance of juvenile green sturgeon (*Acipenser medirostris*). Canadian Journal of Fisheries and Aquatic Sciences 63:1360-1369.

Allen, P. J. and J. J. Cech Jr. 2007. Age/size effects on juvenile green sturgeon, *Acipenser medirostris*, oxygen consumption, growth, and osmoregulation in saline environments. Environmental Biology of Fishes 79:211-229.

Ayers and Associates. 2001. Two-dimensional modeling and analysis of spawning bed mobilization, lower American River. Prepared for the U.S. Army Corps of Engineers, Sacramento District Office.

Bailey, E.D. 1954. Time pattern of 1953-54 migration of salmon and steelhead into the upper Sacramento River. California Department of Fish and Game, Unpublished report. 4 pages.

Bain, M.B., and N.J. Stevenson, editors. 1999. Aquatic habitat assessment: common methods. American Fisheries Society, Bethesda, Maryland.

Barnhart, R.A. 1986. Species profiles: Life history and environmental requirements of coastal fishes and invertebrates (Pacific Southwest), steelhead. U.S. Fish and Wildlife Service, Biological Report 82 (11.60), TREL-82-4. U.S. Fish and Wildlife service, U.S. Army, Corps of Engineers, Coastal Ecology Group, Waterways Experiment Station, Slidell, LA. 21 pp.

Barrett, J. C., G. D. Grossman, and J. Rosenfeld. 1992. Turbidity-induced changes in reactive distance of rainbow trout. Transactions of the American Fisheries Society 121: 437-443.

Bash, J., C. Berman, and S. Bolton. 2001. Effects of turbidity and suspended solids on salmonids. Center for Streamside Studies, University of Washington.

Beamesderfer, R., M. Simpson, G. Kopp, J. Inman, A. Fuller, and D. Demko. 2004. Historical and current information on green sturgeon occurrence in the Sacramento and San Joaquin rivers and tributaries. S.P. Cramer & Associates, Inc. 44 pp.

Beamesderfer, R.C.P., M.L. Simpson, and G.J. Kopp. 2007. Use of life history information in a population model for Sacramento green sturgeon. Environmental Biology of Fishes. 79 (3-4): 315-337.

Bell, M.C. 1991. Fisheries handbook of engineering requirements and biological criteria (third edition). U.S. Army Corps of Engineers, Portland, OR.

Benson, R.L., Turo, S., and McCovey, B.W. 2007. Migration and movement patterns of green sturgeon (*Acipenser medirostris*) in the Klamath and Trinity rivers, California, USA. Environmental Biology of Fishes 79: 269-379.

Bilby, R.E. 1984. Removal of woody debris may affect stream channel stability. Journal of Forestry 82:609-613.

Bisson, P.A., and R.E. Bilby. 1982. Avoidance of suspended sediment by juvenile coho salmon. North American Journal of Fisheries Management 2:371-374.

Bjornn, T.C., and D.W. Reiser. 1991. Habitat requirements of anadromous salmonids. *In* W.R. Meehan (editor), Influences of forest and rangeland management on salmonid fishes and their habitats, pages 83-138. American Fisheries Society Special Publication 19. American Fisheries Society, Bethesda, MD.

Boreman, J. 1997. Sensitivity of North American sturgeon and paddlefish to fishing mortality, *in* Birstein et al, 1997b. p. 402.

Boles, G.L., S.M. Turek, C.C. Maxwell, and D.M. McGill. 1988. Water temperature effects on Chinook salmon (*Oncorhynchus tshawytscha*) with emphasis on the Sacramento River: a literature review. California Department of Water Resources.

Brandes, P. L. and J. S. McLain. 2001. Juvenile Chinook salmon abundance, distribution, and survival in the Sacramento-San Joaquin Estuary. *In*: R.L. Brown, editor. Contributions to the biology of Central Valley salmonids. Volume 2. California Department of Fish and Game Fish Bulletin 179:39-136.

Brett, J.R. 1952. Temperature tolerance of young Pacific salmon, genus *Oncorhynchus*. Journal of the Fisheries Research Board of Canada 9: 265-323.

Brown, K. 2007. Evidence of Spawning by Green Sturgeon, *Acipenser medirostris*, in the Upper Sacramento River, California. Environmental Biology of Fishes 79: 297-303.

Busby, P.J., T.C. Wainright, G.J. Bryant, L. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. 1996. Status review of west coast steelhead from Washington, Idaho, Oregon and California. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-NWFSC-27, 261 pages.

CALFED Bay-Delta Program. 2000. Ecosystem Restoration Program Plan (Volumes 1–3 and maps). Technical appendices, Final programmatic EIS/EIR for the CALFED Bay-Delta Program. July.

CALFED Bay-Delta Program. 2001. Guide to Regulatory Compliance for Implementing CALFED Actions. Volume 1. November.

California Data Exchange Center. 2011. Found at: http://cdec.water.ca.gov/wquality

California Department of Fish and Game. 1983. Annual Report, Feather River Hatchery, 1983-84. Inland Fisheries Administrative Report No. 87-2.

California Department of Fish and Game. 1992. Sturgeon in relation to water development in the Sacramento-San Joaquin Estuary. Entered by California Department of Fish and Game for the State Water Resources Control Board 1992 Water Rights Phase of the Bay-Delta Estuary Proceedings.

California Department of Fish and Game (1993). Restoring Central Valley streams: A plan for action. California Department of Fish and Game

California Department of Fish and Game. 1998. Report to the Fish and Game Commission. A status review of the spring-run Chinook salmon (*Oncorhynchus tshawytscha*) in the Sacramento River Drainage. Candidate species status report 98-01. Sacramento, 394 pages.

California Department of Fish and Game. 1995. Adult steelhead counts in Mill and Deer Creeks, Tehama County, October 1993-June 1994. Inland Fisheries Administrative Report Number 95-3.

California Department of Fish and Game. 2002. California Department of Fish and Game comments to NMFS regarding green sturgeon listing. 79 pages plus appendices.

California Department of Fish and Game (CDFG). 2010. GrandTab spring-run and winter-run Chinook salmon population estimates.

California Department of Fish and Game. – unpublished data.

California Department of Fish and Game. Steelhead Report Card Data.

California Department of Fish and Game. Sturgeon Report Card Data.

California Department of Transportation. 2009. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Prepared for California Department of Transportation. Prepared by ICF Jones & Stokes and Illingworth and Rodkin, Inc. Sacramento, CA. 298 p.

California Department of Transportation. 2013. Biological Assessment for the 5th Street Bridge Replacement Project. 75pp.

California Department of Water Resources (DWR). 2002. Emigration of Juvenile Chinook Salmon in the Feather River, 1998-2001. Department of Water Resources, Division of Environmental Services.

California Department of Water Resources. 2003. Final Assessment of Sturgeon Distribution and Habitat Use. SP-F21, Task 2, Draft Report Oroville Facilities Relicensing FERC Project 2010.

California Department of Water Resources. 2004a. Evaluation of spawning and incubation substrate suitability for salmonids in the lower Feather River. Final report SP-F10, Task 2A. Oroville Facilities Relicensing, FERC Project No. 2100.

California Department of Water Resources. 2004b. Effects of project operations on geomorphic processes downstream of Oroville Dam. Task 5 - Dam effects on channel hydraulics and geomorphology and Task - 8 summary and conclusions. SP-G2. Oroville Facilities Relicensing FERC Project No. 2100.

California Department of Water Resources. 2004c. Effects of project operations on geomorphic processes downstream of Oroville Dam. SP-G2. Oroville Facilities Relicensing FERC Project No. 2100.

California Department of Water Resources. 2004d. Final assessment of potential sturgeon passage impediments. SP-F3.2 Task 3A. Oroville Facilities Relicensing FERC Project No. 2100.

California Department of Water Resources. 2004e. Project effects on temperature regime. SPW6. Oroville Facilities Relicensing FERC Project No. 2100.

California Department of Water Resources. 2004g. Project effects on water quality designated beneficial uses for surface waters. SPW1. Oroville Facilities Relicensing FERC Project No. 2100.

California Department of Water Resources. 2005. Fish Passage Improvement – An Element of CALFED's Ecosystem Restoration Program Bulletin 250. Fish Passage Improvement 2005.

California Department of Water Resources. 2007. Biological Assessment for Federally Listed Anadromous Fishes: Oroville Facilities Relicensing FERC Project No. 2100. California Department of Water Resources, Sacramento, CA. June 2007. 286 pp.

California Department of Water Resources. 2009. Quantification of pre-screen loss of juvenile steelhead within Clifton Court Forebay. Prepared by K.W. Clark, M.D. Bowen, R.B. Mayfield, K.P. Zehfuss, J.D. Taplin, and C.H. Hanson for the Fishery Improvement Section, Bay Delta Office. xvii + 119 pages.

California Department of Water Resources. 2010. Habitat Expansion Agreement for Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead Final Habitat Expansion Plan. November 2010.

California Department of Water Resources. 2011. Annual year-end report for 2011 4(d) project 16073: Lower Feather River Green Sturgeon Spawning Survey by A. Seesholtz, DWR.

California Department of Water Resources. 2012. Lower Feather River Gravel Improvement Project. Biological Assessment prepared by Montgomery, Watson Harza.

California Resources Agency. 1989. Upper Sacramento River fisheries and riparian management plan. Prepared by an Advisory Council established by SB1086, authored by State Senator Jim Nielson. 157 pages.

Calkins, R.D., W.F. Durand, and W.H. Rich. 1940. Report of the Board of Consultants on the fish problem of the upper Sacramento River. Stanford University, Stanford, CA, 34 pages.

Carlson, T. J., M. C. Hastings, and A. N. Popper. 2007. Update on recommendations for revised interim sound exposure criteria for fish during pile driving activities. Available at http://www.dot.ca.gov/hq/env/bio/files/ct-arlington_memo_12-21-07.pdf (February 2011).

Cavallo, B., R. Kurth, A. Seeholtz, and P. M. 2003. Distribution and habitat use of steelhead and other fishes in the lower Feather River, 1999-2001. California Department of Water Resources Division of Environmental Services.

Central Valley Regional Water Quality Control Board. 2008. Clean Water Act Section 305(b) and 303(d) integrated report for the Central Valley Region. California Environmental Protection Agency, Regional Water Quality Control Board - Central Valley Region. September 2009.

Clark, G.H. 1929. Sacramento-San Joaquin salmon (*Oncorhynchus tshawytscha*) fishery of California. Division of Fish and Game of California Fishery Bulletin 17:1-73.

Chambers, J. 1956. Fish passage development and evaluation program. Progress Report No. 5. U.S. Army Corps of Engineers, North Pacific Division, Portland, OR.

Cohen, A.N., and P.B. Moyle. 2004. Summary of data and analyses indicating that exotic species have impaired the beneficial uses of certain California waters: a report submitted to the State Water Resources Control Board on June 14, 2004. 25 pages.

Conomos, T.J., R.E. Smith, and J.W. Gartner. 1985. Environmental settings of San Francisco Bay. Hydrobiologia 129: 1-12.

Cordone, A.J., and D.W. Kelley. 1961. The influences of inorganic sediment on the aquatic life of streams. California Fish and Game 47:89-228.

Decato, R.J. 1978. Evaluation of the Glenn-Colusa Irrigation District fish screen. California Department of Fish and Game, Anadromous Fisheries Branch Administrative Report No. 78-20.

Deng, X., J. P. Van Eenennaam, and S. I. Doroshov. 2002. Comparison of early life stages and growth of green and white sturgeon. *In:* W. Van Winkle, P.J. Anders, D.H. Secor, and D.A. Dixon, editors, Biology, management, and protection of North American sturgeon, pages 237-248. American Fisheries Society, Symposium 28, Bethesda, Maryland.

Dettman, D.H., D.W. Kelley, and W.T. Mitchell. 1987. The influence of flow on Central Valley salmon. Prepared for the California Department of Water Resources. Revised July 1987. (Available from D.W. Kelley and Associates, 8955 Langs Hill Rd., P.O. Box 634, Newcastle, CA 95658).

Dolloff, C.A. 1993. Predation by river otters (*Lontra Canadensis*) on juvenile coho salmon (*Oncorhynchus kisutch*) and Dolly Varden (*Salvelinus malma*) in southeast Alaska. Canadian Journal of Fisheries and Aquatic Sciences 50: 312-315.

Dunford, W.E. 1975. Space and food utilization by salmonids in marsh habitats in the Fraser River Estuary. M.S. Thesis. University of British Colombia, Vancouver, B.C., 81 pages.

Edwards, G.W., K.A.F. Urquhart, and T.L. Tillman. 1996. Adult salmon migration monitoring, Suisun Marsh Salinity Control Gates, September-November 1994. Technical Report 50. Interagency Ecological Program for the San Francisco Bay/Delta Estuary, 27 pages.

Emmett, R. L., S. A. Hinton, S. L. Stone, and M. E. Monaco. 1991. Distribution and abundance of fishes and invertebrates in West Coast estuaries, Volume II: Species life history summaries. ELMR Report No. 8. NOAA/NOS Strategic Environmental Assessments Division, Rockville, Maryland. 329 pages.

Enger, P.S. 1981. Frequency Discrimination in Teleosts – Central Peripheral? Institute of Zoophysiology, University of Oslo 3, Norway. Chapter 12.

Erickson, D.L., J.A. North, J.E. Hightower, J. Weber, L. Lauck. 2002. Movement and habitat use of green sturgeon *Acipenser medirostris* in the Rogue River, Oregon, USA. Journal of Applied Ichthyology 18:565-569.

Erickson, D.L. and J.E. Hightower. 2007. Oceanic distribution and behavior of green sturgeon. American Fisheries Symposium 56: 197-211

Environmental Protection Agency. 1994. Methods for measuring the toxicity and bioaccumulation of sediment associated contaminants with freshwater invertebrates. EPA 600-R-94-024. Duluth, Minnesota.

Fairey, R., K. Taberski, et al. 1997. "Organochlorines and Other Environmental Contaminants in Muscle Tissues of Sportfish Collected from San Francisco Bay." Marine Pollution Bulletin 34(12): 1058-1071.

Federal Energy Regulatory Commission (FERC). 2007. Final Environmental Impact Statement for Hydropower License, Oroville Facilities, FERC Project No. 2100. Federal Energy Regulatory Commission, Washington DC. May 2007.

Feist, B.E., J. J. Anderson and R. Miyamoto. 1992. Potential impacts of pile driving on juvenile pink (*Oncorhynchus gorbuscha*) and chum (*O. keta*) salmon behavior and distribution. FRI-UW-9603. Fisheries Resources Institute, University of Washington. Seattle.

Feist, G. W., M. A. H. Webb, D. T. Gundersen, E. P. Foster, C. B. Schreck, A. G. Maule, and M. S. Fitzpatrick. 2005. Evidence of detrimental effects of environmental contaminants on growth and reproductive physiology of white sturgeon in impounded areas of the Columbia River. Environmental Health Perspectives 113:1675-1682.

Fisher, F. W. 1994. Past and present status of Central Valley Chinook salmon. Conservation Biology 8(3):870-873.

Fisheries Hydroacoustic Working Group. 2008. Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities. June 12, 2008.

Fisheries Hydroacoustic Working Group. 2013. Concurrence and General Instructions on Use of the Underwater Noise Monitoring Plan Template. August 28, 2013.

Foster, E. P., M. S. Fitzpatrick, et al. 2001. "Gonad Organochlorine Concentrations and Plasma Steroid Levels in White Sturgeon (*Acipenser transmontanus*) from the Columbia River, USA." Bulletin of Environmental Contamination and Toxicology 67: 239-245.

Fry, D.H. 1961. King salmon spawning stocks of the California Central Valley, 1940-1959. California Fish and Game 47:55-71.

Gadomski, D.M. and M.J. Parsely. 2005. Effects of turbidity, light level, and cover on predation of white sturgeon larvae by prickly sculpins. Transactions of the American Fisheries Society 134:369-374.

Gaines, P.D. and C.D. Martin 2001. Feasibility of dual marking age-0 Chinook salmon for mark-recapture trials. Red Bluff Fish and Wildlife Office, Red Bluff, CA

Garcia, A. 1989. The impacts of squawfish predation on juvenile Chinook salmon at Red Bluff Diversion Dam and other locations in the Sacramento River. U.S. Fish and Wildlife Service Report No. AFF/FAO-89-05.

Garland, R. D., K. F. Tiffan, D. W. Rondorf, and L. O. Clark. 2002. Comparison of subyearling fall Chinook salmon's use of riprap revetments and unaltered habitats in Lake Wallula of the Columbia River. North American Journal of Fisheries Management 22:1283-1289.

Gaspin, J. B. (1975). Experimental investigations of the effects of underwater explosions on swimbladder fish, I: 1973 Chesapeake Bay tests. *Navel Surface Weapons Center Report* NSWC/WOL/TR 75-58. Fort Belvoir, VA: Defence Technical Information Center.

Gingras, M. 1997. Mark/recapture experiments at Clifton Court Forebay to estimate pre-screen loss of juvenile fishes: 1976-1993. Interagency Ecological Program Technical Report No. 55.

Giovannetti, Sarah and M. R. Brown. 2008. Central Valley Steelhead and Late-fall Chinook Salmon Redd Surveys on Clear Creek, California 2008 Annual Report. Fish and Wildlife Service, Red Bluff Fish and Wildlife Office, Red Bluff, California.

Gisiner, R. C. 1998. Proceedings of the workshop on the effects of anthropogenic noise in the marine environment. *Marine Mammal Science Program*. Washington, DC: ONR.

Goals Project. 1999. Baylands ecosystem habitat goals: A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. U.S. Environmental Protection Agency, San Francisco. San Francisco Bay Regional Water Quality Control Board, Oakland, CA.

Good, T. P., R. S. Waples, and P. Adams (editors). 2005. Updated status of federally listed ESU of West Coast salmon and steelhead. U.S. Department of Commerce, NOAA Technical Memo. NMFS-NWFSC-66. 598 pages.

Goyer, R.A. 1996. Toxic effects of metals. *In* C.D. Klassen (editor), Casarett & Doull's toxicology: the basic science of poisons, fifth edition, pages 691-736. McGraw Hill. New York, NY.

Hallock, R. J. D. H. Fry, and D. A. LaFaunce. 1957. The use of wire fyke traps to estimate the runs of adult salmon and steelhead in the Sacramento River. California Fish and Game. 43(4):271-298.

Hallock, R. J., W. F. Van Woert, and L. Shapovalov. 1961. An evaluation of stocking hatchery-reared steelhead rainbow trout (*Salmo gairdnerii gairdnerii*) in the Sacramento River system. California Department of Fish and Game. Fish Bulletin No. 14. 74 pages.

Hallock, R.J., R.F. Elwell, and D.H. Fry, Jr. 1970. Migrations of adult king salmon, *Oncorhynchus tshawytscha*, in the San Joaquin Delta. California Fish and Game 151. Sacramento. 92 p.

Hare, S. R., N. J. Mantua, and R. C. Francis. 1999. Inverse production regimes: Alaska and West Coast Pacific salmon. Fisheries 24 (1): 6-14.

Harvey-Arrison, C. 2010. . Personal Communication with Brenda Olson. Observed juvenile steelhead population in Antelope and similar spring-run Creeks are at least twice that of juvenile spring Chinook salmon based on snorkel surveys during annual adult spring Chinook holding surveys.

Hastings, M. C. 1995. Physical effects of noise on fishes. *Proceedings of INTER-NOISE 95, The 1995 International Congress on Noise Control Engineering* **II** 979–984.

Hastings, M. C. and Popper, A. N. 2005. Effects of sound on fish. California Department of Transportation Contract 43A0139 Task Order, 1. http://www4.trb.org/trb/crp.nsf/reference/boilerplate/Attachments/$file/EffectsOfSoundOnFish1-28-05(FINAL).pdf

Hastings, M.C., AN. Popper, U. Finneran, and P. Lanford. 1996. Effects of low frequency sound on hair cells of the inner ear and lateral line of the teleost fish *Astronotus ocellatus.* J. Acoustical Soc. Am. 99(3): 1759-1766.

Healey, M.C. 1980. The ecology of juvenile salmon in Georgia Strait, British Columbia. Pages 203-229 *in* W.J. McNeil and D.C. Himsworth, editors. Salmonid ecosystems of the North Pacific. Oregon State University Press and Oregon State University Sea Grant College Program, Corvallis.

Healey, M.C. 1982. Juvenile Pacific salmon in estuaries: the life support system. In V.S. Kennedy (Editor), Estuarine Comparisons, pages 315-341. Academic Press. New York, N.Y.

Healey, M.C. 1991. Life history of Chinook salmon. Pages 213-393 *in* C. Groot and L. Margolis, editors. Pacific salmon life histories. University of British Columbia Press.

Hedgecock, D. 2002. Microsatellite DNA for the management and protection of California's Central Valley Chinook salmon (*Oncorhynchus tshawytscha*). Final Report for the amendment to agreement No. B-59638. University of California, Davis, Bodega Marine Lab., Bodega Bay, CA

Herren, J.R. and S.S. Kawasaki. 2001. Inventory of water diversions in four geographic areas in California's Central Valley. Pages 343-355. *In:* Contributions to the Biology of Central Valley Salmonids. R.L. Brown, editor. Volume. 2. California Fish and Game. Fish Bulletin 179.

Huang, B. and Z. Liu. 2000. Temperature Trend of the Last 40 Years in the Upper Pacific Ocean. Journal of Climate 4:3738–3750.

Heublein, J.C. 2006. Migration of green sturgeon *Acipenser medirostris* in the Sacramento River. Master of Science Thesis. California State University, San Francisco. October 2006. 63 pages.

Heublin, J.C., J.T. Kelly, and A.P. Klimley. 2006. Spawning migration and habitat of green sturgeon, *Acipenser medirostris*, in the Sacramento River. Presentation at the CALFED Science Conference, Sacramento, CA October 23, 2006.

Heublin, J.C., T. Kelly, C. E. Crocker, A. P. Klimley, and S. T. Lindley. 2009. Migration of Green Sturgeon, *Acipenser medirostris*, in the Sacramento River. Environ Biol Fish (2009) 84:245–258. DOI 10.1007/s10641-008-9432-9.

Hughes, N.F. 2004. The wave-drag hypothesis: an explanation for sized-based lateral segregation during the upstream migration of salmonids. Canadian Journal of Fisheries and Aquatic Sciences 61: 103-109.

Ingersoll, C.G. 1995. Sediment tests. *In* G.M. Rand (editor), Fundamentals of aquatic toxicology: effects, environmental fate, and risk assessment, second edition, pages 231-255. Taylor and Francis, Bristol, Pennsylvania.

Interagency Ecological Program Steelhead Project Work Team. 1999. Monitoring, assessment, and research on Central Valley steelhead: status of knowledge, review existing programs, and assessment needs. In Comprehensive Monitoring, Assessment, and Research Program Plan, Tech. App. VII.

Intergovernmental Panel on Climate Change. 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change [Houghton, J.T.,Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell, and C.A. Johnson (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 881 pages.

Israel, J. A. 2006. Mixed Stock Analysis of Green Sturgeon from Washington State Coastal Aggegations. Genomic Variation Laboratory, U.C. Davis.

Israel, J.A., and A. P. Klimley. 2008. Draft Life History Conceptual Model for North American Green Sturgeon (*Acipenser medirostris*), prepared for DRERIP. University of California, Davis, California.

Jeffress, C., Opperman, J. J. & Moyle, P. B. 2008. Ephemeral floodplain habitats provide best growth conditions for juvenile Chinook salmon in a California river. Environmental Biology of Fishes, In Press.

Jones & Stokes Associates, Inc. 2002. Foundation runs report for restoration action gaming trials. Prepared for Friant Water Users Authority and Natural Resource Defense Council.

Jones & Stokes Associates, Inc. 2009. Lower Yuba River Redd Dewatering and Fry Stranding Study – 2007 Annual Report. Draft. Prepared for Yuba County Water Agency. February 2008.

Kastner, A. 2003. Feather River Hatchery Draft Annual Report 2002, 2003. Wildlife and Inland Fisheries Division Administrative Report. California Department of Fish and Game.

Keefer, M. L., C. A. Perry, M. A. Jepson, and L. C. Stuehrenberg. 2004. Upstream migration rates of radio-tagged adult Chinook salmon in riverine habitats of the Columbia River basin. Journal of Fish Biology 65: 1126-1141.

Keller, E.A., and F.J. Swanson. 1979. Effects of large organic material on channel form and fluvial processes. Earth Surface Processes 4:361-380.

Kelly, J.T., Klimley A.P., Crocker C.E. 2007. Movements of green sturgeon, Acipenser medirostris, in the San Francisco Bay estuary, California. Environ Biol Fish, doi: 10.1007/s10641-006-0036-y

Kindopp. 2014. Personal Communication with Dylan Van Dyne. Senior Environmental Scientist, California Department of Water Resources.

Kindopp, J. and R. Kurth. 2003 Lower Feather River steelhead (*Oncorhynchus mykiss*) redd survey. California Department of Water Resources, Oroville Relicensing FERC Project No. 2100.

Kjelson, M.A., P.F. Raquel, and F. W. Fisher. 1982. Life history of fall-run juvenile Chinook salmon, *Oncorhynchus tshawytscha*, in the Sacramento-San Joaquin estuary, California, Pages 393-411 *in* V.S. Kennedy, editor. Estuarine comparisons. Academic Press, New York, NY.

Kruse, G. O. and D. L. Scarnecchia. 2002. "Assessment of bioaccumulated metal and organochlorine compounds in relation to physiological biomarkers in Kootenai River white sturgeon." Journal of Applied Ichthyology 18(4-6): 430-438.

Kynard, B., E. Parker, and T. Parker. 2005. Behavior of early life intervals of Klamath River green sturgeon, *Acipenser medirostris*, with note on body color. Environmental Biology of Fishes 72:85-97.

Lassettre, N.S. and R.R. Harris. 2001. The Geomorphic and Ecological Influence of Large Woody Debris in Streams and Rivers. University of CA, Berkeley. 68pp.

Levings, C.D. 1982. Short term use of low-tide refugia in a sand flat by juvenile chinook, (*Oncorhynchus tshawytscha*), Fraser River estuary. Canadian Technical Reports of Fisheries and Aquatic Sciences, Number 1111. 7 pages.

Levings, C.D., C.D. McAllister, and B.D. Chang. 1986. Differential use of the Campbell River estuary, British Columbia, by wild and hatchery-reared juvenile Chinook salmon (*Oncorhynchus tshawytscha*). Canadian Journal of Fisheries and Aquatic Sciences 43:1386-1397.

Levy, D.A., Northcote, T.G., 1981. The distribution and abundance of juvenile salmon in marsh habitats of the Fraser River estuary. Westwater Research Center, University of British Columbia, Technical Report 25, 117 pp.

Levy, D.A., and T.G. Northcote. 1982. Juvenile salmon residency in a marsh area of the Fraser River estuary. Canadian Journal of Fisheries and Aquatic Sciences 39: 270-276.

Lindley, S. T., M. L. Moser, D. L. Erickson, M. Belchik, D. W. Welch, E. L. Rechisky, J. T. Kelly, J. Heublein, and A. P. Klimley. 2008. Marine migration of North American Green Sturgeon. *Transactions of the American Fisheries Society* 137:182-194.

Lindley, S.T., R. Schick, B.P. May, J.J. Anderson, S. Greene, C. Hanson, A. Low, D. McEwan, R.B. MacFarlane, C. Swanson, and J.G. Williams. 2004. Population structure of threatened and endangered Chinook salmon ESU in California's Central Valley basin. Public review draft. NMFS Southwest Science Center. Santa Cruz, CA.

Lindley, S.T., R. Schick, A. Agrawal, M. Goslin, T.E. Pearson, E. Mora, J.J. Anderson, B. May, May, S. Greene, C. Hanson, A. Low, D. McEwan, R.B. MacFarlane, C. Swanson, and J.G. Williams. 2006. Historical population structure of Central Valley steelhead and its alteration by dams. San Francisco Estuary and Watershed Science.

Lindley, S. T., R. Schick, E. Mora, P.B. Adams, J.J. Anderson, S. Greene, C. Hanson, B. P. May, D. McEwan, R.B. MacFarlane, C. Swanson, and J. G. Williams. 2007. Framework for assessing viability of threatened and endangered Chinook salmon and steelhead in the Sacramento-San Joaquin basins. ESUs in California's Central Valley basin. San Francisco Estuary and Watershed Science. Volume 5, Issue 1, Article 4.

Lindsay, R. B., R. K. Schroeder, K. R. Kenaston, R. N.Toman, and M. A. Buckman. 2004. Hooking mortality by anatomical location and its use in estimating mortality of spring Chinook salmon caught and released in a river sport fishery. North American Journal of Fisheries Management 24:367–378.

Linville RG, Luoma SN, Cutter L, Cutter GA. 2002. Increased selenium threat as a result of invasion of the exotic bivalve *Potamocorbula amurensis* into the San Francisco Bay-Delta. Aquat Toxicol 57: 51−64.

Lloyd, D.S. 1987. Turbidity as a water quality standard for salmonid habitat in Alaska. North American Journal of Fisheries management 7: 34-45.

M. Molnar, Caltrans, Senior Fisheries Biologist and Hydroacoustic Lead. Personal communication with Jacqueline Pearson Meyer, NMFS, regarding the Mad River, Ten Mile River and Van Duzen River Bridge Projects. 2011-2012.

MacFarlane, R.B., and E.C. Norton. 2002. Physiological Ecology of juvenile chinook salmon (*Oncorhynchus tshawytscha*) at the southern end of their distribution, the San Francisco Estuary and Gulf of the Farallons, California. Fishery Bulletin 100: 244-257.

Mantua, N. J. and S. R. Hare. 2002. The Pacific decadal oscillation. J. Oceanogr. 58:35-44

Marston. 2004. Personal Communication with Mike Aceituno. Senior Biologist/Supervisor, CDFG.

Martin, C.D., P.D. Gaines and R.R. Johnson. 2001. Estimating the abundance of Sacramento River juvenile winter Chinook salmon with comparisons to adult escapement. Red Bluff Research Pumping Plant Report Series, Volume 5. U.S. Fish and Wildlife Service, Red Bluff, California.

Maslin, P., M Lennox, and W. McKinney. 1997. Intermittent streams as rearing habitat for Sacramento River Chinook salmon (*Oncorhynchus tshawytscha*). California State University, Chico, Department of Biological Sciences. 89 pages.

Matter, A.L., and B.P. Sandford. 2003. A comparison of migration rates of radio and PIT tagged adult Snake River Chinook salmon through the Columbia River hydropower system. North American Journal of Fisheries Management 23: 967-973.

Mayfield, R.B. and J.J. Cech Jr. 2004. Temperature effects on green sturgeon bioenergetics. Transactions of the American Fisheries Society. 113:961-970.

McCauley, R. D.; Fewtrell, J. & Popper, A. N. 2003. High intensity anthropogenic sound damages fish ears. J. acoust. Soc. Am., 113:638-642.

McCullough, D. A., S. Spalding, D. Sturdevant, and M. Hicks. 2001. Summary of technical literature examining the physiological effects of temperature on salmonids. U. S. Environmental Protection Agency, Washington, D. C. EPA-910-D-01-005.

McDonald, J. 1960. The behavior of Pacific salmon fry during the downstream migration to freshwater and saltwater nursery areas. Journal of the Fisheries Research Board of Canada 17: 655-676.

McEwan, D. and T. A. Jackson. 1996. Steelhead restoration and management plan for California. California Department of Fish and Game. Sacramento, California. 234 pages.

McEwan, D. 2001. Central Valley steelhead. Contributions to the biology of Central Valley salmonids. California Department of Fish and Game Fish Bulletin 179(1):1-44.

McGill, R.R. Jr. 1987. Land use changes in the Sacramento River riparian zone, Redding to Colusa. A third update: 1982-1987. Department of Water Resources, Northern District, 19 pages.

McReynolds, T.R., C.E. Garman, P.D. Ward, and M.C. Schommer. 2005. Butte and Big Chico Creeks spring-run Chinook salmon, *Oncorhynchus tshawytscha* life history investigation, 2003-2004. California Department of Fish and Game, Inland Fisheries Administrative Report No. 2005-1.

Meehan, W. R. and T. C. Bjornn. 1991. Salmonid distributions and life histories. *In* W. R. Meehan, editor, Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats, pages 47-82. American Fisheries Society Special Publication 19. American Fisheries Society. Bethesda, Maryland. 751 pages.

Michny, F., and M. Hampton. 1984. Sacramento River Chico Landing to Red Bluff project, 1984, Juvenile salmon study. U.S. Fish and Wildlife Service, Division of Ecological Services. Sacramento, California.

Monroe, M., J. Kelly, and N. Lisowski. 1992. State of the estuary, a report of the conditions and problems in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. June 1992. 269 pages.

Mora, E. A., S. Lindley, D. Erickson and A. Klimley. 2009. Do impassable dams and flow regulation constrain the distribution of green sturgeon in the Sacramento River, California? J. Appl. Ichthyol. 25 (Suppl. 2) (2009), 39–47.

Moser M.L., Lindley S.T. 2007. Use of Washington estuaries by subadult and adult green sturgeon. Environmental Biology of Fishes. 2007; 79:243–253.

Mount, J. F. 1995. California rivers and streams: The conflict between fluvial process and land use. University California Press, Berkeley, California.

Moyle, P. B., J. E. Williams, and E. D. Wikramanayake. 1989. Fish species of special concern of California. Wildlife and Fisheries Biology Department, University of California, Davis. Prepared for The Resources Agency, California Department of Fish and Game, Rancho Cordova.

Moyle, P.B., Foley P.J., and R.M. Yoshiyama. 1992. Status of green sturgeon, Acipenser medirostris, in California. Final report sent to NMFS, Terminal Island, CA by UC Davis Department of Wildlife and Fisheries Biology. 12 pages.

Moyle, P.B., R.M. Yoshiyama, J.E. Williams, and E.D. Wikramanayake. 1995. Fishes of Special Concern in California. Second Edition. CDFG. 272 pp.

Moyle, P. B. 2002. Inland fishes of California. University of California Press, Berkeley.

Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T. C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status review of chinook salmon from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memorandum. NOAA Fisheries-NWFSC-35. 443 pp.

Nakamoto, R. J., Kisanuki, T. T., and Goldsmith, G. H. 1995. Age and growth of Klamath River green sturgeon (*Acipenser medirostris*). U.S. Fish and Wildlife Service. Project # 93-FP-13. 20 pages

National Marine Fisheries Service and California Department of Fish and Game. 2001. Final report on anadromous salmon fish hatcheries in California. Prepared by Joint Hatchery Review Committee. June 27, 2001.

National Marine Fisheries Service. 1996a. Factors for decline: a supplement to the notice of determination for west coast steelhead under the Endangered Species Act. National Marine Fisheries Service, Protected Resource Division, Portland, OR and Long Beach, CA.

National Marine Fisheries Service. 1996b. Making Endangered Species Act determinations of effect for individual or group actions at the watershed scale. Prepared by NMFS, Environmental and Technical Services Branch, Habitat Conservation Branch. 31 pages.

National Marine Fisheries Service. 1997. National Marine Fisheries Service Proposed Recovery Plan for the Sacramento River Winter-run Chinook Salmon. NMFS, Southwest Region, Long Beach, California, 217 pages with goals and appendices.

National Marine Fisheries Service. 1998. Factors Contributing to the Decline of Chinook Salmon: An Addendum to the 1996 West Coast Steelhead Factors For Decline Report. Protected Resources Division, National Marine Fisheries Service. Portland, Oregon.

National Marine Fisheries Service. 2004. Findings of the NMFS's critical habitat development and review teams for seven salmon and *O. mykiss* ESUs in California. October 2004. NMFS Southwest Region, Protected Resources Division. Long Beach, California. 21p plus seven appendices.

National Marine Fisheries Service. 2005. Final assessment of the National Marine Fisheries Service's critical habitat analytical review teams (CHARTs) for seven salmon and steelhead evolutionarily significant units (ESUs) in California. Prepared by the NOAA Fisheries Protected Resources Division, Long Beach, California.

National Marine Fisheries Service. 2009. Public Draft Central Valley Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-Run Chinook Salmon and Central Valley Spring-Run Chinook Salmon, and the Distinct Population Segment of California Central Valley Steelhead. Southwest Region Protected Resources Division, 273 pp.

National Marine Fisheries Service. 2009a. Biological and Conference Opinion on the Long-term Operations of the Central Valley Plan and State Water Plan. June 4, 2009.

National Marine Fisheries Service. 2009b. Public Draft Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the Distinct Population Segment of Central Valley Steelhead. Sacramento Protected Resources Division. October 2009.

National Marine Fisheries Service. 2009c. Endangered Species Act – Section 7 Consultation Biological Opinion & Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation East Fork of the South Fork Salmon River Bridge Repair Project. 66p

National Marine Fisheries Service. 2011. Central Valley Recovery Domain. 5-Year Review: Summary and Evaluation of *Central Valley Spring-run Chinook Salmon ESU.* National Marine Fisheries Service, Southwest Region. 34 pages.

National Marine Fisheries Service. 2011a. 5-Year Review: Summary and Evaluation of Central Valley Spring-Run Chinook Salmon ESU. Central Valley Recovery Domain. National Marine Fisheries Service, Southwest Region.

National Marine Fisheries Service. 2011b. 5-Year Review: Summary and Evaluation of Central Valley Steelhead DPS. Central Valley Recovery Domain. National Marine Fisheries Service, Southwest Region.

Newcombe, C. P., and J. O. T. Jensen. 1996. Channel suspended sediment and fisheries: a synthesis for quantitative assessment of risk and impact. North American Journal of Fisheries Management. 16:693-727.

Newcombe, C.P. and D.D. MacDonald. 1991. Effects of suspended sediments on aquatic ecosystems. North American Journal of Fisheries Management 11: 72-82.

Newton, J. M., and L.A. Stafford. 2011. Monitoring adult Chinook salmon, rainbow trout, and steelhead in Battle Creek, California, from March through November 2009. USFWS Report. U.S. Fish and Wildlife Service, Red Bluff Fish and Wildlife Office, Red Bluff, California.

Nichols, F.H., J.E. Cloern, S.N. Louma, and D.H. Peterson. 1986. The modification of an estuary. *Science* 231: 567-573.

Nielsen, J.L., S. Pavey, T. Wiacek, G.K. Sage, and I. Williams. 2003. Genetic analyses of Central Valley trout populations, 1999-2003. Final Technical Report to the California Department of Fish and Game, Sacramento, California. December 8, 2003.

Noakes, D. J. 1998. On the coherence of salmon abundance trends and environmental trends. North Pacific Anadromous Fishery Commission Bulletin, pages 454-463.

Nobriga, M. and P. Cadrett. 2003. Differences among hatchery and wild steelhead: evidence from Delta fish monitoring programs. Interagency Ecological Program for the San Francisco Estuary Newsletter 14:3:30-38.

Orsi, J. 1967. Predation study report, 1966-1967. California Department of Fish and Game.

Painter, R.E., L.H. Wixom, and S.N. Taylor. 1977. An evaluation of fish populations and fiheries in the post-Oroville project Feather River. California department of Fish and Game, Anadromous Fisheries Branch. Prepared for the California Department of Water Resources, Sacramento, CA 56 pp.

Peterson, J. and J. Kitchell. 2001. Climate regimes and water temperature changes in the Columbia River: bioenergetic implications for predators of juvenile salmon. *Canadian Journal of Fisheries and Aquatic Sciences*, 2001, 58:1831-1841, 10.1139/f01-111

Phillips, R.W. and H.J. Campbell. 1961. The embryonic survival of coho salmon and steelhead trout as influenced by some environmental conditions in gravel beds. Annual Report to Pacific Marine Fisheries Commission. 14:60-73.

Pickard, A., A. Grover, and F. Hall. 1982. An evaluation of predator composition at three locations on the Sacramento River. Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary. Technical Report No. 2. 20 pages.

Platts, W. S., M. A. Shirazi, and D. H. Lewis. 1979. Sediment particle sizes used by salmon for spawning, and methods for evaluation. EPA-600/3-79-043, 32 pp. Corvallis Environ. Res. Lab., Corvallis, Oregon.

Popper, A. N. 2006. What do we know about pile driving and fish? In *Proceedings of the 2005 International Conference on Ecology and Transportation* (Irwin, C. L., Garrett, P. & McDermott, K. P., eds.), pp. 26–28. Raleigh, NC: Center for Transportation and the Environment, North Carolina State University.

Popper, A. N. 1997. Sound detection by fish: structure and function *in* using sound to modify fish behavior at power production and water-control facilities. A workshop December 12-13, 1995. Portland State University, Portland Oregon Phase II: Final Report *ed.* Thomas Carlson and Arthur Popper 1997. Bonneville Power Administration Portland Oregon.

Radtke, L.D. 1966. Distribution of smelt, juvenile sturgeon, and starry flounder in the Sacramento-San Joaquin Delta with observations on food of sturgeon, in Ecological studies of the Sacramento-San Joaquin Delta, Part II. (J. L. Turner and D. W. Kelley, comp.). California Department of Fish and Game Fish Bulletin 136:115-129.

Rand, G.M., P.G. Wells, and L.S. McCarty. 1995. Introduction to aquatic toxicology. *In* G.M. Rand (editor), Fundamentals of aquatic toxicology: effects, environmental fate, and risk assessment, second edition, pages 3-66. Taylor and Francis. Bristol, Pennsylvania.

Robison, G.E., and Beschta, R.L. 1990. Identifying trees in riparian areas that can provide coarse woody debris to streams. Forest Service 36:790-801.

Rutter, C. 1904. Natural history of the quinnat salmon. Investigations on Sacramento River, 1896-1901. Bulletin of the U.S. Fish Commission 22: 65-141.

Schaffter, R. 1980. Fish occurrence, size, and distribution in the Sacramento River near Hood, California during 1973 and 1974. California Department of Fish and Game.

Schmetterling, D. A., C. G. Clancy, and T. M. Brandt. 2001. Effects of riprap bank reinforcement on stream salmonids in the western United States. Fisheries 26(7): 6-23.

Scholik, A. R. and Yan, H. Y. 2001. Effects of underwater noise on auditory sensitivity of a cyprinid fish, *Hearing Research*, 152: 17-24.

Seesholtz, A. 2003. Final Assessment of Sturgeon distribution and habitat use. SP-F3.2 Task 3A. California Department of Water Resources, Oroville Relicensing FERC Project No. 2100.

Seesholtz, A., B. Cavallo, et al. (2004). Lower Feather River Juvenile Fish Communities: Distribution, Emigration Patterns, and Association with Environmental Variables. Early Life History of Fishes in the San Francisco Estuary and Watershed. Santa Cruz, California.

Seesholtz. 2010. Personal communication with Gretchen Umlauf. Staff Environmental Scientist, California Department of Water Resources.

Seesholtz. 2011. Letter entitled "Feather River Green Sturgeon Eggs Collected from Egg Mats during 2011" to A. Seesholtz (DWR) from J. Van Eenennaam (UCD).

Seeholtz. 2014. Personal communication with Dylan Van Dyne. Staff Environmental Scientist, California Department of Water Resources.

Shapovalov, L. and A. C. Taft. 1954. The life histories of the steelhead rainbow trout (*Salmo gairdneri gairdneri*) and silver salmon (*Oncorhynchus kisutch*) with special reference to Waddell Creek, California, and recommendations regarding their management. California Department of Fish and Game, Fish Bulletin 98:1-375.

Shelton, J.M. 1995. The hatching of Chinook salmon eggs under simulated stream conditions. Progressive Fish-Culturist 17:20-35.

Shin, Hyeon Ok. 1995. Effect of the piling work noise on the behavior of snakehead (*Channa argus*) in the aquafarm. J. Korean Fish. Soc. 28(4) 492-502.

Sigler, J. W., T. C. Bjornn, and F. H. Everest. 1984. Effects of chronic turbidity on density and growth of steelhead and coho salmon. Transactions of the American Fisheries Society 113:142-150.

Slater, D.W. 1963. Winter-run Chinook salmon in the Sacramento River, California, with notes on water temperature requirements at spawning. U.S. Fish and Wildlife Service, Special Science Report Fisheries 461:9.

Smith, A.K. 1973. Development and application of spawning velocity and depth criteria for Oregon salmonids. Transactions of the American Fisheries Society 10: 312-316.

Snider, B., and R. G. Titus. 2000. Timing, composition, and abundance of juvenile anadromous salmonid emigration in the Sacramento River near Knights Landing, October 1996-September 1997. California Department of Fish and Game, Habitat Conservation Division, Stream Evaluation Program Technical Report No. 00-04.

Snider, B. 2001. Evaluation of effects of flow fluctuations on the anadromous fish populations in the lower American River. California Department of Fish and Game, Habitat Conservation Division. Stream Evaluation Program. Tech. Reports No. 1 and 2 with appendices 1-3. Sacramento, California.

Sommer, T., D. McEwan, and R. Brown. 2001. Factors affecting Chinook salmon spawning in the Lower Feather River. Fish Bulletin 179. California Department of Fish and Game

S.P. Cramer and Associates, Inc. 2000. Stanislaus River data report. Oakdale, California.

S.P. Cramer and Associates, Inc. 2001. Stanislaus River data report. Oakdale, California.

Spence, B., G. Lomnicky, R., Hughes, and R. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. Technical Environmental Research Services Corp., Corvallis, Oregon.

Stachowicz, J. J., J. R. Terwin, R. B. Whitlatch, and R. W. Osman. 2002. Linking climate change and biological invasions: Ocean warming facilitates non-indigenous species invasions. PNAS, November 26, 2002. 99:15497–15500.

Stephenson, A.E. and D.E. Fast. 2005. Monitoring and evaluation of avian predation on juvenile salmonids on the Yakima River, Washington. Annual Report 2004. March 2005.

Stevens, D.E. 1961. Food habits of striped bass, *Roccus saxatilis* (Walbaum) in the Rio Vista area of Sacramento River. Master's Thesis. University of California. Berkeley, California.

Stillwater Sciences. 2002. Merced River corridor restoration plan. Stillwater Sciences, Berkeley, California. 245 pages.

Stillwater Sciences. 2004. Appendix H: conceptual models of focus fish species response to selected habitat variables. In Sacramento River Bank Protection final Standard Assessment Methodology. July 2004.

Stillwater Sciences. 2006. Biological Assessment for five critical erosion sites, river miles: 26.9 left, 34.5 right, 72.2 right, 99.3 right, and 123.5 left. Sacramento River Bank Protection Project. May 12.

Stone, L. 1874. Report of operations during 1872 at the U.S. salmon-hatching establishment on the McCloud River, and on the California Salmonidae generally; with a list of specimens collected. Report to U.S. Commissioner of Fisheries for 1872-1873, 2:168-215.

Sweeney, B. W., Bott, T. L. Jackson, J. K. Kaplan, L. A. Newbold, J. D. Standley, L. J. Hession, W. C., and R. J. Horwitz. 2004. Riparian deforestation, stream narrowing, and loss of stream ecosystem services. National Academy of Sciences 101:14132-14137.

Tillman, T.L., G.W. Edwards, and K.A.F. Urquhart. 1996. Adult salmon migration during the various operational phases of Suisun Marsh Salinity Control Gates in Montezuma Slough: August-October 1993. Agreement to California Department of Water Resources, Ecological Services Office by California Department of Fish and Game, Bay-Delta and Special Water Projects Division, 25 pages.

Tucker, M. E., C. D. Martin, and P. D. Gaines. 2003. Spatial and temporal distributions of Sacramento pikeminnow and striped bass at the Red Bluff Diversion Complex, including the research pumping plant, Sacramento River, California: January, 1997 to August, 1998. Red Bluff Research Pumping Plant Report Services, Vol. 10. USFWS, Red Bluff, California 32 pages.

Tucker, M. E., C. M. Williams, and R. R. Johnson. 1998. Abundance, food habits, and life history aspects of Sacramento squawfish and striped bass at the Red Bluff Diversion Complex, including the research pumping plant, Sacramento River, California: 1994 to 1996. Red Bluff Research Pumping Plant Report Services, Vol. 4. USFWS, Red Bluff, California. 54 pages.

U.S. Bureau of Reclamation (BOR). 2004. Long-term Central Valley Project and State Water Project Operations Criteria and Plan biological assessment. U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region. June 2004.

U.S. Bureau of Reclamation. 2008. Draft Biological Assessment on the Continued Long-term Operations of the Central Valley Project and the State Water Project. U.S. Bureau of Reclamation, Mid-Pacific Region, Sacramento, CA August 2008.

U.S. Department of Interior. 1999. Final Programmatic Environmental Impact Statement for the Central Valley Project Improvement Act. October 1999. Technical Appendix, 10 volumes.

U.S. Fish and Wildlife Service. 1995. Sacramento-San Joaquin Delta Native Fishes Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon.

U.S. Fish and Wildlife Service. 1995a. Draft anadromous fish restoration plan—a plan to increase natural production of anadromous fish in the Central Valley of California. Sacramento, CA.

U.S. Fish and Wildlife Service. 1995b. Working paper on restoration needs: habitat restoration actions to double the natural production of anadromous fish in the Central Valley of California, volumes 1-3. Prepared by the Anadromous Fish Restoration Program Core Group for the U.S. Fish and Wildlife Service, Stockton, CA.

U.S. Fish and Wildlife Service. 2000. Impacts of Riprapping to Ecosystem Functioning, Lower Sacramento River, California. U.S. Fish and Wildlife Service, Sacramento Field Office, Sacramento, California. Prepared for U.S. Army Corps of Engineers, Sacramento District.

U.S. Fish and Wildlife Service. unpublished data.

Van Eenennaam, J. P., J. Linares-Casenave, X. Deng, and S. I. Doroshov. 2005. Effect of incubation temperature on green sturgeon embryos, *Acipenser medirostris*. Environmental Biology of Fishes 72:145-154.

Van Eenennaam, J.P., J. Linares-Casenave, S.I. Doroshov, D.C. Hillemeier, T.E. Wilson, and A.A. Nova. 2006. Reproductive conditions of Klamath River green sturgeon. Transactions of the American Fisheries Society 135:151-163.

Van Eenennaam, J.P., M.A.H. Webb, X. Deng, S.I. Doroshov, R.B. Mayfield, J.J. Cech, Jr., D.C. Hillemeir and T.E. Willson. 2001. Artificial spawning and larval rearing of Klamath River green sturgeon. Transactions of the American Fisheries Society 130:159-165.

Van Eenennaam, J.P., J. Linares-Casenave, J-B. Muguet, and S.I. Doroshov. 2009. Induced artificial fertilization and egg incubation techniques for green sturgeon. Revised manuscript to North American Journal of Aquaculture.

Vogel, D. A. and K. R. Marine. 1991. Guide to upper Sacramento River Chinook salmon life history. Prepared for the U.S. Bureau of Reclamation, Mid-Pacific Region by CH2M Hill.

Vogel, D.A., K.R. Marine, and J.G. Smith. 1988. Fish passage action program for Red Bluff Diversion Dam. Final report on fishery investigations. Report No. FR1/FAO-88-19. U.S. Fish and Wildlife Service, Northern Central Valley Fishery Resource Office. Red Bluff, CA.

Vogel, D.A. 2008. Evaluation of adult sturgeon migration at the Glenn-Colusa Irrigation District Gradient Facility on the Sacramento River. Natural Resource Scientist, Inc. May 2008. 33 pages.

Waples, R.S. 1991. Pacific Salmon, *Oncorhynchus spp*., and the definition of "species" under the Endangered Species Act. Marine Fisheries Review 53:11-21.

Ward, P.D., T.R. McReynolds, and C.E. Garman. 2002. Butte and Big Chico Creeks spring-run Chinook salmon, *Oncorhynchus tshawytscha* life history investigation, 2000-2001. California Department of Fish and Game, Inland Fisheries Administrative Report.

Ward, P.D., T.R. McReynolds, and C.E. Garman. 2003. Butte and Big Chico Creeks spring-run Chinook salmon, *Oncorhynchus tshawytscha* life history investigation, 2001-2002. California Department of Fish and Game, Inland Fisheries Administrative Report.

Waters, T.F. 1995. Sediment in streams: sources, biological effects, and control. American Fisheries Society Monograph 7.

Williams, J.G. 2006. Central Valley salmon: a perspective on Chinook and steelhead in the Central Valley of California. San Francisco Estuary and Watershed Science 4(3): Article 2. 416 pages. Available at: http://repositories.cdlib.org/jmie/sfews/vol4/iss3/art

Wright, D.A., and D.J. Phillips. 1988. Chesapeake and San Francisco Bays: A study in contrasts and parallels. Marine Pollution Bulletin 19 (9): 405-413.

Yoshiyama, R. M., E. R. Gerstung, F. W. Fisher, and P. B. Moyle. 1996. Historical and present distribution of Chinook salmon in the Central Valley drainage of California. Sierra Nevada Ecosystem Project: final report to Congress. *In* Assessments, commissioned reports, and background information, volume 3, pages 309-362. University of California, Center for Water and Wildland Resources, Davis, California.

Yoshiyama, R.M., F.W. Fisher, and P.B. Moyle. 1998. Historical abundance and decline of Chinook salmon in the Central Valley region of California. North American Journal of Fisheries Management 18: 487-521.

Yoshiyama, Ronald M., Eric R. Gerstung, Frank W. Fisher, and Peter B. Moyle. 2000. Chinook salmon in the California Central Valley: an assessment. *Fisheries*. 25(2): 6-20.

Zimmerman, C.E., G.W. Edwards, and K. Perry. 2008. Maternal origin and migratory history of *Oncorhynchus mykiss* captured in rivers of the Central Valley, California. Final Report prepared for the California Department of Fish and Game. Contract P0385300. 54 pages.

A. Federal Register Notices Cited

63 FR 13347. March 19, 1998. National Marine Fisheries Service. Final Rule: Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California. *Federal Register*, Volume 63 pages 13347-13371.

64 FR 50394. September 16, 1999. National Marine Fisheries Service. Final Rule: Threatened Status for Two Chinook Salmon Evolutionarily Significant Units in California. *Federal Register*, Volume 64 pages 50394-50415.

60 FR 33102. June 14, 2004. Endangered and Threatened Species: Proposed Listing Determinations for 27 ESUs of West Coast Salmonids; Proposed Rule. *Federal Register*, Volume 60 pages 33102-33179.

70 FR 37160. June 28, 2005. National Marine Fisheries Service. Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs. *Federal Register*, Volume 70 pages 37160-37204.

70 FR 52488. September 2, 2005. Endangered and Threatened Species; Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California. *Federal Register*, Volume 70 pages 52488-52627.

71 FR 834. January 5, 2006. Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead; Final Rule. *Federal Register*, Volume 71 pages 834-862.

170 FR 52630-52858. September 5, 2005. National Marine Fisheries Service. Final Rule: Designated Critical Habitat; Central Valley Spring-run Chinook Salmon. *Federal Register*, Volume 170 pages 52630-52858.

76 FR 50447. August 15, 2011. Endangered and Threatened Species; 5-Year Reviews for 5 Evolutionarily Significant Units of Pacific Salmon and 1 Distinct Population Segment of Steelhead in California. *Federal Register*, 76 pages 50447-50448.

70 FR 17386. April 6, 2005. Endangered and Threatened Wildlife and Plants: Proposed Threatened Status for Southern Distinct Population Segment of North American Green Sturgeon. United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. *Federal Register*, 70 pages 17386-17401.

74 FR 52300. October 9, 2009. Endangered and Threatened Wildlife and Plants: Final Rulemaking to Designate Critical Habitat for the Threatened Southern Distinct Population Segment of North American Green Sturgeon. United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. *Federal Register*, Volume 71 pages 17757-17766

71 FR 17757. April 7, 2006. Final Rule: Endangered and Threatened Wildlife and Plants: Threatened Status for Southern Distinct Population Segment of North American Green Sturgeon. United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. *Federal Register*, Volume 71 pages 17757-17766

Enclosure 2

Magnuson-Stevens Fishery Conservation and Management Act

ESSENTIAL FISH HABITAT CONSERVATION RECOMMENDATIONS[1]
5th Street Bridge Replacement Project (Project)

I. IDENTIFICATION OF ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended (U.S.C. 180 *et seq.*), requires that essential fish habitat (EFH) be identified and described in Federal fishery management plans (FMPs). Federal action agencies must consult with NOAA's National Marine Fisheries Service (NMFS) on any activity which they fund, permit, or carry out that may adversely affect EFH. NMFS is required to provide EFH conservation and enhancement recommendations to the Federal action agencies.

EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purposes of interpreting the definition of EFH, "waters" includes aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means habitat required to support a sustainable fishery and a healthy ecosystem; and, "spawning, breeding, feeding, or growth to maturity" covers all habitat types used by a species throughout its life cycle. Freshwater EFH for salmon consists of four major components: spawning and incubation habitat; juvenile rearing habitat; juvenile migration corridors; and adult migration corridors and adult holding habitat (Pacific Fishery Management Council 2003). Important components of EFH for spawning, rearing, and migration include suitable substrate composition; water quality (e.g., DO, nutrients, temperature); water quantity, depth and velocity; channel gradient and stability; food; cover and habitat complexity (e.g., large woody material, pools, channel complexity, aquatic vegetation); space; access and passage; and floodplain and habitat connectivity (Pacific Fishery Management Council 2003). The proposed project site is within the region identified as EFH for Pacific salmon in Amendment 14 of the Pacific Salmon FMPs.

The Pacific Fishery Management Council (PFMC) has identified and described EFH, Adverse Impacts and Recommended Conservation Measures for salmon in Amendment 14 to the Pacific Coast Salmon FMP (PFMC 1999). Freshwater EFH for Pacific salmon in the California Central Valley includes waters currently or historically accessible to salmon within the Central Valley

[1] The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) set forth new mandates for NOAA's National Marine Fisheries Service (NMFS) and Federal action agencies to protect important marine and anadromous fish habitat. Federal action agencies which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding potential adverse effects of their actions on EFH, and respond in writing to NMFS "EFH Conservation Recommendations." The Pacific Fisheries Management Council has identified essential fish habitat (EFH) for the Pacific salmon fishery in Amendment 14 to the Pacific Coast Salmon Fishery Management Plan.

ecosystem as described in Myers *et al.* (1998). Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley (CV) spring-run Chinook salmon (*O. tshawytscha*), and CV fall-/late fall-run Chinook salmon (*O. tshawytscha*) are species managed under the Pacific Coast Salmon FMP that occur in the Central Valley. CV Fall-run Chinook salmon comprise the largest population of Chinook salmon in the Feather River watershed; additionally a smaller CV spring-run Chinook salmon population persists as well.

Factors limiting salmon populations in the Feather River Watershed include flow conditions affecting juvenile rearing and outmigration, water temperatures and water quality affecting adult immigration, holding, spawning and embryo incubation, and lack of spawning habitat due to sediment transport process being blocked by Oroville Dam, sedimentation affecting embryo incubation, and hybridization between fall-run and spring-run Chinook salmon, affecting genetic integrity.

A. Life History and Habitat Requirements

1. Pacific Salmon

General life history information for CV fall-run Chinook salmon is summarized below. Further detailed information on the other CV Chinook salmon Evolutionarily Significant Units (ESUs) are available in the enclosed biological opinion, the NMFS status review of Chinook salmon from Washington, Idaho, Oregon, and California (Myers *et al.* 1998), and the NMFS proposed rule for listing several ESUs of Chinook salmon (63 FR 11482).

Adult CV fall-run Chinook salmon enter the Sacramento and San Joaquin Rivers from July through December and spawn from October through December while adult CV late fall-run Chinook salmon enter the Sacramento and San Joaquin Rivers from October to April and spawn from January to April (U.S. Fish and Wildlife Service [USFWS] 1998). Chinook salmon spawning generally occurs in clean loose gravel in swift, relatively shallow riffles, or along the edges of fast runs (NMFS 1997).

Egg incubation occurs from October through March (Reynolds *et al.* 1993). Shortly after emergence from their gravel nests, most fry disperse downstream towards the Delta and into the San Francisco Bay and its estuarine waters (Kjelson *et al.* 1982). The remaining fry hide in the gravel or station in calm, shallow waters with bank cover such as tree roots, logs, and submerged or overhead vegetation. These juveniles feed and grow from January through mid-May, and emigrate to the Delta and estuary from mid-March through mid-June (Lister and Genoe 1970). As they grow, the juveniles associate with coarser substrates along the stream margin or farther from shore (Healey 1991). Along the emigration route, submerged and overhead cover in the form of rocks, aquatic and riparian vegetation, logs, and undercut banks provide habitat for food organisms, shade, and protect juveniles and smolts from predation. These smolts generally spend a very short time in the Delta and estuary before entry into the ocean. Whether entering the Delta or estuary as fry or larger juveniles, CV Chinook salmon depend on passage through the Delta for access to the ocean.

II. PROPOSED ACTION

The purpose of the 5th Street Bridge Replacement Project is to replace the functionally-obsolete existing bridge structure over the Feather River. The proposed project connects Yuba City and Marysville, in Sutter and Yuba Counties, California. The proposed project involves the replacement of the bridge along 5th Street, over the Feather River.

For the proposed project, the 5th Street Bridge would be removed and replaced with a new four-lane bridge over the Feather River. This includes construction of a new four-lane bridge over 2nd Street, expansion of 5th Street from two lanes to four lanes between the new bridge and J Street in Marysville, including four lanes under the Union Pacific Railroad, improvements to the 5th Street and J Street intersection in Marysville including a new eastbound dedicated right turn lane on to J Street and reconstruction of sidewalks and curb ramps to current Americans with Disabilities Act standards.

III. EFFECTS OF THE PROPOSED ACTION

The effects of the proposed action on salmonid habitat are described at length in section V. (*Effects of the Action*) of the preceding biological opinion (BO), and generally are expected to apply to Pacific salmon EFH.

Effects to EFH stemming from construction activities that may contribute sediment and increased turbidity will be avoided or minimized by meeting Regional Water Quality Board objectives, Caltrans water pollution specifications, implementing applicable BMPs, staging equipment outside of the riparian corridor, limiting the amount of riparian vegetation removal, and creating a riparian restoration plan at the project site to include the restoration of areas impacted by the project, and will establish a healthy riparian corridor along this reach of the lower Feather River.

EFH will be adversely affected by the disturbance of up to 0.65 acres of riparian vegetation as a result of construction activities. The majority of these impacts are expected to be temporary, as all disturbed areas outside the actual footprint of the new bridge would be restored to preconstruction conditions and any areas of disturbed vegetation will be protected in place where feasible to provide an effective form of erosion and sediment control as well as watershed protection, landscape beautification, dust control, pollution control, noise reduction, and shade. To control invasive species, all landscaping and re-vegetation will consist of Caltrans approved plants or seed mixes from native, locally adapted species.

These effects to EFH may result in a temporary redistribution of some individuals, primarily migrating and rearing juvenile salmonids, but, due to the temporary nature of these disturbances, the adverse effects that are anticipated to result from the proposed project are not of the type, duration, or magnitude that would be expected to adversely modify EFH to the extent that it could lead to an appreciable reduction in the function and conservation role of the affected habitat. NMFS expects that nearly all of the adverse effects to EFH from this project will be of a

short term nature and will not affect any associated Pacific salmon EFH beyond the construction period of the project.

IV. CONCLUSION

Based on our review of the material provided, and the best scientific and commercial information currently available, NMFS has determined that the proposed action would adversely affect EFH for Pacific salmon. However, the proposed action includes adequate measures (described in Enclosure 1 above) to avoid, minimize, or otherwise offset the adverse effects to EFH.

V. EFH CONSERVATION RECOMMENDATIONS

Considering that the habitat requirements of fall-run within the action area are similar to the Federally listed species addressed in the preceding BO, NMFS recommends that Terms and Conditions 1-4, as well as the Conservation Recommendations in the preceding BO prepared for the CV spring-run Chinook salmon ESU, CCV steelhead ESU, and North American green sturgeon DPS be adopted as EFH Conservation Recommendations.

Those terms and conditions which require the submittal of reports and status updates can be disregarded for the purposes of this EFH consultation as there is no need to duplicate those submittals.

VI. STATUTORY REQUIREMENTS

Section 305 (b) 4(B) of the MSA requires that the Federal lead agency provide NMFS with a detailed written response within 30 days, and 10 days in advance of any action, to the EFH conservation recommendations, including a description of measures adopted by the lead agency for avoiding, minimizing, or mitigating the impact of the project on EFH (50 CFR 600.920[j]). In the case of a response that is inconsistent with our recommendations, the lead agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreement with NMFS over the anticipated effects of the proposed action and the measures needed to avoid, minimize, or mitigate such effects.

VII. SUPPLEMENTAL CONSULTATION

Pursuant to 50 CFR 600.920(l), Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations.

VIII. LITERATURE CITED

Healey, M.C. 1991. Life history of Chinook salmon. *In* C. Groot and L. Margolis: Pacific Salmon Life Histories. University of British Columbia Press.

Kjelson, M.A., P.F. Raquel, and F.W. Fisher. 1982. Life history of fall-run juvenile Chinook salmon, *Oncorhynchus tshawytscha*, in the Sacramento-San Joaquin estuary, California, pages 393-411. *In* V.S. Kennedy (Editor), Estuarine Comparisons. Academic Press, New York, New York.

Lister, D.B., and H.S. Genoe. 1970. Stream habitat utilization by cohabiting under yearlings of (*Oncorhynchus tshawytscha*) and coho (*O. kisutch*) salmon in the Big Qualicum River, British Columbia. Journal of the Fishery Resources Board of Canada 27: 1215-1224.

Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status review of Chinook salmon from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-35, 443 pages.

National Marine Fisheries Service (NMFS). 1997. Proposed recovery plan for the Sacramento River winter-run Chinook salmon. National Marine Fisheries Service, Southwest Region, Long Beach, California, 288 pages plus appendices.

Pacific Fishery Management Council (PFMC). 1999. Description and identification of essential fish habitat, adverse impacts and recommended conservation measures for salmon. Amendment 14 to the Pacific Coast Salmon Plan, Appendix A. Pacific Fisheries Management Council, Portland, Oregon.

Pacific Fishery Management Council. 2003. Fishery Management Plan for Commercial and Recreational Salmon Fisheries off the coasts of Washington, Oregon, and California, as revised by Amendment 14 (adopted March 1999).

Reynolds, F.L., T.J. Mills, R. Benthin, and A. Low. 1993. Restoring Central Valley Streams: A Plan for Action. California Department of Fish and Game. Inland Fisheries Division.

U.S. Fish and Wildlife Service. 1998. Central Valley Project Improvement Act tributary production enhancement report. Draft report to Congress on the feasibility, cost, and desirability of implementing measures pursuant to subsections 3406(e)(3) and (e)(6) of the Central Valley Project Improvement Act. U.S. Fish and Wildlife Service, Central Valley Fish and Wildlife Restoration Program Office, Sacramento, California.

A.Federal Register Notices Cited

Volume 63 pages 11482-11520. March 9, 1998. Endangered and Threatened Species: Proposed Endangered Status for Two Chinook Salmon ESUs and Proposed Chinook Salmon ESUs; Proposed Redefinition, Threatened Status, and Revision of Critical Habitat for One

Chinook Salmon ESU; Proposed Designation of Chinook Salmon Critical Habitat in California, Oregon, Washington, Idaho.

Volume 228 pages 52630-52858. September 5, 2005. National Marine Fisheries Service. Final Rule: Designated Critical Habitat; Central Valley Spring-run Chinook Salmon.

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 3, Office of Environmental Management
703 B Street
Marysville, Ca 95901
PHONE (530) 741-7113
FAX (530) 741-4457

Flex your power!
Be Energy efficient!

Howard Brown
National Marine Fisheries Service
Central Valley Office
650 Capitol Mall, Ste. 5-100
Sacramento, CA 95814-460

October 22, 2012

City of Yuba City,
Sutter and Yuba County
Fed Id#: BRLS 5163 (025)
5th Street Bridge Replacement Project

Subject: Request to Initiate Formal Consultation for Affects to Listed Fish Species Resulting From the Proposed 5th Street Bridge Replacement Project.

Dear Mr. Brown,

The City of Yuba City, in cooperation with the City of Marysville, proposes to replace the 5th Street Bridge (Bridge # 18C-0012) over the Feather River and improve approach roadways to the bridge. The existing facility is located between Sutter and Yuba Counties and connects Bridge Street in Yuba City to 5th Street in Marysville.

Caltrans is initiating consultation as part of its NEPA assignment of federal responsibilities by the Federal Highway Administration (FHWA), effective October 1, 2012 and pursuant to 23 USC 327. Please direct all future correspondence on this project to Caltrans.

Project limits in the City of Marysville span from 5th and I Street to I and 3rd Street in the south, portions of River Front Park in the west and continuing over the Feather River into the City of Yuba City limits. Project limits within the City of Yuba City include the roadway along 2nd Street, small portions of Sutter, Yolo and Boyd Streets in the south, and the western expanse of Bridge Street at the intersection with 2nd Street and terminating just past the intersection at Shasta Street.

The enclosed Biological Assessment (BA) has identified and evaluated the impacts associated with construction activities and potential effects to the following federally listed fish species and their associated Critical Habitat: Central Valley steelhead (steelhead) (*Oncorhynchus mykiss*), Central Valley Spring-run Chinook Salmon (Chinook salmon) (*Oncorhynchus tshawytscha*), and North American green sturgeon (green sturgeon) (*Acipenser medirostris*). Additionally, avoidance and minimization measures have been identified and will be implemented to ensure that potential project impacts to steelhead and salmonid species and their Critical Habitat will be minimized to the greatest extent practicable.

After a review of the BA, Caltrans, as designated federal lead agency, has determined that this project "*may affect, is likely to adversely affect*" federally listed species Central Valley steelhead, Central Valley Spring-run Chinook Salmon, and North American green sturgeon, and "*is likely to adversely affect*" Critical Habitat for steelhead, green sturgeon and Chinook salmon.

If, after reviewing the attached Biological Assessment you have any questions, please contact Caltrans Project biologist Maureen Doyle at (530) 741-4470 or the Project Coordinator Cara Lambirth (530) 741-4109.

Sincerely,

Susan D. Bauer

Sue Bauer, Chief
Environmental Management, M-1 Branch

Cc: Chris Collison

Enclosure: Biological Assessment

Appendix H USFWS Species Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

July 17, 2014

Document Number: 140717070155

Angela Scudiere
Dokken Engineering
110 Blue Ravine Road #200
Folsom, CA 95630

Subject: Species List for 5th Street Bridge Replacement Project

Dear: Ms.

We are sending this official species list in response to your July 17, 2014 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be October 15, 2014.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found http://www.fws.gov/sacramento/es/Branch-Contacts/es_branch-contacts.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 140717070155

Current as of: July 17, 2014

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)

Branchinecta lynchi
Critical habitat, vernal pool fairy shrimp (X)
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Plants

Pseudobahia bahiifolia
Hartweg's golden sunburst (E)

Candidate Species

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (C)

Quads Containing Listed, Proposed or Candidate Species:

BROWNS VALLEY (543B)
WHEATLAND (543C)
YUBA CITY (544A)
SUTTER (544B)
GILSIZER SLOUGH (544C)
OLIVEHURST (544D)

County Lists

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)
S

Branchinecta lynchi
Critical habitat, vernal pool fairy shrimp (X)
vernal pool fairy shrimp (T)
S

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)
S

Lepidurus packardi
Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)
S

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)
S

Hypomesus transpacificus
delta smelt (T)
S

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)
S

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)
S

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)
S

Rana draytonii
California red-legged frog (T)
Critical habitat, California red-legged frog (X)
S

Reptiles

Thamnophis gigas
giant garter snake (T)
S

Birds

Charadrius alexandrinus nivosus
western snowy plover (T)
S

Plants

Cordylanthus palmatus
palmate-bracted bird's-beak (E)
S

Pseudobahia bahiifolia
Hartweg's golden sunburst (E)
S

Senecio layneae
Layne's butterweed (=ragwort) (T)
S

Candidate Species

Amphibians

Rana muscosa
mountain yellow-legged frog (C)
S

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (C)
S

Mammals

Martes pennanti
fisher (C)
S

Key:

(E) *Endangered* - Listed as being in danger of extinction.
(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two

procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands,

please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be October 15, 2014.

Appendix I Regional Planning Partnership POAQC Concurrence

S A C O G

Regional Planning Partnership

Item #2

Action Summary
September 28, 2011

In attendance:
Charles Anderson, SMAQMD
Theresa Arnold, SACOG
Mike Brady, Caltrans
Victoria S. Cacciatore, SACOG
Jose Luis Caceres, SACOG
Scott Carson, FHWA
Rick Carter, City of Elk Grove
Tim Chamberlain, Dokken Engineering
Jason Crow, ARB
John Deeter, ECOS
Renée Devere-Oki, SACOG
Jennifer Hargrove, SACOG
Lezlie Kimura, ARB
Anne Novotny, El Dorado County DOT
Karina O'Connor, EPA
Larry Robinson, SMAQMD
David Melko, PCPTA
Samson Okhade, SACOG
Refugio Razo, County of Sacramento
Larry Robinson, SMAQMD
Brit Snipes, City of Rancho Cordova
Lacey Symons-Holtzen, SACOG
Sharon Tang, Caltrans
Susan Wilson, Caltrans
Lucinda Willcox, City of Sacramento

1. **Introductions and Information Sharing.** Ms. Symons-Holtzen reminded the Partnership that *Roberts Rules of Orders* were reinstated at the August meeting.

2. **Action Summary of August 24, 2011, Meeting** (Ms. Symons-Holtzen). Mr. Robinson motioned to accept the action summary; Mr. Brady seconded the motion. The Partnership voted in favor of accepting the action summary and the motion carried.

3. **Project of Air Quality Concern Determination: Fifth Street Bridge Replacement.** Mr. Chamberlain introduced the Fifth Street Bridge Replacement project. The project is a two-lane bridge connecting Yuba City and Marysville. As the bridge is located in a $PM_{2.5}$ nonattainment area, Dokken Engineering prepared an air quality analysis to present to the Partnership for review and to determine if it is a Project of Air Quality Concern (POAQC). Both Mr. Brady and Mr. Robinson commended Dokken Engineering for the strength of their air quality document and recommended that it be used as an example for future documents. Mr. Carter motioned to find that the Fifth Street Bridge Replacement is not a POAQC; Mr. Robinson seconded the motion. The Partnership voted in favor of finding that the Fifth Street Bridge Replacement is not considered a POAQC requiring a hot spot analysis.

4. **Proposal from Ad-hoc Subcommittee to Improve Process for Determining Projects of Air Quality Concern.** Mr. Cáceres introduced the ad-hoc subcommittee proposal for improving the POAQC determination process. The number of projects requiring a determination by the Partnership has increased, following the PM_{10} designation for most of the region, and more of the Partnership's time is occupied with reviewing POAQCs. He explained that the surge in POAQC determinations prompted the formation of a

subcommittee to develop a list of best practices and a more effective way for addressing POAQC evaluation.

The subcommittee presented a proposal to delegate the authority of taking action on POAQCs to a Project Level Conformity Group (PLCG). The PLCG would be composed of representatives from FHWA, FTA, Caltrans, ARB, EPA, transportation planning agencies around the region (including El Dorado and Placer counties), and local air quality management and air pollution control districts. The PLCG would receive materials regarding potential POAQC via email and review them during a two-week period; the PLCG would make quarterly reports to the Partnership to inform them of the determinations made on each project. Mr. Cáceres explained that following approval of the proposal, a complete packet of materials for the new POAQC process would be presented to the Partnership for approval.

Mr. Melko suggested staff look into the possibility of developing a website for posting the materials for the POAQC. Mr. Robinson motioned to accept the proposal to establish the PLCG with Mr. Melko's suggested recommendation; Mr. Anderson seconded the motion. The Partnership voted in favor of establishing the PLCG and the motion carried.

5. **Fall Programming Round—Final Funding Targets.** Ms. Arnold presented the final funding targets for the Fall Programming Round. The final target of $115 million reflects the six-month extension of SAFETEA-LU at current levels and is higher than the preliminary target of $95 million, but still within the preliminary ranges presented last month. While each funding program was increased, the Regional Local program increased the greatest amount. The final funding targets will be presented to the Transportation Committee then to the SACOG Board.

6. **Extension of SACOG's Toll Credits Policy.** Mr. Okhade introduced the extension of the SACOG Toll Credit Policy. The original toll credit policy was developed last year in response to the initiation of a Caltrans demonstration program with $5.7 billion in "credits" for highway capital improvements. The Board adopted a Toll Credit Policy, set to expire October 1, 2011. Staff is recommending to the Transportation Committee that the current Toll Credit Policy get extended one more year.

7. **Metropolitan Transportation Plan/Sustainable Communities Strategy Update.** Ms. Hargrove updated the Partnership regarding the MTP/SCS. The Board endorsed the 2020 and 2035 transportation and land use Draft Preferred Scenario assumptions at the September meeting with two additional considerations—staff is to return to the Board Committees in October to discuss a process for updating the SCS prior to the regularly scheduled four year cycles, and staff will continue to perform outreach with local communities, specifically business communities.

8. **Other Matters.** There were no other matters.

9. **Adjournment.** Mr. Anderson motioned to adjourn the meeting, Mr. Robinson seconded the motion. The Partnership voted to adjourn the meeting and the motion carried. The next meeting is scheduled for October 26, 2011.

Appendix J SHPO Coordination

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

May 3, 2013 Reply To: FHWA110926A

Anmarie Medin
Chief, Cultural Studies Office
Caltrans Division of Environmental Analysis, MS 27
PO Box 942874
Sacramento, CA 94274-0001

Re: Finding of Effect for the Proposed 5th Street Bridge Replacement Project, Yuba City, CA

Dear Ms. Medin:

Thank you for consulting with me about the subject undertaking in accordance with the *Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (PA).

Caltrans has determined that the proposed project will have no adverse effect to either the Marysville Ring Levee or the Northern Electric Railroad, two properties eligible for the National Register of Historic Places (NRHP). Based on review of the submitted documentation, I concur with this finding.

Thank you for considering historic properties during project planning. If you have any questions, please contact Natalie Lindquist of my staff at (916) 445-7014 or email at natalie.lindquist@parks.ca.gov.

Sincerely,

Susan K Stratton for

Carol Roland-Nawi, Ph.D.
State Historic Preservation Officer

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENVIRONMENTAL ANALYSIS, MS 27
1120 N STREET
P. O. BOX 942874
SACRAMENTO, CA 94274-0001
PHONE (916) 653-7507
FAX (916) 653-7757
TTY 711

Flex your power!
Be energy efficient!

April 5, 2013

Ms. Carol Roland-Nawi, PhD.
State Historic Preservation Officer
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816

SUT-00
5th Street Bridge
Replacement Project
Yuba City, Sutter County
BHLS-5163(025)

Attention: Susan Stratton

Subject: Finding of No Adverse Effect for the 5th Street Bridge Replacement Project, Yuba City, Sutter County, California

Dear Ms. Roland-Nawi:

In accordance with the January 1, 2004 Federal-Aid Highway Programmatic Agreement (PA), the California Department of Transportation (Caltrans) is continuing consultation with the State Historic Preservation Officer (SHPO) for the above referenced undertaking. We are consulting with you under Stipulation X.B.1 of the PA, which requires consultation with the SHPO regarding a finding of "No Adverse Effect Without Standard Conditions".

Caltrans District 3 transmitted a Historic Property Survey Report (HPSR) for this undertaking (5th Street Bridge Replacement Project), to the SHPO in September 2010. The 5th Street Bridge (18C0012) was previously determined to be ineligible for the NRHP. Two historic properties were identified in the Area of Potential Effects (APE). They include the Marysville Ring Levee, which was previously determined eligible for listing in the National Register of Historic Places (NRHP) at the local level of significance under criterion A and B (period of significance: 1862 to present) in 2009, and the Northern Electric Railroad Bridge over the Feather River which was determined eligible for the NRHP at the local level of significance under Criterion A (period of significance: 1906 to 1940) as a result of the 2010 study. Following submittal of the HPSR, thirty days passed without comment from the SHPO; therefore, District 3 assumed concurrence and moved forward with the project in accordance with Stipulation VIII.C.5.a of the Section 106 Programmatic Agreement (PA).

In applying the Criteria of Adverse Effect pursuant to Stipulation X.A. of the PA, Caltrans has concluded that a finding of No Adverse Effect (Stipulation X.B.1) is appropriate for the proposed project. Enclosed you will find the Finding of Effect document supporting this conclusion. Caltrans requests your concurrence that this undertaking will have no adverse effect on the aforementioned historic properties identified in the project APE. We look forward to receiving your response within 30 days.

In addition, Caltrans, as assigned by FHWA, may make a *de minimis* finding for Section 4(f) use of the historic property based on your concurrence in the Section 106 No Adverse Effect finding. Please note that if no response is received from your office within 30 days of receipt of this submittal, Caltrans may still make a *de minimis* impact finding for purposes of Section 4(f) as described in our August 11, 2006 letter agreement.

If you have any questions or require additional information, please contact Todd Jaffke at (916) 654-3567 todd_jaffke@dot.ca.gov or Gail St. John at (530) 741-7116 gail.stjohn@dot.ca.gov.

Sincerely,

ANMARIE MEDIN
Chief,
Cultural Studies Office
Division of Environmental Analysis

Enclosures: Finding of No Adverse Effect for the 5th Street Bridge Replacement Project

cc: Todd Jaffke-HQ, Gail St. John-D3; Susan Bauer-D3

Gail St John/D03/Caltrans/CAGov
10/31/2012 01:10 PM
To
sstratton@parks.ca.gov
cc
nlindquist@parks.ca.gov, Cara Lambirth/D03/Caltrans/CAGov@DOT, Daryl Noble/D03/Caltrans/CAGov@DOT, Sue Bauer/D03/Caltrans/CAGov@DOT
bcc

Subject
30-day past notification

Dear Dr. Stratton:

The following project was sent by Caltrans District 3 Division of Environmental Planning to SHPO: HPSR for the 5th Street Bridge Replacement Project, Sutter County

SHPO received this documentation on September 26, 2012, per OHP database log-in (Reference #FHWA110926A].

The 30 day review period ended on October 26, 2012.

Since 30 days for comment has now passed, Caltrans is hereby informing all
concerned that we are proceeding forward per stipulation VIII.C.5.a of the
PA.

Please feel free to call me at 530/741-7116 if you have any questions.

Sincerely,

Gail St. John
AEP - Architectural History

DEPARTMENT OF TRANSPORTATION
DISTRICT 3
703 B STREET
P. O. BOX 911
MARYSVILLE, CA 95901-0911
PHONE (530) 741-7113
FAX (530) 741-4457
TTY (530) 741-4509

Flex your power!
Be energy efficient!

September 22, 2012

Mr. Milford W. Donaldson, FAIA
State Historic Preservation Officer
1725 23rd Street, Suite 100
Sacramento, CA 95816

5th Street Bridge Replacement Project,
City of Yuba City, Sutter County
BHLS-5163(025)
03-965100 (3ENVR)

Re: Historic Property Survey Report and Determination of Eligibility for the 5th Street Bridge Replacement Project, Sutter County.

Dear Mr. Donaldson:

The California Department of Transportation (Caltrans) is initiating consultation with the State Historic Preservation Officer (SHPO) for this project in accordance with the January 2004 *Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federally-Aided Highway Program in California* (PA).

Enclosed you will find a Historic Property Survey Report (HPSR) for the proposed undertaking. We are consulting with you at the present time under Stipulation VIII.C.5 of the PA, which requires that we seek your concurrence on Caltrans' determinations of eligibility for potential historic properties.

Caltrans is transmitting this study as a federal agency, following the provisions of the *Memorandum of Understanding (MOU) between the Federal Highway Administration, California Division and the California Department of Transportation State Assumption of Responsibility for Categorical Exclusions*, which became effective on June 7, 2007. The MOU was signed pursuant to Section 6004 of the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) which allows the Secretary of Transportation to assign, and the State of California to assume, responsibility for most NEPA Categorical Exclusion determinations. For those projects, the State may also be assigned FHWA's responsibilities for environmental consultation and coordination under other federal environmental laws. By statute, the State is deemed to be a Federal agency for these assigned responsibilities. As this project is covered by the Section 6004 MOU, FHWA has assigned and Caltrans has assumed FHWA responsibility for environmental review, consultation, and coordination on this project. Please direct all future correspondence on this project to Caltrans.

The City of Yuba City, in conjunction with Caltrans, is proposing to replace the 5th Street Bridge over the Feather River and improve approach roadways to the bridge. The existing bridge connecting Yuba City and Marysville has been found seismically vulnerable to soil liquefaction. The proposed project would address this potential safety issue as well as improve traffic operations. A full project description and depiction of the Area of Potential Effects (APE) can be found on pages one through three and Figure 3 of the HPSR.

Consultation and identification efforts for this project (summarized on pages three through five) resulted in the identification of 14 cultural resources within the horizontal APE for the proposed project. Of those resources, two bridges (18C0012 and 18C055) had been previously determined ***ineligible*** for listing in the National Register of Historic Places (NRHP) during the Caltrans statewide historic bridge inventory update. One resource, the Marysville Ring Levee, was previously determined ***eligible*** for listing in the NRHP. One resource, the Gilsizer Slough, runs through the horizontal APE but will not be affected by the proposed project; therefore, the slough was not evaluated for this effort. Evaluations of the remaining 10 resources are included in Appendix A of the Historical Resources Evaluation Report, which is included as Attachment 3 of the HPSR.

Pursuant to Stipulation VIII.C.5 of the PA, Caltrans is requesting your concurrence with the following eligibility determinations:

- The Northern Electric Railroad Bridge is **eligible** for listing in the NRHP; and,
- Four bridges, four residences, and a segment of the Union Pacific Railroad are **not eligible** for listing in the NRHP.

We look forward to receiving your response within 30 days of receipt of this submittal in accordance with Stipulation VIIIC.5.a.of the PA. Caltrans will continue consultation with the SHPO regarding effects under Stipulation X. with a future submittal. Please contact Gail St. John, District 3 Architectural Historian, at (530) 741-7116 if you have any questions regarding this document.

Sincerely,

//original signed by//

Susan D. Bauer, Chief
Environmental Management, M1 Branch

Enclosure

cc: Cara Lambirth, Environmental Coordinator
Anmarie Medin, Caltrans HQ

Appendix K List of Acronyms

ACM	Asbestos Containing Material
ADA	Americans with Disabilities Act
ARB	California Air Resources Board
AUL	Activity and Use Limitation
bgs	Below Ground Surface
BMPs	Best Management Practices
BSA	Biological Study Area
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CPUC	California Public Utilities Commission
CTBG	Census Tract Block Group
CVFPB	Central Valley Flood Protection Board
CWA	Clean Water Act
dB	decibels
dBA	A-weighted decibels
DPS	Distinct Population Segment
DWR	Department of Water Resources
EO	Executive Order
EPA	Environmental Protection Act
ESA	Environmentally Sensitive Areas
FCAA	Federal Clean Air Act
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FRAQMD	Feather River Air Quality Management District
FTA	Federal Transit Administration
GHG	Greenhouse Gas
HA	Hydraulic Area
HEI	Health Effects Institute
HU	Hydraulic Unit
LEDPA	Least Environmentally Damaging Practicable Alternative
Leq	equivalent noise level
LOS	level of service
MND	Mitigated Negative Declaration
mph	Miles Per Hour

MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NRHP	National Register of Historic Places
O_3	ozone
OSHA	Occupational Safety and Health Act
PA	Programmatic Agreement
Pb	lead
PCB	Polychlorinated Biphenyl
PDT	Project Development Team
PG&E	Pacific Gas and Electric
PM	particulate matter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
POAQC	Project of Air Quality Concern
ppm	parts per million
PRC	Public Resources Code
PS&E	Plans, Specifications, and Estimates
RAP	Relocation Assistance Program
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
ROW	right-of-way
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SACOG	Sacramento Area Council of Governments
sf	Square Feet
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TIP	Transportation Improvement Program
TMDL	Total Maximum Daily Load
TSCA	Toxic Substances Control Act
UPR	Union Pacific Railroad
USC	United States Code
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USFWS	United State Fish and Wildlife Service
WDR	Waste Discharge Requirements
VELB	Valley Elderberry Longhorn Beetle
VMT	Vehicle Miles Traveled

Appendix L List of Technical Studies

These reports are available at the Yuba City Public Works Department Offices.

Technical Study
Air Quality Report
Biological Assessment for Central Valley Steelhead, Central Valley Spring-run Chinook Salmon, and North American Green Sturgeon
Biological Assessment for Valley Elderberry Longhorn Beetle
Community Impact Assessment
Finding of No Adverse Effect Report
Hazardous Waste Initial Site Assessment
Historical Property Survey Report
Location Hydraulic Study
Natural Environment Study
Noise Study Report
Noise Abatement Decision Report
Relocation Impact Memorandum
Traffic Report
Visual Impact Assessment
Water Quality Assessment

Appendix M FHWA Project Level Air Quality Conformity Determination

U.S. Department of Transportation
Federal Highway Administration

California Division

650 Capitol Mall, Suite 4-100
Sacramento, CA 95814
(916) 498-5001

February 7, 2014

In Reply Refer To:
HDA-CA

Ms. Judy Jones
District Director
California Department of Transportation
District 3
703 B Street
Marysville, CA 95901

Attention: Cara Lambirth

SUBJECT: Project Level Conformity Determination for the Marysville, 5th Street Bridge Replacement Project (SUT10828)

Dear Ms. Jones:

On January 21, 2014, the California Department of Transportation (Caltrans) submitted to the Federal Highway Administration (FHWA) a complete request for a project level conformity determination for the 5th Street Bridge Replacement Project. The project is in an area that is designated Non-Attainment or Maintenance for Ozone and Particulate Matter (PM 2.5).

The project level conformity analysis submitted by Caltrans indicates that the project-level transportation conformity requirements of 40 CFR Part 93 have been met. The project is included in the Sacramento Area Council of Governments' (SACOG) current RTP and TIP, as amended. The design concept and scope of the preferred alternative have not changed significantly from those assumed in the regional emissions analysis.

As required by 40 CFR 93.116 and 93.123, the localized PM analyses are included in the documentation. The analyses demonstrate that the project will not create any new violations of the standards or increase the severity or number of existing violations.

Based on the information provided, FHWA finds that the 5th Street Bridge Replacement project conforms to the SIP in accordance with 40 CFR Part 93.

If you have any questions pertaining to this conformity finding, please contact Joseph Vaughn at (916) 498-5346 or by email at Joseph.Vaughn@dot.gov.

Sincerely,

For: Vincent P. Mammano
Division Administrator

Appendix N Public Notices, Newspaper Advertisements, and Mailings

PUBLIC NOTICE

Notice of Availability of Draft Initial Study/Environmental Assessment and Section 4(f)\6(f) Evaluation
Intent to Adopt the Proposed Mitigated Negative Declaration Announcement of Public Meeting

5th Street Bridge Replacement Project

WHERE AND WHEN?

Date: Thursday, August 22nd, 2013

Time: 6:00 p.m. to 7:00 p.m.

Place: Yuba City, City Hall—Council Chambers
1201 Civic Center Boulevard
Yuba City, CA 95993

WHAT IS BEING PLANNED?

The City of Yuba City (City), in cooperation with the California Department of Transportation (Caltrans), City of Marysville, and Counties of Sutter and Yuba, proposes to replace the existing 5th Street Bridge over the Feather River with a new four -lane structure located in the Cities of Yuba City and Marysville. The project would enhance safety, provide a transportation facility consistent with local, regional, and state standards, and would improve traffic operations and transportation capacity by adding two additional through lanes across the Feather River. Additional details regarding the proposed project are available at the City's website at: www.yubacity.net.

WHY THIS PUBLIC NOTICE?

The City and Caltrans have studied the effects this project may have on the environment. These studies show it will not significantly affect the quality of the environment and a summary of these findings are included in an Initial Study with Proposed Mitigated Negative Declaration/ Environmental Assessment and Section 4(f)/6(f) Evaluation (Draft Environmental Document). This notice is to tell you of the preparation of this Draft Environmental Document and of its availability for you to read.

A public information meeting will be held on August 22, 2013, to give you an opportunity to discuss the project with City staff and to provide written comments which will be included in the Final Environmental Document. This public meeting will be conducted in an "Open House" format; no formal presentation will be made. It is not necessary to attend this meeting if you wish to submit written comments. Please come in at your convenience between 6:00 p.m. and 7:00 p.m.

WHAT'S AVAILABLE?

The Draft Environmental Document and supporting technical studies are available online using the following link:
www.yubacity.net/public-works/5th-street-bridge-replacement/

Hard copies of these documents are available for your review along with other project information at the Yuba City Public Works Office located at 1201 Civic Center Boulevard, Yuba City, CA 95993 during normal business hours (please note that the office will be closed on August 9th and 23rd for furloughs). The Draft Environmental Document is also available to be reviewed at the Sutter County Library located at 750 Forbes Avenue, Yuba City, CA 95991, and at the Marysville City Hall located at 526 C Street, Marysville, CA 95901.

WHERE DO YOU COME IN?

Do you have any comments about processing the project with an Initial Study/Mitigated Negative Declaration and Environmental Assessment? Do you have any comments on the proposed project? Please submit your comments in writing no later than August 31, 2013, to Yuba City, Attention: Kevin Bradford, 1201 Civic Center Boulevard, Yuba City Public Works, CA 95993. You can also submit your comments via email to kbradfor@yubacity.net or submit on a comment card at the public meeting. Yuba City will begin accepting comments on August 2, 2013. If no major concerns are raised, the City will proceed with the project's design.

CONTACT

For more information about this project please contact Kevin Bradford, Project Manager at (530) 822-4626 or kbradfor@yubacity.net.

Notice of Availability of Draft Initial Study/ Environmental Assessment and Section 4(f)\6(f) Evaluation Intent to Adopt the Proposed Mitigated Negative Declaration Announcement of Public Meeting

5th Street Bridge Replacement Project

WHERE AND WHEN?

Date: **Thursday August 22, 2013**

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CONTACT

For more information about this project please contact Kevin Bradford, Project Manager at (530) 822-4626 or kbradfor@yubacity.net

August 2, 2013 Ad #00158121

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: 5th Street Bridge Replacement Project

Lead Agency: Yuba City
Contact Person: Kevin Bradford
Mailing Address: 1201 Civic Center Blvd.
Phone: (530) 822-4786
City: Yuba City
Zip: 95993
County: Sutter County

Project Location: County: Sutter/Yuba
City/Nearest Community: Yuba City/Marysville
Cross Streets: 5th Street and J Street, Bridge Street and Shasta Street
Zip Code: 95993
Longitude/Latitude (degrees, minutes and seconds): 39 ° 08 ' 19 " N / 121 ° 36 ' 23 " W
Total Acres: 165 acres
Assessor's Parcel No.: Numerous
Section: 23
Twp.: 15N
Range: 3E
Base: Mt. Dia.
Within 2 Miles: State Hwy #: 99 and 70
Waterways: Feather River
Airports: O52, MYV
Railways: UPRR
Schools: Multiple

Document Type:

CEQA:
- [ ] NOP
- [ ] Early Cons
- [ ] Neg Dec
- [x] Mit Neg Dec
- [ ] Draft EIR
- [ ] Supplement/Subsequent EIR (Prior SCH No.) _____
- Other: _____

NEPA:
- [ ] NOI
- [x] EA
- [ ] Draft EIS
- [ ] FONSI

Other:
- [x] Joint Document
- [ ] Final Document
- [ ] Other: _____

RECEIVED
AUG 02 2013
STATE CLEARING HOUSE

Local Action Type:

- [ ] General Plan Update
- [ ] General Plan Amendment
- [ ] General Plan Element
- [ ] Community Plan
- [ ] Specific Plan
- [ ] Master Plan
- [ ] Planned Unit Development
- [ ] Site Plan
- [ ] Rezone
- [ ] Prezone
- [ ] Use Permit
- [ ] Land Division (Subdivision, etc.)
- [ ] Annexation
- [ ] Redevelopment
- [ ] Coastal Permit
- [x] Other: Transportation

Development Type:

- [ ] Residential: Units _____ Acres _____
- [ ] Office: Sq.ft. _____ Acres _____ Employees _____
- [ ] Commercial: Sq.ft. _____ Acres _____ Employees _____
- [ ] Industrial: Sq.ft. _____ Acres _____ Employees _____
- [ ] Educational: _____
- [ ] Recreational: _____
- [ ] Water Facilities: Type _____ MGD _____
- [x] Transportation: Type Bridge Replacement
- [ ] Mining: Mineral _____
- [ ] Power: Type _____ MW _____
- [ ] Waste Treatment: Type _____ MGD _____
- [ ] Hazardous Waste: Type _____
- [ ] Other: _____

Project Issues Discussed in Document:

- [x] Aesthetic/Visual
- [ ] Agricultural Land
- [x] Air Quality
- [x] Archeological/Historical
- [x] Biological Resources
- [ ] Coastal Zone
- [x] Drainage/Absorption
- [ ] Economic/Jobs
- [ ] Fiscal
- [x] Flood Plain/Flooding
- [ ] Forest Land/Fire Hazard
- [x] Geologic/Seismic
- [ ] Minerals
- [x] Noise
- [x] Population/Housing Balance
- [x] Public Services/Facilities
- [x] Recreation/Parks
- [ ] Schools/Universities
- [ ] Septic Systems
- [ ] Sewer Capacity
- [x] Soil Erosion/Compaction/Grading
- [x] Solid Waste
- [x] Toxic/Hazardous
- [x] Traffic/Circulation
- [x] Vegetation
- [x] Water Quality
- [x] Water Supply/Groundwater
- [x] Wetland/Riparian
- [ ] Growth Inducement
- [x] Land Use
- [x] Cumulative Effects
- [ ] Other: _____

Present Land Use/Zoning/General Plan Designation:

Residential, Commercial, Industrial, Parkland, Open Space

Project Description: *(please use a separate page if necessary)*

The City of Yuba City, in cooperation with the California Department of Transportation (Caltrans), proposes to replace the 5th Street Bridge (No. 18C-0012) over the Feather River and improve approach roadways to the bridge. Yuba City is the California Environmental Quality Act (CEQA) lead agency, while Caltrans is the National Environmental Policy Act (NEPA) lead agency.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

_____ Air Resources Board
_____ Boating & Waterways, Department of
_____ California Highway Patrol
_____ Caltrans District # _____
_____ Caltrans Division of Aeronautics
_____ Caltrans Planning
_____ Central Valley Flood Protection Board
_____ Coachella Valley Mtns. Conservancy
_____ Coastal Commission
_____ Colorado River Board
_____ Conservation, Department of
_____ Corrections, Department of
_____ Delta Protection Commission
_____ Education, Department of
_____ Energy Commission
_____ Fish & Game Region # _____
_____ Food & Agriculture, Department of
_____ Forestry and Fire Protection, Department of
_____ General Services, Department of
_____ Health Services, Department of
_____ Housing & Community Development
_____ Integrated Waste Management Board
_____ Native American Heritage Commission

_____ Office of Emergency Services
_____ Office of Historic Preservation
_____ Office of Public School Construction
_____ Parks & Recreation, Department of
_____ Pesticide Regulation, Department of
_____ Public Utilities Commission
_____ Regional WQCB # _____
_____ Resources Agency
_____ S.F. Bay Conservation & Development Comm.
_____ San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
_____ San Joaquin River Conservancy
_____ Santa Monica Mtns. Conservancy
_____ State Lands Commission
_____ SWRCB: Clean Water Grants
_____ SWRCB: Water Quality
_____ SWRCB: Water Rights
_____ Tahoe Regional Planning Agency
_____ Toxic Substances Control, Department of
_____ Water Resources, Department of

_____ Other: _____
_____ Other: _____

Local Public Review Period (to be filled in by lead agency)

Starting Date August 2, 2013 Ending Date August 31, 2013

Lead Agency (Complete if applicable):

Consulting Firm: Dokken Engineering
Address: 110 Blue Ravine Road #200
City/State/Zip: Folsom, CA 95630
Contact: Tim Chamberlain
Phone: (916) 858-0642

Applicant: Kevin Bradford, Yuba City Public Works
Address: 1201 Civic Center Blvd.
City/State/Zip: Yuba City, CA 95993
Phone: (530) 822-4786

Signature of Lead Agency Representative: _____ **Date:** 7/31/13

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Appendix O Public Comments and Responses

Comment 1.

Francis Coats (received via email, 08/04/13-08/05/13)

From: Francis Coats [mailto:fecoats@msn.com]
Sent: Sunday, August 04, 2013 4:28 PM
To: Kevin Bradford
Cc: Andrew Streng; ben vandermeer; CalTrans D3 Public Info Office; Chris Unkel; Cindy McKim; jennifer.lucchesi@slc.ca.gov; thomaswilcox@digitalpath.net; ereimondo@americanrivers.org; megan@americanwhitewater.org; danielle@riversforchange.org; tbartlett@dfg.ca.gov; john@riversforchange.org; dcneubert@gmail.com; info@californiacavalry.us; bhackamack@frontier.com; grace95991@hughes.net; jss1934@yahoo.com; ajames@sc.edu; eric@maidu.com; raymcreynolds@yahoo.com; hsweetser@aol.com; brent.handley@tpl.org; sharman07@comcast.net; alan@alarsonsafety.com; hkruger@appealdemocrat.com; staff@tuolumne.org; johnsonsbait@syix.com; jpokrandt@riverpartners.org; josh2th@aol.com; patrick@tuolumne.org; frydee@comcast.net; ahurtado@ou.edu; ccreekin@yahoo.com; mphogan@ucdavis.edu
Subject: comments on 5th street bridge environmental document

Aah. so this is both a project planned by DOT and by Yuba City. So both S&HWC 84.5 and 1809 would apply (they require somewhat different things. It appears that 84.5 has more teeth. It requires the subject of providing access for public recreational purposes to be covered, including the written report on the feasibility of providing a means of public access, during the public planning process.
I don't think Yuba City will have a problem doing this. However, given CalTrans past history, it is very important that this be included, and be included in public discussions.
This is in Caltrans manuals on how to plan a bridge project. I have no explanation for why it gets forgotten. Especially since CalTrans District 3 and I have been discussing this in detail for a few years.
CalTrans has, in its Project Development Planning Manual, very specific requirements for complying with 84.5.
Please make sure they are complied with, or explain why not.
this must be standard operating procedure for CalTrans, and it apparently is not.
Attached is copy of CalTrans policy as of 2012 amendments.

1-A

also:
is there a problem with the link provided in the E document to CalTrans copy of document?

Why isn't State Lands Commission permit required?
where is compliance with S&HWC 84.5, 991, 1809?

From: Francis Coats <fecoats@msn.com>
Sent: Sunday, August 04, 2013 3:32 PM
To: Kevin Bradford
Cc: Evan Reimondo; Dave Steindorf; Megan Hooker; John Cain; jennifer.lucchesi@slc.ca.gov; cunkel@americanrivers.org; thomaswilcox@digitalpath.net; danielle@riversforchange.org; tbartlett@dfg.ca.gov; john@riversforchange.org; dcneubert@gmail.com; info@californiacavalry.us; bhackamack@frontier.com; grace95991@hughes.net; jss1934@yahoo.com; ajames@sc.edu; eric@maidu.com; raymcreynolds@yahoo.com; hsweetser@aol.com; brent.handley@tpl.org; sharman07@comcast.net; alan@alarsonsafety.com; hkruger@appealdemocrat.com; staff@tuolumne.org; johnsonsbait@syix.com; jpokrandt@riverpartners.org; josh2th@aol.com; patrick@tuolumne.org; frydee@comcast.net; ahurtado@ou.edu; ccreekin@yahoo.com; mphogan@ucdavis.edu
Subject: Fifth "Street Bridge Environmental Document

More comments:
the report does not indicate that a permit is required from State Lands Commission. Why would this be so?
also, where is the compliance with Streets and Highways 84.5, 991 and 1809?

1-B

From: Francis Coats <fecoats@msn.com>
Sent: Sunday, August 04, 2013 3:47 PM
To: Kevin Bradford
Subject: fifth street bridge replacement project comments on draft EI doc.

Is the link to CalTrans site for document wrong or broken? It does not bring up the bridge replacement project, so far as I can tell, and I cannot find it on the CalTrans dist 3 site otherwise.

why no State Lands Permit required?

Where is S&HWC sec 84.5/991/1809 compliance?

ARTICLE 6 Environmental Considerations

Public Access to Waterways

• Navigable Rivers: Section 84.5 of the Streets and Highways Code requires full consideration of, and a report on the feasibility of providing a means of public access for recreational purposes to any navigable river over which a new bridge is being constructed. The Office of the Attorney General finds that a "navigable river" as defined under California common law, is any watercourse "capable of being navigated by oar or motor propelled small craft" (People ex rel. Baker v. Mack (1971) 19 Cal.App.3d 1040, 1050).

It is necessary to discuss this subject at any public hearing and to justify and document the position taken on public access to waterways in the project approval document thus satisfying State code. All environmental and engineering aspects must be considered as well as the intent of the Legislature to maximize such public access by requiring its consideration during the planning of such projects. As such, the potential for this item should be fully considered and addressed in the project initiation document and project report as appropriate. See Appendix K – Preparation Guidelines for Project Report, Article 2, Section 7 Report on Feasibility of Providing Access to Navigable Rivers.

• Public Boat Ramps: Section 147 of the 1976 Federal Aid Highway Act provides that certain federal funds (see Chapter 4 – Programming, Article 4) may be used to construct access ramps to public boat launching areas in conjunction with bridge projects on these systems. In addition, it is not the intention of Section 147 to provide an extended roadway system within publicly owned recreation areas, but rather to provide direct access ARTICLE 6 Environmental Considerations

1-A

Public Access to Waterways

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It is necessary to discuss this subject at any public hearing and to justify and document the position taken on public access to waterways in the project approval document thus satisfying State code. All environmental and engineering aspects must be considered as well as the intent of the Legislature to maximize such public access by requiring its consideration during the planning of such projects. As such, the potential for this item should be fully considered and addressed in the project initiation document and project report as appropriate. See Appendix K – Preparation Guidelines for Project Report, Article 2, Section 7 Report on Feasibility of Providing Access to Navigable Rivers.

• Public Boat Ramps: Section 147 of the 1976 Federal Aid Highway Act provides that certain federal funds (see Chapter 4 – Programming, Article 4) may be used to construct access ramps to public boat

launching areas in conjunction with bridge projects on these systems. In addition, it is not the intention of Section 147 to provide an extended roadway system within publicly owned recreation areas, but rather to provide direct access from the highway right-of-way to the water traversed by such highway.from the highway right-of-way to the water traversed by such highway.

(8-58 04/20/2012L Project Development Procedures Manual)

From: Francis Coats [mailto:fecoats@msn.com]
Sent: Monday, August 05, 2013 4:07 PM
To: Kevin Bradford; Mary Hays
Subject: RE: comments on 5th street bridge environmental document

Kevin Bradford
City of Yuba City
kbradfor@yubacity.net
Thank you for your telephone call today.

I still question whether a State Lands Permit may be required for the bridge. State Lands is essentially the trustee for the public interest in the navigable servitude/public trust lands, and so has an interest in the construction of the bridge even if the land under the river is owned in fee by private persons or one of the two cities.

Also, this land was part of the New Helvetia grant, and the New Helvetia grant was held to not include the bed of the river below low water mark because of the special language in which the grant was written. Even though most Mexican grant land had title going to the center of the river, that is not correct for the New Helvetia grant. 1-B

Also, I don't believe that the fact that the river has moved east in the last 150 years deprives State Lands, or the people of the State, of rights in the river. If that were so, then you would need to get State Lands permission to build that part of your project now on dry land on the Sutter county side.

And, of course, it is still important to me that CalTrans comply with section 84.5 of the Streets and Highways Code, and that Marysville and Yuba City both comply with 1809; and, to the extent that the counties are involved, that they comply with 991.

Frank Coats

From: Francis Coats [mailto:fecoats@msn.com]
Sent: Monday, August 05, 2013 4:50 PM
To: Kevin Bradford
Subject: Fifth Street Bridge Environmental Document comments

Kevin Bradford
City of Yuba City
Kbradfor@yubacity.net

I had a chance to look, and found Ferris v. Coover, (October 1858) 10 Cal. 589, which indicates that the description of the New Helvetia Grant was to the "margins" of the Sacramento and the Feather, and that this meant the edge, not the center. So, for these rivers in the vicinity of the New Helvetia grant, it appears that private title goes only to the edge of the river, the low water line; and, that the remainder must have been conveyed to the State (unless someone has some case law indicating that the grant on the east side of the Feather at Marysville extended to the west bank of the river).
This would appear to reflect on whether or not a State Lands permit may be required.
Frank Coats

Response 1.

Thank you for your comments; they have been included in the final environmental document.

Response 1-A: Since this project is on local city streets, of the three California Streets and Highways Codes referenced, only Section 1809 applies to the 5th Street Bridge Replacement Project. Section 1809 states: "Before any bridge on a city street is constructed over any navigable river, the legislative body of the city, after a study and public hearing on the question, shall determine and prepare a report on the feasibility of providing public access to the river for recreational purposes and a determination as to whether such public access can be provided." It is an important goal of the City of Yuba City to provide and maintain suitable access to existing park and recreational facilities. The proposed 5th Street Bridge Replacement Project would, at a minimum, provide the same public access for recreational purposes when compared with the existing condition, therefore, no impacts to public access or recreational access are anticipated as a result of this project. To the greatest extent possible, access to recreational facilities will remain open during construction which will minimize potential temporary access impacts.

In order to comply with the Streets and Highways Code Section 1809, prior to construction, Yuba City Public Works Department will document the existing public access routes currently provided to the Feather River and provide a recommendation to the City Council if additional access should be considered as an addition to the 5th Street Bridge Replacement Project. This recommendation will be considered by the City Council during a public hearing and members of the public will be provided an opportunity to provide input. This hearing will likely occur after approval of the environmental document, but prior to completion of the final design of the project.

Response 1-B: During the environmental review, the proponents believed that at the existing 5th Street Bridge, the land at the Feather River was completely owned by the City of Marysville. As a result of your comments, we have coordinated further with the State Lands Commission and determined that an update to the lease agreement for the existing 5th Street Bridge will be necessary and will be reviewed and approved by the State Land Commission in coordination with Sutter County. The environmental document has been updated to reflect the need for additional State Lands Commission coordination and an updated lease agreement.

Comment 2.
Chris Starkley (received via email, 08/09/13)

From: Chris Starkey [mailto:starkey_chris@yahoo.com]
Sent: Friday, August 09, 2013 8:21 AM
To: Kevin Bradford
Subject: 5th Street Bridge Replacement

Mr. Bradford,

Thank you for taking comments via e-mail. I have looked through the package available on the City webpage and only have one real comment and it is very possible it was answered and I missed it.

The old rail bridge, can it be used as the pedestrian/bicycle crossing? I have looked at the area and thought it made sense to use it for that purpose and with the thought of Yuba City trying to be a bicycle town it was perfect. Easy tie-in to both levee bicycle paths and it keeps people away from vehicle traffic. 2-A

Thank you for your time and please feel free to contact me with any questions.

Chris Starkey

Response 2.

Thank you for your comments; they have been included in the final environmental document.

Response 2-A: During the preliminary alternative screening for this project, the concept of converting the railroad bridge into a pedestrian/bicycle facility over the Feather River was strongly considered. Unfortunately, during further review of this alternative several issues were identified which made this an infeasible option for Yuba City. First, the Union Pacific Railroad still owns the railroad bridge and negotiations between the City and railroad could have caused substantial delays in the implementation of this bridge replacement project. Second, in addition to the one-time costs to improve the railroad bridge to be a suitable bridge for pedestrian and bicycle access, the City was concerned that the age and deterioration could result in a large ongoing maintenance cost to keep the bridge open and operational. Lastly, during this environmental review, the railroad truss bridge was found to be a historic structure associated with railroad activities in the region. Modifications to the bridge would have required substantially more environmental analysis and coordination with historic preservation agencies and could have resulted in further delays to the bridge replacement project.

In spite of these issues, the City is still willing to consider a future project that would convert the existing railroad bridge into a pedestrian facility; however, for the reasons stated above, it is not being considered as part of this project. A Class I separated pedestrian and bicycle path will be provided on the new 5th Street Bridge and will connect with the existing multi-modal facilities on both the Yuba City and Marysville sides of the project.

Comment 3.

Central Valley Regional Water Quality Control Board (received via mail, 08/13/13)

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

RECEIVED
AUG 1 3 2013
CITY OF YUBA CITY
PUBLIC WORKS DEPT

12 August 2013

Kevin Bradford
Yuba City
Public Works Office
1201 Civic Center Boulevard
Yuba City, CA 95993

CERTIFIED MAIL
7012 1640 0000 4750 9057

COMMENTS TO REQUEST FOR REVIEW FOR THE DRAFT MITIGATED NEGATIVE DECLARATION, 5TH STREET BRIDGE REPLACEMENT PROJECT, SCH NO. 2013082011, SUTTER COUNTY

Pursuant to the State Clearinghouse's 2 August 2013 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Draft Mitigated Negative Declaration* for the 5th Street Bridge Replacement Project, located in Sutter County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, 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. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/.

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 97-03-DWQ.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml.

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACOE). If a Section 404 permit is required by the USACOE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACOE at (916) 557-5250.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACOE permit, or any other federal permit, is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Waste Discharge Requirements

If USACOE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project will require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/help/business_help/permit2.shtml.

If you have questions regarding these comments, please contact me at (916) 464-4684 or tcleak@waterboards.ca.gov.

Trevor Cleak
Environmental Scientist

cc: State Clearinghouse Unit, Governor's Office of Planning and Research, Sacramento

Response 3.

Thank you for your comments; they have been included in the final environmental document.

Current planning for this project will include compliance with Section 404 and 401 of the Clean Water Act, as well as preparing a Storm Water Pollution Prevention Plan and General Construction Permit prior to the start of construction. These permits are referenced in Table 1.5-1: Permits and Approvals on page 11 of the Initial Study/Environmental Assessment.

Comment 4.

Claudia Hollis (received via comment card at public meeting, 08/22/13)

COMMENT CARD

RECEIVED
AUG 27 2013
CITY OF YUBA CITY
PUBLIC WORKS DEPT

5th Street Bridge Replacement Project

Public Meeting – August 22, 2013 at 6:00 p.m.

Name*: Claudia Hollis, Branch Manager at FREED,
Telephone (Optional): 530-742-4474 Disability Resource Center
Email (Optional): claudia@freed.org
Address (Optional): FREED Center for Independent Living
508 J Street, Marysville, CA 95901

Comments:

The access to the walkway to the bridge on both sides needs to be accessible to people with disabilities. ADA requirement is 1 inch rise for every 12 inches on length for wheelchair access. 4-A

*Your Name and Address will NOT be held confidential if provided

Response 4.

Thank you for your comments; they have been included in the final environmental document.

Response 4-A: Specific design of the pedestrian facilities will be prepared during the final design phase of the project. It is a goal of Yuba City and Marysville to design this project to Americans with Disabilities Act standards which would limit the slope percentages and/or provide resting areas for users in wheelchairs.

Comment 5.

California Department of Fish and Wildlife (received via mail, 08/26/13)

State of California -The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95667
(916) 358-2900
http://www.dfg.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

August 26, 2013

Kevin Bradford, Associate Civil Engineer
Yuba City Public Works Department
1201 Civic Center Boulevard
Yuba City, CA 95993

Subject: Comments on the Initial Study/Mitigated Negative Declaration for the 5th Street Bridge Replacement Project, SCH 2013072011

Dear Mr. Bradford:

The California Department of Fish and Wildlife (CDFW) is providing comments on the Initial Study Mitigated Negative Declaration (IS/MND) for the 5th Street Bridge Replacement Project (project) as both a trustee agency and responsible agency under the California Environmental Quality Act (CEQA). As trustee for the State's fish and wildlife resources, the CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species. As a responsible agency, CDFW administers the California Endangered Species Act (CESA) and other provisions of the Fish and Game Code that afford protection to the State's fish and wildlife public trust resources. CDFW offers the following comments and recommendations on this document in our role as a trustee and responsible agency under the CEQA.

The proposed project consists of replacing the existing 2-lane 5th Street Bridge over the Feather River with a 4-lane bridge. Construction will take place within the floodplain of the Feather River, between Yuba City and Marysville. The project is located within the *Yuba City, California* United States Geologic Survey (USGS) 7.5-minute quadrangle map. The following documents were reviewed:

- Initial Study/Mitigated Negative Declaration for the 5th Street Bridge Replacement Project (Yuba City, July 2013);
- Biological Assessment for Central Valley Steelhead (*Oncorhynchus mykiss*), Central Valley Spring-run Chinook Salmon (*Oncorhynchus tshawytscha*) and North American Green Sturgeon (*Acipenser medirostris*), 5th Street Bridge Replacement Project (Dokken, June 2013); and
- 5th Street Bridge Replacement Project, Natural Environment Study (NES) (Yuba City, September 2012).

The IS/MND does not adequately assess botanical resources, does not provide an adequate impact analysis/mitigation proposal required to reduce impacts on rare plant and fish species to below a significant level pursuant to CEQA, and does not provide adequate avoidance, minimization and mitigation measures required for impacts to the

State listed threatened Spring-run Chinook salmon. Specific deficiencies regarding these special status species are provided below.

Rare Plants

Surveys for rare plants were conducted only once, on April 27, 2011 (Yuba City, September 2012). A query for special-status plant species using the California Native Plant Society (CNPS) online inventory (http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi) for the quadrangles surrounding the *Yuba City* 7.5-minute USGS quadrangle map produced a list of 12 special status plant species that occur in this general region, the NES only looked at 7 species. The plants on this list are known to bloom at various times from March until October. Additional rare plant species not identified in the CNPS inventory for those nine quadrangles may be present in the project area depending on the habitats present.

In order to capture the blooming periods for all of these species, rare plant surveys should be conducted at least once in April, once in June and again in August or September; however, this is highly dependent on the habitats present within the project area and the current climate conditions for the survey year. In addition, the CDFW recommends conducting surveys following the Department's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (DFG 2009). These guidelines recommend rare plant surveys to be conducted at the proper time of year when rare or listed species, with suitable habitat in the project area, are both "evident" and identifiable. If floristic survey results are positive for the presence of rare plants, the IS/MND should include an impact analysis, including cumulative impacts, and appropriate mitigation measures to reduce impacts to below a significant level. 5-A

Fish Species

The Biological Assessment (Dokken, June 2013) for this project identified the potential to adversely impact Central Valley steelhead, North American green sturgeon and State-listed threatened Spring-run Chinook salmon. In order to minimize and avoid impacts to these species, the Biological Assessment (BA) proposed measures including stream crossing guidelines and water pump screens. The CDFW recommends that these measures be included in the IS/MND in order to protect both listed and non-listed fish species.

The BA also identified sound generated from pile-driving as an activity that may impact fish. The CDFW recommends that the project description includes that pile-driving sound levels shall not exceed 206 dB for more than 5 strikes in a single day. If this threshold is exceeded, then operations shall stop and CDFW shall be contacted to determine the future course of operation. Recent projects on the Feather River have attenuated sound to acceptable levels through the use of a dewatered casing around the pile being driven. Bubble curtains, as suggested in the BA, are not effective in rivers due to river currents moving the bubbles away from the pile that is being driven. 5-B

It is unlawful to take a species listed pursuant to CESA. Fish and Game Code (FGC) §86 defines "take" as to hunt, pursue, catch, capture or kill or attempt to hunt,

pursue, catch capture or kill. If project activities have the potential to take a State listed species, the CDFW may provide authorization for take pursuant to FGC §2081 et seq.

Summary
In summary, the CDFW finds that the IS/MND (a) does not adequately assess all of the special status plants which have the potential to occur within the project area (b) does not provide adequate measures to avoid take of the State listed threatened Spring-run Chinook salmon and measures to minimize and fully mitigate the significant impacts to this State-listed fish species. Impact determinations and formulation of mitigation measures must be included in the IS/MND before project approval.

Thank you for considering our concerns with the adequacy of the IS/MND. The CDFW personnel are available for consultation regarding biological resources and strategies to minimize impacts. If you have questions please contact Tim Nosal, Environmental Scientist, by e-mail at Tim.Nosal@wildlife.ca.gov or by phone at (916) 358-2853.

Sincerely,

Tina Bartlett
Regional Manager

ec: Jeff Drongesen, CDFW
Jennifer Navicky, CDFW
Tim Nosal, CDFW

State Clearinghouse

Response 5.

Thank you for your comments; they have been included in the final environmental document.

Response 5-A: In 2011, Dokken Engineering biologists conducted database and background research for rare plants. This research included a 6 USGS quad search of CNDDB records for areas surrounding the project site (Sutter, Gilsizer Slough, Olivehurst, Yuba City, Browns Valley, and Wheatland). Based on coordination with USFWS and CDFW on previous projects, the location of this project in relation to the six quads, and the lack of suitable habitat in the project area, the project biologists determined that this search area would be adequate for assessing potential biological resources in the biological study area. The search resulted in seven species which were identified to potentially occur in the 5th Street Bridge Replacement Project biological study area. This research was used in conjunction with the April 27, 2011 rare plant focused survey.

The research conducted by California Department of Fish and Wildlife (CDFW) resulted in five additional rare plant species being identified. Two of these additional plant species, Recurved larkspur

(*Delphinium recurvatum*) and Sanford's arrowhead (*Sagittaria sanfordii*) were not listed in the 2011 search done by Dokken Engineering and have since been added to the CNDDB records; therefore they could not have been included in the 2011 research. The remaining three additional plant species, Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii),* Red Bluff dwarf rush *(Juncus leiospermus* var. *leiospermus),* and Ahart's paronychia *(Paronychia ahartii),* are located in three USGS quads that were not in our research area (Gridley, Honcut, and Loma Rica).

The project area is dominated by developed/non vegetated area, as well as a large area which has been developed for public park use (Riverfront Park in Marysville). These areas are not suitable for any of the twelve rare plants identified in the CDFW search. Furthermore, other habitats in the project area including Disturbed Valley Foothill Riparian habitat, Disturbed Valley Oak Woodland, and ruderal/non-native grasses, do not provide suitable habitat for any of these species. The focused rare plant survey conducted on April 27, 2011 did not identify any of the twelve plants listed in the updated CNDDB search, and an additional biological survey of the riparian corridor was conducted on July 19, 2011 and this survey did not result in any positive identification of any rare plants. Based on the habitat types identified in the project area, as well as their generally disturbed condition and fragmentation from other natural habitat communities, combined with the two biological surveys conducted during the blooming season for the twelve rare plants identified by CDFW, the City of Yuba City as the lead agency under CEQA and Caltrans as the lead agency under NEPA agree that each of those rare plant species are presumed absent in the biological study area. At this time, additional rare plant surveys are not necessary to ensure the project has no direct or indirect impacts to rare plants.

<u>Response 5-B</u>: The IS/EA has been updated to include all of the approved avoidance, minimization and mitigation measures provided through consultation with the National Marine Fisheries Service pursuant to Section 7 of the Federal Endangered Species Act. The final version of these measures was provided by the Fisheries Service in a Biological Opinion on May 19, 2014 and a copy of the Opinion is included under Appendix G of the Final Environmental Document.

In regards to Noise Attenuation, Yuba City and Caltrans have worked diligently with the National Marine Fisheries Service to provide a broad scope of noise and vibration minimization as part of our consultation efforts. In the Biological Assessment referenced in your letter, the second page of Appendix A includes a design detail for the construction of the main piles which will support the proposed bridge. This construction design already includes a 12 foot temporary steel casing which will be dewatered. This temporary casing will provide the majority of the noise attenuation. The bubble curtain was added to the project construction methodology as further noise and vibration minimization at the implicit request of the National Marine Fisheries Service and is a required measure as part of their Biological Opinion. At this time, no additional noise attenuation measures have been added beyond what was included in the Biological Opinion provided by the Fisheries Service; however, the City will need to obtain an incidental take permit from the California Department of Fish and Game for potential impacts to protected fish (either through a 2080.1 or 2081 process). If at that time CDFW determines that additional measures to minimize noise and vibration are necessary to ensure specific noise thresholds are not exceeded, they can be included in the incidental take permit approval.

Comment 6.

California Central Valley Flood Protection Board (received via mail, 08/29/13)

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY EDMUND G. BROWN JR., GOVERNOR

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. 151
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-2380 FAX: (916) 574-0682

RECEIVED
AUG 29 2013
CITY OF YUBA CITY
PUBLIC WORKS DEPT

August 26, 2013

Mr. Kevin Bradford
Yuba City
1201 Civic Center Boulevard
Yuba City, California 95993

Subject: 5th Street Bridge Replacement Project
SCH Number: 2013082011
Document Type: Mitigated Negative Declaration

Dear Mr. Bradford:

Staff of the Central Valley Flood Protection Board (Board) has reviewed the subject document and provides the following comments:

The proposed project is located adjacent to or within the Feather River which is under the jurisdiction of the Central Valley Flood Protection Board. The Board is required to enforce standards for the construction, maintenance, and protection of adopted flood control plans that will protect public lands from floods. The jurisdiction of the Board includes the Central Valley, including all tributaries and distributaries of the Sacramento River, the San Joaquin River, and designated floodways (Title 23 California Code of Regulations (CCR), Section 2).

A Board permit is required prior to starting the work within the Board's jurisdiction for the following:

- The placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee (CCR Section 6);

- Existing structures that predate permitting, or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the encroachment has not been clearly established or ownership and use have been revised (CCR Section 6);

- Vegetation plantings will require the submission of detailed design drawings; identification of vegetation type; plant and tree names (i.e. common name and scientific name); total number of each type of plant and tree; planting spacing and irrigation method that will be utilized within the project area; a complete vegetative management plan for maintenance to prevent the interference with flood control, levee maintenance, inspection, and flood fight procedures (CCR Section 131).

Mr. Kevin Bradford
August 27, 2013
Page 2 of 2

Vegetation requirements in accordance with Title 23, Section 131 (c) states "Vegetation must not interfere with the integrity of the adopted plan of flood control, or interfere with maintenance, inspection, and flood fight procedures."

The accumulation and establishment of woody vegetation that is not managed has a negative impact on channel capacity and increases the potential for levee over-topping. When a channel develops vegetation that then becomes habitat for wildlife, maintenance to initial baseline conditions becomes more difficult as the removal of vegetative growth is subject to federal and State agency requirements for on-site mitigation within the floodway. The project should include mitigation measures to avoid decreasing floodway channel capacity.

Hydraulic Impacts - Hydraulic impacts due to encroachments could impede flood flows, reroute flood flows, and/or increase sediment accumulation. The project should include mitigation measures for channel and levee improvements and maintenance to prevent and/or reduce hydraulic impacts. Off-site mitigation outside of the State Plan of Flood Control should be used when mitigating for vegetation removed within the project location.

The permit application and Title 23 CCR can be found on the Central Valley Flood Protection Board's website at http://www.cvfpb.ca.gov/. Contact your local, federal and State agencies, as other permits may apply.

The Board's jurisdiction, including all tributaries and distributaries of the Sacramento River and the San Joaquin River, and designated floodways can be viewed on the Central Valley Flood Protection Board's website at http://gis.bam.water.ca.gov/bam/.

If you have any questions, please contact me by phone at (916) 574-0651, or via e-mail at jherota@water.ca.gov.

Sincerely,

James Herota
Staff Environmental Scientist
Projects and Environmental Branch

cc: Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, California 95814

Response 6.

Thank you for your comments; they have been included in the final environmental document.

As referenced in Table 1.5-1: Permits and Approvals on page 11 of the Initial Study/Environmental Assessment, an encroachment permit application will be sent to the Central Valley Flood Protection Board to ensure that all of the requirements stated above are met in the final plans and specifications. Approval from the Board will be required prior to the start of construction.

Comment 7.

Sandra Sells (received via email, 08/30/13)

From: Sandra Sells [mailto:sells2001@hotmail.com]
Sent: Friday, August 30, 2013 10:01 AM
To: Diana Langley; Kevin Bradford; Jody Burgess
Subject: 640 sutter street

Kevin Bradford
Diana Langley

Good morning Kevin and Diana

First thank you for having the meeting with my brother Jerry Copeland and my self Sandy Sells on August 28th 1 pm in Yuba City at the City of Yuba city Hall.

The discussion was in regards to property Jerry owns in Yuba City Located at 640 Sutter Street very close to the 5th street bridge. Which it is my understanding the city is in the process of a 70 million dollar, project. That currently they have 53 million funded and the balance of 17 million will be or disapproved end of August 2013.

At the meeting above we were given a book, hundreds of pages, Replacement Project prepared by the City of Yuba City and it appears Caltrans consisting of hundreds of page's.

That we only had until Sat the 31st for public comment. Jerry nor I have computer access in Yuba City. Therefore could not review or print the C.D. that was sent. So thank you for the complete booklet you gave us, on Weds the 28th.

Which as I told everyone I'm not an attorney and I do not know legally how to protect my brother.

The documents that Kevin copied and were given to us consist of Relocation Impact and information for bike paths
etc that I can only assume will affect Jerry's property.

In the meeting Kevin and Diana gave us maps of the purposed off ramp improvement. With some blue lines that were a may or may not happen.
Looking at the maps and the documents Kevin copied it appears to me, and I may be wrong because of the discussion in the meeting. Jerry's property will be severally impacted, that he will not have any access from Sutter street or Alor Ave and Maybe not even Bridge street.

7-A

So his project could not be developed or sold.

Which then he would not be able to develop or sell to anyone ever.

Because of the documentation Kevin gave to us, we respectably request that you review all of our concerns voiced at the meeting. Including ingress and egress. Value of the property and relocation for Jerry if and you did say that was not the plan, however it appears to me that is the plan.

Jerry is a Vietnam veteran , decorated for his service to the United States. Jerry nor I can do what may be required legally in two days to protect Jerry, if needed. So we request that time be given so that my attorney can give us advice.

Jerry and myself agree we would like to corporate with the City of Yuba City, however as you are aware Gilsizer and the City did several years ago did attempt to take Jerry's property. Which they backed out because of the appraisal differences. They did end up paying all of the legal fees and cost and Jerry did get to keep his property.
We certainly do not want this again, we remain fully corporative, we only request a level playing field and Jerry be taken care of without deception or be taken advantage of. Please

I will and have e mailed a copy off this letter to Jody Burgess my attorney and will attempt to meet with him next week to discuss this project.

At this time I respectably, request you receive this e mail as comments and concerns we have for Jerry's property and value of same. Understanding that Jerry needs someone to review and suggest what will protect him. So please allow us time.

My understanding is that the City intends to seek approval of the Declaration for the 5th street bridge, even if we have concerns. If I have not covered the areas that need to be covered that were discussed at August, 28th meeting. I reserve the right to seek legal counsel for Jerry.

Thank you very much for having the meeting Kevin as you know I had to drive form Denver to get here. It was also nice meeting Diana. My concern is of course is for my brother. However both of us, will corporate in hopes that the City and Jerry are fairly treated.

Warm Regards
Sandy Sells

From: Sandra Sells [mailto:sells2001@hotmail.com]
Sent: Saturday, August 31, 2013 8:46 AM
To: Kevin Bradford
Subject: RE: 640 sutter street

Hi Kevin
I will see Jody as soon as he can squeeze me in next week.
In the mean time it appears you will not give us any additional time for comments, so I will attempt to cover Jerry's concerns.

Noise
Dust
Equipment on his property for staging
Ingress and egress for his home during the construction period, most important after construction
Value of his property 4.67 acres during and after construction
Zoning R3 as I understand
Kevin last offer was $1,200,000 couple years ago. City according to the developer would not assist in progress for development. 10 days prior to closing they canceled the contract.
Appraisal 25 years $489,000 during Eminent domain attempt by Gilsizer
Kevin we understand these values do not have any use today, however it does give us all an idea of the past

7-B,C,D

7-E

Again Kevin thanks for your help, I intend to take all of this to Jody and again respectfully, request you allow him to review and comment if needed.
As I understand your e mail Jerry delivered the drawing of the proposed condominium project, to you on Friday the 30th of August that he had designed by Kosorow

In your letter you indicate its really not necessary, to have additional comment time, until some later date. That will be the crucial time for protection for Jerry. Thanks for the input.
Regards Sandy Sells Jerry's sister.

P.S. Kevin Jerry does not have, nor does he know how to use a computer,
He also does not have a phone, he has lived on this property for over 30 years its all he knows as his!
Jerry recently suffered the loss of his Mother.
Jerry has been hospitalized for more then 100 blood clots in his lungs from his legs
Please continue to be kind and understanding to Jerry.
Kevin I will send Jerry copies of all communication and you can as well. I need to have mine hand delivered, so that I'm sure he receives them. My niece will attend to this process.

Again Warm regards
Sandy

Response 7.

Thank you for your comments; they have been included in the final environmental document.

Response 7-A: Based on the preliminary engineering design for this project, some right of way impacts are likely unavoidable to the property located at 640 Sutter Street. A small portion of the property may need to be acquired by Yuba City for a new ramp connecting Sutter Street with Bridge Street and the proposed roadway improvements at the Sutter Street and loop off-ramp intersection may change and could affect the existing access to the residence located there. Right of way impacts are an unfortunate necessity for many large transportation projects; however, it is a priority for Yuba City to address concerns, and ensure that all right of way transactions are negotiated fairly.

The specifics relating to the amount of property needed and the exact changes to your properties access cannot be addressed at this preliminary stage of the project, but after completion and approval of this environmental document, the City will contract with an engineering firm to prepare the final design and specification for the 5th Street Bridge Replacement Project. At that time, the exact amount of property to be acquired will be determined and the City will work with property owners to address specific concerns regarding right of way issues such as access. The property at 640 Sutter Street fronts Bridge Street, Sutter Street, and the proposed on-ramp, so access from a publicly maintained street will not be eliminated by the project. Negotiations for how to compensate property owners for right of way impacts can begin shortly after approval of the environmental document.

Response 7-B: As part of the environmental analysis done for this project, changes in the noise environment were evaluated for all sensitive receptors (including residences) within or adjacent to the project area. The residence at 640 Sutter Street was evaluated and the proposed changes associated with this project would not result in a substantial increase in traffic noise on that property. Some noise impacts may be incurred during construction but those impacts would be predominately during daytime hours and would be relatively short term. As a result, construction noise is not considered a significant impact to adjacent property owners. All construction activities will be in compliance with the City's noise ordinance.

Response 7-C: As part of the environmental analysis done for this project, one potential air quality impact identified was dust from construction activities. To ensure that ambient dust does not impact local property owners and people moving through the construction area, measures have been identified which will ensure that dust is mitigated during construction. Generally, water trucks will be used to ensure that dust is controlled throughout construction.

Response 7-D: As stated in response 7-A, changes in access will be addressed during the final design and right of way phase of the project and will be part of the right of way impacts and compensation negotiation. Access to private properties will be maintained throughout construction activities, utilizing temporary access routes if absolutely necessary. The property at 640 Sutter Street fronts Bridge Street, Sutter Street, and the proposed on-ramp, so access from a publicly maintained street will not be eliminated by this project.

Response 7-E: We understand your concerns regarding this project and the potential for it to change certain features of your property. Property values are assessed based on several variables, many of which may change as a result of this project; however, not all changes will necessarily be detrimental to existing property values. Exact changes to individual property values cannot be assessed until the final design process determines the details of the exact scope of project features, and these changes will be part of the right of way impacts and compensation negotiation process. If the subject property has the potential for development, that will be weighed during a fair appraisal of the property which will used as part of the information during the negotiation process.

Comment 8.

California Public Utilities Commission (received via mail, 09/03/13)

STATE OF CALIFORNIA EDMUND G. BROWN JR., *Governor*

PUBLIC UTILITIES COMMISSION
320 WEST 4TH STREET, SUITE 500
LOS ANGELES, CA 90013
(213) 576-7083

September 3, 2013

Mr. Kevin Bradford
City of Yuba
1201 Civic Center Boulevard
Yuba, California 95993

Re: SCH 2013082011 5th Street Bridge Replacement Project, MND

Dear Mr. Bradford:

The California Public Utilities Commission (Commission) has jurisdiction over the safety of highway-rail crossings (crossings) in California. The California Public Utilities Code requires the Commission approval for construction or alteration of crossings and grants the Commission exclusive power on design, alteration, and/or closure of crossings in California. The Commission's Rail Crossings Engineering Section (RCES) has received a copy of the draft *Mitigated Negative Declaration* (DMND) for the proposed City of Yuba (City) 5th Street Bridge Replacement Project from the State Clearinghouse.

According to the DMND, the project proposes to replace the 5th Street Bridge over the Feather River and improve approach roadways to the bridge. The new bridge will be expanded from the existing two (2) lanes to four (4) lanes. The project includes: (1) construction of the 4-lane 5th Street section between the new bridge and J Street and under the Union Pacific Railroad (UPRR) Company tracks) in Maryville; and (2) removal of two (2) abandoned UPRR rail overpasses above the on-ramp (from Bridge Street to 5th Street) and Second Street, respectively.

This project may involve construction of a new public crossing or modification (including closure) of an existing public crossing requires authorization from the Commission, through the formal application or the General Order (GO) 88-B request processes, respectively. Prior to submission of a formal application or GO 88-B request, the City should arrange a diagnostic meeting with RCES and UPRR to discuss relevant safety issues and requirements for the Commission's authorization. RCES representatives are available for consultation on crossing safety matters. See the link for more information: http://www.cpuc.ca.gov/PUC/safety/Rail/Crossings/index.htm.

If you have any questions in this matter, please contact Ken Chiang at (213) 576-7076, yen.chiang@cpuc.ca.gov, or Daniellia Fristoe at (916) 928-2108, dvm@cpuc.ca.gov.

Sincerely,

Ken Chiang, P.E.
Utilities Engineer
Rail Crossings Engineering Section
Safety and Enforcement Division

C: State Clearinghouse
Daniellia Fristoe

Response 8.

Thank you for your comments; they have been included in the final environmental document.

As referenced in Table 1.5-1: Permits and Approvals on page 11 of the Initial Study/Environmental Assessment, a General Order 88B Public Crossing Modification Request will be sent to the California Public Utility Commission to obtain an encroachment permit for impacts on railroad right-of-way, and to ensure that all of the requirements stated above are met in the final plans and specifications. Approval from the Commission will be required prior to the start of construction.

Comment 9.

California State Clearinghouse and Planning Unit (received via mail, 09/04/13)

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

RECEIVED
SEP 05 2013
CITY OF YUBA CITY
PUBLIC WORKS DEPT

September 4, 2013

Kevin Bradford
Yuba City
1201 Civic Center Boulevard
Yuba City, CA 95993

Subject: 5th Street Bridge Replacement Project
SCH#: 2013082011

Dear Kevin Bradford:

The State Clearinghouse submitted the above named Mitigated Negative Declaration to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on September 3, 2013, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH#	**2013082011**
Project Title	5th Street Bridge Replacement Project
Lead Agency	Yuba City

Type	**MND** Mitigated Negative Declaration
Description	The City of Yuba City, in cooperation with the Caltrans, proposes to replace the 5th Street Bridge (No. 18C-0012) over the Feather River and improve approach roadways to the bridge. Yuba City is the CEQA lead agency, while Caltrans is the NEPA lead agency.

Lead Agency Contact

Name	Kevin Bradford		
Agency	Yuba City		
Phone	530 882 4786	***Fax***	
email			
Address	1201 Civic Center Boulevard		
City	Yuba City	***State*** CA	***Zip*** 95993

Project Location

County	Sutter, Yuba						
City	Yuba City, Marysville						
Region							
Lat / Long	39° 8' 19" N / 121° 36' 23" W						
Cross Streets	5th Street and J Street, Bridge and Shasta Street						
Parcel No.	Numerous						
Township	15N	***Range***	3E	***Section***	23	***Base***	MDB&M

Proximity to:

Highways	Hwy 99 and 70
Airports	O52, MYV
Railways	UPRR
Waterways	Feather River
Schools	Multiple
Land Use	Residential, Commercial, Industrial, Parkland, Open Space

Project Issues	Aesthetic/Visual; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Geologic/Seismic; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Landuse; Cumulative Effects
Reviewing Agencies	Resources Agency; Department of Boating and Waterways; Department of Fish and Wildlife, Region 2; Office of Historic Preservation; Department of Parks and Recreation; Central Valley Flood Protection Board; Department of Water Resources; California Highway Patrol; Air Resources Board, Transportation Projects; Regional Water Quality Control Bd., Region 5 (Sacramento); Department of Toxic Substances Control; Native American Heritage Commission; Public Utilities Commission; State Lands Commission

Date Received	08/02/2013	***Start of Review***	08/02/2013	***End of Review***	09/03/2013

Response 9.

Thank you for your comments; they have been included in the final environmental document.