Natural Environment Study

and

Jurisdictional Delineation Report

Stevenson Bridge (23C0092) at Putah Creek

Rehabilitation Project

Solano County, CA

Federal ID Number: BRLS-5923 (059)

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February 2012

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration, and
STATE OF CALIFORNIA
Department of Transportation

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Summary

The Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project (Project) is a federally funded project administered by Caltrans Local Assistance. Stevenson Bridge is a two-lane bridge that crosses the Solano and Yolo county line at Putah Creek. The road on the Solano County side of the bridge is Stevenson Bridge Road; the road on the Yolo County side of the bridge is County Road 95A. The existing bridge is 296 feet long and 24 feet wide with two 40-foot approach spans and two 108-foot main tied arch spans. The bridge, built in 1923, is rated by Caltrans as both functionally obsolete and structurally deficient.

The purpose of the Project is to rehabilitate the existing bridge to address seismic deficiencies, scour, cracks, spalling, and de-lamination, while maintaining the historical architectural features of the bridge. Rehabilitation of the bridge includes fiber wrapping the arches and columns of the structure, constructing additional pile supports for the existing bridge foundation system, refinishing the deck and concrete railing, and removing and reconstructing the deck drains. Rock slope protection (RSP) will be used to stabilize the creek bank and prevent scour. The retaining wall on the south side of the bridge will be reconstructed. A gravel access road will be constructed on the north bank of Putah Creek east of the bridge and will be maintained permanently. A creek crossing will be constructed between Piers 1 and 2, using either culverts and fill or temporary low span/bridge. Stevenson Bridge Road will be realigned to eliminate two sharp turns just south and east of the bridge. The realignment will go through the orchard and transition onto the existing road alignment near Strathgordon Lane. Utility poles will be relocated by the utility owners. Acquisition of right-of-way will be needed for temporary construction, permanent road realignment, and drainage/maintenance easements.

The Project will require closure of the road during construction. Traffic will be detoured via a loop along Stevenson Bridge Road, Sievers Road, Pedrick Road, Russell Boulevard, and Road 95A, at a maximum length of 13.7 miles.

Caltrans administers the Highway Bridge Program (HBP) on behalf of the Federal Highways Administration (FHWA). FHWA delegated to Caltrans the responsibility to comply with the National Environmental Policy Act (NEPA), Executive Orders, and other federal laws, such as the Federal Endangered Species Act (FESA), prior to the release of HBP funds. The Caltrans Local Assistance Program Manual (Caltrans 2004) describes the procedures for local agencies to apply for deferral funds and comply with NEPA, FESA, and other federal laws and regulations. As the lead local agency for this Project, the County is responsible for compliance with the California Environmental Quality Act (CEQA).

The Biological Study Area (BSA) for the Project occupies 9.34 acres. Sensitive natural communities in the BSA include Putah Creek (a waters of the U.S.), Valley Oak Woodland, and Fremont Cottonwood Forest. The Project will permanently impact less than 0.01 acres of Putah Creek, 0.18 acres of Valley Oak Woodland, and 0.06 acres of Fremont Cottonwood Forest. Native trees removed in the Valley Oak Woodland and Fremont Cottonwood Forest will be replaced at a 3:1 ratio.

Elderberry shrubs, suitable habitat for Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*), a federal-listed species, occur in the BSA. Construction of the proposed Project requires the removal of 29 elderberry shrubs. The northeast portion of the BSA occurs in the U.C. Davis Russell Ranch Mitigation Site B. The mitigation site was developed for projects on the U.C. Davis campus that impact VELB, Swainson's hawks, and burrowing owls. Solano County will coordinate with U.C. Davis as necessary for the construction of the Project. The Project may affect, and is likely to adversely affect VELB. A Biological Assessment and Compensatory Mitigation and Monitoring Plan was prepared to support a formal section 7 consultation between Caltrans and USFWS for VELB (Sycamore Environmental 2011).

Central Valley fall-run Chinook salmon, a state species of special concern, are known to occur in Putah Creek. Putah Creek provides potential spawning habitat for federal-listed salmonids and is designated essential fish habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The BSA provides suitable habitat for Central Valley steelhead Distinct Population Segment (DPS), a federal-listed anadromous fish. There have been no substantiated records of steelhead in Putah Creek since the 1960s (pers. comm., Dr. Peter Moyle). The Project may affect, but is not likely to adversely affect Central Valley steelhead DPS. The Project is not located in designated critical habitat for Central Valley steelhead DPS. A Biological Assessment was prepared to support a formal section 7 consultation between Caltrans and NMFS for Central Valley steelhead DPS and EFH (Sycamore Environmental 2011).

Giant garter snake (GGS) is federally listed as threatened. There is a CNDDB record for giant garter snake along Putah Creek 5 miles downstream of the BSA. The BSA does not provide suitable habitat for GGS. The Project may affect, but is not likely to adversely affect GGS.

Construction will be required in the FEMA mapped 100 year floodplain. The County's Project description includes constructing a creek crossing using culverts and fill or a temporary low span/bridge during the dry season. Permits and authorizations required for this Project include a Section 404 Permit from the U.S. Army Corps of Engineers (Corps), a Section 401 Water Quality Certification, a National Pollutant Discharge Elimination System (NPDES) Permit from the Regional Water Quality Control Board (RWQCB), and a 1602 Streambed Alteration

Agreement from the California Department of Fish and Game (DFG). A Preliminary Jurisdictional Delineation is Attachment E.

There are 23 invasive plant species that occur in the BSA (California Invasive Plant Council, Cal-IPC 2006). Giant reed (*Arundo donax*), Himalayan blackberry (*Rubus discolor*), and smallflower tamarisk (*Tamarix parviflora*) are rated "High" by Cal-IPC. The spread of invasive species in the BSA will be reduced by revegetating disturbed areas in the BSA with native or sterile nonnative species. The limited scope of this Project precludes effective eradication of these invasive species from the BSA.

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List of Abbreviated Terms

ac	acre(s)
BMP	Best Management Practices
BSA	Biological Study Area
Cal-IPC	California Invasive Plant Council (previously California Exotic Pest Plants Council [CalEPPC])
Caltrans	California Department of Transportation
CESA	California Endangered Species Act
CIDH	Cast-in-drilled-holes
CMMP	Compensatory Mitigation and Monitoring Plan
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	Army Corps of Engineers
CWA	Clean Water Act
DBH	Diameter at breast height
DFG	California Department of Fish and Game
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESU	Evolutionarily Significant Unit
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
ft	foot/feet
HBP	Highway Bridge Program
mi	mile(s)
NES	Natural Environment Study
NMFS	National Marine Fisheries Service (a division of National Oceanic and Atmospheric Administration)
NPDES	National Pollutant Discharge Elimination System
WPT	Western pond turtle
PFMC	Pacific Fishery Management Council
quad	USGS topographic quadrangle
ROW	right-of-way
RWQCB	Regional Water Quality Control Board
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

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Chapter 1. Introduction

1.1. Project History

The County of Solano, in conjunction with County of Yolo, the California Department of Transportation (Caltrans), and the Federal Highway Administration (FHWA), is proposing to rehabilitate the Stevenson Bridge crossing Putah Creek. The Stevenson Bridge (23C0092) at Putah Creek was constructed in 1923. The existing bridge is an arterial structure that provides access for approximately 900 vehicles per day between Solano and Yolo counties. Stevenson Bridge is comprised of reinforced concrete T-beam approach spans and concrete tied arch main spans. The bridge structure is 296 feet long and 24 feet wide with two 40-foot approach spans and two 108-foot tied arch main spans. The substructure is supported on reinforced concrete piers with curtain walls, founded on a timber pile foundation.

A study was conducted to assess the feasibility of rehabilitating the existing bridge structure. The study recommendations are described in the "Feasibility Study for Stevenson Bridge Road Bridge over Putah Creek, Bridge Number: 23C0092, Location 04-SOL/03-YOL County Line" dated 1 February 2007. The Feasibility Study determined that the bridge is past the design life span, the structure is scour critical, and has seismic deficiencies. The main issues affecting the bridge are spalled or delaminated concrete, exposed reinforcing steel bar, flexural cracking in both approach spans, and the failure of the retaining wall at Pier 1. Alternatives analyzed included two Rehabilitation / Retrofit Alternatives (Option No. 1 and Option No. 2), and a Replacement Alternative.

The conclusion was that although Option 1 and Option 2 alternatives were both structurally feasible, Option 1 was the most economically feasible in addressing the structural and scour deficiencies of the existing structure. In addition, rehabilitation and retrofitting was recommended over bridge replacement due to the historical aspect of the existing bridge, impact to local communities, and environmental considerations.

1.2. Project Description

The approximately 9.34-acre Biological Study Area (BSA) crosses Putah Creek on the border of Solano County and Yolo County, CA, approximately 5 miles west of the City of Davis and 8 miles east of the City of Winters (Figure 1). The bridge is located along Stevenson Bridge Road in Solano County, which becomes County Road 95A in Yolo County.

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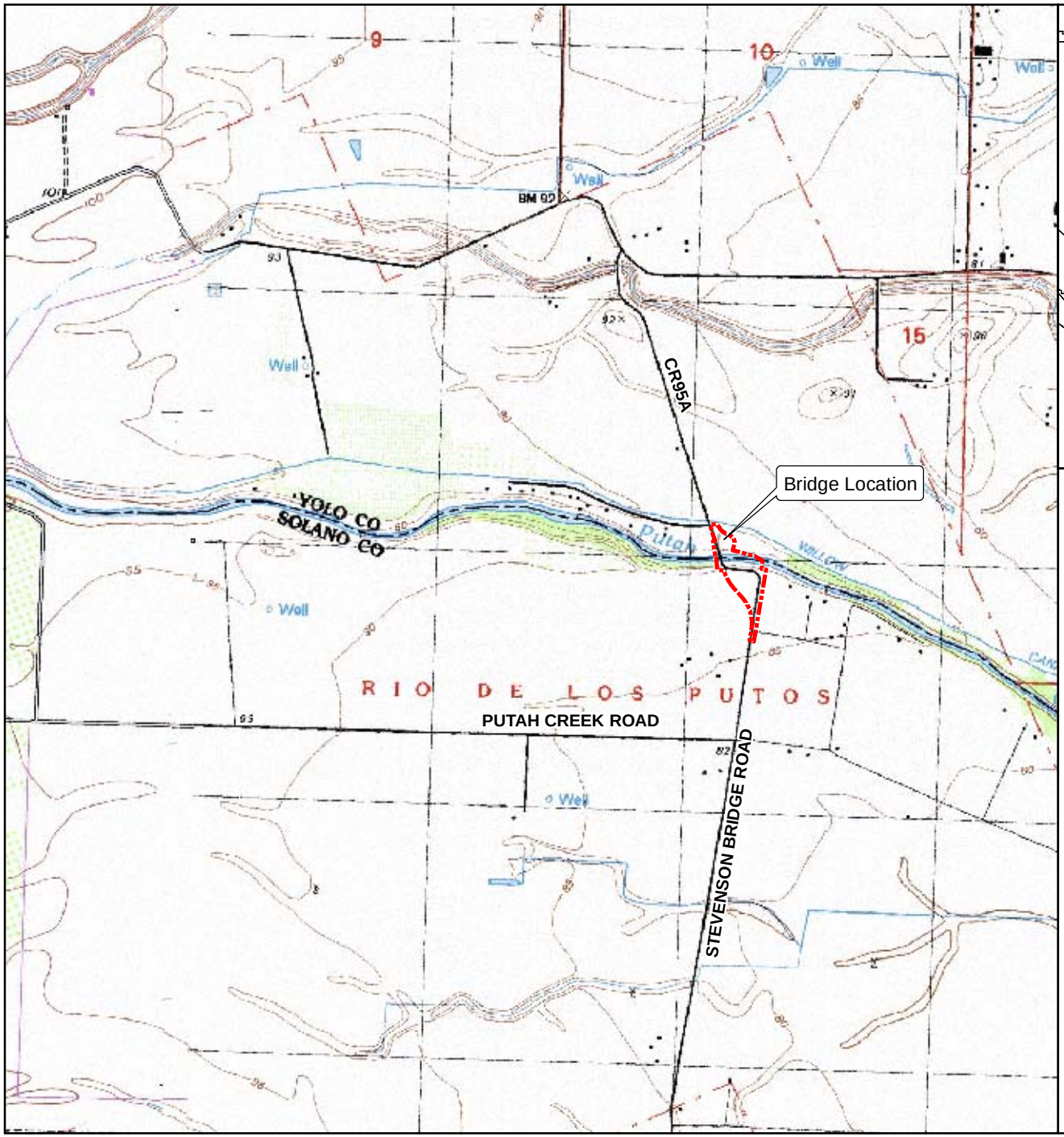

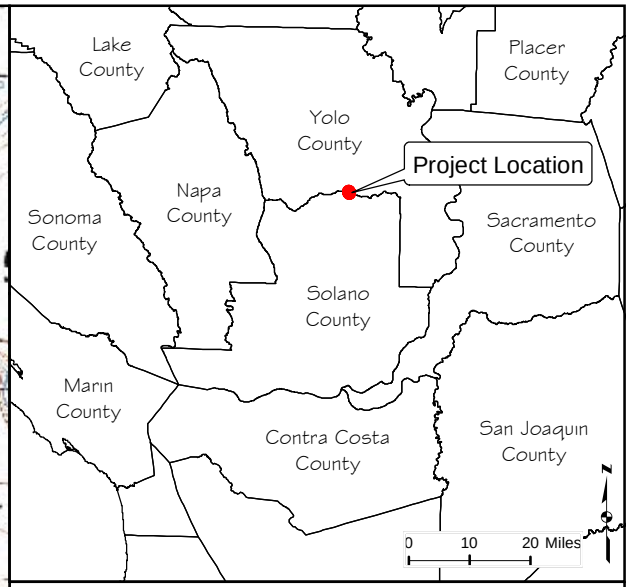

Stevenson Bridge (23C0092) at
Putah Creek Rehabilitation Project
Solano County, CA
28 February 2012

Figure 1. Location Map

Project Location

2,000 1,000 0 2,000 Feet

N

Scale: 1 inch = 2,000 feet

24K DRG:
Merritt, CA (1992)
USGS 7.5' Quad. DRG Mosaics
o_nw0301.sid
California Spatial Information Library (CASIL)

09067StevensonBrdgRdRehab_Fig1LocationMap.mxd

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The BSA is on the Merritt USGS topographic quad (unsectionalized portion of the Rio de Los Putos Land Grant) and is in the Lower Sacramento River hydrologic unit (hydrologic unit code 18020109). Elevation in the BSA ranges from approximately 60 feet above sea level at the Putah Creek ordinary high water mark (OHWM), to approximately 94 feet above sea level in the surrounding upland area. The centroid (WGS84) is 38.536428° north, 121.851041° west, UTM coordinate 600,138 meters East, 4,265,961 meters North, Zone 10 North (WGS84). Figure 2 is an aerial photograph of the BSA. Photographs of the BSA are in Appendix E.

Stevenson Bridge has been identified by Caltrans as both functionally obsolete and structurally deficient. The functionally obsolete rating is based on the existing 20 feet deck width, compared to current standards of 28 feet. The structurally deficient rating was assigned mainly due to existing delaminated concrete on the bridge deck and the tight curve radius of the south roadway approach. Additional major issues include spalled or delaminated concrete and exposed reinforcing steel bar, flexural cracks in both approach spans, and failure of the retaining wall at Pier 1.

The area above the northeast creek bank between County Road 95A and the access road will be used as a staging area. General bridge construction equipment to be used includes, but is not limited to, haul trucks, backhoes, dump trucks, excavators, grade-alls, bulldozers, drilling equipment, water trucks, concrete delivery trucks, and service vehicles.

Bridge Assessment

Seismic assessment of the bridge showed that many of the existing structural components of the bridge are unable to withstand seismic loads without retrofitting. Flexural and shear demands exceed the corresponding capacities, requiring retrofit or replacement of several structural members in order to meet safety requirements. Deficient components include the bridge railing, deck spalling and carbonation, deck drains, cracking of approach spans, and substandard south approach alignment. In addition, the Hydraulic Analysis determined the structure is scour critical and scour mitigation will be required to maintain the structural integrity of the bridge.

The existing bridge is proposed for rehabilitation and retrofitting in accordance with the Federal Highway Administration (FHWA) guidelines under the Highway Bridge Program (HBP). The rehabilitation work will maintain the historical architectural features while extending the life of the structure between 50 and 75 years.

Traffic Detour

Road closure will be required during road construction and bridge rehabilitation work. Traffic will be detoured using a loop along Stevenson Bridge Road, Sievers Road, Pedrick Road, Russell Boulevard, and Road 95A, with a maximum length of 13.7 miles.

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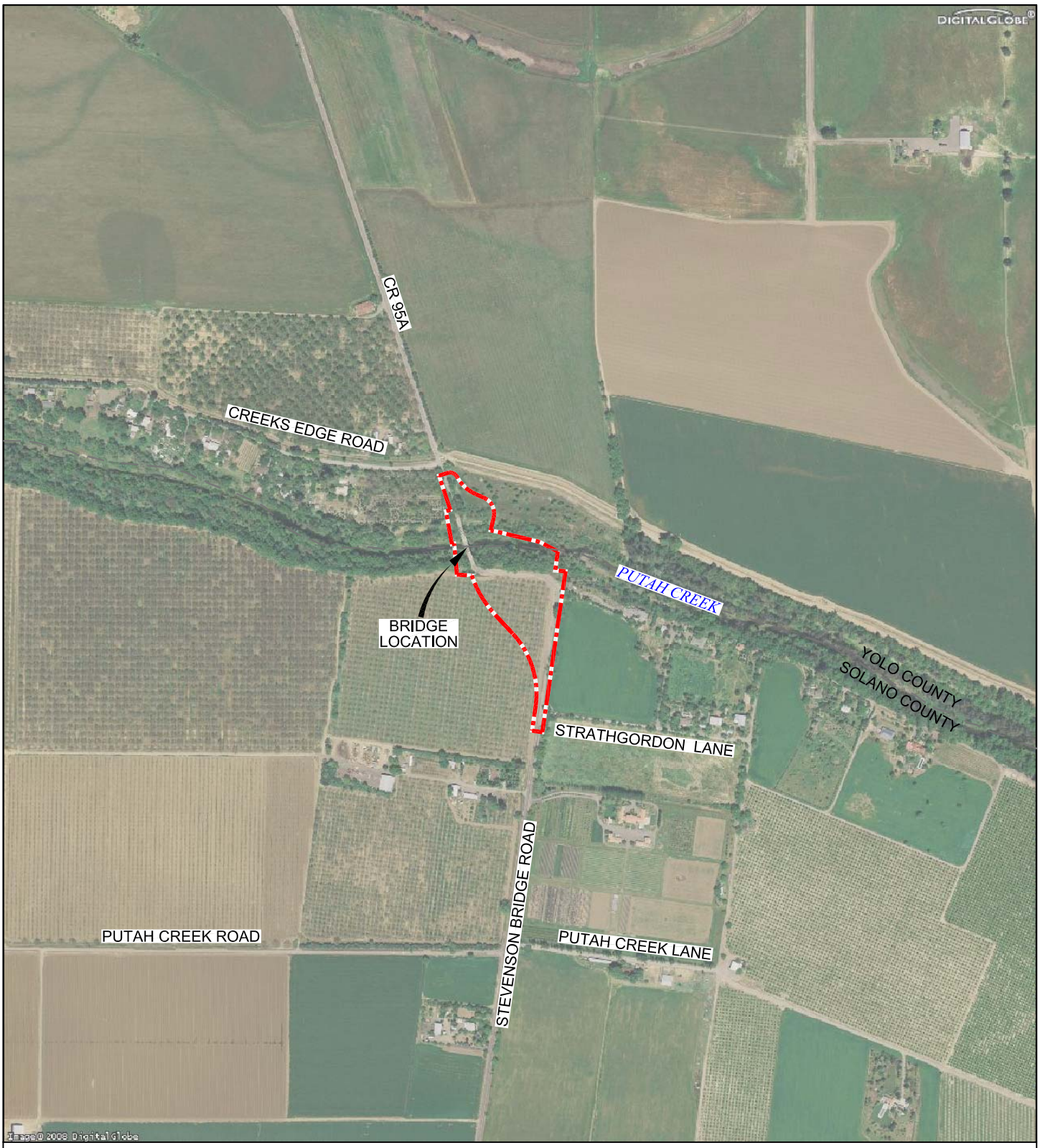

Stevenson Bridge (23C0092) at
Putah Creek Rehabilitation Project
Solano County, CA

28 February 2012

Biological Study Area (BSA)

0 400 800 ft

Scale: 1" = 800'

N

Aerial Photograph:
April 2009, Copyright 2010.
DigitalGlobe, Inc. All rights reserved.

Figure 2. Aerial Photograph

09067StevensonBridgeRd_v6.dwg

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Bridge Rehabilitation

Bridge rehabilitation work (Figure 3) will be conducted on the deck, piers, abutments, bent caps, hanger-column, retaining wall, concrete railings and approach spans. Deck drains will be removed, reconstructed, and refinished. The concrete railing will also be refinished, and the spalled and delaminated concrete will be patched. A hanger-column will be removed and reconstructed, and the arch ribs from the spring line to the first column will be fiber wrapped (FRP). Piers 1, 2 and 3 will also be fiber wrapped. The pier curtain wall will be removed and reconstructed at Piers 1 and 2. Two cast-in-drilled-holes (CIDH) piling and pier footing overlays will be constructed at Piers 1, 2, and 3, and two CIDH piling and caps will be placed behind the abutments. Exterior girders and bent caps will be bolstered. The retaining wall on the south side of the bridge will be reconstructed, and 10 feet of the approach span slab will be removed and reconstructed. Rock slope protection (RSP) will be used to stabilize the creek bank and prevent scour. Pier bents will have 5 to 7 feet of excavation immediately around them to install scour protection measures.

Road Approach Realignment

Stevenson Bridge Road will be realigned to eliminate two sharp turns just south and east of the bridge. The realignment will go through the orchard and transition onto the existing road alignment near Strathgordon Lane. The realigned road will comply with County standards and provide for safer vehicle passage. The existing south approach has two, sharp curves, one of which is a 90 degree curve. The road realignment is roughly 1,000 feet in length and joins the existing Stevenson Bridge Road just north of Strathgordon Lane. Realignment of the south approach will require right of way (ROW) acquisition from one privately owned parcel, APN 0107-020-040. Fill will be needed to create the new roadway alignment. No buildings will need to be relocated or removed as a result of the proposed construction.

Access Road and Temporary Creek Crossing

An access road will be cut down east of the bridge, on the north bank, to access Piers 1 and 2. A temporary access road splits off from the permanent road at the top of the slope to access Pier 3. The access road will be composed of gravel and allow construction equipment to access the creekbed and the underside of the bridge. A creek crossing will be constructed between Piers 1 and 2, using either culverts and fill or temporary low span/bridge. The access road to the creek bed will be designed as a permanent road to allow for future maintenance activities.

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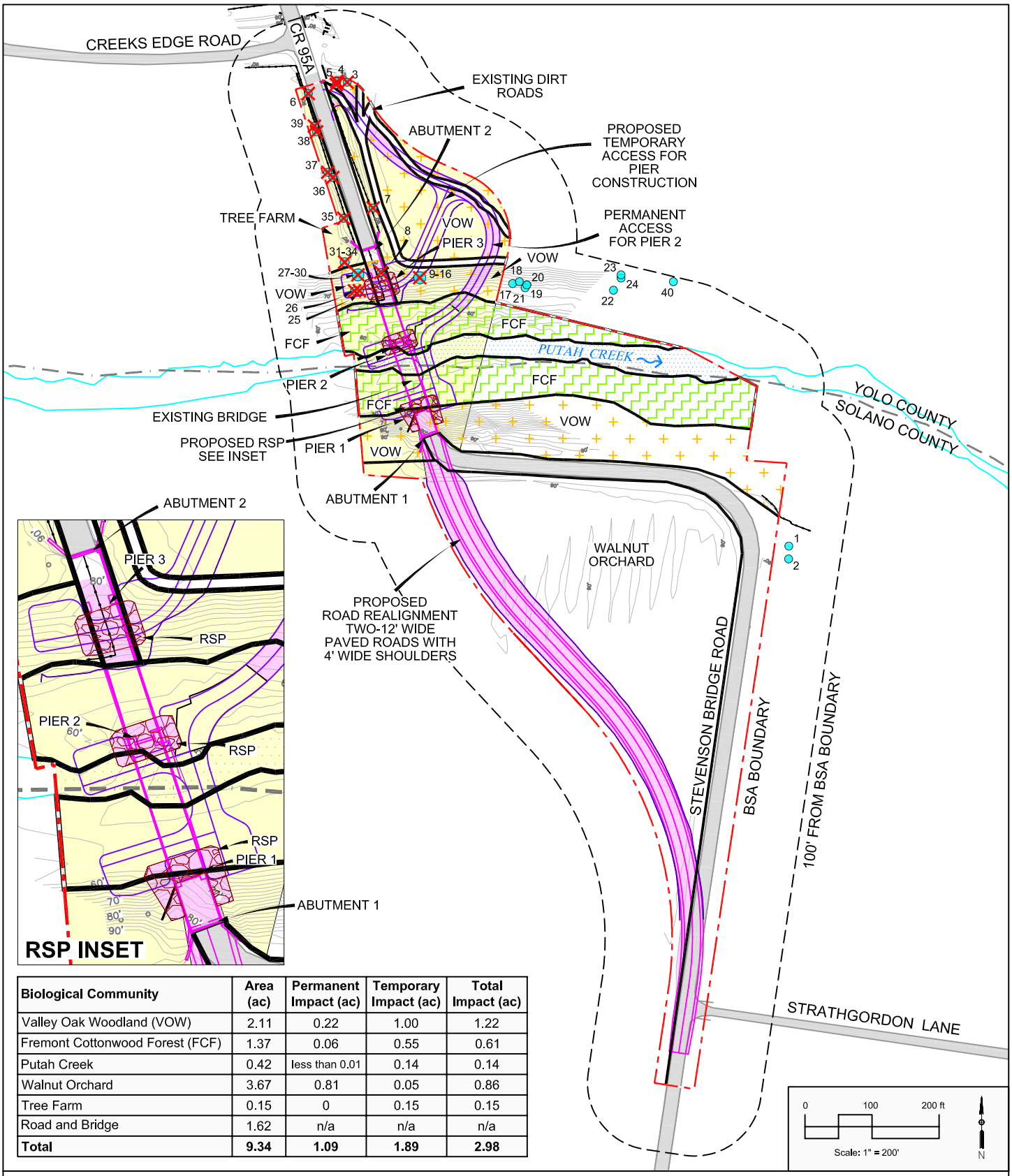

Biological Community	Area (ac)	Permanent Impact (ac)	Temporary Impact (ac)	Total Impact (ac)
Valley Oak Woodland (VOW)	2.11	0.22	1.00	1.22
Fremont Cottonwood Forest (FCF)	1.37	0.06	0.55	0.61
Putah Creek	0.42	less than 0.01	0.14	0.14
Walnut Orchard	3.67	0.81	0.05	0.86
Tree Farm	0.15	0	0.15	0.15
Road and Bridge	1.62	n/a	n/a	n/a
Total	**9.34**	**1.09**	**1.89**	**2.98**

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project
Solano County, CA

28 February 2012

Biological Study Area (BSA)

100' Buffer from BSA boundary

Biological Community Boundary

Putah Creek

25 Elderberry shrub and number

Permanent Impact

Temporary Impact

Fremont Cottonwood Forest (FCF)

Valley Oak Woodland (VOW)

25 Elderberry shrub to be removed

Proposed Rock Slope Protection (RSP)

Basemap: Topography Map with Proposed Alignment 055TEVENSONTO.dwg (14Feb10) by Solano County Dept. of Resource Management Public Works Engineering

Figure 3. Project Impact Map

09067StevensonBridgeRd_v6.dwg

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Utility Relocation

Overhead poles with electric and phone lines occur along the south bridge approach, cross Putah Creek parallel to each side of the bridge, and continue north of the bridge. It is uncertain whether the pole and lines will need to be relocated. If relocation is necessary, the utility company will be required to move the utilities prior to construction.

UC Davis Russell Ranch

The 1994 UC Davis Long Range Development Plan (LRDP) Environmental Impact Report (EIR) identified potential impacts to biological resources if lands identified in the LRDP were fully developed. One of the mitigation measures in the LRDP EIR was to convert parcels on the Russell Ranch from agricultural use to habitat managed specifically for three special status species: Swainson's hawk, burrowing owl, and the valley elderberry longhorn beetle. A portion of Russell Ranch Mitigation Site B is located in the BSA east side of Stevenson Bridge and north side of Putah Creek (UC Davis 2005). The site contains Fremont Cottonwood Forest, Valley Oak Woodland, and 39 elderberry shrubs.

1.3. Preparation History

Sycamore Environmental Consultants is under contract to Solano County to prepare a Natural Environment Study (NES), a Preliminary Jurisdictional Delineation (Appendix F), and a Biological Assessment (Sycamore Environmental 2011).

Jeffery Little is the Project Manager. Leane Dunn, M.F., Biologist, and Jessica Easley, Biologist, conducted field surveys. Mr. Little and Michael Bower, M.S., Biologist conducted a general reconnaissance survey. Ms. Dunn prepared the report. Aramis Respall, CAD Specialist, prepared the figures and calculated Project impacts. Ms. Easley and Adam Forbes, M.S., Biologist edited the documents. Cynthia Little, Senior Editor, and Mr. Little, edited the documents and ensured quality control.

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Chapter 2. Study Methods

An evaluation of biological resources was conducted to determine whether any special-status plant or wildlife species, or their habitat, or sensitive habitats occurs in the BSA. Data on special-status species and habitats known in the area was obtained from state and federal agencies. Maps and aerial photographs of the BSA and surrounding areas were reviewed. A field survey was conducted to determine the habitats present. The field survey, map review, and a review of the biology of evaluated species and habitats were used to determine the special-status species and sensitive habitats that could occur in the BSA.

Special-status species in this NES are those listed (or candidate or proposed) under the federal or state endangered species acts, under the California Native Plant Protection Act, as a California species of special concern or fully protected by the Department of Fish and Game (DFG), or that are on List 1 or 2 of the California Native Plant Society's Inventory of Rare and Endangered Plants of California (CNPS 2011). Special-status natural communities in this NES are waters, wetlands, riparian communities, and any natural community ranked S1, S2, or S3 by DFG (2010a).

2.1. Regulatory Requirements

The purpose of the NES is to document biological studies and perform analyses and evaluations necessary to satisfy the legal requirements of State and Federal statutes. These statutes include:

- National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.);
- Section 404 of the Clean Water Act (33 U.S.C. 1251-1376);
- Section 401 Water Quality Certification (33 U.S.C. 1341);
- Section 402 of the Clean Water Act (33 U.S.C. 1342)
- Section 10 of the Rivers and Harbors Act (33 U.S.C. 401 et seq.);
- Section 1602 of the California Fish and Game Code pertains to streambed alterations;
- Federal Endangered Species Act (16 U.S.C. 1531-1543);
- Fish and Wildlife Coordination Act (16 U.S.C. 661-666);
- National Wild and Scenic Rivers Act (16 U.S.C. 1271-1287);
- Executive Order 11990, Protection of Wetlands (May 24, 1977);
- California Environmental Quality Act (P.R.C. 21000 et seq.);
- California Endangered Species Act (California Fish and Game Code 2050 et seq.);
- Native Plant Protection Act (California Fish and Game Code 1900-1913);
- California Wild and Scenic Rivers Act (P.R.C. 5093.50 et seq.);

- Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711);
- Magnuson-Stevens Fishery Conservation and Management Act (as amended through 11 October 1996);
- Fish and Game Code 3503.5 – Birds of Prey
- Fish and Game Code 3511, 4700, 5050, 5515 – Fully Protected Species
- Executive Order 13112, Invasive Species (3 February 1999).

Section 404 Permit - U.S. Army Corps of Engineers (Corps)

The Corps and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredge and fill material into "waters of the United States" under Section 404 of the Clean Water Act (33 U.S.C. 1344). The Corps issues permits for certain dredge and fill activities in waters of the U.S. pursuant to the regulations in 33 CFR 320-330.

Section 401 Water Quality Certification - Regional Water Quality Control Board

Under Section 401 of the Clean Water Act (33 U.S.C. 1341), applications for a federal permit or license for any activity that may result in a discharge to a water body, require a State Water Quality Certification to ensure that the proposed activity complies with state water quality standards.

Section 402 of the Clean Water Act - NPDES Phase II Permit - Regional Water Quality Control Board (RWQCB)

Section 402(p) of Clean Water Act establishes a permit under the National Pollution Discharge Elimination System Permit (NPDES) program for discharges of storm water resulting from ground disturbing construction activities, such as grading. For ground disturbing construction activities in excess of one acre a NPDES Phase II permit from the RWQCB is required. The preparation of a Stormwater Pollution Prevention Plan (SWPPP) is a requirement of the NPDES Phase II permit.

Section 1602 Streambed Alteration Agreement - Department of Fish and Game (DFG)

Section 1602 of the DFG Code requires any person, government agency, or public utility proposing any activity that will divert or obstruct the natural flow or change the bed, channel or bank of any river, stream, or lake, or proposes to use any material from a streambed, must first notify DFG of such proposed activity.

Federal Endangered Species Act (FESA)

FESA defines take (Section 9) and prohibits taking of a federal-listed endangered or threatened animal without an Incidental Take Permit (16 U.S.C. 1532, 50 CFR 17.3). If a federal-listed

animal could be harmed, harassed, injured, or killed by a project, a Section 7 consultation is initiated by a federal agency or a Section 10 consultation is initiated by a local agency or private applicant. Formal consultations culminate with a Biological Opinion and may result in the issuance of an Incidental Take Permit.

California Endangered Species Act (CESA)

CESA prohibits take of wildlife and plants listed as threatened or endangered by the California Fish and Game Commission. "Take" is defined under California Fish and Game Code as any action or attempt to "hunt, pursue, catch, capture, or kill." CESA allows exceptions for take that occurs during otherwise lawful activities. Section 2081 of the California Fish and Game Code describes the requirements needed for incidental take applications under CESA. Incidental take of state-listed species may be authorized if an applicant submits a plan that minimizes and mitigates the impacts of take.

Federal Migratory Bird Treaty Act (MBTA)

All migratory birds are protected under the federal MBTA of 1918 (16 U.S.C. 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10 including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR Part 21). Any construction-related disturbance that causes direct injury, death, nest abandonment, or forced fledging of migratory birds, is restricted under the MBTA. Any removal of active nests during the breeding season or any disturbance that results in the abandonment of nestlings is considered a 'take' of the species under federal law.

Magnuson-Stevens Fishery Conservation and Management Act

Under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), Essential Fish Habitat (EFH) for the Pacific coast salmon fishery includes waters and substrates necessary for salmon production to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. The geographic extent of freshwater EFH is specifically defined as all currently viable waters and most of the habitat historically accessible to salmon within a USGS hydrologic unit (PFMC 1999). Consultation with NOAA Fisheries is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH.

Fish and Game Code 3503.5 – Birds of Prey

Fish and Game Code 3503.5 protects all birds in the orders Falconiformes and Strigiformes (collectively known as birds of prey). Birds of prey include raptors, falcons, and owls. It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes

(birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.

Fish and Game Code 3511, 4700, 5050, 5515 - Fully Protected Species

DFG's classification of "fully protected" species was the State's initial effort in the 1960s to identify and protect animals that were rare or faced possible extinction. Lists were created for birds (3511) mammals (4700) reptiles and amphibians (5050), and fish (5515). The Fish and Game Code states that fully protected species, "….may not be taken or possessed at any time. No provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected" species.

California Fish and Game Code

The California Fish and Game Code defines 'take' (Section 86) and prohibits 'taking' of a species listed as threatened or endangered under CESA (California Fish and Game Code Section 2080) or otherwise fully protected, as defined in California Fish and Game Code Sections 3511, 4700, and 5050.

Other Special-Status Species Classifications

Other special-status species classifications evaluated in this NES include California Species of Special Concern (SSC), plant species with California Rare Plant Ranks 1B and 2 (CNPS 2011), plants listed under the California Native Plant Protection Act, and active raptor nests.

Invasive Plant Species

Section 5.4 evaluates invasive plant species in the study area. Executive Order 13112, issued 3 February 1999, directs federal agencies, whose actions may affect the status of invasive plant species, to use relevant programs and authorities to prevent the introduction of invasive species, control existing populations of such species, monitor populations of such species, and provide for the restoration of native species. The Federal Highway Administration (FHWA) is ordered to not authorize, fund, or carry out projects that are likely to cause or promote the introduction or spread of invasive species.

The California Invasive Plant Council (Cal-IPC) maintains an inventory of invasive nonnative plants that threaten wildland areas of California (Cal-IPC 2006). Assessments are based on Warner et al. (2003; "Criteria for Categorizing Non-Native Plants that Threaten Wildlands"). The Cal-IPC inventory involves evaluation of ecological impacts, invasive potential, and ecological distribution. Species receive an overall rating of High, Moderate, or Limited. Ratings are defined below (Cal-IPC 2006).

> **High:** "These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other

attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically."

Moderate: "These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread."

Limited: "These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic" (Cal-IPC 2006).

2.2. Studies Required

A list was obtained on 23 June 2011 from the U.S. Fish and Wildlife Service (USFWS), Sacramento Field Office, (data dated 29 April 2010; USFWS 2010e; Appendix A). The list identifies federal-listed, candidate, or proposed species that potentially occur in or could be affected by projects on the Merritt quad or in Solano and Yolo counties.

The California Natural Diversity Database (CNDDB) was queried on 24 June 2011 for the Merritt quad and the eight surrounding quads to determine known occurrences of special-status species in or near the BSA (data dated 7 June 2011, DFG 2011a, Appendix B). The CNDDB tracks other species that have not been designated by DFG as a California species of special concern; these species were not evaluated as special-status species in this NES.

Data received from USFWS, CNDDB/ RareFind records, and DFG species lists were used to compile a table of regional species and habitats of concern.

Biological surveys consisted of walking through the BSA to determine if any special-status plant or wildlife species or their habitat were present. Plant species and plant communities were identified and recorded. Wildlife species observed, their sign, and potential habitats were recorded. Appendix D is a list of plant and wildlife species observed during surveys.

A Preliminary Jurisdictional Delineation Report of wetlands and other waters of the U.S. was prepared to identify jurisdictional features regulated under Section 404 of the CWA (Appendix F).

A separately bound Biological Assessment Report (Sycamore Environmental 2011) was prepared to support a formal section 7 consultation between Caltrans (FHWA's federal designee), and USFWS for VELB and NMFS for protected fish species.

2.3. Personnel and Survey Dates

Jeffery Little, Project Manager, conducted a general reconnaissance survey on 28 September 2009. Mike Bower, M.S., conducted a general reconnaissance survey on 22 March 2011. Leane Dunn, M.F., Biologist and Jessica Easley, Biologist, conducted the general biological survey, jurisdictional delineation, and elderberry shrub survey on 31 March 2011.

2.4. Agency Coordination and Professional Contacts

Mr. Rich Marovich, Putah Creek Streamkeeper, Solano County Water Agency was contacted on 6 June 2011 to discuss revegetation and restoration efforts on Putah Creek.

Ms. Maria Rea, Supervisor for NMFS Central Valley Office, responded to a request for a technical assistance in a letter dated 10 June 2011 regarding federally listed anadromous fish species that may occur in the BSA (Appendix C). The letter stated that Central Valley steelhead Distinct Population Segment (DPS) could occur in the BSA and designated critical habitat may occur downstream from the BSA. The letter also stated that the Project may affect EFH for Pacific salmon. NMFS provided recommendations to minimize impacts and adverse effects on listed fish and EFH, including: use of a silt/curtain fence around in-water work; limiting construction activities to between 15 July and 15 October; erosion control treatment of disturbed soil; and riparian habitat avoidance and replanting specifications. Conservation recommendations to fulfill the requirements of section 7(a)(1) include: purchasing fish riparian enhancement credits, channel enhancement credits, and rearing habitat credits each at a 3:1 ratio for areas impacted; implementation of Best Management Practices (BMPs); riparian habitat avoidance and replanting specifications; use of a rock-soil mixture of Rock Slope Protection (RSP); and guidelines for salmonid passage at stream crossings.

Mr. Joe Heublein, NMFS Natural Resource Management Specialist, was contacted on 29 July 2011 regarding salmon spawning habitat in Putah Creek. Mr. Heublein stated that there is anecdotal information that spawning occurred in Putah Creek historically. Mr. Heublein stated that the biggest concern regarding fish currently spawning in Putah Creek is the difficulty in accessing the creek. Flash boards that are connected to the Toe Drain are not removed until late in the season, so there is no early fish passage to Putah Creek. There is no habitat upstream of the Putah Creek Diversion Dam.

Mr. Dylan VanDyne, NMFS Fishery Biologist, was contacted on 2 August 2011 to discuss the proposed temporary creek crossing between Pier 1 and Pier 2. Mr. VanDyne was contacted again on 15 August 2011 to discuss potential for Chinook salmon Central Valley spring-run ESU to occur in Putah Creek in the BSA. Mr. VanDyne stated that it was unlikely that Chinook salmon Central Valley spring-run ESU would occur in the Creek during summer construction.

Mr. Leopoldo Flores, P.E., and Mr. Matt Tuggle, P.E. of the Solano County Department of Resource Management were contacted to discuss various Project related issues (pers. comm. Leopoldo Flores and Matt Tuggle).

2.5. Limitations That May Influence Results

No problems or limitations were encountered that may have influenced the results.

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Chapter 3. Results: Environmental Setting

The BSA is located at the boundary of Solano County and Yolo County, CA. The southerly portion of the bridge is referred to as Stevenson Bridge Road and occurs in Solano County. The northerly portion of the bridge is referred to as Road 95A and occurs in Yolo County. The BSA spans Putah Creek and includes riparian areas, oak woodland, a walnut orchard, and a tree farm.

3.1. Description of the Existing Biological and Physical Conditions

3.1.1. Biological Study Area

The approximately 9.34-acre BSA begins just south of Strathgordon Lane and extends north across Putah Creek to just south of Creeksedge Road. The BSA includes portions of two privately owned parcels (APNs 0038-160-140 and 0107-020-040), a parcel owned by U.C. Davis (APN 0037-170-100), and one parcel owned by Solano County (APN 0107-020-050). Putah Creek flows east through the BSA.

3.1.2. Physical Conditions

Elevation in the BSA ranges from approximately 60 feet above sea level at the Putah Creek OHWM, to approximately 94 feet above sea level in the surrounding upland areas. The BSA is in the Lower Sacramento hydrologic unit (hydrologic unit code 18020109). The BSA crosses a riparian area adjacent to Putah Creek, and is surrounded by oak woodland, agriculture, and rural residential land uses. Structures in the BSA include Stevenson Bridge, Stevenson Bridge Road to the south, and Road 95A to the north. Soils in the BSA are described in the Preliminary Jurisdictional Delineation Report (Appendix F).

3.1.3. Biological Conditions in the BSA

Biological communities are defined by species composition and relative abundance. The biological communities are mapped on Figure 4. Invasive plant species in the BSA are discussed in Chapter 5.5.

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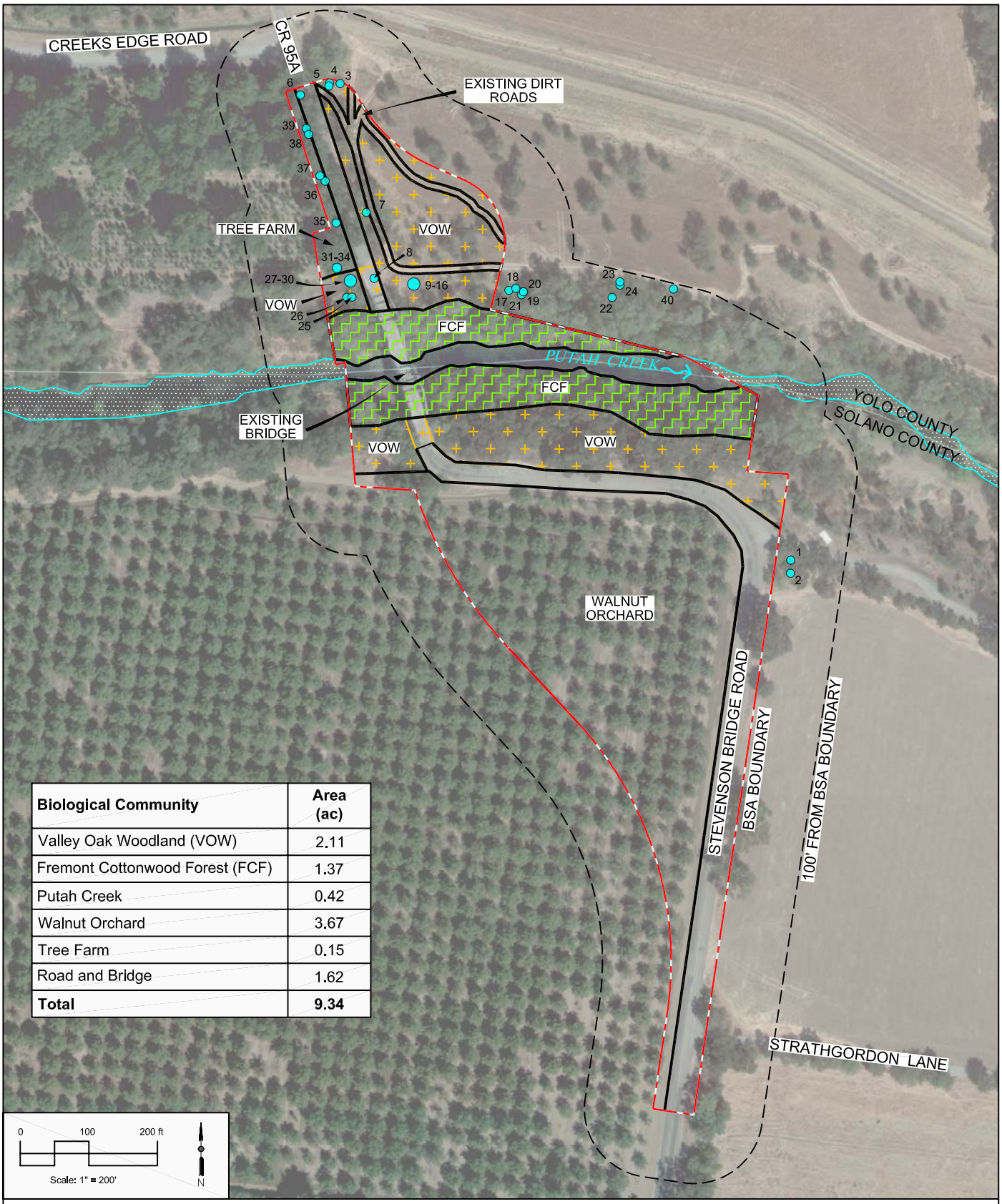

Biological Community	Area (ac)
Valley Oak Woodland (VOW)	2.11
Fremont Cottonwood Forest (FCF)	1.37
Putah Creek	0.42
Walnut Orchard	3.67
Tree Farm	0.15
Road and Bridge	1.62
Total	**9.34**

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project
Solano County, CA

28 February 2012

Biological Study Area (BSA)

100' Buffer from PSA boundary

Biological Community Boundary

Putah Creek

Fremont Cottonwood Forest (FCF)

Valley Oak Woodland (VOW)

25 Elderberry shrub and number

Basemap:
Topography Map with Proposed Alignment
055TEVENSONTO.dwg
(14Feb10)
by Solano County Dept. of Resource Management
Public Works Engineering

Aerial Photograph:
24 Sept. 09
Google Earth Pro

Figure 4. Biological Resources Map

09067StevensonBridgeRd_v6.dwg

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3.2. Regional Species and Habitats of Concern

Data acquired from USFWS and CNDDB records were used to compile a table of regional species and habitats of concern (Table 1). Field surveys were conducted to determine if individuals or suitable habitat for the species occur in the BSA. Table 1 provides a brief habitat description for each species and a determination as to whether habitat for each species is present or absent from the BSA. Species for which there is no habitat in the BSA, or have ranges that preclude occurrence in the BSA, are evaluated in Table 1 and are not discussed further.

Table 1. Regional Species and Habitats of Concern

Scientific Name	Common Name	Federal Status [a]	State Status [a]	General Habitat Description	Habitat Present/ Absent [c]	Rationale
Invertebrates						
Branchinecta conservatio	Conservancy fairy shrimp	E, CH	--	Occurs in swales in grassland communities and in large moderately turbid vernal pools, where rooted vegetation is absent (USFWS 1994a). Known from eight populations in California: Vina Plains, Butte and Tehama counties; Sacramento National Wildlife Refuge, Glenn County; Yolo Bypass Wildlife Area, Yolo County; Jepson Prairie, Solano County; Mapes Ranch, Stanislaus County; University of California, Merced, Merced County; Grasslands Ecological Area, Merced County; and Los Padres National Forest, Ventura County (USFWS 2007c).	Absent	There is no habitat for this species in the BSA. The BSA is not located in designated critical habitat for this species (USFWS 2010i).
Branchinecta lynchi	Vernal pool fairy shrimp	T, CH	--	Occurs in grassy (occasionally mud-bottomed), swale, earth slump, or basalt-flow depression pools in unplowed grasslands (USFWS 1994a). Identified in 1990, so historical information is lacking. Currently known to inhabit a wide range of vernal pool habitats in the southern and Central Valley areas of California, and in two vernal pool habitats within the "Agate Desert" area of Jackson County, Oregon (USFWS 2007c)	Absent	There is no habitat for this species in the BSA. The BSA is not located in designated critical habitat for this species (USFWS 2010i).
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	T, CH	--	Requires an elderberry shrub as a host plant (USFWS 1999a, USFWS 2009b). Females lay their eggs on the bark of elderberry, and larvae hatch and burrow into the stems. After two years, the larvae emerge as adults. The elderberry stems must be > 1.0 inches in diameter to support larvae (USFWS 2009b). The range extends throughout California's Central Valley and associated foothills from about the 3,000-ft elevation contour on the east and the watershed of the Central Valley on the west (USFWS 1999a), from southern Shasta Co to Fresno Co. (USFWS 2009b).	Present	*Sambucus mexicana* shrubs occur in the BSA. See text.

Scientific Name	Common Name	Federal Status [a]	State Status [a]	General Habitat Description	Habitat Present/ Absent [c]	Rationale
Elaphrus viridis	Delta green ground beetle	T, CH	--	Found primarily on sandy-clay soils along the shorelines of larger vernal lakes, usually within 1.5 m of the waterline (USFWS 1985). Has also been seen along the edges of smaller vernal pools and on bare ground or areas of sparse and short vegetation in the adjacent valley grasslands, along trails and on roadsides (USFWS 1985, USFWS 2009a). This beetle has only been seen in the greater Jepson Prairie area in the south-central Solano County, and includes the Jepson Prairie Preserve, Wilcox Ranch property, and Michael Remy vernal pool preserve. Beetle presence is associated with vernal pool plant cover (*Navarretia* sp, *Frankenia* sp., *and Downingia* sp.), proximity to water, soil type (sandy mud substrates of Pescadero Clay, Solano-Pescadero Complex, Solano Loam, and Pescadero Clay Loam), cracks in the soil, and presence of springtails for prey. Beetles are also found in adjacent upland habitat during the winter season (USFWS 2009a).	Absent	There is no habitat for this species in the BSA. The BSA is not located in the greater Jepson Prairie area in south-central Solano County. The BSA is not located in designated critical habitat for this species (USFWS 2010i).
Lepidurus packardi	Vernal pool tadpole shrimp	E, CH	--	Occurs in a variety of vernal pool habitats (USFWS 1994a). Typically inhabits vernal pools with clear to highly turbid water. They feed on organic debris and living organisms, including fairy shrimp and other invertebrates. This species has a patchy and highly fragmented distribution across the Central Valley from Shasta to Tulare Co, and isolated occurrences in Alameda and Contra Costa Co. They are uncommon where they are found (USFWS 2007c).	Absent	There is no habitat for this species in the BSA. The BSA is not located in designated critical habitat for this species (USFWS 2010i).

Scientific Name	Common Name	Federal Status [a]	State Status [a]	General Habitat Description	Habitat Present/ Absent [c]	Rationale
Speyeria callippe callippe	Callippe silverspot butterfly	E	--	Inhabits native grasslands and associated habitats in the San Francisco Bay area. Necessary habitat components include continuous grassland habitat on cooler north and east facing slopes that support a wide variety of adult nectar sources, sufficient numbers of the larval host plant (*Viola pedunculata*), are within the area influenced by coastal fog, and contain hilltops for mating congregations. When listed in 1997, two populations were described in San Bruno Mountain (San Mateo County) and the city park in Alameda County. The city park population is believed to be extirpated, and no longer supports the larval host plant. A third population was located in the Cordelia Hills between Vallejo and Cordelia (Solano County) after the species was listed. Three additional populations have been observed but have not been taxonomically verified: 1) Sears Point, Sonoma County; 2) hills in the City of Pleasanton, Alameda County; and 3) along the watershed to the east of Calaveras Reservoir (just east of the city of Milpitas), Alameda County. There is no critical habitat designated for callippe silverspot butterfly (USFWS 2009d).	Absent	*Viola pedunculata* does not occur in the BSA. There is no habitat for Callippe silverspot butterfly in the BSA.
Fish						
Acipenser medirostris	Green sturgeon, southern DPS	T, CH	SC	Anadromous fish that spawn from March through July. Spawning activity occurs in deep pools in large and turbulent freshwater rivers. Currently believed to spawn in the Rogue and Sacramento River, and the Klamath River Basin, occasionally in the Eel River, rarely in the Umpqua River. Thought to be extirpated in the South Fork of the Trinity River, but juveniles are captured at Willow Creek. Decline primarily due to reduction in spawning areas (NMFS 2011c). For the southern DPS, the federal listing includes all spawning populations south of the Eel River (DFG 2011b).	Absent	The BSA is outside of the geographic range of this species (NMFS 2011c, CalFish 2010). There is no designated critical habitat for this species in the BSA (NMFS 2009a).

Scientific Name	Common Name	Federal Status [a]	State Status [a]	General Habitat Description	Habitat Present/ Absent [c]	Rationale
Hypomesus transpacificus	Delta smelt	T, CH	E	Euryhaline (tolerant of a wide salinity range) species that is endemic to the Delta. Currently found only from the San Pablo Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties. Spawns in freshwater dead-end sloughs and shallow edge-waters of channels in the upper Delta and in Montezuma Slough near Suisin Bay. Specific environmental conditions and habitats are needed within the estuary for various parts of their life cycle. USFWS decided in April 2010 that the reclassification of delta smelt from FT to FE was warranted, but precluded by other higher priority listing actions (USFWS 2010d). Delta smelt was changed from ST to SE on 20 January 2010 (DFG 2011b).	Absent	The BSA does not provide habitat for this species. The BSA is not located at or near the Delta estuary. The BSA is outside the current geographic range of this species (USFWS 2010d). There is no designated critical habitat for this species in the BSA (USFWS 1994b).
Oncorhynchus kisutch	Central CA coast Coho salmon ESU	E, CH	E	Historically distributed throughout the North Pacific Ocean from Central California to Point Hope, AK, and probably inhabited most coastal streams in WA, OR, and northern and central CA. This anadromous species exhibits a relatively simple 3-year life cycle. Adults typically begin their freshwater spawning migration in the late summer and fall, spawn by mid-winter, and then die. Juveniles rear in fresh water for up to 15 months, then migrate to the ocean before returning to their natal streams to spawn as 3 year-olds (NMFS 1996). The federal listing is limited to naturally spawning populations in streams between Punta Gorda in Humboldt Co., and the San Lorenzo River in Santa Cruz Co. The state listing is limited to Coho south of Punta Gorda, Humboldt Co. (DFG 2011b).	Absent	The BSA is outside the ESU range of this species (NMFS 1996). The BSA is outside of the geographic range of this species (CalFish 2010). There is no designated critical habitat for this species in the BSA (NMFS 2000).

Scientific Name	Common Name	Federal Status [a]	State Status [a]	General Habitat Description	Habitat Present/ Absent [c]	Rationale
Oncorhynchus mykiss	Central Valley steelhead DPS	T, CH	--	Anadromous fish that are able to spawn more than once (McEwan 1996). Historically widely distributed in the Sacramento and San Joaquin drainages. While steelhead are found elsewhere in the Sacramento River system, the principal remaining wild populations are a few hundred fish that spawn annually in Deer and Mill Creeks in Tehama Co. and a population of unknown size in the lower Yuba River. With the possible exception of a small population in the lower Stanislaus River, steelhead appear to be extirpated from the San Joaquin basin (Moyle 2002). Spawning occurs in small tributaries on coarse gravel beds in riffle areas (Busby et al. 1996). Major river basins known to support the California Central Valley Steelhead ESU include the Sacramento, San Joaquin, Stanislaus, American, Feather, Merced, Mokelumne, Tuolumne and Yuba Rivers; Battle, Butte, Big Chico, Beegum, Cache, Deer, Mill, Antelope, Putah, Stony, and Cottonwood Creeks; as well as the Sacramento-San Joaquin Delta and Honker, Grizzly, Suisun, and San Francisco Bays (NMFS 2000). Federal listing includes all runs in the Sacramento and San Joaquin Rivers and their tributaries (DFG 2011b).	Present	The BSA is within the winter steelhead distribution range and within steelhead DPS range (CalFish 2010, NMFS 2000). See text.
Oncorhynchus mykiss	Central California Coast steelhead DPS	T, CH	--	Anadromous fish that are able to spawn more than once (McEwan 1996). Spawning occurs in small tributaries on coarse gravel beds in riffle areas (Busby 1996). Gravel substrates free of excessive salt are needed for spawning (NMFS 2011c). Federal listing includes all runs in coastal basins from the Russian River in Sonoma County, south to Soquel Creek in Santa Cruz Co., inclusive. It includes the San Francisco and San Pablo Bay basins, but excludes the Sacramento-San Joaquin River basins (DFG 2011b).	Absent	The BSA is outside the geographic distribution of this DPS. The BSA does not occur in the San Francisco or San Pablo Bay basins. Designated critical habitat for this species does not occur in the BSA (NMFS 2000).

Scientific Name	Common Name	Federal Status [a]	State Status [a]	General Habitat Description	Habitat Present/ Absent [c]	Rationale
Oncorhynchus tshawytscha	Chinook salmon, Central Valley spring-run ESU	T, CH	T	Anadromous fish that prefer streams that are deeper and larger than those used by other Pacifica salmon species, with larger gravel and more water flow (NMFS 2011c). Enters the Sacramento/San Joaquin Basin from July through April and spawns from October through February. Adult female Chinook will prepare a spawning bed in a stream with suitable gravel composition, water depth, and velocity (McGinnis 1984). Extant populations of this ESU spawn in the Sacramento River and its tributaries (Moyle 2002). Populations in the San Joaquin River are believed to be extirpated (NMFS 1998a). The state listing is for the Sacramento River Drainage. The Federal listing includes populations spawning in the Sacramento River and its tributaries (DFG 2011b).	Absent	Putah Creek is not within the current or historic distribution for spring-run Chinook salmon (NMFS 2011a, NMFS 2009b). The BSA does not contain critical habitat for spring-run Chinook salmon (NMFS 2009b). NMFS stated that it was unlikely that spring-run Chinook would occur in the Creek during summer construction. (pers. Comm. Dylan VanDyne). The BSA is within EFH for Pacific salmon (NMFS 2011b, Appendix C).
Oncorhynchus tshawytscha	Chinook salmon, Sacramento River winter-run ESU	E, CH	E	Anadromous fish that prefer streams that are deeper and larger than those used by other Pacifica salmon species, with larger gravel and more water flow (NMFS March 2011b). Once found throughout the upper Sacramento River basin, the winter-run Chinook salmon ESU is now confined to the mainstem Sacramento River below Keswick Dam (Moyle 2002). This ESU is believed to be extirpated from the San Joaquin River Basin. However, an intermittent run has been reported in the lower Calaveras River (NMFS 1998a).	Absent	Putah Creek is not within the current or historic distribution for winter-run Chinook salmon (NMFS 2011a, NMFS 2009b). The BSA does not contain critical habitat for winter-run Chinook salmon (NMFS 2009b). The BSA is within EFH for Pacific salmon (NMFS 2011b, Appendix C).
Oncorhynchus tshawytscha	Chinook salmon, Central Valley fall-run ESU	--	SC	Anadromous fish that prefer streams that are deeper and larger than those used by other Pacifica salmon species, with larger gravel and more water flow (NMFS 2011c). Fall- and late fall-run Chinook enter the Sacramento/San Joaquin Rivers from July through April and spawn from October through February. Both runs are ocean-type Chinook salmon, emigrating predominantly as fry and subyearlings and remaining off the CA coast during their ocean migration (NMFS 1998a). Adult female Chinook will prepare a spawning bed in a stream with suitable gravel composition, water depth, and velocity (McGinnis 1984). This ESU includes all naturally spawned populations of fall-run Chinook salmon in the Sacramento and San Joaquin River Basins and their tributaries, east of Carquinez Strait, CA (NMFS 2010, DFG 2011b).	Present	Putah Creek is within the current and historic distribution for fall run Chinook salmon (NMFS 2011a). The BSA is within EFH for Pacific salmon (NMFS 2011b, Appendix C).

Scientific Name	Common Name	Federal Status [a]	State Status [a]	General Habitat Description	Habitat Present/ Absent [c]	Rationale
Pogonichthys macrolepidotus	Sacramento splittail	--	SC	Splittail prefer low-salinity, shallow-water habitat in lower reaches of rivers. Flooded vegetation is needed for spawning and foraging areas for young. Most spawning occurs February through April. Historical distribution included lakes and rivers throughout the Central Valley as far north as Redding, CA (Moyle et al. 1995). Splittail are now largely confined to the Delta, Suisun Bay, Suisun Marsh, Napa River, Petaluma River, and other parts of the Sacramento-San Joaquin estuary (Moyle 2002). In wet years, they can be found as far up the Sacramento River as Redding (below the Battle Creek Fish Hatchery in Shasta County), the Feather River as high as Oroville (below the Oroville Dam), the American River to Folsom (below the Nimbus Dam), and 11 km upstream in the lower Tuolumne River between Chinese Camp and Buchanan (Moyle 2002, Moyle et al. 1995). They may also ascend the San Joaquin River as high as Salt Slough (Merced County). The Sutter and Yolo Bypasses, along the Sacramento River, are apparently important spawning areas today (Moyle 2002). In wet years, Sacramento splittail are commonly found in the Putah Creek Sinks, in the region where Putah Creek crosses the Yolo Bypass, and the Bypass provides valuable spawning and rearing habitat for splittail. In spring 2004, juvenile splittail were caught in Putah Creek in the reach downstream of the County Road 106 crossing during surveys (LPCCC 2005).	Absent	The BSA is outside the known geographic range of this species.

Scientific Name	Common Name	Federal Status [a]	State Status [a]	General Habitat Description	Habitat Present/ Absent c	Rationale
Amphibians						
Ambystoma californiense	California tiger salamander, central population/ Central Valley DPS	T, CH	T, SC	Restricted to grassland, oak savannah, and edges of mixed woodland and lower elevation coniferous forest, typically below 2000 ft, where lowland aquatic sites are available for breeding (Stebbins 2003, USFWS 2009c). Spends much time underground in mammal burrows. Usually breeds in temporary ponds such as vernal pools but may also breed in slower parts of streams and some permanent waters (Stebbins 2003). Ponds with large populations of California tiger salamander larvae usually contain very few larvae of other amphibians (CWHR 2011). Requires long-lasting pools to complete larval development of a minimum of approximately 10 weeks (Jennings and Hayes 1994). Threatened throughout its range, endangered in Sonoma and Santa Barbara cos. (USFWS 2009c). The state listing refers to the entire range of the species. The federal threatened listing is only for the Central Valley population. The Sonoma and Santa Barbara populations are federally listed as endangered (DFG 2011b).	Absent	There is no habitat for this species in the BSA. The BSA is not located in designated critical habitat for this species (USFWS 2010i).
Rana draytonii	California red-legged frog	T, CH	SC	Inhabits quiet pools of streams, marshes, and occasionally ponds. Requires permanent or nearly permanent pools for larval development (CWHR 2011). Adults require dense, shrubby, or emergent vegetation in deep pools with still or slow moving water (USFWS 2010b). The range of CA red-legged frog extends from near sea level to approximately 5,200 ft, though nearly all sightings have occurred below 3,500 ft (USFWS 2002a). Abundant in SF Bay Area and Marin Co., and the central coast. Isolated populations occur in the Sierra Nevada, north Coast, and northern Transverse ranges. Believed to be extirpated from the southern Transverse and Peninsular Ranges, but still present in Baja CA. (USFWS 2010b). Critical habitat was revised in 2010, and occurs in Alameda, Butte, Calaveras, Contra Costa, El Dorado, Kings, Kern, Los Angeles, Marin, Mendocino, Merced, Monterey, Napa, Nevada, Placer, San Benito, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Solano, Sonoma, Stanislaus, Ventura, and Yuba counties (USFWS 2010c).	Absent	There are no quiet pools or dense, emergent vegetation in Putah Creek in the BSA that can provide habitat for CRLF. The BSA is not located in designated critical habitat for this species (USFWS 2010i).

Scientific Name	Common Name	Federal Status [a]	State Status [a]	General Habitat Description	Habitat Present/ Absent c	Rationale
Reptiles						
Emys marmorata	Western pond turtle	--	SC	Occurs from sea level to 6,000 ft. Prefers aquatic habitats with abundant vegetative cover and exposed basking sites such as logs and rocks or mud banks. They are associated with permanent or nearly permanent water in a wide variety of habitat types, normally in ponds, lakes, streams, irrigation ditches or permanent pools along intermittent streams (CWHR 2011).	Present	See text.
Masticophis lateralis euryxanthus	Alameda whipsnake [=striped racer]	T, CH	T	This subspecies inhabits the Inner Coast Ranges mostly in Contra Costa and Alameda cos, with additional occurrences in San Joaquin and Santa Clara cos. (USFWS 2002b). Found in northern coastal scrub, coastal sage scrub and chaparral plant communities, but may also occur in adjacent grasslands oak savannah, and oak and oak/bay woodlands. Prefers open-canopy stands and habitats with woody debris and exposed rock outcrops (USFWS 1997). Rock outcrops provide retreat and promote lizard populations. Hibernation occurs from November through March. The current distribution is reduced to five separate areas, with little to no interchange due to habitat loss, alteration, or fragmentation: 1) Sobrante Ridge, Tilden/Wildcat Regional Parks to the Briones Hills, in Contra Costa Co. (Tilden-Briones population); 2) Oakland Hills, Anthony Chabot area to Las Trampas Ridge, in Contra Costa Co. (Oakland-Las Trampas population); 3) Hayward Hills, Palomares area to Pleasanton Ridge, in Alameda Co. (Hayward-Pleasanton Ridge population); 4) Mount Diablo vicinity and the Black Hills, in Contra Costa Co. (Mount Diablo-Black Hills population) 5) Wauhab Ridge, Del Valle area to the Cedar Mountain Ridge, in [Alameda Co] (Sunol-Cedar Mountain population; USFWS 2005).	Absent	The BSA is outside the geographic range of this species. The BSA is not located in designated critical habitat for this species (USFWS 2010i).

Thamnophis gigas	Giant garter snake	T	T	Endemic to the Central Valley of California, where they occupy a variety of agricultural, managed, and natural wetlands, including their waterways and adjacent upland habitats. Agricultural wetlands include irrigation and drainage canals, ricelands, marshes, sloughs, ponds, small lakes, and low gradient streams. Essential habitat consists of the following: 1) adequate water during the snake's active season (early spring through mid-fall); 2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes; 3) upland habitat with grassy banks and openings in waterside vegetation for basking; and 4) higher elevation uplands for cover and refuge during the snakes inactive season in winter. Absent from larger rivers, and from wetlands with sand, gravel, or rock substrates. Riparian woodlands do not typically provide suitable habitat because of extensive shade, lack of basking sites, and absence of prey populations. Inhabits small mammal burrows during winter dormancy. More common in Sacramento Valley, with isolated populations in the San Joaquin Valley (USFWS 1999b).	Absent	There is a record for giant garter snake on Putah Creek 5 mi downstream. See text.
Birds						
Agelaius tricolor	Tricolored blackbird	--	SC	Common throughout CA and in coastal district from Sonoma Co. south. Breeds near freshwater, preferably in emergent marsh of dense cattails or tules, and also in thickets of willow, blackberry, tall herbs and wild rose in northeastern CA. The nesting area is highly colonial, supporting a minimum of 50 pairs (CWHR 2011). Nesting colonies are of concern to DFG (Jan 2011).	Absent	The BSA does not provide suitable habitat for this species. There is no marsh habitat in the BSA.
Ammodramus savannarum	Grasshopper sparrow	--	SC	An uncommon and local summer resident and breeder in foothills and lowlands west of Cascade-Sierra Nevada crest from Mendocino to Trinity cos, south to San Diego Co. Occurs in dry, dense grasslands, especially with scattered shrubs for sitting perches. Secretive in winter, when it may occur in southern coastal CA. Nests are built of grasses and forbs in slight depression in ground hidden by a clump of grasses or forbs. Breeds from early April to mid-July. May form semicolonial breeding groups of 3-12 pairs (CWHR 2011). Nesting sites are of concern to DFG (Jan 2011).	Present	The BSA provides habitat for this species. See text.

Scientific Name	Common Name	Federal Status [a]	State Status [a]	General Habitat Description	Habitat Present/ Absent c	Rationale
Athene cunicularia	Burrowing owl	--	SC	Yearlong resident of open, dry grassland and desert habitat, and in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats. Uses small mammal burrows, often ground squirrel, for roosting and nesting cover. Perches in open sunlight in early morning, and moves to shade or burrow when hot (CWHR 2011). Burrowing sites and some wintering sites are of concern to DFG (DFG Jan 2011).	Absent	Burrowing owls or small mammal burrows were not observed during the general biological survey in the BSA. Ground squirrel burrows could become established in the BSA prior to construction.
Buteo swainsoni	Swainson's hawk	--	T	Uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen Co., and Mojave Desert. Nests in stands with few trees in juniper-sage flats, in riparian areas and in oak savannah in the Central Valley. Forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. Feeds on small birds, rodents, mammals, reptiles, large arthropods, amphibians, and, rarely, fish (CWHR 2011). Nesting sites are of concern to DFG (Jan 2011).	Present	Swainson's hawk was observed in the BSA. Suitable nesting habitat occurs in the BSA. See text.
Charadrius alexandrinus nivosus	Western snowy plover	T, CH	SC	Nests, feeds, and takes cover on sandy or gravelly beaches along the coast, at sand pits, dune-backed lakes, beaches at creek and river mouths, salt pans, estuarine salt ponds, alkali lakes, and the Salton Sea (CWHR 2011, USFWS 2007b). Requires a sandy, gravelly or friable soil substrate for nesting, which are shallow depressions in the sand or soil. Nesting sites at salt ponds and other inland areas are due to increased human disturbances at the coastal nesting sites (CWHR 2011). Federal T listing applies only to the Pacific coastal population. State SC designation refers to both the coastal and interior populations. Nesting sites are of concern to DFG (2011). A proposed revision of CH occurred in March 2011, which proposes CH in Del Norte, Humboldt, Mendocino, Napa, Marin, Alameda, Santa Cruz, San Mateo, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego cos. (USFWS 2011). The previous CH designation extends 50 mi from the Pacific Ocean on the mainland coast, peninsulas, offshore islands, bays, estuaries, or rivers. Breeding data indicates that the coastal populations are becoming distinct from the interior populations; however, there is no significant genetic differentiation (USFWS 2007b).	Absent	The BSA does not provide habitat for this species. The BSA does not occur along the coastline. There are no salt pans, salt ponds, or alkali lakes in or near the BSA. The BSA is not located in designated or proposed critical habitat for this species (USFWS 2011, USFWS 2007b).

Charadrius montanus	Mountain plover	PT	SC	This species does not nest in California. It is a winter resident from September through March in the Central Valley from Sutter and Yuba cos. southward into Mexico below 3,200 ft. Also found in foothill valleys west of San Joaquin Valley, Imperial Valley, plowed fields of Los Angeles and western San Bernardino cos. Mountain plover forage in short and open grasslands, plowed fields with little vegetation, and open sagebrush areas (CWHR 2011). Nonbreeding/wintering sites are of concern to DFG (Jan 2011).	Absent	Construction activities will occur during the nesting season. This species does not nest in CA.
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	C	E	Uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations in CA. Breeding populations known from the Colorado River (southeast CA border), Sacramento and Owens valleys, along the South Fork of the Kern River (Kern Co.), along the Santa Ana River (Riverside Co.), and along the Amargosa River (Inyo & San Bernardino cos.). They may also nest along San Luis Rey River (San Diego Co.). Nests in dense cover of deciduous trees and shrubs, especially willows, which usually abut a slow-moving watercourse, backwater or seep. Also utilizes adjacent orchards, especially walnuts, in the Central Valley (CWHR 2011). Nesting sites are of concern to DFG (Jan 2011).	Absent	The BSA does not provide habitat for this species. The BSA is outside the current distribution for this species. There are no CNDDB records for this species in the 9 quad area surrounding the BSA.
Elanus leucurus	White-tailed kite	--	FP	Common to uncommon yearlong resident in coastal and valley lowlands, found in open stages of most habitats in cismontane CA. Rarely found away from agricultural areas. Uses trees with dense canopies for nesting and cover near open foraging area; also uses saltgrass and Bermuda grass for cover in southern CA. Range and population numbers have increased in recent decades (CWHR 2011). Nesting sites are of concern to DFG (Jan 2011).	Present	Suitable nesting habitat occurs in the BSA. See text.
Pelecanus occidentalis californicus	California brown pelican	D	D, FP	Found in estuarine, marine sub-tidal, and marine pelagic waters along the CA coast. Feeds almost entirely on fish. Usually rests on water or rocks piles, but also uses mudflats, sandy beaches, wharfs, and jetties (CWHR 2011). Breeding and nesting occurs in colonies on islands without mammal predators (USFWS 2010a). Nesting colony and communal roosts are of concern to DFG (2011). This species is considered recovered, was state delisted in June 2009, and federally delisted in December 2009 (DFG 2011b).	Absent	The BSA does not provide habitat for this species. Estuarine, marine sub-tidal, and marine pelagic waters do not occur in the BSA.

Rallus longirostris obsoletus	California clapper rail	E	E, FP	Found in coastal wetlands, saltwater and brackish marshes around San Francisco, Monterey, and Morro bays. Requires emergent wetlands and tidal sloughs. Nests mostly in lower zones, where Pacific cordgrass (*Spartina foliosa*) is abundant and tidal sloughs are nearby (CWHR 2011). Nesting occurs March through August (USFWS 2010a). Typically inhabit marshes dominated by pickleweed (*Salicornia virginica*) and Pacific cordgrass, but also live in tidal brackish marshes which vary significantly in vegetation (CWHR 2011, USFWS 2010a). Currently restricted almost entirely to the marshes of the San Francisco estuary. Clapper rails and Virginia rails (*Rallus limicola*) are morphologically similar and may co-occur in marshes (USFWS 2010a).	Absent	The BSA does not provide habitat for this species. There are no saltwater or brackish marshes in the BSA. The BSA is outside the known geographic range of the species.
Riparia riparia	Bank swallow	--	T	Neotropical migrant found primarily in riparian and other lowland habitats in CA west of deserts during spring-fall period; a spring and fall migrant in the interior; less common on coast. Uncommon and very local summer resident, restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs. Casual in southern CA in winter. Flocks with other swallows over many open habitats during migration. Approx. 75% of breeding population in CA occurs along banks of the Sacramento and Feather rivers in the northern Central Valley. Other colonies are known from the central coast from Monterey to San Mateo cos., and northeastern CA in Shasta, Siskiyou, Lassen, Plumas, and Modoc cos. Colonial breeder, with 10 to 1500, typically 100-200, nesting pairs. Nests near water in fine textured or sandy banks or cliffs. Digs horizontal nesting tunnel and burrow, with a small chamber at the end with the nest (CWHR 2011). Nesting sites are of concern to DFG (Jan 2011).	Absent	Suitable nesting habitat does not occur in the BSA. There are no vertical cliffs in the BSA.
Sternula (=*Sterna*) *antillarum browni*	California least tern	E	E, FP	Breeding colonies are located in southern CA along marine and estuarine shores, and in the San Francisco Bay in abandoned salt ponds and along estuarine shores. Feeds in nearby shallow, estuarine waters or lagoons where small fish are abundant, especially near the shore in the open ocean. Prefers undisturbed nest sites on open, sandy or gravelly shores near shallow-water feeding areas in estuaries May use artificially created depressions on hard soil. Will abandon nests readily if disturbed. Colonies present from April through August (CWHR 2011). The current distribution for this species occurs along the Pacific Coast, from San Francisco to Baja California (USFWS 2007c). Nesting colonies are of concern to DFG (Jan 2011).	Absent	The BSA does not provide habitat for the species. The BSA is not located near the Pacific coast. The BSA is outside the geographic range of this species.

Strix occidentalis caurina	Northern spotted owl	T, CH	SC	In northern California, resides in dense, old growth, multi-layered mixed conifer, redwood, and Douglas fir habitats from sea level to approximately 7,600 ft. Breeding range extends west of the Cascade Range through the North Coast Ranges, in the Sierra Nevada, and in more localized areas of the Transverse and Peninsular Ranges. Usually nests in tree or snag cavity, or in the broken top of a large tree. Mature, multi-layered forest stands are required for breeding. Breeds from early March through June, with peak in April and May, producing one brood per year (CWHR 2011). CH was revised in 2008, and occurs in WA, OR, and the following CA counties: Del Norte, Shasta, Siskiyou, Humboldt, Mendocino, Trinity, Colusa, Glenn, Lake, Tehama (USFWS 2008).	Absent	The BSA is outside the geographic range of this species. There are no dense, old growth, multi-layered forest stands in the BSA. The BSA is not located in designated critical habitat for this species (USFWS 2008).
Mammals						
Antrozous pallidus	Pallid bat	--	SC	This species is locally common in low elevations in CA where it occupies a wide variety of habitats including grasslands, shrub lands, woodlands, and forests. Prefers open, dry habitats with rocky areas for roosting. It is absent in the high Sierra Nevada from Shasta to Kern cos., and the northwest corner of the state from Del Norte and western Siskiyou cos. to northern Mendocino Co. Day roosts in caves, crevices, mines, and occasionally in buildings and hollow trees that protect them from high temperatures. Night roosts may be more open, such as porches and open buildings. Prefers rocky outcrops, cliffs, and crevices with access to open habitats for foraging (CWHR 2011). This species is known to use artificial roosts (Tatarian 2001). Social, with most bats roosting in groups of 20 or more. Known to roost with other bats. Very sensitive to disturbance of roosting sites (CWHR 2011).	Present	There are artificial bat boxes under Stevenson Bridge. See text.
Reithrodontomys raviventris	Salt marsh harvest mouse	E	E, FP	Restricted to the salt and brackish marshes of San Francisco, San Pablo, and Suisun Bay areas (USFWS 2010f). Pickleweed (*Salicornia virginica*) saline emergent wetland is preferred habitat. Grasslands adjacent to pickleweed marsh are used, but only when new grass growth affords suitable cover in spring and summer months. Nests on ground and does not burrow. Distribution and abundance dependent on availability of dense pickleweed salt marsh (CWHR 2011).	Absent	The BSA does not provide habitat for this species. There are no salt or brackish marshes in the BSA. The BSA is outside the known geographic range of this species.

Taxidea taxus	American badger	--	SC	Uncommon permanent resident found throughout CA. except in the northern North Coast area. Abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Carnivorous species that preys mainly on small mammals, but also reptiles, insects, earthworms, eggs, birds, and carrion. Dig burrows in friable soil for cover, which is frequently reused. Young are born in the burrows dug in relatively dry, often sandy, soil usually with sparse overstory cover. Family members may share territory of a female, but males are generally solitary except during breeding season. Important in controlling small mammal populations. Tolerant of human activities, but predator trappings and poisons can cause extensive losses (CWHR 2011).	Absent	There is no habitat for this species in the BSA. VOW area with grassland understory is small and isolated. The BSA consists of alluvial soils. No burrows were present in the BSA.
Plants			**/CNPS** [b]			
Astragalus tener var. *ferrisiae*	Ferris' milk-vetch	--	--/ 1B.1	Annual herb found on vernally mesic meadows and seeps and subalkaline flats of valley and foothill grassland from 6 to 247 ft. Known from only six extant occurrences in Butte, Colusa, Glenn, Sutter and Yolo cos. Extirpated from Solano Co. Most historical habitat destroyed by agriculture. Blooms April through May (CNPS 2011).	Absent	There is no habitat for this species in the BSA.
Astragalus tener var. *tener*	Alkali milk-vetch	--	--/ 1B.2	Annual herb found on alkaline soil in playas, valley and foothill grasslands with adobe clay soil, and vernal pools from 3 to 200 ft. Found from Alameda, Merced, Napa, Solano and Yolo cos. Extirpated from Contra Costa, Monterey, San Benito, Santa Clara, San Francisco, San Joaquin, Sonoma, and Stanislaus cos. Blooms March through June (CNPS 2011).	Absent	There is no habitat for this species in the BSA.
Atriplex cordulata	Heartscale	--	--/ 1B.2	Annual herb found on saline or alkaline soils in chenopod scrub, meadows and seeps, and sandy valley and foothill grassland from 3 to 1,230 ft. Known from Alameda, Butte, Colusa, Fresno, Glenn, Kern, Madera, Merced, San Luis Obispo, Solano, and Tulare cos. Extirpated from San Joaquin, Stanislaus and Yolo cos. Similar to *A. coronata* var *coronata*. Blooms April through October (CNPS 2011).	Absent	There is no habitat for this species in the BSA.
Atriplex depressa	Brittlescale	--	--/ 1B.2	Annual herb found on alkaline and clay soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools from 3 to 1,050 ft. Known from Alameda, Contra Costa, Colusa, Fresno, Glenn, Kern, Merced, Solano, Stanislaus, Tulare, and Yolo cos. Closely related to *A. minuscule* and *A. parishii*. Blooms April through October (CNPS 2011).	Absent	There is no habitat for this species in the BSA.

Atriplex joaquiniana	San Joaquin spearscale	--	--/ 1B.2	Annual herb found on alkaline soils in chenopod scrub, meadows and seeps, playas, and valley and foothill grassland from 3 to 2,740 ft. Known from Alameda, Contra Costa, Colusa, Fresno, Glenn, Merced, Monterey, Napa, San Benito, Solano and Yolo cos. Report from Solano Co. needs verification. Possibly found in San Luis Obispo and Tulare cos. Extirpated from Santa Clara and San Joaquin cos. Blooms April through October (CNPS 2011).	Absent	There is no habitat for this species in the BSA.
California macrophyllum	Round-leaved filaree	--	--/ 1B.1	Annual herb found on clay soils in cismontane woodland and valley and foothill grassland from 49 to 3,940 ft. Known from Alameda, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Lake, Lassen, Los Angeles, Merced, Monterey, Napa, Riverside, Santa Barbara, San Benito, Santa Clara, San Diego, San Joaquin, San Luis Obispo, San Mateo, Solano, Sonoma, Stanislaus, Tehama, Ventura, and Yolo cos., Baja California, and Oregon. Extirpated from Santa Cruz Island. Possibly extirpated from Butte Co. Blooms March through May (CNPS 2011).	Absent	There is no habitat for this species in the BSA.
Cirsium hydrophilum var. *hydrophilum*	Suisun thistle	E, CH	--/ 1B.1	Perennial herb found in salt marshes and swamps from 0 to 4 ft. Known from two occurrences on Grizzly Island in the Suisun Marsh, Solano Co. Protected in part at Grizzly Island Wildlife Area and Peytonia Slough Ecological Reserve (both DFG). Blooms June through September (CNPS 2011). Associated with the upper intertidal marsh plain near the smallest branches of natural small tidal creeks, banks, and marsh edges that are very infrequently flooded. Similar artificial ditch edges and natural creek bank habitats are less stable and more prone to invasion by non-native species. Once widespread in Suisun Marsh, Solano Co. (USFWS 2010f). Currently found only at Peytonia Slough Marsh, Hill Slough Marsh, and Rush Ranch/Grizzly Island Wildlife Area south of Fairfield in Solano County (USFWS 2010f). CH is designated in the same areas (USFWS 2007a).	Absent	There is no habitat for this species in the BSA. The BSA is outside the known elevation range for this species. The BSA is not located in designated critical habitat for this species (USFWS 2007a).

Cordylanthus mollis ssp. *mollis* (=*Chloropyron molle* ssp. *molle*)	Soft bird's beak	E, CH	R/ 1B.2	Annual hemiparasitic herb found in coastal salt marshes and swamps from 0 to 10 ft. Known from fewer than fifteen occurrences in Contra Costa, Napa, and Solano cos. Extirpated from Marin, Sacramento, and Sonoma cos. Blooms July through November (CNPS 2011). Soft bird's-beak is mainly found in the upper reaches of salt grass/pickleweed marshes at or near the limits of tidal action. It is associated with pickleweed or Virginia glasswort (*Salicornia virginica*), saltgrass (*Distichlis spicata*), fleshy or marsh jaumea (*Jaumea carnosa*), alkali seaheath (*Frankenia salina*) and seaside arrowgrass (*Triglochin maritima*). Populations are currently documented only in nine general areas: Rush Ranch, Hill Slough, Joice Island, Benicia State Recreation Area, and Denverton in Solano Co; Point Pinole, Concord Naval Weapons Station, and McAvoy Boat Harbor in Contra Costa Co.; and Fagan Slough in Napa Co. (USFWS 2010a). CH occurs at Fagan Slough Marsh off the Napa River in Napa Co.; Point Pinole Shoreline of the San Pablo Bay in Contra Costa Co; Hill Slough Marsh and Rush Ranch/Grizzly Island Wildlife Area south of Fairfield in Solano Co; and Southhampton Marsh at Southhampton Bay in Solano Co. (USFWS 2007a).	Absent	There is no habitat for this species in the BSA. The BSA is outside the known elevation range of this species. The BSA is not located in designated critical habitat for this species (USFWS 2007a).
Cordylanthus palmatus (=*Chloropyron palmatum*)	Palmate-bracted bird's beak	E	E/ 1B.1	Annual hemiparasitic herb found on alkaline soils in chenopod scrub and valley and foothill grassland from 16 to 510 ft. Known from Alameda, Colusa, Fresno, Glenn, Madera, and Yolo cos. Extirpated from San Joaquin Co. Plants in Glenn Co. are introduced. Threatened by agriculture, urbanization, vehicles, altered hydrology, grazing, and development. Conservation research is ongoing. Blooms May through October (CNPS 2011). Historically known from scattered locations in the Sacramento and San Joaquin Valleys on saline-alkaline soils and in alkali sink scrub habitats (USFWS 2010b).	Absent	There is no habitat for this species in the BSA. There is on critical habitat for this species.
Delphinium recurvatum	Recurved larkspur	--	--/ 1B.2	Perennial herb found on alkaline soils in chenopod scrub, cismontane woodland, and valley and foothill grassland from 10 to 2,461 ft. Known from Alameda, Contra Costa, Fresno, Glenn, Kings, Kern, Madera, Merced, Monterey, San Joaquin, San Luis Obispo, Solano, and Tulare cos. Extirpated from Butte and Colusa cos. Many occurrences are historical. Much habitat has been converted to agriculture. Blooms March through June (CNPS 2011).	Absent	There is no habitat for this species in the BSA.
Downingia pusilla	Dwarf downingia	--	--/ 2.2	Annual herb found in vernal pools and mesic valley and foothill grasslands from 3 to 1,460 ft. Known from Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba cos. and South America. Blooms March through May (CNPS 2011).	Absent	There is no habitat for this species in the BSA.

Fritillaria pluriflora	Adobe-lily	--	--/ 1B.2	Perennial bulbiferous herb often found on adobe soil in chaparral, cismontane woodland, and valley and foothill grassland 197 from to 2,313 ft. Known from Butte, Colusa, Glenn, Lake, Napa, Solano, Tehama, and Yolo cos. Blooms February through April (CNPS 2011).	Absent	There is no habitat for this species in the BSA.
Lasthenia conjugens	Contra Costa goldfields	E, CH	--/ 1B.1	Annual herb found on mesic soils in cismontane woodland, alkaline playas, valley and foothill grassland, and vernal pools from 0 to 1,542 ft. Known from Alameda, Contra Costa, Marin, Monterey, Napa, Solano, and Sonoma cos. Extirpated from Mendocino, Santa Barbara, and Santa Clara cos. Many historical occurrences extirpated by development and agriculture. Blooms March through June (CNPS 2011). Grows in vernal pools within open grassy areas in woodland and valley grasslands (USFWS 2010a). Critical habitat for this species occurs in Alameda, Contra Costa, Mendocino, Napa, and Solano cos. (USFWS 2006a).	Absent	There is no habitat for this species in the BSA. The BSA is not located in designated critical habitat for this species (USFWS 2006a).
Lepidium latipes var. *heckardii*	Heckard's pepper-grass	--	--/ 1B.2	Annual herb found on alkaline flats in valley and foothill grassland from 6 to 656 ft. Known from Glenn, Merced, Sacramento, Solano, and Yolo cos. Blooms March through May (CNPS 2011).	Absent	There is no habitat for this species in the BSA.
Lilaeopsis masonii	Mason's lilaeopsis	--	R/ 1B.1	Perennial rhizomatous herb found in riparian scrub and brackish or freshwater marshes and swamps from 0 to 33 ft. Known from Alameda, Contra Costa, Marin, Napa, Sacramento, San Joaquin, Solano, and Yolo cos. Locally common in Suisun Bay. Many populations ephemeral, exploiting newly deposited or exposed sediments. Blooms April through November (CNPS 2011).	Absent	There is no habitat for this species in the BSA.
Navarretia leucocephala ssp. *bakeri*	Baker's navarretia	--	--/ 1B.1	Annual herb found in mesic areas of cismontane woodlands, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools from 16 to 5,710 ft. Known from Colusa, Glenn, Lake, Mendocino, Marin, Napa, Solano, Sonoma, Sutter, Tehama, and Yolo cos. May be more widespread. Blooms April through July (CNPS 2011).	Absent	There is no habitat for this species in the BSA.
Neostapfia colusana	Colusa grass	T, CH	E/ 1B.1	Annual herb found in large adobe vernal pools from 16 to 656 ft (CNPS 2011). Known primarily from Stanislaus and Merced cos., but also known from Glenn, Solano, and Yolo cos. (CNPS 2011, USFWS 2009d). Extirpated from Colusa Co. Blooms May through August (CNPS 2011). Occurs on the rim of alkaline basins in the Sacramento and San Joaquin Valleys, on acidic soils of alluvial fans and stream terraces along the eastern margin of the San Joaquin Valley and into the adjacent foothills, as well as in Northern Claypan and Northern Hardpan vernal pool types (USFWS 2009d). CH occurs in Yolo, Stanislaus, Tuolumne, Mariposa, and Merced county. CH in Yolo County is located south of Davis and east of I-80 (USFWS 2006a).	Absent	There is no habitat for this species in the BSA. The BSA is not located in designated critical habitat for this species (USFWS 2006a).

Tuctoria mucronata	Solano grass [=Crampton's tuctoria]	E, CH	E/ 1B.1	Annual herb found in vernal pools and mesic areas of valley and foothill grassland from 16 to 33 ft. Known from only three occurrences in Solano and Yolo cos. Occurrences are at Olcott Lake at Jepson Prairie Preserve, on private land near the Preserve, and on DOD (US Air Force Base) land south of Davis, CA (CNPS 2011). The DOD land has been transferred to the Yolo County Parks Department (USFWS 2009d). Plants in Jepson Prairie have not been found since 1994 and are believed to be extirpated. Blooms April through August (CNPS 2011). CH occurs in Yolo, Stanislaus, Tuolumne, Mariposa, and Merced county. CH in Yolo County is located south of Davis and east of I-80 (USFWS 2006a).	Absent	There is no habitat for this species in the BSA. The BSA is outside the known distribution of this species. The BSA is not located in designated critical habitat for this species (USFWS 2006a).
Natural Communities						
Valley Oak Woodland		--	--/ --	On deep, well-drained alluvial soils, usually in valley bottoms, apparently with more moisture in summer than in blue oak woodland. Intergrades with Valley oak riparian forest near rivers and with blue oak woodland on drier slopes. Also found on non-alluvial setting in the South Coast and Transverse ranges. Fire may have prevented some Valley oak stands from succeeding to Ponderosa pine or Coulter pine forests before fire suppression. Typically open stands with grassy-understoried savanna rather than a closed woodland. *Quercus lobata* is usually the only tree present. Most stands consist of open-canopy growth form trees and seldom exceed 30-40% absolute cover (Holland 1986).	Present	This community type occurs in the BSA. See text.

[a] **Status**: Candidate (C); Candidate Endangered (CE); Candidate Threatened (CT); Delisted (D); Endangered (E); Federal Critical Habitat (FCH); DFG Fully Protected (FP); Proposed (P); Proposed Critical Habitat (PCH); Proposed Endangered (PE); Proposed Threatened (PT); Species of Special Concern (SC); Species of Local Concern (SLC); State Rare (R); Threatened (T);
NOTE: Critical Habitat [CH] - Project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is present.
[b] **CNPS List**. 1A = Presumed Extinct in CA; 1B = Rare or Endangered in CA and elsewhere; 2 = R/E in CA and more common elsewhere. **CNPS List Decimal Extensions**: .1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat); .2 = Fairly endangered in California (20-80% occurrences threatened); .3 = Not very endangered in California (<20% of occurrences threatened or no current threats known**).**
[c] **Absent** = No habitat present and no further work needed. **Present** = habitat is, or may be present.

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

Species identified in Table 1 as having potential habitat present in the BSA are further discussed in this chapter. Wetlands and waters potentially subject to CWA jurisdiction, birds listed under the Federal Migratory Bird Treaty Act, birds listed under CA Fish and Game Code 3503.5, and impacts to natural communities of special concern are also discussed.

Under the Magnuson-Stevens Act, Essential Fish Habitat (EFH) for the Pacific coast salmon fishery includes waters and substrates necessary for salmon production to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. The Magnuson-Stevens Act requires consultation for all federal agency actions that may adversely affect EFH. Consultation with National Marine Fisheries Service (NMFS) is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH.

The BSA is located in the Lower Sacramento River USGS hydrologic unit (HUC 18020109), which is designated as EFH for Chinook salmon (*Oncorhynchus tshawytscha;* NMFS 2008) and is within the range of Chinook salmon (CalFish 2010). Putah Creek is listed in the Central Valley Chinook Salmon current stream habitat distribution table (NMFS 2011a) and on the Central Valley Chinook salmon distribution maps (NMFS 2011b) for fall-run Chinook salmon. Putah Creek is located within the range of Central Valley steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS), and within the species winter distribution (CalFish 2010).

4.1. Natural Communities of Special Concern

Sensitive natural communities include rare communities, communities that are adversely affected by minimal disturbance, and communities that provide habitat for special-status plant or wildlife species. Sensitive natural communities in the BSA include Fremont Cottonwood Forest, Valley Oak Woodland, and Putah Creek. Trees within the portion of the BSA that will be affected by Project construction were mapped by the County.

Table 2 summarizes the habitat types and other features in the BSA and provides habitat acreages and impact acreages. The Project will permanently affect 0.22 acres of Valley Oak Woodland, 0.06 acres Fremont Cottonwood Forest, and less than 0.01 acres of Putah Creek (waters of the U.S.).

Table 2. Project Impacts to Natural Communities

Natural Community (DFG Alliance; rarity rank)	Acreage	Permanent Impact (ac)	Temporary Impact (ac)
Valley Oak Woodland (*Quercus lobata* Alliance; G3 S3)	2.11	0.22	1.00
Fremont Cottonwood Forest (*Populus fremontii* Alliance; G4 S3)	1.37	0.06	0.55
Putah Creek	0.42	less than 0.01	0.14
Walnut Orchard	3.67	0.81	0.05
Tree Farm	0.15	0.00	0.15
Other			
Road and Bridge	1.62	n/a	n/a
Total	**9.34**	**1.09**	**1.89**

Acres were calculated by AutoCAD® functions.

An English walnut (*Juglans regia*) orchard occurs in the BSA on the southwest side of Stevenson Bridge Road. No shrub layer is present and the understory is composed of scattered ruderal herbaceous species.

Stevenson Bridge Road, Road 95A, and the bridge are paved areas in the BSA. Other areas associated with these features include disturbed areas along the shoulders of the roads and existing dirt roads on the east side of Road 95A in the Valley Oak Woodland community, and Stevenson Bridge.

A tree farm occurs in the BSA on the west side of County Road 95A. Species present include incense cedar (*Calocedrus decurrens*) and Douglas fir (*Pseudotsuga menziesii*). No shrub layer is present and the understory is composed of scattered ruderal herbaceous species.

4.1.1. Discussion of Valley Oak Woodland

4.1.1.1. SURVEY RESULTS

Valley Oak Woodland occurs on the upper slopes adjacent to the Fremont Cottonwood Forest on the north and south banks of Putah Creek (Figure 4). The Valley Oak Woodland also occurs on the northeast side of the bridge in the Russell Ranch Mitigation area. The dominant tree species is Valley oak (*Quercus lobata*).

Valley Oak Woodland along the slopes above Putah Creek has a different composition than the woodland in the Russell Ranch Mitigation Area east of Road 95A. The dense understory community on the slopes above Putah Creek consists of grasses, forbs, and shrubs dominated by milk thistle (*Silybum marianum*), blue elderberry (*Sambucus mexicana*), western poison oak (*Toxicodendron diversilobum*), and rose (*Rosa* sp.).

The understory community in the Russell Ranch Mitigation Area consists of grasses dominated by foxtail (*Hordeum murinum* ssp. *leporinum*), ripgut grass (*Bromus diandrus*), and wild oat (*Avena fatua*). The Valley oaks on the top of the slope are widely spaced apart. The existing dirt roads that traverse the Valley Oak Woodland community are considered part of the road and bridge community.

Valley Oak Woodland is designated as a community of special concern by DFG, with a state rank of S3 (DFG 2010a). Special status natural communities are of limited distribution statewide or within a county or region, and are often vulnerable to environmental effects of projects (DFG 2009). Global (G) and State (S) ranking of alliances follows NatureServe's Heritage Methodology, and are based on their degree of imperilment as measured by rarity, trends, and threats (DFG 2010a). Status ranks are labeled from G1/S1 (critically imperiled) to G5/S5 (secure; Faber-Langendoen et al. 2009). Natural communities with a rank of S1-S3 are considered rare under DFG (2010a).

4.1.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

The Valley Oak Woodland cannot be completely avoided during construction. Tree removal will be necessary for construction access and vehicle movement. Due to the widely spaced locations of the Valley oaks in the Russell Ranch Mitigation Area, equipment may be able to maneuver around trees and allow additional trees to be preserved.

Efforts to minimize impacts to the portions of the Valley Oak Woodland not scheduled to be removed will include marking the limits of construction with temporary fencing. Fencing will be placed around the drip line of trees not intended for removal. Trucks and other vehicles will not be allowed to park beyond, nor will equipment be stored beyond, the fencing. No vegetation removal or ground disturbing activities will be permitted beyond the fencing. Incorporation of this avoidance measure will help ensure that construction is limited to the Project area to avoid the potential for impacts to the Valley Oak Woodland beyond those permitted by construction entitlements.

Native trees removed in the Valley Oak Woodland community will be replaced at a 3:1 ratio as specified in the Restoration Plan in Appendix H. Disturbed areas in the BSA will be seeded with native herbaceous plant species in accordance with Appendix G (Revegetation Planting and Erosion Control Specifications). Tree impacts are further discussed in Section 4.1.4.

4.1.1.3. PROJECT IMPACTS

The Project will result in the permanent loss of 0.22 acres of the Valley oak woodland in the BSA (Figure 3). A total of 1.00 acres of the Valley oak woodland will be temporarily disturbed.

4.1.1.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed. The Project proposes to revegetate areas of temporary disturbance within the Project footprint with native vegetation in accordance with Appendix G and Appendix H.

4.1.1.5. CUMULATIVE EFFECTS

With implementation of the re-vegetation measures, the Project will not result in cumulative effects to Valley Oak Woodland.

4.1.2. Discussion of Fremont Cottonwood Forest

4.1.2.1. SURVEY RESULTS

The Fremont Cottonwood Forest occurs along the north and south banks to Putah Creek in the BSA (Figure 4). Common tree species include Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), sandbar willow (*Salix exigua*), red willow (*Salix laevigata*), and Northern California black walnut (*Juglans californica* var. *hindsii*). Common understory species includes Himalayan blackberry (*Rubus discolor*), ripgut grass (*Bromus diandrus*), goose grass (*Galium aparine*), and cranesbill (*Geranium dissectum*). The Fremont Cottonwood Forest community occurs on the topographically flat floodplain adjacent the creek, and transitions into the Valley Oak Woodland on the slopes above Putah Creek.

Fremont Cottonwood Forest is designated as a community of special concern by DFG, with a state rank of S3 (DFG 2010a). Sensitive natural community ranking is further discussed in Section 4.1.1.1.

4.1.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

The Fremont Cottonwood Forest cannot be completely avoided during construction. Tree removal will be necessary for construction access and vehicle movement. Efforts to minimize impacts to the portions of the Fremont cottonwood forest not scheduled to be removed will include:

- Marking the limits of construction with temporary fencing. Fencing will be placed around the drip line of trees not intended for removal.
- Trucks and other vehicles will not be allowed to park beyond, nor shall equipment be stored beyond, the fencing.
- No vegetation removal or ground disturbing activities will be permitted beyond the fencing.

Incorporation of these avoidance measures will ensure that construction is limited to the Project area to avoid the potential for impacts to the Fremont Cottonwood Forest beyond those permitted by construction entitlements.

Native trees removed in the Fremont Cottonwood Forest community will be replaced at a 3:1 ratio as specified in the Restoration Plan in Appendix H. Disturbed areas in the BSA will be seeded with native herbaceous plant species in accordance with Appendix G (Revegetation Planting and Erosion Control Specifications). Tree impacts are further discussed in Section 4.1.4.

4.1.2.3. PROJECT IMPACTS

The Project will result in the permanent loss of 0.06 acres of the Fremont Cottonwood Forest in the BSA (Figure 3). A total of 0.55 acres of the Fremont Cottonwood Forest will be temporarily disturbed.

4.1.2.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed. The Project proposes to revegetate areas of temporary disturbance within the Project footprint with native vegetation in accordance with Appendix G and Appendix H.

4.1.2.5. CUMULATIVE EFFECTS

With implementation of the revegetation measures, the Project will not result in cumulative effects to Fremont cottonwood forest.

4.1.3. Discussion of Putah Creek

4.1.3.1. SURVEY RESULTS

Putah Creek is a waters of the U.S. and is mapped as a perennial river on the USGS Merritt quad map and as a temporary flooded forested palustrine system (PFOA) on the National Wetlands Inventory online mapper (USFWS 2010h). The Putah Creek watershed begins in the Coast Ranges west of and outside the BSA. Putah Creek flows east through the BSA underneath Stevenson Bridge to the Yolo Bypass, which connects to the East Toe Drain through a series of irrigation channels. The East Toe Drain connects to slough channels in the Delta (LPCCC 2005). The Fremont Cottonwood Forest community occurs along either side of Putah Creek in the BSA. The creek bed consists of gravel and large rocks. The depth and flow of the creek precludes vegetation from growing in the creek bed, with the exception of several clusters of torrent sedge (*Carex nudata*) along the edges. Putah Creek was flowing during the September 2009 and March 2011 surveys. Putah Creek in the BSA typically flows year around.

4.1.3.2. AVOIDANCE AND MINIMIZATION EFFORTS

During construction, water quality will be protected by implementation of best management practices (BMPs) of the California Stormwater Quality Association (2003) to minimize the potential for siltation and downstream sedimentation of Putah Creek. Avoidance and minimization efforts will follow those described for California Central Valley steelhead in Section 4.3.1.2. Native trees removed in the Fremont Cottonwood Forest community will be replaced at a 3:1 ratio in accordance with Appendix H (Restoration Plan). Disturbed areas in the BSA will be seeded with native herbaceous plant species in accordance with Appendix G (Revegetation Planting and Erosion Control Specifications). Tree impacts are further discussed in Section 4.1.4.

4.1.3.3. PROJECT IMPACTS

Construction will require a temporary creek crossing be constructed between Piers 1 and 2, using either culverts and fill or a temporary low span/bridge (Figure 3). The abutments of the bridge are located outside the OHWM of Putah Creek. Pier bents will have 5 to 7 feet of excavation immediately around the base where RSP will be placed to stabilize the creek bed and prevent scour. The installation of RSP will require a temporary water diversion. The temporary creek crossing and rehabilitation work around the Piers will result in a temporary disturbance of 0.14 acres of Putah Creek. Placement of RSP will result in a permanent loss of less than 0.01 acres of jurisdictional waters of the U.S. in the BSA (Figure 3).

4.1.3.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed. The Project proposes to revegetate areas of temporary disturbance within the Project footprint with native vegetation in accordance with Appendix G and Appendix H.

4.1.3.5. CUMULATIVE EFFECTS

With implementation of the revegetation measures, the Project will not result in cumulative impacts to Putah Creek.

4.1.4. Discussion of Trees

4.1.4.1. SURVEY RESULTS

The Solano County Resource Management Department surveyed trees in and near the BSA, and provided the information to Sycamore Environmental. Figure 5 is a map of the trees in the project area. The survey data does not include species. Tree species recorded during the biological surveys are listed in Appendix D.

CREEKS EDGE ROAD

CR 95A

EXISTING DIRT ROADS

PROPOSED TEMPORARY ACCESS FOR PIER CONSTRUCTION

ABUTMENT 2

PERMANENT ACCESS FOR PIER 2

PIER 3

PROPOSED BRIDGE

PROPOSED RSP SEE INSET

PUTAH CREEK

PIER 2

PIER 1

ABUTMENT 1

YOLO COUNTY

SOLANO COUNTY

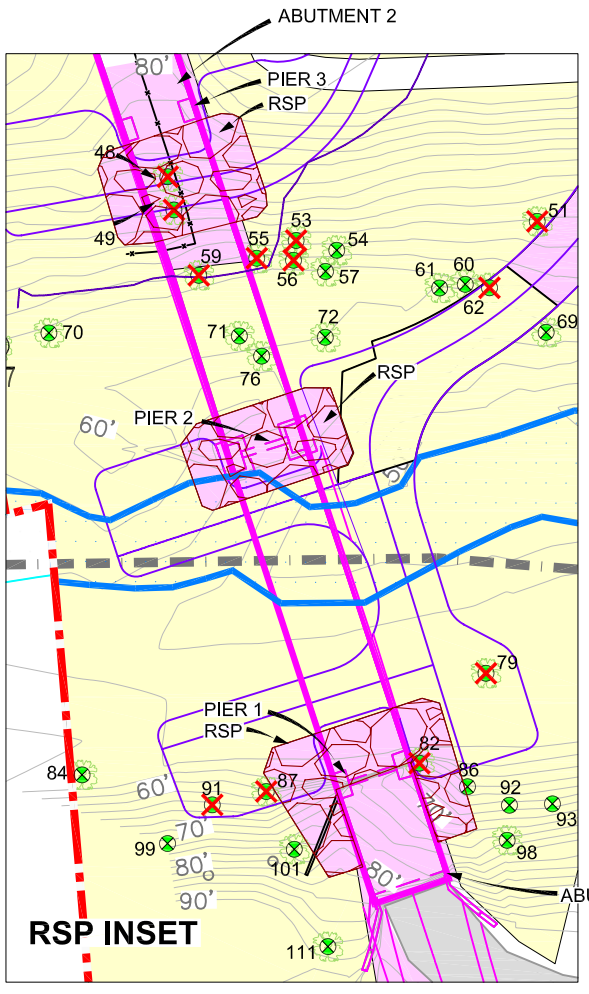
PROPOSED ROAD REALIGNMENT TWO-12' WIDE PAVED ROADS WITH 4' WIDE SHOULDERS

WALNUT ORCHARD

STEVENSON BRIDGE ROAD

BSA BOUNDARY

STRATHGORDON LANE



Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project
Solano County, CA

28 February 2012

Figure 5. Tree Location Map

Biological Study Area (BSA)

Putah Creek

Proposed Rock Slope Protection (RSP)

Permanent Impact

Temporary Impact

40 Tree location and number

40 Tree Removed

Basemap:
Topography Map with Proposed Alignment
05STEVENSONTO.dwg
(14Feb10)
by Solano County Dept. of Resource Management Public Works Engineering

0 50 100 ft

Scale: 1" = 100'

N

09067StevensonBridgeRd_v6.dwg

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4.1.4.1. AVOIDANCE AND MINIMIZATION EFFORTS

Native tree removal will occur in the Fremont Cottonwood Forest and Valley Oak Woodland communities to provide adequate access for construction personnel and vehicle movement. Additional trees may be preserved depending on the maneuverability of construction equipment used for the project.

Efforts to avoid impacts to the trees in portions of the Fremont Cottonwood Forest and Valley Oak Woodland not scheduled to be removed will include:

- Marking the limits of construction with temporary fencing. Fencing will be placed around the drip line of trees not intended for removal.
- Trucks and other vehicles will not be allowed to park beyond, nor shall equipment be stored beyond, the fencing.
- No vegetation removal or ground disturbing activities will be permitted beyond the fencing.

Incorporation of these avoidance measures will ensure that construction is limited to the BSA to avoid the potential for impacts to the Fremont Cottonwood Forest and Valley Oak Woodland beyond those permitted by construction entitlements.

Mr. Rich Marovich, Putah Creek Streamkeeper at the Solano County Water Agency, was contacted on 6 June 2011 to discuss revegetation and restoration efforts on Putah Creek. Mr. Marovich said the following tree species should be replanted: Valley oak (*Quercus lobata*), Oregon ash (*Fraxinus latifolia*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), Western sycamore (*Platanus racemosa*), box elder (*Acer negundo* ssp. *californicum*), red willow (*Salix laevigata*), and sandbar willow (*Salix exigua*). In addition, Mr. Marovich recommended planting big leaf maple (*Acer macrophyllum*), which is native to other parts of Putah Creek, and white alder (*Alnus rhombifolia*), which provides good fish habitat.

Native trees removed in the Fremont Cottonwood Forest and Valley Oak Woodland will be replaced at a 3:1 ratio as specified in the Restoration Plan in Appendix H. A total of 66 native trees will be planted on-site to mitigate for the 22 trees removed during Project construction. Disturbed areas in the BSA will be seeded with native herbaceous plant species in accordance with Appendix G (Revegetation Planting and Erosion Control Specifications).

As discussed in Section 4.2.1.4 a Compensatory Mitigation and Monitoring Plan (CMMP) was prepared for project impacts to VELB habitat (Appendix I). The CMMP requires the planting of 34 associative trees and shrubs for impacts to VELB habitat. The 34 trees/shrubs planted to mitigate Project impacts to VELB habitat will be counted towards mitigation for loss of sensitive natural communities (native trees) in the BSA. A total of 32 additional native

trees will be planted to achieve the 3:1 (66 trees) replacement ratio (66 – 34 = 32; Table 3). The 32 replacement trees will be planted in the BSA along with the 34 native trees required by the CMMP for the VELB. In addition to the native trees planted, it is expected that volunteer native trees will colonize the BSA.

Table 3. Number and Location of Native Replacement Trees to be Planted

Native Tree Species to be Planted	# needed to satisfy VELB CMMP	# of additional trees needed to satisfy mitigation for tree impacts	Total # to be planted in the BSA
Valley oak	10	8	18
Oregon ash	3	3	6
Fremont cottonwood	3	3	6
Western sycamore	3	3	6
Box elder	3	3	6
Red willow	3	3	6
Sandbar willow	3	3	6
Big leaf maple	3	3	6
White alder	3	3	6
Total:	**34**	**32**	**66**

The 32 additional trees planted to mitigate trees removed in the Fremont Cottonwood Forest and Valley Oak Woodland communities in the BSA will be monitored once yearly for a period of two years to assess the success of the mitigation plantings. Monitoring of these trees can be conducted concurrently with monitoring required for VELB CMMP as described in Appendix I. Mitigation for impacts to trees removed will be considered successful and complete if 60% of native tree plantings survive their two year monitoring period. Native volunteer trees that colonize the BSA will be counted towards the 60% success criterion. If the 60% success criterion is not met at the end of the initial two years, Solano County will plant additional trees and continue yearly monitoring until the success criterion is met for two continuous years.

Tree planting in the BSA will be in accordance with the Restoration Plan in Appendix H. After the trees have been planted, the revegetation contractor will supply Solano County with an “as-built” report summarizing the mitigation planting. The report will include a map that clearly indicates the locations, numbers, and types of plants that were planted in the Mitigation Area.

4.1.4.2. PROJECT IMPACTS

The Project will remove an estimated 22 trees in the BSA. Figure 5 shows the location of trees in the BSA and identifies which ones will be removed by the Project. The final tree removal determination will be made by the County.

4.1.4.1. COMPENSATORY MITIGATION

No compensatory mitigation is proposed. The Project proposes to revegetate areas of temporary disturbance within the Project footprint with native vegetation in accordance with Appendix G and Appendix H.

4.1.4.2. CUMULATIVE EFFECTS

With implementation of the revegetation measures, the Project will not result in cumulative impacts to native trees in the Fremont Cottonwood Forest or Valley Oak Woodland in the BSA.

4.2. Special-Status Invertebrates

4.2.1. Discussion of Valley Elderberry Longhorn Beetle (VELB; *Desmocerus californicus dimorphus*)

VELB was listed as a federal threatened species on 8 August 1980, with critical habitat for this species designated at the time of listing. Critical habitat for VELB occurs in Sacramento County (USFWS 1980b). BSA does not occur within Critical Habitat for this species. Although not officially designated critical habitat, the American River Parkway just west of Nimbus Dam, and Putah Creek at Solano Lake Park are considered essential habitat (USFWS 1980b). The BSA does not occur within essential habitat for VELB. In September 2006 the USFWS recommended VELB be delisted (USFWS 2006b); however, delisting of VELB has not yet occurred.

VELB is a two centimeter long beetle that is found only in association with its host plant elderberry (*Sambucus mexicana* and *S. racemosa* var. *microbotrys*). Adults emerge from mid-March through June. Adults feed on foliage, perhaps also the flowers, and mate during this period. The females then lay eggs on living elderberry plants. The first larval instar bores through the center of the elderberry stem and develops for one to two years while feeding on the elderberry pith. Prior to pupation, the larva chews a hole through the bark and plugs it with wood shavings. The larva crawls back into its pupal chamber, metamorphoses, and emerges as an adult (USFWS 2006b).

The elderberry host plant for VELB occurs in a variety of habitats, most commonly in riparian forests and margins and adjacent grassy savannas. Elderberries are also known to occur in oak woodland and mixed chaparral-foothill woodland (USFWS 1991). At the time of listing, loss of riparian habitat was identified as a major threat to VELB (USFWS 2006b). VELB is found in population clusters that are unevenly distributed across available host plants. Host plants are typically large and mature plants, though how the beetle selects a particular host is unknown. Exit holes are circular or slightly oval, and between 7 and 10 mm in diameter (USFWS 1991).

Range: Endemic to the Central Valley. When VELB was listed in 1980, it was known from less than 10 locations on the American River, Putah Creek, and the Merced River in the Central Valley. Currently, VELB is known throughout the Central Valley from southern Shasta County south to Fresno County, and from the east side of the Coast Range to the foothills of the Sierra Nevada. There are records for VELB in Kern County, but they have not been verified (USFWS 2006b). Critical habitat is listed in two areas along the American River in the greater Sacramento metropolitan area (USFWS 1991).

Known Records: There are three CNDDB records for VELB on the project and eight surrounding quads, none of which occur within 5 miles of the BSA. The closest CNDDB record for VELB is from 1991, approximately 6.5 miles southeast of the BSA. VELB were found at Dudley Creek on elderberries along a fence of a residence adjacent to an agriculture field. The second closest CNDDB record for VELB is from 2001, approximately 7.2 miles west-southwest of the BSA. Between one and three adults, and many exit holes, were observed between 1996 and 2001 along Putah Creek and tributaries to Putah Creek. The record is located 0.95 miles south-southwest of BM 133 in Winters, and 1.3 miles west-northwest of the intersection of Winters Road and Bakers Road. Sycamore Environmental conducted a site survey of the Winters Road Bridge at Putah Creek Replacement Project in 2006 (Sycamore Environmental 2007). Potential VELB exit holes were observed on two elderberry shrubs in the Winters Road Bridge BSA.

4.2.1.1. SURVEY RESULTS

During the field survey in March 2011, 29 elderberry shrubs (EB) were mapped in the BSA, and 11 were mapped in the 100-foot buffer surrounding the BSA. Potential VELB exit holes were observed on EB 3 within the BSA and EB 18 within the 100-foot buffer. Elderberry shrub locations are shown on Figure 3 and 4.

4.2.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

There are 11 elderberry shrubs in the BSA that will not be affected by Project construction (Table 4 and Figure 3). To protect the shrubs from disturbance, the County will implement

the following avoidance and protective measures as described in "Conservation Guidelines for the Valley Elderberry Longhorn Beetle" (USFWS 1999a).

- Fence and flag all areas to be avoided during construction activities. In areas where encroachment on the 100-foot buffer has been approved by the Service, provide a minimum setback of at least 20 feet from the dripline of each elderberry plant.
- Brief contractors on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements.
- Erect signs every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.
- Instruct work crews about the status of the beetle and the need to protect its elderberry host plant.

Disturbed ground within the BSA boundary will be revegetated after completion of construction in accordance with the Revegetation Planting and Erosion Control Specifications in Appendix G.

In addition to the protective measures from the "Conservation Guidelines for the Valley Elderberry Longhorn Beetle" (USFWS 1999a) described above, a qualified biologist will train all Project staff regarding habitat sensitivity, identification of VELB, and required practices before the start of construction. The training shall include the general measures that are being implemented to conserve the VELB as they relate to the Project, penalties for noncompliance, and boundaries of the construction area. A fact sheet or other supporting materials containing this information will be prepared and distributed. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.

If a VELB is observed within the BSA, the resource agencies will be contacted within 24 hours of the sighting.

4.2.1.3. PROJECT IMPACTS

The Project would affect 29 elderberry shrubs that provide potential habitat for the federal-listed VELB. As a result, the Project may affect, is likely to adversely affect VELB. Affected and non-affected shrubs are listed in Table 4 and their locations are shown on Figures 3 and 4.

Table 4. Elderberry Shrubs Affected and Not Affected by the Project

	Elderberry shrubs in the BSA affected by the Project	Elderberry shrubs in 100 ft buffer around the BSA and not affected by the Project
Figure 4	EB 3, EB 4, EB 5, EB 6, EB 7, EB 8, EB 9, EB 10, EB 11, EB 12, EB 13, EB 14, EB 15, EB 16, EB 25, EB 26, EB 27, EB 28, EB 29, EB 30, EB 31, EB 32, EB 33, EB 34, EB 35, EB 36, EB 37, EB 38, EB 39	EB 1, EB 2, EB 17, EB 18, EB 19, EB 20, EB 21, EB 22, EB 23, EB 24, EB 40

4.2.1.4. COMPENSATORY MITIGATION

A Compensatory Mitigation and Monitoring Plan (CMMP) has been prepared to address impacts to elderberry shrubs in the BSA (Appendix I). Implementation of the plan will mitigate Project impacts to VELB.

4.2.1.5. CUMULATIVE EFFECTS

There will be no cumulative effects on VELB from the proposed Project.

4.3. Special-Status Fish

4.3.1. Discussion of California Central Valley Steelhead (*Oncorhynchus mykiss*) DPS

California Central Valley steelhead was listed as a federal threatened species on 19 March 1998 (NMFS 1998b), and reaffirmed as threatened on 5 January 2006 (NMFS 2006). The 2006 NMFS ruling applied the Distinct Population Segment (DPS) policy to the species because the resident and anadromous life forms of steelhead remain "markedly separated," and may therefore warrant delineation as a separate DPS. NMFS Fisheries designated critical habitat for 19 ESUs of salmon and steelhead in February 2000, including the California Central Valley steelhead DPS. In this rule, the Lower Sacramento River hydrologic unit was designated as critical habitat in Placer, Sacramento, Solano, Sutter and Yolo counties. The Monticello Dam was considered the upstream extent of critical habitat (NMFS 2000). The February 2000 critical habitat designation for salmon and steelhead were later withdrawn after being legally challenged. NMFS Fisheries designated new critical habitat for 7 ESUs of Pacific salmon and steelhead in California in September 2005 (NMFS 2005). Putah Creek is considered and "occupied but excluded stream," and is not within designated critical habitat for California Central Valley steelhead (NMFS 2005, CalFish 2011). The closest critical

habitat for Central Valley steelhead DPS is located at the Toe Drain (labeled as Yolo Bypass on the Critical Habitat maps), a tributary approximately 15.7 miles downstream from the BSA (NMFS 2005).

Steelhead are an anadromous salmonid species that are born in freshwater and emigrate to the ocean, where they grow until they are ready to return to freshwater to spawn. Unlike Pacific salmon, some steelhead survive after spawning. Survival rates after spawning are quite low (McEwan 1996), and the ones that do survive are more often females (NMFS 2009b).

Steelhead typically migrate during high water flows. Natural channel water depth is usually not a hindrance, but altered streams can pose a significant barrier. Migration begins in the main stem of the Sacramento River in July, peaks near the end of September, and continues through February or March. Spawning occurs mainly from January through March, though it can begin as early as December and extend through April. Spawning water depth ranges from 6 to 24 inches (preferred depth of 14 inches) typically in gravel-sized substrate, but also in a mixture of sand-gravel and gravel-cobble.

Females dig a redd (nest) at a site where there is good inter-gravel flow. High permeability of the gravel is needed to continue incubating and oxygenating the eggs. Eggs are deposited in the redd while an attendant male fertilizes them. The redd is then covered with gravel when the female digs another redd just upstream (McEwan 1996). Eggs typically hatch in 30 days. Fry initially move to shallow protected areas along the stream margin, then move to other areas of the stream and establish feeding locations in riffles with slightly larger cobble and rubble. Steelhead require one to three years of freshwater rearing before emigrating to the ocean, and typically remain at sea for one to four growing seasons before returning to freshwater to spawn (McEwan 1996).

California Central Valley steelhead is grouped into six eco-regions within the Central Valley called diversity groups. The BSA resides in the area of the Northwestern California Diversity Group (NCDG). Extant populations of steelhead in the NCDG are known or believed to occur in Clear Creek, Cottonwood/Beegum Creek, Thomas Creek, and Putah Creek. Anadromous steelhead historically spawned in the upper tributaries flowing into Putah Creek above the Berryessa Valley (now Lake Berryessa); however, there have been no recent confirmed reports of anadromous steelhead in this creek. The Putah Diversion Dam (located west and upstream of the BSA) and the Monticello Dam (located at Lake Berryessa) block migration into historic spawning and rearing areas located in the interdam reach and the upstream Berryessa Valley (NMFS 2009b).

Putah Creek is characterized as having a low potential to support a steelhead population. In May 2000, organizations surrounding Putah Creek agreed to establish permanent surface

water flows for the 23 miles below the Putah Diversion Dam to allow permanent seasonal in-stream flows for salmon and anadromous steelhead. Adult steelhead could potentially make it up the stream under high winter flow, but are unlikely during most flow years unless water is spilling from Lake Berryessa. Part of the conceptual recovery plan scenario aims at establishing a spawning population in a small reach near the Putah Diversion Dam (NMFS 2009b).

Loss of historical spawning habitat, degradation of remaining habitat, and threats to the genetic integrity of the wild spawning populations from hatchery steelhead production programs in the Central Valley are the major threats to steelhead (NMFS 2009b). High summer water temperatures are also drivers of habitat fragmentation, migration, and steelhead population structure in the Central Valley. In addition, impassable dams block access to approximately 80 percent of historically available habitat (McEwan 1996).

There is currently no commercial steelhead fishery in California, and no ocean sport fishery for steelhead (McEwan 1996). Since steelhead is not a commercially fished species, they are not covered under the Magnuson-Stevens Act, and therefore have no essential fish habitat (pers. comm. Michael Tucker).

Range: Steelhead were historically widespread throughout the Central Valley, but were more common in the Sacramento River tributaries than the San Joaquin River tributaries due to natural barriers (NMFS 2007). The current California Central Valley steelhead DPS includes all naturally spawned anadromous populations below natural and manmade impassable barriers in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries. This DPS includes two artificial propagation programs: the Coleman NFH, and Feather River Hatchery steelhead hatchery programs (NMFS 2006). The Sacramento River is currently the main source of steelhead production in the Central Valley (NMFS 2007). Putah Creek is within the distribution range (CalFish 2011, NMFS 2009b), and within the current rearing and/or migration range for Central Valley steelhead DPS (NMFS 2007, NMFS 2009b).

Known Records: There are no CNDDB records for California Central Valley steelhead DPS within the nine-quad area surrounding the BSA. Records of fish, however, are limited in the CNDDB database. There have been no substantiated records of steelhead in Putah Creek since the 1960s (pers. comm., Dr. Peter Moyle)

Mr. Rich Marovich, Putah Creek Streamkeeper for the Solano County Water Agency, was contacted on 6 June 2011 regarding the fish survey data in lower Putah Creek. Mr. Marovich is the main contact for the Lower Putah Creek Watershed Management Action Plan (WMAP; LPCCC 2005), which was also reviewed. Mr. Marovich stated that steelhead has not been

observed during surveys conducted in Putah Creek, and there is no scientific confirmation of steelhead occurring in the creek. Based on the WMAP (LPCCC 2005), steelhead historically spawned in the upper tributaries of Putah Creek, but there are no recent confirmed reports of steelhead in the creek (LPCCC 2005). The Los Rios Check Dam (downstream of the Project at the Yolo Bypass) is currently a fish barrier resulting in low populations of Chinook in Putah Creek. Solano County Water Agency is in the process of trying to remove this barrier (pers. comm. Rich Marovich). The lack of suitable gravel spawning sites is also a constraint for salmon spawning (LPCCC 2005).

Ms. Maria Rea, Supervisor for NMFS Central Valley Office, responded to a request for technical assistance in a letter dated 10 June 2011 regarding federally listed anadromous fish species that may occur in the BSA (Appendix C). The letter stated that California Central Valley steelhead DPS could occur in the BSA, and designated critical habitat may occur downstream from the BSA. NMFS provided recommendations to minimize impacts and adverse effects on listed fish and EFH, and conservation recommendations to fulfill the requirements of section 7(a)(1).

Mr. Joe Heublein, NMFS Natural Resource Management Specialist, was contacted on 29 July 2011 regarding salmon spawning habitat in Putah Creek. Mr. Heublein stated that there is anecdotal information that spawning occurred in Putah Creek historically. Mr. Heublein stated that the biggest concern regarding spawning in Putah Creek is the difficulty in accessing the creek. Flash boards that are connected to the Toe Drain are not removed until late in the season, so there is no early fish passage to Putah Creek. There is no habitat upstream of the Putah Creek Diversion Dam.

Mr. Dylan VanDyne, NMFS Fishery Biologist, was contacted on 2 August 2011 to discuss the proposed temporary creek crossing between Pier 1 and Pier 2.

4.3.1.1. SURVEY RESULTS

California Central Valley steelhead were not observed in Putah Creek during biological surveys of the BSA. There have been no substantiated records of steelhead in Putah Creek since the 1960s (pers. comm., Dr. Peter Moyle).

4.3.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

The following measures will be implemented to avoid and minimize impacts to fish species in Putah Creek. These measures are based on the NMFS list of recommendations to minimize impacts and adverse effects on federal-listed anadromous fish (Appendix C).

- During construction, water quality will be protected by implementation of best management practices (BMPs) of the California Stormwater Quality Association (2003) to minimize the potential for siltation and downstream sedimentation of Putah Creek.

- The in-water work period will be restricted to the period between 1 June and 15 October. This is a period of the year when weather conditions are generally dry and listed fish species are least likely to occur in the project area.
- A silt curtain/fence will be used around any in-water work area to minimize turbidity and sedimentation. Equipment will be refueled and serviced at designated construction staging areas. All construction material will be stored and contained in a designated area that is located away from channel areas to prevent transport of materials into the adjacent Putah Creek. The preferred distance is a minimum 100 feet from the wetted width of the creek. A silt fence will be installed to collect any discharge, and adequate materials for spill cleanup will be kept on site. Construction vehicles and equipment will be maintained to prevent contamination of soil or water from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease.
- A temporary diversion structure will be designed so that fish passage is maintained up and down stream of the BSA. Dewatering in the BSA would include the existing piers to facilitate their rehabilitation. This dewatered basin will be sealed off from the active flows in the Putah Creek before beginning any dewatering using water pillows, rock, sandbags, sheet piling, pipes, coffer dams, or other structural methods approved by the Project Engineer, DFG, and RWQCB. The diversion will not create an impassible barrier. The diversion structure will be designed to pass summertime high flows. The contractor will prepare a creek dewatering plan that complies with any applicable permit conditions.
- If pumps are used to temporarily divert a stream to facilitate construction, an acceptable fish screen must be used to prevent entrainment or impingement of small fish. Potential contact between fish and pump will be minimized and/or avoided by constructing an open basin prior to commencing dewatering. The open basin will be inspected for fish, which will be salvaged and placed in the active flow of Putah Creek adjacent to the work zone by a qualified biologist.
- A biological monitor will conduct a survey of the area to be dewatered immediately after installation of the dewatering device, prior to the continuation of dewatering activities. The monitor will use a net to capture trapped fish in the area to be dewatered. Captured fish will be released into Putah Creek downstream of the active construction zone. Salvage will continue during dewatering activities when fish are concentrated and easier to catch.
- RSP placed on the banks will use a soil-rock mixture to facilitate revegetation of the BSA. A ratio of rock to soil (70:30) is recommended, with a soil-rock mixture on top of

the rock revetment to allow native vegetation to be planted to ensure the riparian habitat is replaced.

- Construction of the bridge will take one season. All disturbed soils in the BSA will undergo erosion control treatment prior to October 15 and/or immediately after construction is terminated at the completion of the Project. Treatment includes temporary seeding and the application of sterile straw mulch. Any disturbed soils on a gradient of over 30 percent will have erosion control blankets installed. Permanent vegetation and tree replanting will take place in small openings in the erosion control blanket, with native species.
- Valley Oak Woodland and Fremont Cottonwood Forest vegetation should be avoided and preserved to the maximum extent practicable. Where riparian vegetation impacts are unavoidable, native tree species 5 inches diameter at breast height (DBH) or greater to be removed will be replaced at a ratio of 3:1. Section 4.1.4 of this NES and Appendix H provides details regarding native tree planting.
- A litter control program shall be instituted at the entire Project site. All workers will ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the study area are deposited in covered or closed trash containers.

In addition to the measures described above, a qualified biologist will train all project staff regarding habitat sensitivity, identification of California Central Valley steelhead, and required practices before the start of construction. The training shall include the general measures that are being implemented to conserve the California Central Valley steelhead as they relate to the project, penalties for noncompliance, and boundaries of the construction area. A fact sheet or other supporting materials containing this information will be prepared and distributed. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.

With the implementation of the avoidance and minimization efforts, the Project will not adversely affect water quality in Putah Creek and fish movement will not be impeded in the creek.

4.3.1.3. PROJECT IMPACTS

There have been no substantiated records of steelhead in Putah Creek since the 1960s (pers. comm., Dr. Peter Moyle). The Project will result in 0.55 acres of temporary impacts to the Fremont Cottonwood Forest riparian community. The removal of riparian vegetation is considered to be an indirect impact. Riparian vegetation provides fish habitat such as shading of the creek which affects temperature, provides litter and invertebrate fall, buffers the creek from impacts from adjacent uplands, and provides large woody debris and stream bank

stability (Flosi et al. 1998). The Project proposes to revegetate areas of temporary disturbance within the Project footprint with native riparian vegetation (Appendix G and Appendix H). Placement of RSP will result in the permanent loss of less than 0.01 acres of Putah Creek. RSP placed on the banks will use a soil-rock mixture to facilitate re-vegetation of the Project area. The Project may affect, is not likely to adversely affect California Central Valley steelhead DPS.

4.3.1.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed. The Project proposes to revegetate areas of temporary disturbance within the Project footprint with native vegetation in accordance with Appendix G and Appendix H.

4.3.1.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.3.2. Discussion Central Valley Fall-run Chinook ESU (*Oncorhynchus tshawytscha*)

Central Valley fall-run Chinook salmon Evolutionary Significant Unit (ESU) is listed as a state species of special concern (DFG 2011b). Chinook are an anadromous salmonid species that are born in freshwater and migrates to the ocean, where they grow until they are ready to return to freshwater to spawn. Chinook salmon do not survive after spawning (NMFS 2011c).

Fall-run Chinook salmon have historically been the most abundant salmon run in California. They are ocean-type salmon adapted for spawning in lowland reaches of big rivers and their tributaries. They move up from the ocean in late summer and early fall in mature condition and spawn within a few days or weeks of arriving on the spawning grounds. Juveniles emerge from the gravel in spring and move downstream within a few months to rear in the mainstem of rivers or estuaries before heading out to sea (Moyle et al. 2002).

In general, a female Chinook prepares a nest (redd) in a stream. Stream characteristics include larger gravel and more water flow than sites used by other Pacific salmon. After laying the eggs, the male fertilizes them, and the adults guard the nest from a few days to up to a month before dying. Depending on water temperatures, Chinook salmon eggs hatch after three to five months. Hatching occurs during the following spring when the water is sufficient for juvenile survival and growth. Juveniles spend from three months to two years in freshwater before migrating to estuarine areas as smolts, and then into the ocean to feed and mature. As out-migration approaches, juveniles change their scale markings. Parr marks, a pattern of vertical bars and spots used for camouflage, are lost and replaced with a dark back and light belly coloration used by fish in open water. Gills and kidneys also begin to change

to process salt water. Ocean rearing time varies between one and six years, commonly two to four. An exception are yearling males (jack salmon), which either mature in freshwater or return to freshwater after two to three months in salt water (NMFS 2011c).

Range: Central Valley fall-run Chinook salmon ESU includes all naturally spawning populations of fall-run Chinook salmon in the Sacramento and San Joaquin River Basins and their tributaries, east of Carquinez Strait, California (NMFS 2010, DFG 2011b).

Known Records: There are no CNDDB records for Central Valley fall-run Chinook salmon ESU within the nine-quad area surrounding the BSA. Records of fish, however, are limited in the CNDDB database. The BSA occurs in the Lower Sacramento Hydrologic Unit (18020109), which has been designated as EFH.

Mr. Rich Marovich, Putah Creek Streamkeeper for the Solano County Water Agency, was contacted on 6 June 2011 regarding the fish survey data in lower Putah Creek. Mr. Marovich is the main contact for the Lower Putah Creek Watershed Management Action Plan (LPCCC 2005), which was also reviewed. Mr. Marovich stated that fall-run Chinook salmon adults and redds have been found in Putah Creek. Chinook salmon have historically spawned in Putah Creek and, after decades of sparse occurrences, returned to spawn in larger numbers in lower Putah Creek in fall 2003 (LPCCC 2005). Fall 2003 was one of the largest runs of Chinook salmon that occurred in Putah Creek in recent years (LPCCC 2005). Mr. Marovich said that Chinook salmon had not been found in Putah Creek during the most recent survey in October 2010. The Los Rios Check Dam (downstream of the Project, at the Yolo Bypass) is currently a fish barrier resulting in low populations of salmon in Putah Creek. Solano County Water Agency is in the process of trying to remove this barrier. The lack of suitable gravel spawning sites is also a constraint for salmon spawning (LPCCC 2005).

Ms. Maria Rea, Supervisor for NMFS Central Valley Office, responded to a request for a technical assistance in a letter dated 10 June 2011 regarding federally listed anadromous fish species that may occur in the BSA (Appendix C). The letter stated that the Project may affect EFH for Pacific salmon. NMFS provided recommendations to minimize impacts and adverse effects on EFH, and conservation recommendations to fulfill the requirements of section 7(a)(1).

Mr. Joe Heublein, NMFS Natural Resource Management Specialist, was contacted on 29 July 2011 regarding salmon spawning habitat in Putah Creek. Mr. Heublein stated that there is anecdotal information that spawning occurred in Putah Creek historically. Mr. Heublein stated that the biggest concern regarding spawning in Putah Creek is the difficulty in accessing the creek. Flash boards that are connected to the Toe Drain are not removed until

late in the season, so there is no early fish passage to Putah Creek. There is no habitat upstream of the Putah Creek Diversion Dam.

Mr. Dylan VanDyne, NMFS Fishery Biologist, was contacted on 2 August 2011 to discuss the proposed temporary creek crossing between Pier 1 and Pier 2.

4.3.2.1. SURVEY RESULTS

Central Valley fall/ late fall-run Chinook salmon ESU were not observed in Putah Creek during biological surveys of the BSA. Central Valley fall/ late fall-run Chinook salmon ESU is known to occur in the BSA.

4.3.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

The avoidance and minimization efforts described in Section 4.3.1.2 for California Central Valley steelhead DPS will also protect Central Valley fall-run Chinook salmon ESU and EFH.

4.3.2.3. PROJECT IMPACTS

The Project will result in 0.55 acres of temporary impacts to the Fremont Cottonwood Forest riparian community. The removal of riparian vegetation is considered to be an indirect impact. Riparian vegetation provides fish habitat such as shading of the creek which affects temperature, provides litter and invertebrate fall, buffers the creek from impacts from adjacent uplands, and provides large woody debris and stream bank stability (Flosi et al. 1998). The Project proposes to revegetate areas of temporary disturbance within the Project footprint with native riparian vegetation (Appendix G and Appendix H). Placement of RSP will result in the permanent loss of less than 0.01 acres of Putah Creek. RSP placed on the banks will use a soil-rock mixture to facilitate revegetation of the Project area.

4.3.2.4. COMPENSATORY MITIGATION

No compensatory mitigation is necessary for Central Valley fall/ late fall-run Chinook salmon ESU. No compensatory mitigation is proposed for EFH. The Project proposes to revegetate areas of temporary disturbance within the Project footprint with native vegetation in accordance with Appendix G and Appendix H.

4.3.2.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.4. Special-Status Amphibians

There is no habitat for special-status amphibians in the BSA.

4.5. Special-Status Reptiles

4.5.1. Discussion of Western Pond Turtle (WPT; *Emys marmorata*)

WPT is listed as a state species of special concern (DFG 2011b). WPT is associated with permanent or nearly permanent water in a wide variety of habitats, such as permanent ponds, reservoirs, lakes, rivers, streams, irrigation ditches, permanent and ephemeral shallow wetlands, permanent pools along intermittent streams, abandoned gravel pits, stock ponds, and sewage treatment lagoons (CWHR 2011, BLM 2006). Pools are the preferred habitat when found in streams (BLM 2006). The presence of adequate emergent basking sites, emergent vegetation, and suitable refugia is also preferred (BLM 2006). Basking sites include partially submerged logs, rocks, mats of floating vegetation, or open mud banks. In colder areas, hibernation occurs underwater in bottom mud (CWHR 2011). WPT are omnivorous and are known to feed on aquatic plant material, small insects, aquatic invertebrates, fish, frogs, snakes, and carrion (CWHR 2011, BLM 2006). Home range varies from 2.42 acres in males and 0.62 acres in females, with daily movements ranging from 92 to 286 feet (BLM 2006).

Courtship and mating of WPT have been observed most of the year except December through January. Nesting occurs from late April through August (BLM 2006). Two distinct habitats may be used for oviposition: along large slow-moving streams, nests are constructed in sandy banks; and along foothill streams, females may climb hillsides to find a suitable nest site (CWHR 2011). Typically, nests have been observed in open, grassy areas with a southern exposure (BLM 2006). Females may travel up to 1.2 miles to find suitable nesting habitat (BLM 2006). WPT nests are usually 4 inches deep, and have been observed in soil types from sandy to very hard. Three to 13 eggs are laid from March to August, depending on local conditions and female body size (CWHR 2011, BLM 2006). Egg incubation varies with latitude, and can range from 80 to 126 days (BLM 2006). In northern California, hatchlings remain in the nest through the winter (BLM 2006). Sexual maturity is attained from six or seven (BLM 2006) to about eight years (CWHR 2011) in age.

Range: WPT ranges from southern Washington south to Baja California west of the Sierra-Cascade crest from sea level to 4,690 feet. WPT is absent from desert regions except along the Mojave River and its tributaries in the Mojave Desert (CWHR 2011).

Known Records: There are two CNDDB records for WPT in the nine-quad area surrounding the BSA, none of which occur within 5 miles of the BSA. The closest record is from 2001, approximately 5.3 miles east of the BSA. WPT was found in the UC Davis Arboretum Waterway (North Fork of Putah Creek) along the southern edge of the UC Davis Campus. Virtually all of the surrounding vegetation is non-native and heavily irrigated. A total of 76

adults, one hatchling, and eight juveniles were captured in a mark and recapture study from September 1996 to May 2001. Nest and neonatal survival were almost zero in the urbanized setting. The second CNDDB record for WPT is from 1990, approximately 7.0 miles west of the BSA. WPT was observed along Putah Creek and an unnamed tributary south-southeast of Winters.

4.5.1.1. SURVEY RESULTS

WPT were not observed during general biological surveys in the BSA. Putah Creek in the BSA provides potential habitat for WPT.

4.5.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

The following avoidance and minimization efforts will be implemented:

- A survey of the BSA will be conducted for WPT within one week prior to initial construction activities. A qualified biologist will be present during grubbing and clearing activities in the riparian corridor to ensure that no WPT are present. If a WPT is observed in the construction area, construction will cease until the biologist has either removed the WPT from the construction zone, or, after thorough inspection, determined the WPT has moved away from the construction zone.
- Environmentally Sensitive Areas (ESAs) will be established along the boundaries of the BSA to exclude construction activities from the riparian habitat that is not to be affected. Temporary orange construction barrier fencing will be installed to define the limits of the ESA.

4.5.1.3. PROJECT IMPACTS

With implementation of the avoidance and minimization measures, the proposed Project will not affect WPT.

4.5.1.4. COMPENSATORY MITIGATION

No compensatory mitigation is necessary for WPT.

4.5.1.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.5.2. Discussion of Giant Garter Snake (GGS; *Thamnophis gigas*)

Giant garter snake (GGS) was state listed as threatened in 1971, and federally listed as threatened in 1993 (USFWS 1999b, DFG 2011b). Historically inhabiting natural wetlands, GGS now inhabits agricultural wetlands and other waterways, such as irrigation and drainage canals, ricelands, marshes, sloughs, ponds, small lakes, low gradient streams, and adjacent

uplands. Essential habitat components consist of: 1) adequate water during the snake's active season (early spring through mid-fall) to provide adequate permanent water to maintain dense populations of food organisms; 2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; 3) upland habitat with grassy banks and openings in waterside vegetation for basking; and 4) higher elevation upland habitats for cover and refuge from flood waters during the snake's inactive season in the winter.

GGS primarily feed on aquatic prey, such as fish and amphibians. They appear to take advantage of pools which trap and concentrate prey items. In response to disturbance, GGS quickly retreat or dive underwater, remain motionless, or retreat underground. GGS are most active from spring to mid-fall (approximately April through the end of October). The breeding season begins after emergence from overwintering sites, approximately March through May, and resumes briefly in September. Females brood young internally, and give birth to live young from late July through early September. Young scatter immediately into dense cover and absorb their yolk sacs, and begin feeding on their own (USFWS 1999b).

GGS are absent from larger rivers, and from wetlands with sand, gravel or rock substrates. Riparian woodlands do not typically provide suitable habitat because of excessive shade, lack of basking sites, and the absence of prey populations. Ideal marsh habitat would have shallow and deep water with variations in topography, including higher grounds. This habitat is often found in rice fields, where GGS now appear to be the most numerous. Basking occurs in bulrush, cattails, shrubs overhanging the water, patches of waterweed and other floating vegetation, and on grassy banks. Riparian vegetation such as saltbush and willows provide cover from predation. GGS will also bask in openings in vegetation created by riprap placed around water control structures. Small mammal burrows and other soil crevices above the flood elevation are used during the winter. Burrows are typically located in sunny exposures along south and west facing slopes (USFWS 1999b).

Range: GGS is endemic to wetlands in the Central Valley of California, from Red Bluff to Bakersfield. Once common throughout the Central Valley, GGS is currently found in the Sacramento Valley and isolated populations in San Joaquin Valley. The GGS Recovery Plan recognizes 13 separate populations of GGS that coincide with riverine flood basins and tributary streams: Butte Basin, Colusa Basin, Sutter Basin, American Basin, Yolo Basin/Willow Slough, Yolo Basin/Liberty Farms, Sacramento Basin, Badger Creek/Willow Creek, Caldoni Marsh, East Stockton – Diverting Canal and Duck Creek, North and South Grasslands, Mendota, and Burrel/Lanare. These populations occur in Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo counties (USFWS 1999b).

Known Records: There is one CNDDB record for GGS within 5 miles of the BSA. This record is from 1976, approximately 5 miles downstream (east) of the BSA. The CNDDB record is based on DFG records, and located along the South Fork of Putah Creek at Old Davis Road in Davis. GGS was not found during subsequent surveys in 1986 and 1987. Based on aerial imagery from Google Earth, dated 20 September 2010, the riparian woodland vegetation at this location is spare, providing areas for basking sites.

4.5.2.1. SURVEY RESULTS

GGS were not observed during general biological surveys in the BSA. The BSA does not provide habitat for GGS. Putah Creek is surrounded by dense riparian woodland, which provides shade and a lack of basking sites. The project may affect, is not likely to adversely affect GGS.

4.5.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

The BSA does not provide habitat for GGS. No avoidance and minimization efforts are proposed.

4.5.2.3. PROJECT IMPACTS

The proposed Project may affect, is not likely to adversely affect GGS.

4.5.2.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.5.2.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.6. Special-Status Birds

4.6.1. Migratory Birds and Birds of Prey Discussion

Fish and Game Code 3503.5 protects all birds in the orders Falconiformes and Strigiformes (collectively known as birds of prey). Birds of prey include raptors, falcons, and owls. Other DFG codes protecting birds and their nests are 3503, 3513, and 3800. Migratory birds are protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10 including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). All migratory bird species are protected by the MBTA. Any disturbance that causes direct injury, death, nest abandonment, or forced fledging of migratory birds, is restricted under the MBTA. Any removal of active

nests during the breeding season or any disturbance that results in the abandonment of nestlings is considered a 'take' of the species under federal law.

4.6.1.1. SURVEY RESULTS

The BSA provides potential nesting habitat for birds of prey and birds listed by the MBTA. Occupied swallow nests were observed beneath Stevenson Bridge. An unoccupied bird nest was observed within 100 feet of the southwest side of the BSA. Additional nests could become established in or near the BSA before construction begins.

4.6.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

Under the MBTA, nests that contain eggs or unfledged young are not to be disturbed during the breeding season. The nesting season for migratory birds and birds of prey is generally 1 February through 31 August. Preconstruction nest surveys will be conducted. Implementation of the following avoidance and minimization measures will avoid potential impacts.

Swallows

Cliff swallows arrive in mid-February, increase in numbers until late March, and remain until October. Nesting begins in April, peaks in June, and continues into August. Measures shall be taken to prevent establishment of cliff swallow nests prior to construction. Techniques to prevent nest establishment include the following:

- The contractor can visit the site weekly and remove partially completed nests using either hand tools or high pressure water; or
- Hang netting from the bridge before nesting begins. If this technique is used, netting should be in place from late February until project construction begins.

Birds of Prey and Birds Protected by the Migratory Bird Treaty Act

<u>Preconstruction Activities</u>

- Trees and vegetation scheduled for removal may be removed during the non-breeding season from 1 September to 31 January. Vegetation removal includes trees and vegetation within the stream zone. Vegetation may be removed using hand tools, including chain saws and mowers, and may be trimmed several inches above the ground with the roots left intact to prevent erosion.
- If tree and vegetation removal is scheduled to begin during the breeding season, 1 February and 31 August, then a qualified biologist shall conduct a preconstruction survey for active nests at the project site and within 250 feet of the project site from

publicly accessible areas within one week prior to vegetation removal activities If no active nest of a bird of prey or MBTA bird is found, then no further mitigation measures are necessary. If an active nest is found, the buffer and/or monitoring measures described below will be implemented.

- Tree and vegetation removal are pre-construction activities, and not considered the commencement of construction.

Construction Activities

- If construction begins outside the 1 February to 31 August breeding season, there will be no need to conduct a preconstruction survey for active nests.
- If construction is scheduled to begin between 1 February and 31 August then a qualified biologist shall conduct a preconstruction survey for active nests at the construction site and within 250 feet of the construction site from publicly accessible areas within one week prior to construction. If no active nest of a bird of prey or MBTA bird is found, then no further mitigation measures are necessary.
- If an active nest of a bird of prey or MBTA bird is found at any time, then the biologist shall establish a minimum 250-foot Environmentally Sensitive Area (ESA) around the nest if the nest is of a bird of prey, and a minimum 100-foot ESA around the nest if the nest is of an MBTA bird other than a bird of prey.
- No vegetation removal or construction activity shall be allowed in the buffer until the biologist determines that the nest is no longer active, or unless monitoring determines that a smaller buffer will protect the active nest.
- The buffer may be reduced if the biologist monitors the vegetation removal or construction activities and determines that no disturbance to the active nest is occurring. The size of suitable buffers depends on the species of bird, the location of the nest relative to the Project, Project activities during the time the nest is active, and other Project specific conditions.
- Between 1 February and 31 August, if additional trees or shrubs need to be trimmed and/or removed after construction has started, a survey will be conducted for active nests in the area to be affected. If an active nest is found, the above measures will be implemented.
- If an active nest is identified in or adjacent to the construction zone after construction has started, the above measures will be implemented to ensure construction is not causing disturbance to the nest.

4.6.1.3. PROJECT IMPACTS

Removal or abandonment of an active nest due to construction would be considered a significant impact. As a precautionary measure, preconstruction surveys will be conducted for raptor and migratory bird nests.

4.6.1.4. COMPENSATORY MITIGATION

No compensatory mitigation is necessary for birds of prey and migratory birds.

4.6.1.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.6.2. Discussion of grasshopper sparrow (*Ammodramus savannarum*)

Grasshopper sparrow is listed as a state species of special concern (DFG 2011b). Grasshopper sparrows are a summer resident in California from March through September, and are considered rare and secretive in California during winter. The ecology of this species varies from region to region, and has received little research in California (Shuford and Gardali 2008).

In general, the grasshopper sparrow prefers short to middle-height, dense to moderately open grasslands with scattered shrubs for singing perches (CWHR 2011, Shuford and Gardali 2008). They prefer large tracts of habitat, and are generally absent in areas with extensive shrub cover. Foraging mainly occurs on bare ground or from low vegetation (Shuford and Gardali 2008). Thick cover is necessary for concealment (CWHR 2011). Native bunchgrass is an important habitat component in parts of its range, though this is not the case in most of the state. Grasshopper sparrow feeds primarily on insects, such as grasshoppers, but also on plant seeds, such as knotweed (*Polygonum* spp.), campion (*Lychnis* spp.), oats (*Avena* spp.), and pigweed (*Amaranthus* spp.). Populations fluctuate markedly from year to year, perhaps shifting to take advantage of habitat variability caused by precipitation differences or grazing activities. Urbanization is the primary current threat (Shuford and Gardali 2008).

The breeding season for grasshopper sparrows occurs from mid-March to August (Shuford and Gardali 2008). Nests are built with grasses and forbs in a slight depression in the ground at the base of a grass clump (CWHR 2011, Shuford and Gardali 2008). Nests are domed with a side entrance, well concealed by overhanging grass. Pairs nest solitary or in semi-colonial breeding groups of three to 12 pairs. The female incubates three to six eggs for 11 to 12 days. Females tend the young while the male guards the nest. Young leave the nest in approximately nine days, though they are still unable to fly (Shuford and Gardali 2008). Pairs

can raise up to three broods in a year (CWHR 2011), and will re-nest following nest failure (Shuford and Gardali 2008). Nesting sites are of concern to DFG (2011).

Range: Grasshopper sparrows are a summer resident from Mendocino, Trinity, and Tehama counties south, west of the Cascade-Sierra Nevada axis and southeastern deserts, to San Diego County, from sea level to 4,900 feet. This species is known to occur on the coast slope of southern California during winter (Shuford and Gardali 2008).

Known Records: There is one CNDDB record for grasshopper sparrow in the nine-quad area surrounding the BSA, none of which occur within 5 miles of the BSA. The closest CNDDB record for grasshopper sparrow is from 2007, approximately 12.5 miles southeast of the BSA. The site is located on the west side of Etzel Road and 0.4 miles north of Delhi Road, southeast of Dixon. One adult was observed in June, and had been observed by several people in the area over a week. Surrounding habitat consisted of non-native grassland and agriculture.

4.6.2.1. SURVEY RESULTS

Grasshopper sparrow was not observed during general biological surveys in the BSA. The oak woodland at the northeast section of the BSA provides marginal habitat for grasshopper sparrow because of the presence of oak woodlands and its small size. The oak woodland understory has dense grassland.

4.6.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

Avoidance and minimization efforts described in Section 4.6.1.2 for migratory birds and birds of prey will also protect grasshopper sparrow.

4.6.2.3. PROJECT IMPACTS

Removal or abandonment of an active nest due to construction would be considered a significant impact. As a precautionary measure, preconstruction surveys, described in Section 4.6.1.2, will be conducted.

4.6.2.4. COMPENSATORY MITIGATION

No compensatory mitigation is necessary for grasshopper sparrow.

4.6.2.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.6.3. Discussion of burrowing owl (*Athene cunicularia*)

Burrowing owl is state listed as a species of special concern (DFG 2011b). Burrowing owls primarily inhabit open, dry grassland and desert habitats, such as grasses, forbs, and open shrub stages of pinyon-juniper and ponderosa pine habitats (CWHR 2011, Shuford and Gardali 2008). Main habitat components include burrows for roosting and nesting, and relatively short vegetation with sparse shrubs and taller vegetation (Shuford and Gardali 2008). Burrowing owls most commonly use ground squirrel burrows, but they may also use badger, coyote, and fox holes or dens; or human-made structures such as culverts, piles of concrete rubble, pipes and nest boxes (CWHR 2011, Shuford and Gardali 2008). An active nest chamber is often lined with excrement, pellets, debris, grass and feathers (CWHR 2011). This species also thrives in highly altered human landscapes. In agricultural areas, owls nest along roadsides, under water conveyance structures, and near and under runways and similar structures. In urban areas, burrowing owls persist in low numbers in highly developed parcels, busy urban parks, and adjacent to roads with heavy traffic. In the Imperial Valley, owls are able to excavate their own burrows in soft earthen banks of ditches and canals (Shuford and Gardali 2008).

Burrowing owls are a semi-colonial species that breeds in California from March through August, though breeding can begin as early as February and extend into December (Shuford and Gardali 2008, CWHR 2011). The female typically lays two to 10 eggs and young emerge from the burrow in about two weeks. The young are able to fly by week four (CWHR 2011). A large proportion of adults show strong nest site fidelity, though both young and adults have a high dispersal rate (Shuford and Gardali 2008). Burrowing owls will perch in open sunlight in the early morning, and move to shade or the burrow when hot (CWHR 2011). Owls typically feed on a broad range of arthropods, but also feed on small rodents, birds, amphibians, reptiles, and carrion. Foraging usually occurs close to their burrow. The greatest threat to burrowing owls is habitat loss and degradation from rapid urbanization of farmland in the core of the Central and Imperial valleys (Shuford and Gardali 2008). Burrow sites and some wintering sites are of concern to DFG (2011).

Range: Burrowing owls are a year round resident in most of the state, particularly in the Central Valley, San Francisco Bay region, Carrizo Plain, and Imperial Valley (Shuford and Gardali 2008). This species is generally absent from the humid coastal counties north of Marin and mountainous areas above 5,300 feet (CWHR 2011, Shuford and Gardali 2008). This species has declined along the central and southern coast, but large populations remain in agricultural areas in the Central and Imperial valleys, often on private lands (Shuford and Gardali 2008).

Known Records: There are 77 CNDDB records in the nine-quad area surrounding the BSA, five of which occur within five miles of the BSA. The closest CNDDB record for burrowing owl is from 1989, approximately 2.4 miles north of the BSA. The site is located 0.7 miles north on County Road 95 from the intersection of County Road 31, adjacent to the Yolo County Airport. Ten pairs were seen from 1976 to 1980. The site was flooded in 1983 to create a pond, and no owls have been seen since. The second closest record is from 2003, approximately 3.2 miles northeast of the BSA. The burrow was located on the south bank of an east/west drainage on the north side of Hwy 128. One owl was flushed from the burrow site in 1992, and no owls were observed in 2003.

4.6.3.1. SURVEY RESULTS

Burrowing owls or small mammal burrows were not observed during the general biological survey in the BSA. Ground squirrel burrows could become established in the BSA prior to construction.

4.6.3.2. AVOIDANCE AND MINIMIZATION EFFORTS

During the burrowing owl non-breeding season (1 September to 31 January) of the winter prior to construction, it is recommended that a biologist survey the BSA for wintering burrowing owls or potential denning habitat. If wintering burrowing owls are found in the BSA, they should be passively excluded in accordance with the DFG 1995 guidelines, prior to the start of the nesting season. If unoccupied burrows suitable for burrowing owl are found, the burrows should be collapsed. The BSA should be maintained free of burrows until construction commences to avoid the potential for a nesting burrowing owl in the BSA.

Avoidance and minimization efforts described in Section 4.6.1.2 for migratory birds and birds of prey will also protect burrowing owl.

4.6.3.3. PROJECT IMPACTS

Removal or abandonment of an active nest due to construction would be considered a significant impact. As a precautionary measure, preconstruction surveys, described in Section 4.6.1.2, will be conducted.

4.6.3.4. COMPENSATORY MITIGATION

No compensatory mitigation is necessary for burrowing owl.

4.6.3.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.6.4. Discussion of Swainson's hawk (*Buteo swainsoni*)

Swainson's hawk is state listed as threatened (DFG 2011b). Swainson's hawk breed from late March to late August, with peak activity late May through July. Between two to four eggs are incubated for 25 to 28 days (CWHR 2011). Throughout its range, Swainson's hawks nest almost exclusively in trees. In a few instances, they have been recorded nesting on cliffs, coulees, structures, and the ground, but these sites are rarely used (BLM 2006). Nesting habitat includes stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Nests are built on a platform of sticks, bark, and fresh leaves in a tree, bush, or utility pole from 4 to 100 feet above the ground (CWHR 2011). Swainson's hawk will often return to areas where they nested the previous year (NatureServe 2011). Nesting sites are of concern to DFG (2011).

Swainson's hawk forage in grasslands or suitable grain or alfalfa fields, or livestock pastures adjacent to nesting areas. They feed on mice, gophers, ground squirrels, rabbits, large arthropods, amphibians, reptiles, birds, and rarely, fish (CWHR 2011).

Range: Swainson's hawk is a resident and breeding migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert with limited breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, and Antelope Valley (CWHR 2011). Nearly all Swainson's hawks spend the winter in South America (BLM 2006).

Known Records: There are 473 CNDDB records for Swainson's hawk in the nine-quad area surrounding the BSA, 102 of which occur within 5 miles of the BSA. There are seven CNDDB occurrences for Swainson's hawk within one mile of the BSA, five of which occur along Putah Creek. The closest CNDDB record for Swainson's hawk is from 1992, approximately 0.25 miles east of the BSA. A nest was located in a eucalyptus tree in the riparian area surrounding Putah Creek. Agricultural fields provided foraging habitat surrounding the nest. A more recent CNDDB record for Swainson's hawk is from 2005, approximately 0.34 miles south of the BSA. A nest was located in a deodar cedar adjacent to a large house with many varied trees, on the west side of Stevenson Bridge Road.

4.6.4.1. SURVEY RESULTS

Several Swainson's hawks were observed flying over the BSA. The BSA provides suitable foraging habitat for this species. Trees in and adjacent to the BSA provide suitable nesting habitat.

4.6.4.2. AVOIDANCE AND MINIMIZATION EFFORTS

Avoidance and minimization efforts described in Section 4.6.1.2 for migratory birds and birds of prey will also protect Swainson's hawk.

4.6.4.3. PROJECT IMPACTS

Removal or abandonment of an active nest due to construction would be considered a significant impact. As a precautionary measure, preconstruction surveys, described in Section 4.6.1.2, will be conducted. With implementation of the avoidance and minimization measures, the Project will not adversely affect Swainson's hawk. The Project will not result in the loss of suitable foraging habitat.

4.6.4.4. COMPENSATORY MITIGATION

No compensatory mitigation is necessary for Swainson's hawk.

4.6.4.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.6.5. Discussion of White-tailed kite (*Elanus leucurus*)

White-tailed kite is a DFG fully protected species (DFG 2011b). White-tailed kite roosts in trees with dense canopies. They also roost in saltgrass and Bermuda grass in southern California. Roosting sites can be communal during nonbreeding seasons. Nests are typically located near the top of dense oak, willow, or other tree stands from 20 to 100 feet above the ground. The nests are made out of loosely piled sticks and twigs lined with grass, straw, or rootlets, and located near open foraging areas with herbaceous lowlands and variable tree growth. White-tailed kite breeds from February to October, with peak activity occurring from May through August. Between four and five eggs are incubated for 28 days, and the young fledge in 35 to 40 days (CWHR 2011). Nesting sites are of concern to DFG (2011).

Range: White-tailed kite is a common to uncommon yearlong resident in coastal and valley lowlands, and is rarely found far from agricultural areas. This species typically inhabits herbaceous and open stages of most habitats, mainly in cismontane California (CWHR 2011).

Known Records: There are 11 records of white-tailed kite in the nine-quad area surrounding the BSA, three of which occur within 5 miles of the BSA. The closest CNDDB record is from 1993, approximately 2.0 miles north of the BSA. The nest site was located in a line of pine trees with a few eucalyptus, bordered on the north and south by fallow fields. Two adults and two juveniles were observed nesting and foraging. The second closest CNDDB record for white-tailed kite is from 1993, approximately 3.0 miles east of the BSA. A nest site was located on the south side of Putah Creek in the riparian area dominated by oaks and poplars. Fallow fields were adjacent to the riparian area bordered with a few pines. Two

adults and one fledged young were observed in September. Several other kite nests in the vicinity had failed.

4.6.5.1. SURVEY RESULTS

White-tailed kite was observed flying over the BSA. Potential nesting and foraging habitat for white-tailed kite occurs in the BSA.

4.6.5.2. AVOIDANCE AND MINIMIZATION EFFORTS

Avoidance and minimization efforts described in Section 4.6.1.2 for migratory birds and birds of prey will also protect white-tailed kite.

4.6.5.3. PROJECT IMPACTS

Removal or abandonment of an active nest due to construction would be considered a significant impact. As a precautionary measure, preconstruction surveys, described in Section 4.6.1.2, will be conducted.

4.6.5.4. COMPENSATORY MITIGATION

No compensatory mitigation is necessary for white-tailed kite.

4.6.5.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.7. Special-Status Mammals

4.7.1. Discussion of Pallid bat (*Antrozous pallidus*)

Pallid bat is listed as a state species of special concern (DFG 2011b). Pallid bat is a large, light-colored bat with prominent ears that inhabits rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations, and higher elevation coniferous forests, often in xeric ecosystems. Foraging occurs over open shrub-steppe grasslands, oak savannah grasslands, open Ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards (WBWG 2005). Winter habitats are poorly known, but pallid bats do not migrate long distances between summer and winter sites. Overwintering sites in coastal California are located in protected structures that have a relatively cool, stable temperature. Elsewhere, pallid bats have been found hibernating alone or in small groups wedged deeply into narrow fissures in mines, caves, and buildings (WBWG 2005).

Pallid bat may roost alone, in small groups, or gregariously. Day and night roosts are similar, consisting of crevices in rocky outcrops and cliffs, caves, mines, trees (basal hollows of coast

redwoods and giant sequoias, bole cavities of oaks, exfoliating Ponderosa pine and Valley oak bark, deciduous trees in riparian areas, and fruit trees in orchards), and various human structures such as bridges (especially wooden and concrete girder designs), barns, porches, bat boxes, and human occupied as well as vacant buildings (WBWG 2005). Roosts are warm and high above the ground where they are inaccessible to terrestrial predators, though the species has been found roosting on or near the ground under burlap sacks, stone piles, rags, and baseboards. Roosting sites are often reused, but are switched on a daily and seasonal basis (WBWG 2005). Pallid bat is known to nest in artificial roosting sites. Smaller artificial roosts are typically used by males, and do not attract larger maternity colonies (Tatarian 2001). Pallid bat is very sensitive to roosting site disturbance (CWHR 2011).

Female and young pallid bats roost in maternity colonies separate from adult and yearling males. Mating occurs from October to February, with one to two (sometimes three) pups born from late April to July. Young are weaned in August, and maternity colonies disperse between August and October. Exact dates vary across latitudes and between years. Sexual maturity can be reached in one year for both males and females (WBWG 2005).

Passive acoustic cues, occasionally echolocation, are usually used to locate prey. This species has an extensive collection of social communication calls, some of which can be heard by humans. Pallid bats are opportunistic generalists that eat a variety of insects captured on the ground and on the wing. Rarely, they eat geckos, lizards, skinks, and small rodents. Diet and foraging style tend to vary within and between populations (WBWG 2005). Pallid bat is known to roost with other bats, typically *Myotis* spp. and Brazilian free-tailed bat (*Tadarida brasiliensis*; CWHR 2011).

Range: Locally common in low elevations. Pallid bat occurs throughout California except for the high Sierra Nevada and the northwest corner of the state (CWHR 2011).

Known Records: There are 2 records of pallid bat in the nine-quad area surrounding the BSA, none of which occur within 5 miles of the BSA. The closest CNDDB record is from 1964, approximately 5.5 miles east of the BSA. One female specimen was collected in Davis by Albert Beck in July of 1964. The second closest CNDDB record for pallid bat is from 1957, approximately 10.5 miles northeast of the BSA. One male specimen was collected by Charles Thaeler Jr. and Robert Rudd in Woodland.

4.7.1.1. SURVEY RESULTS

Pallid bat was not observed during general biological surveys in the BSA. Stevenson Bridge has an artificial bat box attached to the underside of the bridge. Bat vocalizations were heard from the artificial bat box during the March 2011 field survey, but the bat species was not identified. Pallid bat is known to roost under bridges and in artificial roosting sites. Due to

the small size of the bat box and lack of caves, cliffs, and mines, it is unlikely that a roosting colony of pallid bats would occur in the BSA. Pallid bat has the potential to occur in the BSA.

4.7.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

The following mitigation measure will prevent adverse impacts to these species.

- A preconstruction survey will be performed by a qualified biologist to determine if bat species are roosting on the underside of the bridge or in the artificial bat box. The survey will be performed prior to April 1 before the bats have given birth. If bats are roosting on the bridge or in the bat box, exclusion of these bats shall take place prior to construction. After the bats have been excluded, the bat box should be removed from the bridge.
- An additional survey will be conducted two weeks before construction activities to determine if bat species are still roosting on the bridge. If roosting is occurring, the County will contact DFG for additional guidance on bat avoidance and impact minimization during rehabilitation activities.

4.7.1.3. PROJECT IMPACTS

With implementation of the avoidance and minimization measure, the proposed Project will not adversely affect pallid bat.

4.7.1.4. COMPENSATORY MITIGATION

No compensatory mitigation is necessary for pallid bat.

4.7.1.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.7.2. Discussion of Non-Special-Status Bat Species

Non-special-status bat species could occur within the study area. Many widespread bat species roost in orchards, trees, crevices, bat boxes, abandoned swallow nests and under bridges (WBWG 2005). Most California bat species mate in the fall and give birth in the spring to mid-summer (May through July; CWHR 2011).

4.7.2.1. SURVEY RESULTS

Bats could roost in crevices, abandoned swallow nests, or in the bat box on the underside of Stevenson Bridge in the BSA. Bats could also roost in the trees and orchard in the BSA. Bat

vocalizations were heard from the artificial bat box during the March 2011 field survey, but the bat species was not identified.

4.7.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

Avoidance and minimization efforts described in Section 4.7.1.2 for pallid bat will also protect non-special-status bat species. Avoidance and minimization measures described in Section 4.6.1.2 for migratory birds and birds-of-prey requires the removal of trees between 1 September and 31 January. This measure will also minimize impacts to bat nursery colonies.

4.7.2.3. PROJECT IMPACTS

With implementation of the avoidance and minimization measure, the proposed Project will not adversely affect non-special-status bat species.

4.7.2.4. COMPENSATORY MITIGATION

No compensatory mitigation is necessary for non-special-status bat species.

4.7.2.5. CUMULATIVE EFFECTS

No cumulative effects were identified. This Project will not cause an increase in traffic or encourage changes to existing land use patterns.

4.8. Special-Status Plants

No habitat for special-status plants occurs in the BSA.

Chapter 5. Results: Permits and Technical Studies for Special Laws or Conditions

5.1. Federal Endangered Species Act (FESA) Consultation Summary

FESA defines "take" (section 9) and prohibits "taking" of a listed endangered or threatened species (16 U.S.C. 1532, 50 CFR 17.3). If a federal-listed species could be harmed by a project, then section 7 or 10 consultations must be initiated and an Incidental Take Permit must be obtained (16 U.S.C. 1539, 50 CFR 13).

Section 7 of FESA states that all federal departments and agencies shall, in consultation with and with the assistance of the Secretary of the Interior/Commerce, insure that any actions authorized, funded, or carried out by them do not jeopardize the continued existence of federal-listed or proposed species or result in adverse modification of designated critical habitat, unless an exception has been granted by the Endangered Species Committee (16 USC 1536(a)(2)).

Section 9(a)(1) of FESA and federal regulation pursuant to section 4(d) of FESA prohibit the take of endangered and threatened fish and wildlife species. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct.

Harass is defined by USFWS as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

Harm is defined by USFWS to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering.

Based on the following criteria, a Biological Assessment evaluates the potential effects of an action on federal-listed species or critical habitat to determine whether or not the species or its habitat is likely to be adversely affected by the action (USFWS & NMFS 1998):

1. Based on the best available scientific and commercial data, is the species: a) likely to be found in the area; b) potentially found in the area; or c) unlikely to be found in the area.

2. If a species is unlikely to occur in or migrate through the BSA due to lack of suitable habitat or the BSA is outside of the known range of the species, it was determined that the project would have no effect on the species.
3. If it is reasonably foreseeable for a species to occur in the BSA, further analysis of the species' life history and habitat requirements, and the suitability of habitat for any life stage of the species, was made.
4. If suitable habitat for a species was determined to occur in the BSA, an analysis of the potential effects to the species was conducted. Details of life history and habitat requirements for potentially affected species were evaluated to ascertain the likelihood and severity of impact. Technical assistance was requested from resource agencies regarding the likelihood and timing of occurrence for species.
5. A determination was then made of the type of effect in accordance with terminology used by USFWS (USFWS & NMFS 1998) for listed species and/or designated critical habitat pursuant to FESA. The types of determinations based on USFWS terminology are listed in Table 5. A summary of FESA consultations for the Project are in Table 6.
6. If a conclusion was reached that the project "may affect" a federal-listed species, reasonable and prudent mitigation measures were developed to ensure that "take" would not occur or if "take" was anticipated, it would be minimal.

Table 5. Types of Federal Consultation Determinations

Determination	Course of Action
No effect	No incidental take will occur. No incidental take statement is required. No consultation with USFWS is required.
May affect, is not likely to adversely affect	No incidental take will occur. USFWS may concur in writing during informal consultation.
May affect, is likely to adversely affect	Incidental take is anticipated to occur. A formal section 7 consultation is required to obtain an Incidental Take Statement. During consultation, USFWS will make the determination that the project is or is not likely to jeopardize the continued existence of the species or adversely modify critical habitat.
Is likely to jeopardize the continued existence of the species or adversely modify critical habitat	If the project is likely to jeopardize the continued existence of the species or adversely modify critical habitat, conference with the Secretary of the Department of Interior is required.

Table 6 summarizes potential Project effects on federal listed special-status species. The Project may affect, is not likely to adversely affect Central Valley steelhead DPS. The Project

may affect, is likely to adversely affect VELB. The Project will have no effect on critical habitat for VELB and Central Valley steelhead DPS.

Table 6. Summary of FESA Consultation Requirements

Scientific Name	Common Name	Status	No Effect	May affect, is not likely to adversely affect	May affect, is likely to adversely affect
Invertebrates					
Branchinecta conservato	Conservancy fairy shrimp	E, CH	X		
Branchinecta lynchi	Vernal pool fairy shrimp	T, CH	X		
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	T			X
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	CH	X		
Elaphrus viridis	Delta green ground beetle	T, CH	X		
Lepidurus packardi	Vernal pool tadpole shrimp	E, CH	X		
Speyeria callippe callippe	Callippe silverspot butterfly	E, PCH	X		
Fish					
Acipenser medirostris	Green sturgeon, southern DPS	T, CH	X		
Hypomesus transpacificus	Delta smelt	T, CH	X		
Oncorhynchus kisutch	Central CA coast Coho salmon ESU	E, CH	X		
Oncorhynchus mykiss	Central Valley steelhead DPS	T		X	

Scientific Name	Common Name	Status	No Effect	May affect, is not likely to adversely affect	May affect, is likely to adversely affect
Oncorhynchus mykiss	Central Valley steelhead DPS	CH	X		
Oncorhynchus mykiss	Central California Coast steelhead DPS	T, CH	X		
Oncorhynchus tshawytscha	Chinook salmon, Central Valley spring-run ESU	T, CH	X		
Oncorhynchus tshawytscha	Chinook salmon, Sacramento River winter-run ESU	E, CH	X		
Amphibians					
Ambystoma californiense	California tiger salamander, central population/ Central Valley DPS	T, CH	X		
Rana draytonii	California red-legged frog	T, CH	X		
Reptiles					
Masticophis lateralis euryxanthus	Alameda whipsnake [=striped racer]	T, CH	X		
Thamnophis gigas	Giant garter snake	T		X	
Birds					
Charadrius alexandrinus nivosus	Western snowy plover	T, CH	X		
Charadrius montanus	Mountain plover	PT	X		

Scientific Name	Common Name	Status	No Effect	May affect, is not likely to adversely affect	May affect, is likely to adversely affect
Coccyzux americanus	Western yellow-billed cuckoo	C	X		
Rallus longirostris obsoletus	California clapper rail	E	X		
Sternula (=*Sterna*) *antillarum browni*	California least tern	E	X		
Strix occidentalis caurina	Northern spotted owl	T, CH	X		
Mammals					
Reithrodontomys raviventris	Salt marsh harvest mouse	E	X		
Plants					
Cirsium hydrophilum var. *hydrophilum*	Suisun thistle	E, CH	X		
Cordylanthus mollis ssp. *mollis*	Soft bird's beak	E, CH	X		
Cordylanthus palmatus (=*Chloropyron palmatum*)	Palmate-bracted bird's beak	E	X		
Lasthenia conjugens	Contra Costa goldfields	E, CH	X		
Neostapfia colusana	Colusa grass	T, CH	X		

Scientific Name	Common Name	Status	No Effect	May affect, is not likely to adversely affect	May affect, is likely to adversely affect
Tuctoria macronata	Solano grass [=Crampton's tuctoria]	E, CH	X		

FHWA has delegated authority to Caltrans to request concurrence from USFWS and NMFS when a project is not likely to adversely affect federal-listed species. For projects that have no effect on federal-listed species or critical habitat, no consultation is required.

5.2. California Endangered Species Act (CESA) Consultation Summary

No take of California state listed species will occur as a result of this Project.

5.3. Wetlands and Other Waters Coordination Summary

A Preliminary Jurisdictional Delineation Report of the BSA is in Appendix F. Based on current Corps guidance, Putah Creek would be considered a relatively permanent waters subject to jurisdiction as a waters of the U.S. A total of 0.05 acres of Putah Creek will be temporarily affected by Project construction. A total of 0.09 acres of Putah Creek will be permanently affected by Project construction. The Project will require permits from the Corps, DFG, and the RWQCB. All permit conditions will be implemented.

5.4. Essential Fish Habitat (EFH)

Under the Magnuson-Stevens Act, the Pacific Fishery Management Council (PFMC) manages salmon fisheries through the designation of EFH and monitoring of threats to that habitat from both fishing and non-fishing activities. Salmon EFH includes all those streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California. Salmon EFH excludes areas upstream of longstanding naturally impassible barriers (i.e. natural waterfalls in existence for several hundred years), but includes aquatic areas above all artificial barriers except specifically named impassible dams. Essential habitat types identified by NMFS for salmon include juvenile rearing areas, juvenile migration corridors, areas for growth and development into adulthood, adult migration corridors, and spawning areas (65 FR 7773).

The BSA is located in the Lower Sacramento River USGS hydrologic unit (HUC 18020109). The Lower Sacramento River USGS hydrologic unit is designated as EFH for Chinook

salmon (*Oncorhynchus tshawytscha;* NMFS 2008) and is within the range of Chinook salmon (CalFish 2010). Putah Creek is listed in the Central Valley Chinook Salmon current stream habitat distribution table (NMFS 2011a) and on the Central Valley Chinook salmon distribution maps (NMFS 2011b) for fall-run Chinook salmon.

In a letter dated 10 June 2011, the National Marine Fisheries Service (NMFS) stated that Putah Creek in the BSA is considered EFH for Chinook salmon (Appendix C). Bridge rehabilitation work will be conducted on the piers and abutments. All three piers will be fiber wrapped, and the pier curtain wall will be removed and reconstructed at Piers 1 and 2. CIDH piling will be constructed at the piers and behind the abutments. RSP will be placed along the banks of Putah Creek to stabilize the creek and prevent scour. A creek crossing will be constructed between Piers 1 and 2, using either culverts and fill or temporary low span/bridge. Implementation of NMFS-approved avoidance and minimization measures for Central Valley steelhead DPS listed above in Section 4.3.1.2 will also protect EFH. With implementation of the avoidance and minimization efforts, the Project will not adversely affect designated EFH for Chinook salmon.

5.5. Evaluation of Invasive Plant Species (EO 13112)

There are 23 invasive plant species that occur in the BSA (California Invasive Plant Council, Cal-IPC 2006). Three species in the BSA are rated as "High" by Cal-IPC relative to their ecological impact, invasive potential, and ecological distribution: giant reed (*Arundo donax*), Himalayan blackberry (*Rubus discolor*), and smallflower tamarisk (*Tamarix parviflora*). These species are also rated as a Level 1 Priority under the Lower Putah Creek Watershed Management Action Plan (LPCCC 2005). Level 1 species have incipient or widespread distribution patterns and are either highly invasive in general or known to cause substantial impacts. Invasive plant species in the BSA categorized by Cal-IPC (2006) as moderate or limited are noted in Appendix D.

Giant reed is an aggressive plant that reproduces through creeping rootstocks and rooting stem fragments. It thrives in many soil types under a broad range of ecological conditions. Giant reed forests out-compete native vegetation, eliminate wildlife habitat, can create fire hazards, and threatens infrastructure during flood events (LPCCC 2005).

Himalayan blackberry has become naturalized in moist areas throughout the west. The majority of reproduction is vegetative, with stems rooting where they touch the ground and shoots forming along the root system. This species can be both beneficial and harmful to wildlife. The berries provide food for birds and mammals, and the dense thickets provide nesting and foraging habitat for songbirds. Himalayan blackberries also harbor rats that prey on riparian birds, and its rapid spread outcompetes native vegetation in which other wildlife

depend on. The dense thickets create an impenetrable barrier to larger wildlife moving through the riparian corridor or trying to access water. Himalayan blackberry also impedes drainage, which causes bank erosion by deflecting flood flow (LPCCC 2005).

Tamarisk disperses both by seeds and vegetatively. As it grows, tamarisk draws salt from deeper soil layers and deposits it on the soil surface, which hinders germination of native salt-intolerant plants. This species traps sediment, transforming floodplains and altering the channel profile. Tamarisk is highly adapted to fire, and resprouts vigorously after being burned. Eventually, tamarisk dominated landscapes have higher frequencies and intensities of fire and floods. Native vegetation that provides wildlife habitat is outcompeted. Similar to Himalayan blackberry, dense thickets impede drainage, causing bank erosion (LPCCC 2005).

These invasive plant species are common throughout Solano County. The spread of invasive species in the BSA will be reduced by cleaning equipment before it comes to the BSA and revegetating disturbed areas with native or sterile nonnative species. By revegetating disturbed creek banks and roadsides with native species, the Project will reduce the spread of these species in the BSA. To aid in eradication of LPCCC Level 1 species, giant reed, Himalayan blackberry, and/or tamarisk will be removed during normal ground disturbing activities to the extent feasible. Removal outside normal construction activities is at the discretion of the Project manager.

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Personal Communications:

Mr. Leopoldo Flores, P.E. Various 2011. Contacted to discuss various Project related issues. Supervisor, County of Engineering Services, Solano County Resource Management Department, Fairfield, CA.

Mr. Joe Heublein. 29 July 2011. Contacted to discuss salmon spawning habitat in Putah Creek. NMFS Natural Resource Management Specialist. Southwest Regional Field Office, Santa Rosa, CA.

Mr. Rick Marovich. 6 June 2011. Contacted regarding revegetation and restoration efforts on Putah Creek, and fish species surveys on Putah Creek. Putah Creek Streamkeeper, Solano County Water Agency, Vacaville, CA.

Dr. Peter Moyle. 2 July 2011. Email correspondence regarding presence of fish species in Putah Creek. Professor of fish biology in the Department of Wildlife, Fish, and Conservation Biology University of California, Davis.

Ms. Maria Rea. 10 June 2011. Signed by Jeffery McLain for Ms. Rea. Letter regarding special-status fish species and EFH that are likely to be present in the Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project BSA. Supervisor, NMFS Central Valley Office, Sacramento, CA

Mr. Matt Tuggle. Various 2011. Contacted to discuss various Project related issues. Solano County Department of Resource Management, Public Works Engineering, Fairfield, CA

Mr. Michael Tucker. 17 January 2011. E-mail regarding steelhead essential fish habitat. Branch Chief, NMFS Protected Resources Division. Sacramento Office, Sacramento, CA.

Mr. Dylan VanDyne. 2 August 2011. Contacted to discuss technical assistance letter dated 10 June 2011. NMFS Fishery Biologist. Sacramento Office, Sacramento Office, Sacramento, CA

Appendix A USFWS Letter

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

December 6, 2010

Document Number: 101206041806

R. John Little, Ph.D.
Sycamore Environmental Consultants, Inc.
6355 Riverside Blvd., Suite C
Sacramento, CA 95831

Subject: Species List for Stevenson Bridge Road Bridge (23C0092) Rehabilitation Project

Dear: Dr. Little

We are sending this official species list in response to your December 6, 2010 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 March 06, 2011.

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 at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

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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: 101206041806

Database Last Updated: April 29, 2010

Quad Lists

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (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)

Quads Containing Listed, Proposed or Candidate Species:

MERRITT (514D)

County Lists

Solano County

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)
Critical habitat, Conservancy fairy shrimp (X)

Branchinecta lynchi
Critical habitat, vernal pool fairy shrimp (X)
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Elaphrus viridis
Critical habitat, delta green ground beetle (X)
delta green ground beetle (T)

Lepidurus packardi
Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)

Speyeria callippe callippe
callippe silverspot butterfly (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
Critical habitat, delta smelt (X)
delta smelt (T)

Oncorhynchus kisutch
coho salmon - central CA coast (E) (NMFS)

Oncorhynchus mykiss
Central California Coastal steelhead (T) (NMFS)
Central Valley steelhead (T) (NMFS)
Critical habitat, Central California coastal steelhead (X) (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)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)
Critical habitat, CA tiger salamander, central population (X)

Rana draytonii
California red-legged frog (T)
Critical habitat, California red-legged frog (X)

Reptiles

Masticophis lateralis euryxanthus
Alameda whipsnake [=striped racer] (T)

Thamnophis gigas
giant garter snake (T)

Birds

Charadrius alexandrinus nivosus
western snowy plover (T)

Pelecanus occidentalis californicus
California brown pelican (E)

Rallus longirostris obsoletus
California clapper rail (E)

Sternula antillarum (=Sterna, =albifrons) browni
California least tern (E)

Mammals

Reithrodontomys raviventris
salt marsh harvest mouse (E)

Plants

Cirsium hydrophilum var. hydrophilum
Suisun thistle (E)

Cordylanthus mollis ssp. mollis
soft bird's-beak (E)

Lasthenia conjugens
Contra Costa goldfields (E)

Critical habitat, Contra Costa goldfields (X)

Neostapfia colusana
Colusa grass (T)

Tuctoria mucronata
Solano grass (=Crampton's tuctoria) (E)

Proposed Species

Amphibians

Rana draytonii
Critical habitat, California red-legged frog (PX)

Plants

Cirsium hydrophilum var. hydrophilum
Critical habitat, Suisun thistle (PX)

Cordylanthus mollis ssp. mollis
Critical habitat, soft bird's-beak (PX)

Yolo County

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)

Branchinecta lynchi
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
Critical habitat, delta smelt (X)

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)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)
Critical habitat, CA tiger salamander, central population (X)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Birds

Strix occidentalis caurina
northern spotted owl (T)

Plants

Cordylanthus palmatus
palmate-bracted bird's-beak (E)

Neostapfia colusana
Colusa grass (T)
Critical habitat, Colusa grass (X)

Tuctoria mucronata
Critical habitat, Solano grass (=Crampton's tuctoria) (X)
Solano grass (=Crampton's tuctoria) (E)

Candidate Species

Birds

Coccyzus americanus occidentalis

Western yellow-billed cuckoo (C)

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) 414-6580.

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 March 06, 2011.

Appendix B California Natural Diversity Database (CNDDB) Summary

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	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
1	Agelaius tricolor	tricolored blackbird	ABPBXB0020			G2G3	S2		SC
2	Ambystoma californiense	California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3		SC
3	Ammodramus savannarum	grasshopper sparrow	ABPBXA0020			G5	S2		SC
4	Antrozous pallidus	pallid bat	AMACC10010			G5	S3		SC
5	Astragalus tener var. ferrisiae	Ferris' milk-vetch	PDFAB0F8R3			G1T1	S1.1	1B.1	
6	Astragalus tener var. tener	alkali milk-vetch	PDFAB0F8R1			G1T1	S1.1	1B.2	
7	Athene cunicularia	burrowing owl	ABNSB10010			G4	S2		SC
8	Atriplex cordulata	heartscale	PDCHE040B0			G2?	S2.2?	1B.2	
9	Atriplex depressa	brittlescale	PDCHE042L0			G2Q	S2.2	1B.2	
10	Atriplex joaquiniana	San Joaquin spearscale	PDCHE041F3			G2	S2	1B.2	
11	Branchinecta conservatio	Conservancy fairy shrimp	ICBRA03010	Endangered		G1	S1		
12	Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	Threatened		G3	S2S3		
13	Branchinecta mesovallensis	midvalley fairy shrimp	ICBRA03150			G2	S2		
14	Buteo swainsoni	Swainson's hawk	ABNKC19070		Threatened	G5	S2		
15	California macrophylla	round-leaved filaree	PDGER01070			G2	S2	1B.1	
16	Charadrius alexandrinus nivosus	western snowy plover	ABNNB03031	Threatened		G4T3	S2		SC
17	Charadrius montanus	mountain plover	ABNNB03100	Proposed Threatened		G2	S2?		SC
18	Cicindela hirticollis abrupta	Sacramento Valley tiger beetle	IICOL02106			G5TH	SH		
19	Cordylanthus palmatus	palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1.1	1B.1	
20	Delphinium recurvatum	recurved larkspur	PDRAN0B1J0			G2	S2.2	1B.2	
21	Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	Threatened		G3T2	S2		
22	Downingia pusilla	dwarf downingia	PDCAM060C0			G3	S3.1	2.2	
23	Elanus leucurus	white-tailed kite	ABNKC06010			G5	S3		
24	Emys marmorata	western pond turtle	ARAAD02030			G3G4	S3		SC
25	Falco columbarius	merlin	ABNKD06030			G5	S3		
26	Fritillaria pluriflora	adobe-lily	PMLIL0V0F0			G3	S3	1B.2	
27	Lasionycteris noctivagans	silver-haired bat	AMACC02010			G5	S3S4		
28	Lasiurus cinereus	hoary bat	AMACC05030			G5	S4?		
29	Lepidium latipes var. heckardii	Heckard's pepper-grass	PDBRA1M0K1			G4T1	S1.2	1B.2	
30	Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	Endangered		G3	S2S3		
31	Linderiella occidentalis	California linderiella	ICBRA06010			G3	S2S3		
32	Myrmosula pacifica	Antioch multilid wasp	IIHYM15010			GH	SH		
33	Navarretia leucocephala ssp. bakeri	Baker's navarretia	PDPLM0C0E1			G4T2	S2.1	1B.1	

	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
34	Neostapfia colusana	Colusa grass	PMPOA4C010	Threatened	Endangered	G2	S2	1B.1	
35	Nycticorax nycticorax	black-crowned night heron	ABNGA11010			G5	S3		
36	Plegadis chihi	white-faced ibis	ABNGE02020			G5	S1		
37	Pogonichthys macrolepidotus	Sacramento splittail	AFCJB34020			G2	S2		SC
38	Riparia riparia	bank swallow	ABPAU08010		Threatened	G5	S2S3		
39	Taxidea taxus	American badger	AMAJF04010			G5	S4		SC
40	Thamnophis gigas	giant garter snake	ARADB36150	Threatened	Threatened	G2G3	S2S3		
41	Tuctoria mucronata	Crampton's tuctoria or Solano grass	PMPOA6N020	Endangered	Endangered	G1	S1.1	1B.1	
42	Valley Oak Woodland	Valley Oak Woodland	CTT71130CA			G3	S2.1		

Appendix C NMFS Letter

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814-4700

JUN 10 2011

Jeff Little
Vice President
Sycamore Environmental Consultants, Inc.
6355 Riverside Blvd., Suite C
Sacramento, California 95831

Dear Mr. Little:

This is in response to your April 19, 2011, letter requesting technical assistance from NOAA's National Marine Fisheries Service (NMFS) regarding the Solano County Resource Management Department's Stevenson Road Bridge (23C0092) at Putah Creek Rehabilitation project located on the central border of Yolo and Solano Counties, California. Sycamore Environmental has requested NMFS to comment on listed species that may occur within the project area.

Available information indicates that the following federally listed species could occur in the project area and designated critical habitat may occur downstream from the project area:

California Central Valley steelhead distinct population segment (*Oncorhynchus mykiss*)
threatened (January 5, 2006, 71 FR 834)
critical habitat (September 2, 2005, 70 FR 52488)

You should be aware that the proposed project may also affect Essential Fish Habitat (EFH) for Pacific salmon as described in Amendment 14 of the Pacific Salmon Fishery Management Plan pursuant to the Magnuson-Stephens Fishery Conservation and Management Act.

In order to minimize the impacts and adverse effects on listed fish and EFH, the following is a list of recommendations to consider when finalizing your project plan:

(1) Use a silt curtain/fence around the in-water work area to minimize turbidity and sedimentation. In addition, use best management practices to reduce water quality impacts. Equipment should be refueled and serviced at designated construction staging areas. All construction material should be stored and contained in a designated area that is located away from channel areas to prevent transport of materials into the adjacent river. The preferred distance is a minimum of 100 feet from the wetted width of a stream. A silt fence should be installed to collect any discharge, and adequate materials for spill cleanup should be kept on site. Construction vehicles and equipment should be

maintained to prevent contamination of soil or water from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease.

(2) Activities conducted in the active channel should be limited to the period between July 15 and October 15. This is a period of the year when Pacific salmonids are least likely to occur in the project area.

(3) All disturbed soils at each site should undergo erosion control treatment prior to October 15 and/or immediately after construction is terminated. Treatment includes temporary seeding and the application of sterile straw mulch. Any disturbed soils on a gradient of over 30 percent should have erosion control blankets installed. Permanent vegetation and tree replanting should take place in small openings in the erosion control blanket, with native species.

(4) Shaded riverine aquatic (SRA) habitat or natural woody riparian habitat should be avoided and preserved to the maximum extent practicable. Where impacts to riparian and SRA habitats are unavoidable, replanting of native woody riparian species should be implemented at 3:1 ratio on an area or linear foot basis, as appropriate. The success of replanting is measured as 100 percent or greater replacement of impacted vegetation after three years.

Section 7(a)(1) of the Endangered Species Act (ESA) directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Conservation recommendations are discretionary agency activities intended to minimize or avoid adverse effects of a proposed project on listed species or critical habitat, to help implement recovery plans, or to develop information.

In order to fulfill the requirements of section 7(a)(1), NMFS recommends the following:

(1) Purchase fish riparian habitat enhancement credits at a 3:1 ratio for the acres of riparian habitat removed at a NMFS approved anadromous fish conservation bank, in an effort to maintain and protect existing riparian habitat on site;

(2) Purchase channel enhancement credits at a 3:1 ratio for the acres of impacted critical habitat within the stream channel at a NMFS approved anadromous fish conservation bank;

(3) Purchase rearing habitat credits at a 3:1 ratio for the placement of rock slope protection (RSP) within the action area at a NMFS approved anadromous fish conservation bank;

(4) Implement best management practices, including a Storm Water Pollution Prevention Program and Water Pollution Control Program, to minimize effects to federally listed fish and their designated critical habitats;

(5) Minimize the removal of existing vegetation in the project area to the maximum extent possible. Any disturbance or removal of vegetation should be replaced with native riparian species at a 3:1 ratio. In addition, provide a re-vegetation monitoring plan to ensure the success of the growth of native riparian vegetation. The plan should include a list of species and designs to show the location of the species and their density;

(6) If RSP is placed on the stream bank, use a soil-rock mixture to facilitate re-vegetation of the project area. A ratio of rock to soil (70:30) is recommended. We suggest a soil-rock mixture on top of the rock revetment to allow native riparian vegetation to be planted to ensure SRA habitat is replaced, and;

(7) To address potential fish migration concerns upstream and downstream of the RSP placement points, see the NMFS Guidelines for Salmonid Passage at Stream Crossings at http://swr.nmfs.noaa.gov/hcd/NMFSSCG.PDF.

Be advised that NMFS can only enter formal section 7 consultations with another Federal agency or its designee. Therefore, this response is provided as informal technical assistance. This response is not intended to take the place of formal comments or consultation as required under the ESA of 1973, as amended (16 U.S.C. 1531 et seq.) and does not provide incidental take authorization pursuant to section 7(b)(4) and section 7(o)(2) of the ESA.

Please contact Dylan Van Dyne at (916) 930-3725, or via e-mail at Dylan.VanDyne@noaa.gov if you have any questions or require additional information concerning this project.

Sincerely,

for

Maria Rea
Supervisor, Central Valley Office

cc: Copy to file: ARN 151422SWR2011SA00231
NMFS-PRD, Long Beach, CA

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Appendix D Plant and Wildlife Species Observed

Plant Species Observed

Family	Scientific Name	Common Name	Native/ Introduced	Cal-IPC Rating[4]
CONIFERS				
Cupressaceae	*Calocedrus decurrens*[1]	Incense cedar	N	
Pinaceae	*Pinus pinea*	Italian stone pine	I	--
	Pinus	Pine	--	
	Pseudotsuga menziesii[1]	Douglas-fir	N	
DICOTS				
Aceraceae	*Acer negundo* ssp. *californicum*	Box elder	N	
	Acer saccharinum	Silver Maple	I	--
Amaranthaceae	*Amaranthus* sp.			
Anacardiaceae	*Schinus molle*	Peruvian pepper tree	I	Limited
	Toxicodendron diversilobum	Western poison oak	N	
Apiaceae	*Conium maculatum*	Poison hemlock	--	Moderate
Apocynaceae	*Nerium oleander*	Oleander	I	--
	Vinca major	Greater periwinkle	I	Moderate
Asteraceae	*Artemisia douglasiana*	Mugwort	N	
	Baccharis pilularis	Coyote brush	N	
	Carduus pycnocephalus	Italian thistle	I	Moderate
	Hypochaeris sp.	Cat's ear	I	
	Lactuca serriola	Prickly lettuce	I	--
	Picris echioides	Bristly oxtongue	I	Limited
	Senecio vulgaris	Common groundsel	I	--
	Silybum marianum	Milk thistle	I	Limited
	Sonchus sp.	Sow-thistle	--	
	Xanthium strumarium	Cocklebur	N	
Brassicaceae	*Brassica nigra*	Black mustard	I	Moderate
	Capsella bursa-pastoris	Shepherd's purse	I	--
	Cardamine oligosperma	Bitter cress	N	
	Hirschfeldia incana	Mediterranean hoary mustard	I	Moderate
	Lepidium sp.	Peppergrass	--	
	Raphanus sp.	Wild radish	--	
Caprifoliaceae	*Sambucus mexicana*	Blue elderberry	N	
Chenopodiaceae	*Atriplex* sp.		--	
Convolvulaceae	*Convolvulus arvensis*	Field bindweed	I	--
Fabaceae	*Genista* sp. [2]	Broom	I	
	Medicago sp.	Burclover	I	
Fagaceae	*Quercus lobata*	Valley oak	N	
Geraniaceae	*Erodium moschatum*	Filaree	I	--
	Geranium dissectum	Cranesbill	I	Moderate
Juglandaceae	*Juglans californica* var. *hindsii* [3]	N. California black walnut	N	
	Juglans regia	English walnut	I	--
Lamiaceae	*Lamium amplexicaule*	Dead nettle	I	--
	Marrubium vulgare	Horehound	I	Limited
Lythraceae	*Lagerstroemia* sp.	Crape myrtle	I	--
Malvaceae	*Malva* sp.	Mallow	I	--
Moraceae	*Ficus carica*	Edible fig	I	Moderate
Myrtaceae	*Eucalyptus globulus*	Blue gum	I	Moderate

Family	Scientific Name	Common Name	Native/ Introduced	Cal-IPC Rating[4]
	Feijoa sp.			
Oleaceae	*Fraxinus latifolia*	Oregon ash	N	
	Olea europaea	Olive	I	Limited
Onagraceae	*Epilobium* sp.	Fireweed	N	
Pittosporaceae	*Pittosporum* sp.	Mock orange	I	--
Plantaginaceae	*Plantago lanceolata*	English plantain	I	Limited
Polygonaceae	*Rumex crispus*	Curly dock	I	Limited
Portulacaceae	*Claytonia perfoliata ssp. perfoliata*	Miner's lettuce	N	
Rosaceae	*Heteromeles arbutifolia*	Toyon	N	
	Pyracantha/ Cotoneaster		--	
	Prunus dulcis	Almond	I	--
	Prunus sp.		--	
	Rosa sp.		--	
	Rubus discolor	Himalayan blackberry	I	High
Rubiaceae	*Galium aparine*	Goose grass	N	
	Galium sp. (annual)	Bedstraw, cleavers	--	
Salicaceae	*Populus fremontii* ssp. *fremontii*	Fremont cottonwood	N	
	Salix babylonica	Weeping willow	I	--
	Salix exigua	Sandbar willow	N	
	Salix laevigata	Red willow	N	
	Salix sp.	Willow	--	
Solanaceae	*Datura* sp.	Jimson weed	--	
Tamaricaceae	*Tamarix parviflora*	Smallflower tamarisk	I	High
Viscaceae	*Phoradendron villosum*	Oak mistletoe	N	
Vitaceae	*Vitis californica*	California wild grape	N	
MONOCOTS				
Arecaceae	*Phoenix* sp.	Palm	I	
Cyperaceae	*Carex nudata*	Torrent sedge	N	
Poaceae	*Arundo donax*	Giant reed	I	High
	Avena fatua	Wild oat	--	
	Bromus diandrus	Ripgut grass	I	Moderate
	Cynodon dactylon	Bermuda grass	I	Moderate
	Elymus glaucus	Blue wildrye	N	--
	Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	I	Moderate
	Hordeum murinum ssp. *leporinum*	Foxtail	I	Moderate
	Lolium multiflorum	Italian ryegrass	I	Moderate
	Paspalum dilatatum	Dallis grass	I	--
	Poa annua	Annual bluegrass	I	--
	Setaria sp.			
	Sorghum halepense	Johnsongrass	I	--
	Triticum aestivum	Wheat	I	--

*N = Native; I = Introduced

[1] Species from Tree Farm.
[2] Horticultural.
[3] Trees of this species have hybridized extensively with other Juglans spp. and have naturalized widely in a non-historic range (CNPS 2010). Northern CA black walnut trees receiving CNPS 1B.1 status are restricted to those trees which recruited naturally long ago and have not hybridized. The walnut trees that occur in the PSA have no special status.
[4] Cal-IPC rating for ecological impact of invasive plants (Cal-IPC 2006).

Wildlife Species Observed

Scientific Name	Common Name
AMPHIBIANS	
Pseudacris regilla	Pacific treefrog
REPTILES	
Sceloporus occidentalis	Western fence lizard
BIRDS	
Accipiter cooperii	Cooper's hawk
Accipiter striatus	Sharp-shinned hawk
Agelaius phoeniceus	Red-winged blackbird
Anas platyrhynchos	Mallard
Aphelocoma californica	Western scrub-jay
Baeolophus inornatus	Oak titmouse (Plain titmouse)
Bombycilla cedrorum	Cedar waxwing
Buteo jamaicensis	Red-tailed hawk
Buteo lineatus	Red-shouldered hawk
Buteo swainsoni	Swainson's hawk
Callipepla californica	California quail
Carpodacus mexicanus	House finch
Cathartes aura	Turkey vulture
Colaptes auratus	Northern flicker
Columbia livia	Rock dove
Corvus brachyrhynchos	American crow
Dendroica coronata	Yellow-rumped warbler
Elanus leucurus	White-tailed kite
Hirundo pyrrhonota	Cliff swallow
Junco hyemalis	Dark-eyed junco
Meleagris gallopavo	Wild turkey
Mimus polyglottos	Northern mockingbird
Petrochelidon pyrrhonota	Cliff swallow
Pica nuttalli	Yellow-billed magpie
Psaltriparus minimus	Bushtit
Sayornis nigricans	Black phoebe
Sialia mexicana	Western bluebird
Sitta carolinensis	White-breasted nuthatch
Sturnus vulgaris	European starling
Turdus migratorius	American robin
Zenaida macroura	Mourning dove
Zonotrichia leucophrys	White-crowned sparrow
MAMMALS	
Castor canadensis	Beaver (sign)
Sciurus griseus	Western gray squirrel

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Appendix E Photographs

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Photo 1: North road approach to Stevenson Bridge. 31 Mar 2011.

Photo 2: South road approach to Stevenson Bridge. 28 Sept 2009.

Photo 3: Walnut orchard on the southwest side of Stevenson Bridge Road. 31 Mar 2011.

Photo 4: Tree farm on the west side of Road 95A, north of Putah Creek. 31 Mar 2011.

Photo 5: Valley oak woodland community with grassland understory east of Road 95A. 31 Mar 2011.

Photo 6: Valley oak woodland on the slopes adjacent to the Fremont cottonwood forest. 31 Mar 2011.

Photo 7: Valley oak woodland on slope (left). Fremont cottonwood forest on bank of Putah Creek (right). 31 Mar 2011.

Photo 8: Fremont cottonwood forest riparian area along Putah Creek. 31 Mar 2011.

Photo 9: Fremont cottonwood forest riparian area along Putah Creek. 31 Mar 2011.

Photo 10: Elderberry shrub found on Project site. 31 Mar 2011.

Appendix F Jurisdictional Delineation Report

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Appendix F

Preliminary

Jurisdictional Delineation Report

for

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project

Solano County, CA

Prepared by:

Sycamore Environmental Consultants, Inc.
6355 Riverside Blvd., Suite C
Sacramento, CA 95831
Phone: 916/ 427-0703
Contact: R. John Little, Ph.D.

Prepared for:

Solano County Resource Management Department
Public Works Engineering
675 Texas Street, Suite 5500
Fairfield, CA 94533
Phone: 707/ 784-6072
Contact: Matthew Tuggle, P.E.
County Engineering Manager

21 October 2011

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Preliminary
Jurisdictional Delineation Report
for
Stevenson Bridge (23C0092) at Putah Creek
Rehabilitation Project

Solano County, CA

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I. INTRODUCTION

A. Purpose

Sycamore Environmental Consultants, Inc., conducted a jurisdictional delineation of the Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Biological Study Area (BSA) in Solano and Yolo Counties, CA. The purpose of the delineation was to identify wetlands and waters in the BSA. Jurisdictional delineations are preliminary until verified by the U.S. Army Corps of Engineers (Corps). This delineation report is technical Appendix F to a Natural Environment Study prepared in support of a National Environmental Policy Act (NEPA) environmental review for a federally funded project (Sycamore Environmental 2011).

B. Project Location

The approximately 9.34-acre BSA crosses Putah Creek on the border of Solano County and Yolo County, CA, approximately 5 miles west of the City of Davis and 8 miles east of the City of Winters (Figure 1). The bridge is located along Stevenson Bridge Road in Solano County, which becomes County Road 95A in Yolo County. The BSA is on the Merritt USGS topographic quad (unsectionalized portion of the Rio de Los Putos Land Grant) and is in the Lower Sacramento River hydrologic unit (hydrologic unit code 18020109). Elevation in the BSA ranges from approximately 60 feet above sea level at the Putah Creek ordinary high water mark (OHWM), to approximately 94 feet above sea level in the surrounding upland area. The centroid (WGS84) is 38.536428° north, 121.851041° west, UTM coordinate 600,138 m East, 4,265,961 m North, Zone 10 North (WGS84).

To access the BSA from Sacramento, take Highway 80 west to Davis, and merge onto CA-113 North. From 113 North, take the Russell Blvd exit. Turn left onto Russell Blvd/County Road 32. Turn left on County Road 95A for approximately 0.8 miles until you reach Putah Creek. Figure 2 is an aerial photograph of the BSA.

C. Applicant and Engineer

Solano County Resource Management Department
Public Works Engineering
675 Texas Street, Suite 5500
Fairfield CA 94533
Phone: 707/ 784-6072
Contact: Matthew Tuggle, P.E.
County Engineering Manager

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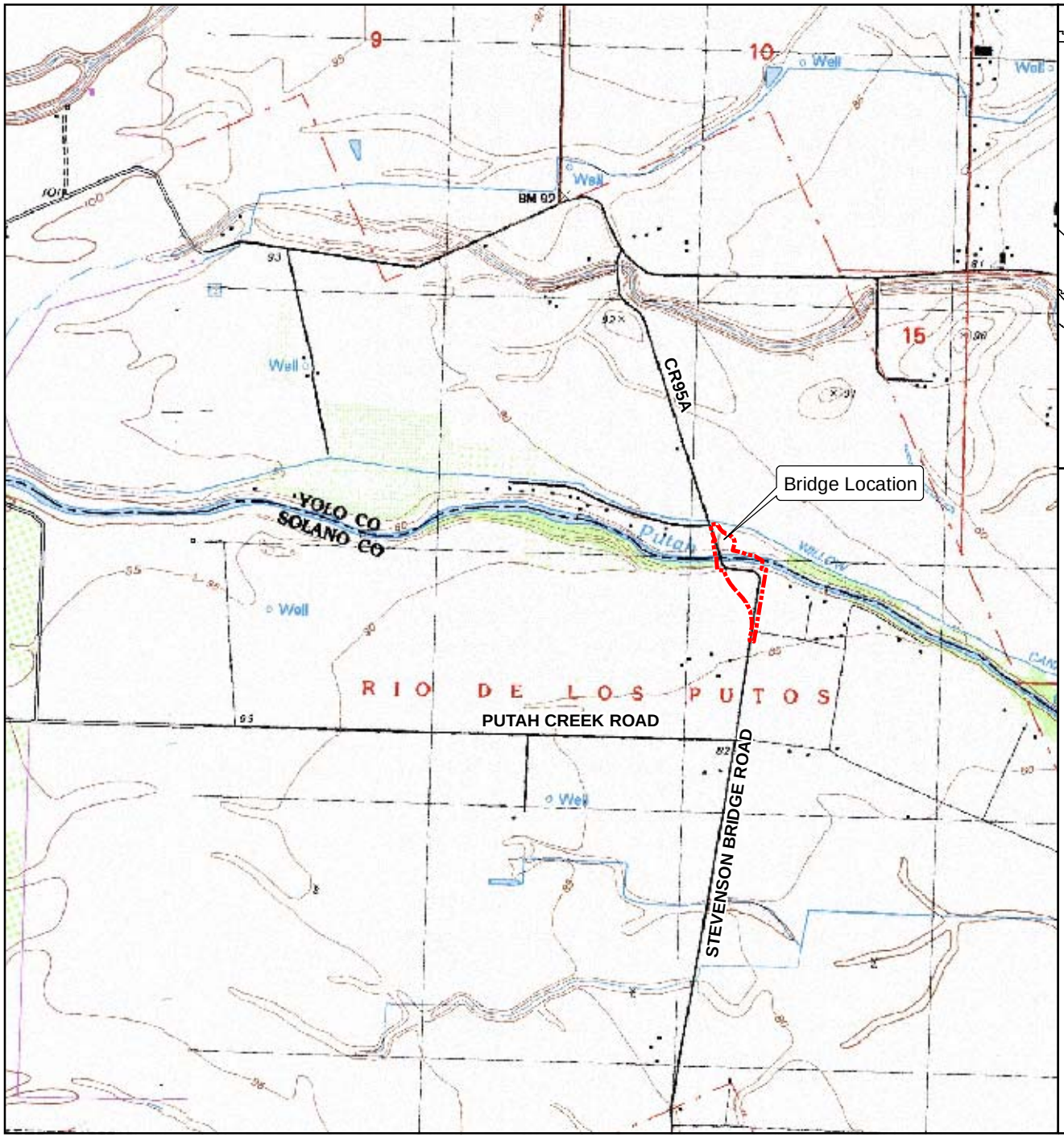

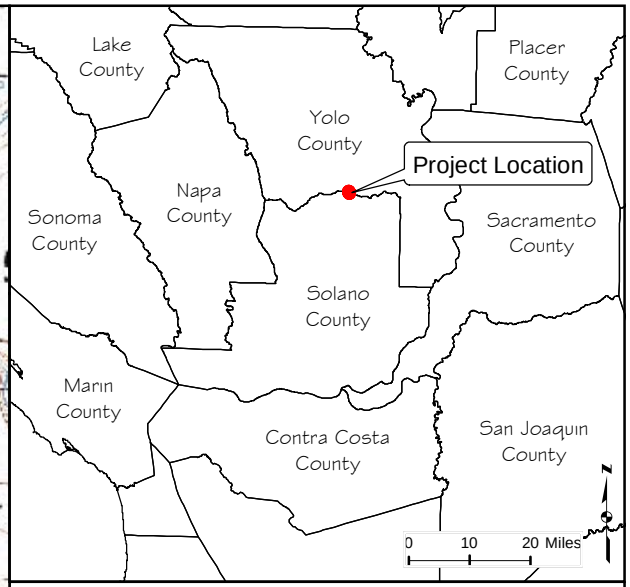

Stevenson Bridge (23C0092) at
Putah Creek Rehabilitation Project
Solano County, CA
28 February 2012

Figure 1. Location Map

Project Location

2,000 1,000 0 2,000 Feet

N

Scale: 1 inch = 2,000 feet

24K DRG:
Merritt, CA (1992)
USGS 7.5' Quad. DRG Mosaics
o_nw0301.sid
California Spatial Information Library (CASIL)

09067StevensonBrdgRdRehab_Fig1LocationMap.mxd

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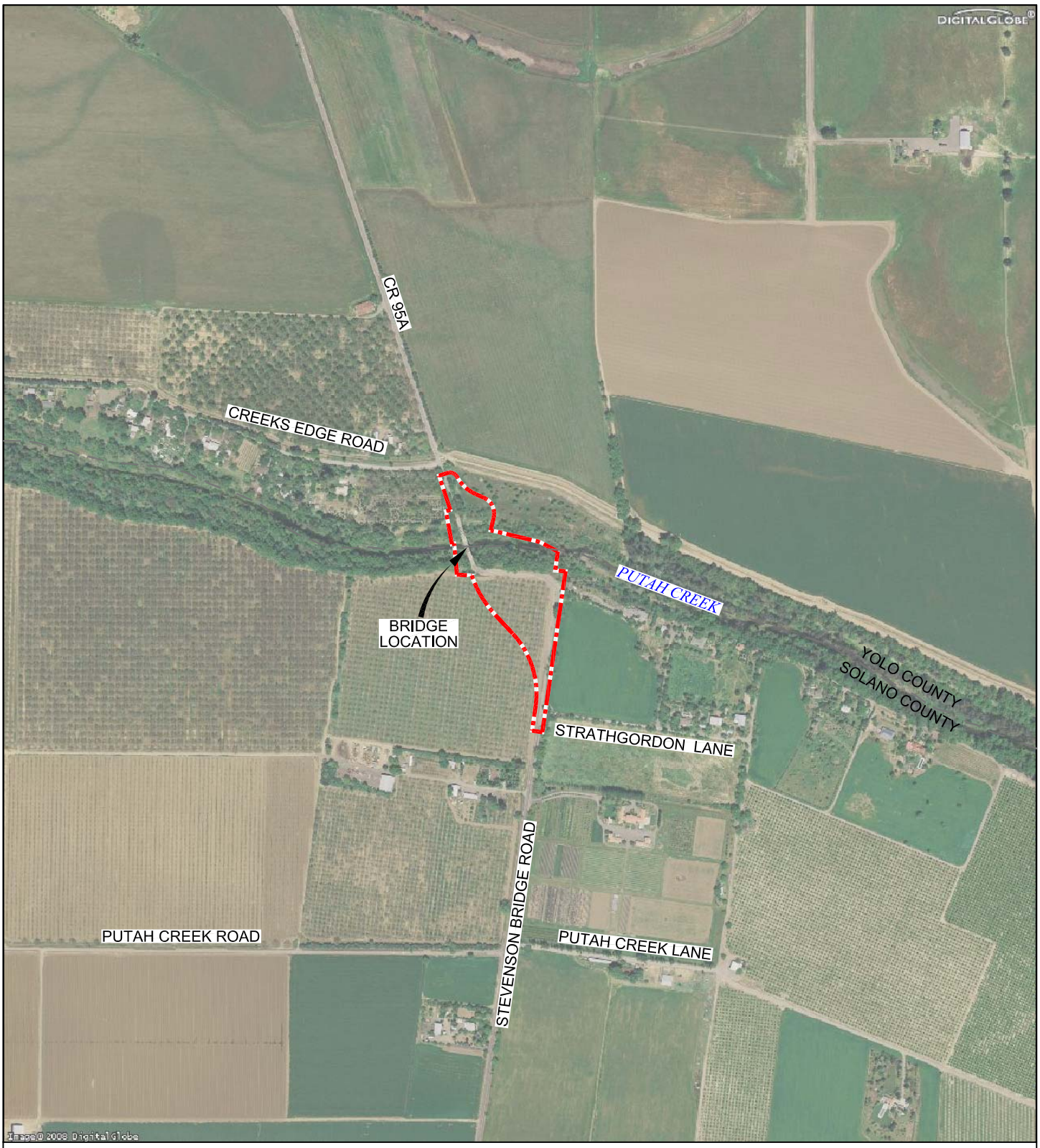

Stevenson Bridge (23C0092) at
Putah Creek Rehabilitation Project
Solano County, CA

28 February 2012

Biological Study Area (BSA)

0 400 800 ft

Scale: 1" = 800'

N

Aerial Photograph:
April 2009, Copyright 2010.
DigitalGlobe, Inc. All rights reserved.

Figure 2. Aerial Photograph

09067StevensonBridgeRd_v6.dwg

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D. Project Description

Stevenson Bridge has been identified by Caltrans as both functionally obsolete and structurally deficient. The purpose of the Project is to rehabilitate the existing bridge to address seismic deficiencies, scour, cracks, spalling, and delamination, while maintaining the historical architectural features of the bridge. Rehabilitation of the bridge includes fiber wrapping the arches and columns of the structure, constructing additional pile supports for the existing bridge foundation system, refinishing the deck and concrete railing, and removing and reconstructing the deck drains.

Rock slope protection (RSP) will be used to stabilize the creek bank and prevent scour. The retaining wall on the south side of the bridge will be reconstructed. A gravel access road will be constructed on the north bank of Putah Creek east of the bridge and will be maintained permanently. For rehabilitation of the bridge, a temporary creek crossing will be constructed between Piers 1 and 2, using either culverts and fill or temporary low span/bridge.

Stevenson Bridge Road will be realigned to eliminate two sharp turns just south and east of the bridge. The realignment will go through the orchard and transition onto the existing road alignment near Strathgordon Lane. A portion of the existing road right-of-way may be abandoned by the County. Utility poles will be relocated by the utility owners. Acquisition of right-of-way will be needed for temporary construction, permanent road realignment, and drainage/maintenance easements.

A Biological Assessment was prepared to support a formal section 7 consultation between Caltrans, FHWA's federal designee, and USFWS for Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*) and giant garter snake (GGS; *Thamnophis gigas*); and between NMFS for California Central Valley Steelhead (*Oncorhynchus mykiss*) DPS.

II. STUDY METHODS

A. Data Sources

Table 1 is a list of data sources compiled for this report and utilized by the Corps and EPA for determinations of jurisdiction (2007; "Data Sources" section of the Approved Jurisdictional Determination Form).

Table 1. Data Sources

Map References	Source
• Maps, plans, plots or plat submitted by or on behalf of the applicant	Solano County Resource Management Department
• Data sheets prepared/submitted by or on behalf of the applicant	Appendix A: Channel Data Sheets Appendix B: Wetland Determination Data Forms
• Corps navigable waters study	Corps 2011
• U.S. Geological Survey Hydrologic Atlas 1. USGS NHD data 2. USGS 8- and 12-digit HUC maps	USGS 8-digit HUC map (18020109)
• U.S. Geological Survey map(s)	Merritt USGS quadrangle, 1992; 1:24,000
• USDA Natural Resources Conservation Service Soil Survey	Soil Survey of Solano County, California (NRCS 1977). Soil Survey of Yolo County, California (NRCS 1972). Hydric Soils National List, all states (NRCS 2011).
• National wetlands inventory map(s)	USFWS (2010)
• State/Local wetland inventory map(s)	None known
• FEMA/FIRM maps	Solano County– FEMA (2009) Community number 0606310075E; Map number 06095C0075E Yolo County – FEMA (2010) Community number 0604230590G; Map number 06113C0590G
• 100-year Floodplain Elevation is: (e.g. National Geodetic Vertical Datum of 1929)	Zone A: Special flood hazard areas subject to inundation by the 1% annual chance of flood. No base flood elevation determined (FEMA 2009, 2010). Zone X (unshaded): Areas determined to be outside the 0.2% annual chance floodplain (FEMA 2009, 2010).
• Photographs: 1. Aerial (Name & Date): 2. Other (Name & Date):	 DigitalGlobe, Inc, image date April 2009. None
• Previous determination(s). File no. and date of response letter	None known

B. Survey Dates and Personnel

Jessica Easley and Leane Dunn, M.F., conducted the jurisdictional delineation on 31 March 2011.

C. Survey Methods

This jurisdictional delineation report has been prepared in accordance with the Sacramento District minimum standards (Corps 2001), U.S. Army Corps of Engineers Wetland Delineation Manual (Corps 1987), Regulatory Guidance Letter 05-05 (Corps 2005), and the

Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0; Corps 2008). The supplement is intended to bring the Corps Manual (Corps 1987) up to date with current knowledge and practice in the region. Use of the Corps Manual in combination with the supplement is intended to improve the accuracy and efficiency of wetland delineation procedures in the Arid West regions. The Arid West Regional Supplement is applicable because the BSA experiences hot, dry summers typical of Mediterranean California and is located in the Sacramento Valley (Corps 2008). All wetland and channel features were identified and mapped.

D. Jurisdictional Data

The jurisdictional delineation was conducted in accordance with the Corps Wetland Delineation Manual (Corps 1987), and the Arid West Regional Supplement (Corps 2008). Plant species were identified by Ms. Easley, Chuck Hughes, M.S., and Mike Bower, M.S. A channel data sheet for Putah Creek is in Appendix A. Soil data points 1-3 were taken to determine potential presence of wetlands surrounding Putah Creek, and were recorded on the Wetland Determination Data Form for the Arid West Region (Corps 2008). Soil pits were dug to observe the chroma, texture, degree of saturation, and other characteristics. Soil datasheets are in Appendix B. Photographs are in Appendix D.

E. Mapping of Data and Acreage Calculation

The ordinary high watermark (OHWM) of Putah Creek was mapped using a Trimble GeoXT™ sub-meter accurate GPS. Because satellite reception was poor in a few locations (reducing the accuracy of the GPS unit), the GPS data was adjusted slightly to reflect the location of the OHWM. Field notes and the topographic base map provided by Solano County Resource Management Department were used in conjunction with the GPS data to create Figure 4. Acreages were calculated using AutoCAD® functions. Figure 2 is an April 2009 aerial photo of the BSA and surrounding area (DigitalGlobe, Inc.).

F. Definitions

The U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency regulate the discharge of dredge and fill material into "waters of the United States" under Section 404 of the Clean Water Act (33 U.S.C. 1344). The Corps issues permits for certain dredge and fill activities in waters of the U.S. pursuant to the regulations in 33 CFR 320-330. The lateral limits of jurisdiction in those waters may be divided into three categories. The categories include the territorial seas, tidal waters, and non-tidal waters (see 33 CFR 328.4 (a), (b), and (c), respectively). The term "waters of the U.S." is defined at 33 CFR 328.3(a) as:

a. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
1. All interstate waters including interstate wetlands;
2. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
iii. Which are used or could be used for industrial purpose by industries in interstate commerce;

3. All impoundments of waters otherwise defined as waters of the United States under the definition;
4. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
5. The territorial seas;
6. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(1)-(6) of this section.

The term "adjacent" is defined at 33 CFR 328.3(c):

> The term *adjacent* means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are ''adjacent wetlands.''

The limits of jurisdiction are identified in 33 CFR 328.4 as:

b. Territorial Seas. The limit of jurisdiction in the territorial seas is measured from the baseline in a seaward direction a distance of three nautical miles. (See 33 CFR 329.12)
c. Tidal Waters of the United States. The landward limits of jurisdiction in tidal waters:
    1. Extends to the high tide line, or
    2. When adjacent non-tidal waters of the United States are present, the jurisdiction extends to the limits identified in paragraph (c) of this section.
d. Non-Tidal Waters of the United States. The limits of jurisdiction in non-tidal waters:
    1. In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or
    2. When adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands.
    3. When the water of the United States consists only of wetlands the jurisdiction extends to the limit of the wetland.

Wetlands, as defined by the Corps for regulatory purposes, are identified using a three-parameter test that considers whether hydrophytic vegetation, hydric soils, and hydrology are present (Corps 1987). Wetlands are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328.3, 40 CFR 230.3). Wetlands also include less conspicuous wetland types such as vernal pools and other seasonal wetlands.

An ephemeral stream has flowing water only during and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow. An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow (66 FR 42099).

III. SETTING INFORMATION

The approximately 9.34-acre BSA crosses Putah Creek on the border of Solano County and Yolo County, CA. The BSA is surrounded by agriculture on all sides. The land east of Road 95A and north of Putah Creek is the UC Davis Russell Ranch. During the November

fieldwork, walnut orchards occurred on the southwest side of the BSA; and a tree farm occurred on the west side of Road 95A north of Putah Creek.

A. Topography

Elevation in the BSA ranges from approximately 60 feet above sea level at the Putah Creek ordinary high water mark (OHWM), to approximately 94 feet above sea level in the surrounding upland area. The upland areas surrounding Putah Creek are generally flat. Putah Creek is bordered by a flat bank with riparian vegetation, and then slopes steeply upward to the road (see photos, Appendix D). There is one channel outside and north of the BSA (Figure 4). The entire BSA drains to Putah Creek.

B. Weather and Climate Conditions

Fieldwork for the jurisdictional delineation was conducted on 31 March 2011. The historic average precipitation for the National Weather Service Davis 2WSW (DVS) gauge from July through March (based on precipitation data beginning in 1905) is 15.02 inches (CDWR 2011). The DVS gauge is located in the City of Davis approximately 4.5 miles east of the BSA at an elevation of 60 feet. From July 2010 through March 2011 the gauge had received 20.22 inches of rain (CDWR 2010), or 134.6% of the average accumulated precipitation. The BSA had higher than normal spring hydrologic conditions during the delineation.

C. Vegetation

Biological communities in the BSA are Walnut Orchard, Tree Farm, Fremont Cottonwood Forest, Valley Oak Woodland, and Putah Creek. An English walnut (*Juglans regia*) orchard occurs in the BSA on the southwest side of Stevenson Bridge Road. No shrub layer is present and the understory is composed of scattered ruderal herbaceous species.

A tree farm occurs in the BSA on the west side of County Road 95A. Species present include incense cedar (*Calocedrus decurrens*) and Douglas fir (*Pseudotsuga menziesii*). No shrub layer is present and the understory is composed of scattered ruderal herbaceous species.

The Fremont Cottonwood Forest occurs along the north and south banks of Putah Creek in the BSA. Common tree species include Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), sandbar willow (*Salix exigua*), red willow (*Salix laevigata*), and Northern California black walnut (*Juglans californica* var. *hindsii*). Common understory species include Himalayan blackberry (*Rubus discolor*), ripgut grass (*Bromus diandrus*), goose grass (*Galium aparine*), and cranesbill (*Geranium dissectum*). The Fremont Cottonwood Forest community occurs on the topographically flat floodplain adjacent the creek, and transitions into the Valley Oak Woodland on the slopes above Putah Creek. The Natural Environment Study (Sycamore Environmental 2011) provides a further account of biological communities.

Valley Oak Woodland occurs on the upper slopes of Putah Creek adjacent to the Fremont Cottonwood Forest on the north and south banks of Putah Creek. The Valley Oak

Woodland also occurs on the northeast side of the bridge in the Russell Ranch Mitigation Area. The dominant tree species is Valley oak (*Quercus lobata*).

Valley Oak Woodland along the slopes above Putah Creek has a different composition than the woodland in the Russell Ranch Mitigation Area east of Road 95A. The dense understory community on the slopes above Putah Creek consists of grasses, forbs, and shrubs dominated by milk thistle (*Silybum marianum*), blue elderberry (*Sambucus mexicana*), western poison oak (*Toxicodendron diversilobum*), and rose (*Rosa* sp.).

The understory community in the Russell Ranch Mitigation Area consists of grasses dominated by foxtail (*Hordeum murinum* ssp. *leporinum*), ripgut grass (*Bromus diandrus*), and wild oat (*Avena fatua*). The Valley oaks on the top of the slope are widely spaced apart. Existing dirt roads that traverse the Valley Oak Woodland community are considered part of the road and bridge community.

D. Existing Level of Disturbance

Stevenson Bridge Road, Road 95A, and the bridge are paved areas in the BSA. The road shoulders support ruderal vegetation. Dirt roads occur on the east side of Road 95A in the Valley Oak Woodland community. The area is known for illegal dumping (pers. comm. Rich Marovich), and a couch and various other trash were observed in the BSA.

E. Soils

Mapped soil units in the BSA are Riverwash, Yolo loam, and Yolo silt loam. Riverwash and Yolo silt loam are considered hydric soils. Riverwash is typically found in channels and streams, and Yolo silt loam is typically found in alluvial fans (NRCS 2011). The following descriptions are summarized from NRCS (1972, 1977). Figure 3 is a soils map.

<u>Riverwash, Solano County</u>
The riverwash series consists of excessively drained, coarse-textured, sandy, gravelly, cobbly, or stony stream deposits that are stratified throughout. This soil type is found in stream channels and is subject to flooding. Vegetation consists of scattered cottonwoods, willows, and salt-cedars. Permeability is very rapid, runoff is very slow in areas that are not flooded, and available water capacity is less than 1 inch. Effective rooting depth is very shallow to moderately deep. This classification type is mainly used for rainwater drainageways, but is also used for wildlife habitat and recreation.

<u>Yolo Loam, Solano County</u>
The Yolo series is classified as a fine-silty, mixed, thermic Xerochrepts Inceptisol, and consists of nearly level, well-drained soils on alluvial fans. The mixed alluvium soils are derived from sedimentary rocks. Where the soil is not cultivated, the vegetation is annual grasses and forbs. Yolo loam is similar to the Yolo series except that it has a loam texture throughout. Permeability for Yolo loam is moderate, runoff is slow, and erosion is a slight hazard. The available water capacity is 9 to 11 inches. Yolo loam is used mostly for agricultural and orchard crops, urban development, wildlife habitat, and recreation.

Stevenson Bridge Road
Bridge (23C0092) Rehabilitation
Solano County, CA
28 February 2012

Figure 3. Soils Map

Project Study Area
Soil Boundary (Solano County)
Soil Boundary (Yolo County)

Soil Types:
Rh: Riverwash (Yolo County)
Rw: Riverwash (Solano County)
Ya: Yolo silt loam (Yolo County)
Yo: Yolo loam (Solano County)
W: Water

N
0 1,000 2,000 4,000
Feet
Scale: 1 inch = 2,000 feet

USDA NRCS
Soil Survey Geographic (SSURGO) databases
for Solano County, CA (14 Dec. 2006)
and Yolo County, CA (27 Feb 2007)
http://SoilDataMart.nrcs.usda.gov/
Aerial Photograph:
USGS Digital Ortho Quadrangle (DOQ)
Microsoft TerraServer Map Server

09067StevensonBrdgRdRehab_Fig3SoilsMap.mxd

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Riverwash, Yolo County

Riverwash is a land type consisting of excessively drained, sandy, gravelly, or stony stream and river deposits. Riverwash occupies stream channels and is subject to overflow. Elevation ranges from 5 to 500 feet. Vegetation on this land type is scattered and consists mostly of cottonwood, willow, and saltcedar. Included in mapping are small areas of loamy alluvial land and of Soboba gravelly sandy loam. Permeability is very rapid. Surface runoff is very slow when the land is not flooded, and the available water holding capacity is variable. Riverwash is subject to scouring and deposition. The effective rooting depth is variable, and natural fertility is very low. This land type is used mainly as a source of sand and gravel. It is also used as wildlife habitat and for recreation.

Yolo silt loam, Yolo County

The Yolo series consists of well-drained silt loams and silty clay loams on alluvial fans. Yolo silt loam is on slopes of less than 1 percent. The soils formed in alluvium from sedimentary rocks. Elevation ranges from 25 to 400 feet. The average annual temperature is 60º F; the annual rainfall is 16 to 22 inches, and the frost-free season is about 270 days. In uncultivated areas the vegetation is annual grasses and forbs. In a typical profile, the soil is grayish-brown to pale-brown silt loam and silty clay loam that extends to a depth of more than 60 inches. In some areas the soil is silty clay loam throughout the profile. Yolo silt loam is moderately permeable. Surface runoff is very slow, and the erosion hazard is none to slight. Yolo silt loam is primarily used for almonds, walnuts, corn, sugar beets, tomatoes, alfalfa, and melons. Other uses include dry farmed barley, wildlife habitat, and recreation.

F. National Wetlands Inventory Map

Putah Creek is mapped in the BSA as a perennial river on the USGS Merritt quad map and as a temporarily flooded forested palustrine system (PFOA) on the National Wetlands Inventory online mapper (USFWS 2010). There are no other wetlands or waters in the BSA.

IV. WETLANDS AND WATERS

On 5 June 2007, the Corps issued a memorandum providing guidance on implementation of the Supreme Court's decision in the consolidated cases *Rapanos v. United States* and *Carabell v. United States* (Corps 2007). An evaluation of channels relative to their potential jurisdiction under Section 404 of the Clean Water Act (33 U.S.C. 1344) in light of the June 2007 Rapanos guidance, is in Section V. Waters in the BSA are shown on Figure 4.

A. Waters

Putah Creek: Putah Creek is mapped as a perennial river on the USGS Merritt quad map and as a temporarily flooded forested palustrine system (PFOA) on the National Wetlands Inventory online mapper (USFWS 2010). Putah Creek was flowing during both surveys in March 2011. Putah Creek in the BSA has an approximate average width of 33.5 feet. Approximately 0.42 acres of Putah Creek, at a length of 545 feet, occur in the BSA.

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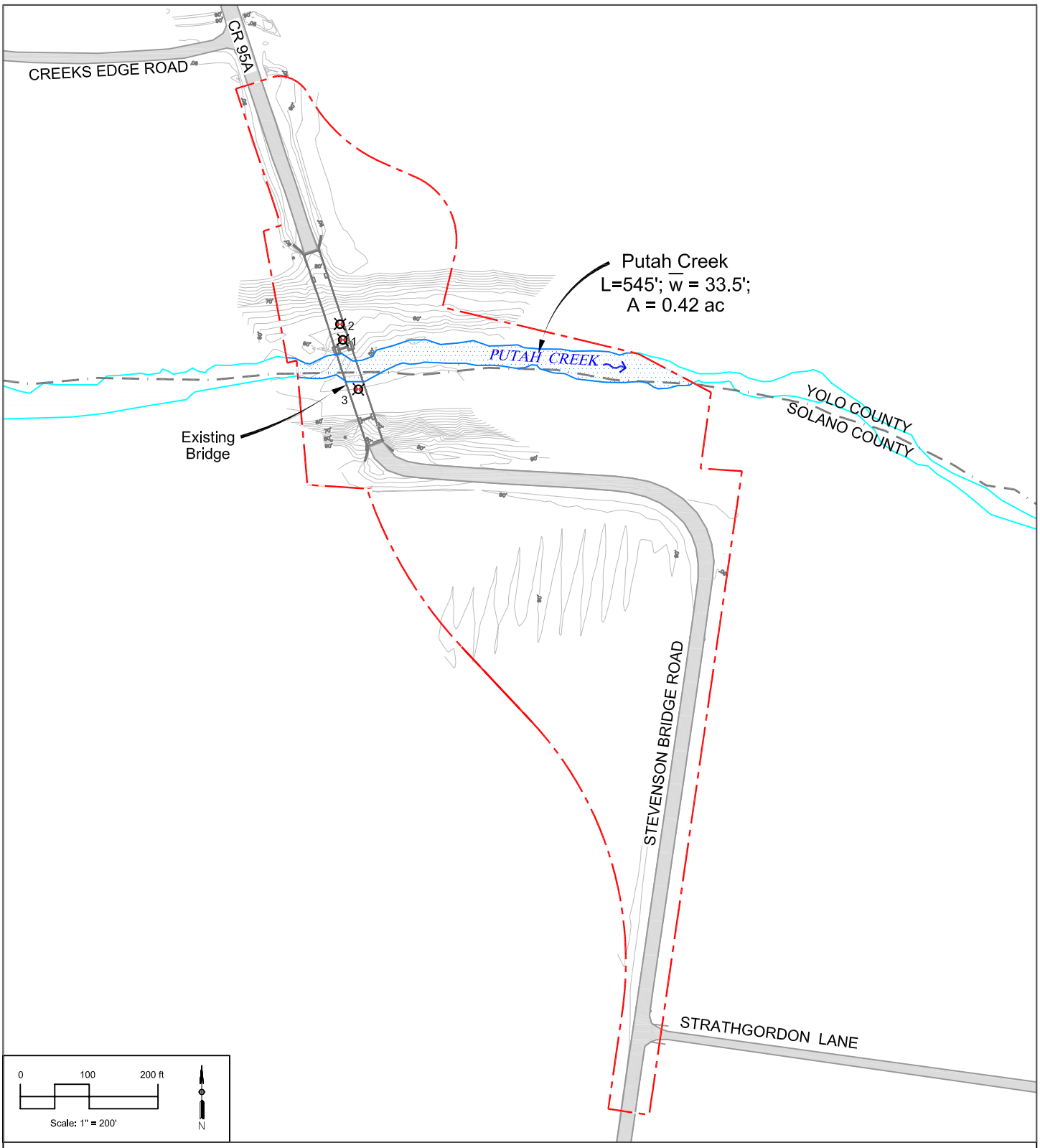

Stevenson Bridge (23C0092) at
Putah Creek Rehabilitation Project
Solano County, CA

28 February 2012

Date	Submittal	Delineators
31 Mar 11	Original Map	LSD, JAE

Project Study Area (PSA)

Putah Creek OHWM

1 Soil data point and number

Basemap:
Topography Map with Alignment
055TEVENSONTO.dwg (14Feb10)
by Solano County Dept. of Resource
Management Public Works
Engineering

Figure 4. Jurisdictional Delineation Map

09067StevensonBridgeRd_v6.dwg

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The bed of Putah Creek is composed of gravel and large rocks. The banks consist of a vegetated riparian bench. The OHWM determination for Putah Creek in the BSA was based on the natural line impressed on the bank; destruction of terrestrial vegetation; presence of litter and debris; wracking; vegetation matted down, bent or absent; sediment sorting; scour; multiple observed flow events; bed and banks; and a change in the plant community (Corps 2005).

The depth and flow of the creek precludes vegetation from growing in the creek bed, with the exception of several clusters of torrent sedge (*Carex nudata*) along the edges. Hydrophytic species in the Fremont cottonwood forest adjacent to Putah Creek include sandbar willow (*Salix exigua*), red willow (*Salix laevigata*), Himalayan blackberry (*Rubus discolor*), and Northern California black walnut (*Juglans californica* var. *hindsii*).

The Putah Creek watershed begins in the Coast Ranges west and outside the BSA. Putah Creek flows east through the BSA underneath Stevenson Bridge to the Yolo Bypass, which connects to the East Toe Drain through a series of irrigation channels. The East Toe Drain connects to slough channels in the Delta (LPCCC 2005).

B. Wetlands

There are no wetlands in the BSA.

V. REGULATORY ANALYSIS AND DISCUSSION

On 5 June 2007, the Corps issued a memorandum providing guidance on implementation of the Supreme Court's decision in the consolidated cases *Rapanos v. United States* and *Carabell v. United States* (Corps 2007). The guidance distinguishes among traditional navigable waters (TNW), relatively permanent waters (RPW), and non-relatively permanent waters (non-RPW). The Corps will routinely exercise jurisdiction over TNWs, RPWs, and wetlands abutting or adjacent to these waters. The jurisdictional determination for non-relatively permanent waters and their adjacent wetlands (if any) will be based on whether there exists a significant nexus with a TNW. Factors evaluated by the Corps during the significant nexus evaluation will include ecology, hydrology, and the influence of the water on the "chemical, physical, and biological integrity of downstream traditional navigable waters" (Corps 2007). The Corps may exert jurisdiction if the findings of the significant nexus evaluation indicate that "the tributary and its adjacent wetlands are likely to have an effect [on downstream traditional navigable waters] that is more than speculative or insubstantial" (Corps 2007).

The Rapanos memorandum (Corps 2007) does not affect the Court's decision in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, No. 99-1178 (January, 2001; "SWANCC") which involved statutory and constitutional challenges to the assertion of CWA jurisdiction over isolated, non-navigable, intrastate waters used as habitat by

migratory birds. Isolated wetlands and waters are not subject to Clean Water Act jurisdiction. Table 2 applies the "significant nexus" status of waters in the BSA.

Wetlands and waters not subject to the Corps' jurisdiction may come under the jurisdiction of DFG and/or the RWQCB. For example, "isolated" wetlands not subject to Section 404 in accordance with the SWANCC decision are subject to regulation by the RWQCB.

Table 2. Proposed Rapanos Guidance Correlation of Wetlands and Waters

Feature	Rapanos Guidance Correlation	Significant Nexus	Jurisdictional Acreage	Non-Jurisdictional Acreage
Putah Creek	RPW	--[1]	0.42	--
Total:			**0.42**	--

[1] The Corps (2007) has determined that RPWs that are tributaries of TNWs are jurisdictional.

A. TNWs and Adjacent Wetlands

No TNWs or wetlands adjacent to TNWs occur in the BSA.

B. RPWs that flow directly or indirectly into TNWs

The portion of Putah Creek in the BSA is an RPW that is an indirect tributary to a TNW. Putah Creek is an RPW because it flows for more than three continuous months during normal precipitation years. Putah Creek in the BSA typically flows year-round (pers. comm. Matt Tuggle). Putah Creek is mapped as a perennial river on the USGS Merritt quad map and as a temporary flooded forested palustrine system (PFOA) on the National Wetlands Inventory online mapper (USFWS 2010).

The Putah Creek watershed begins in the Coast Ranges west and outside the BSA. Putah Creek flows east through the BSA underneath Stevenson Bridge to the Yolo Bypass, which connects to the East Toe Drain through a series of irrigation channels. The East Toe Drain connects to slough channels in the Delta (LPCCC 2005). All waters affected by tidal action are considered traditional navigable waters (33 CFR Part 329). The Toe Drain is close enough to sea level to be tidal (LPCCC 2005). Putah Creek in the BSA is approximately 15.7 river miles upstream from the East Toe Drain.

C. Non-RPWs that flow directly or indirectly into TNWs

No non-RPWs that flow directly or indirectly into TNWs occur in the BSA.

D. Wetlands directly abutting RPWs that flow directly or indirectly into TNWs

No wetlands directly abutting RPWs occur in the BSA.

E. Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs

No wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs occur in the BSA.

F. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs

No wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs occur in the BSA.

G. Impoundments of waters

There are no impoundments of water in the BSA.

H. Isolated (interstate or intrastate) waters, including isolated wetlands

Wetlands that are isolated and lack an interstate or foreign commerce connection, but otherwise meet the three-parameter test for wetlands, are considered "isolated wetlands" and are not regulated by the Corps. No isolated wetlands occur in the BSA.

I. Non-jurisdictional waters

There are no non-jurisdictional waters in the BSA.

J. Summary of Jurisdictional Acreages

A total of 0.42 acres of potential jurisdictional waters occur in the BSA.

VI. LITERATURE CITED

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Personal Communications:

Mr. Rick Marovich. 6 June 2011. Contacted regarding revegetation and restoration efforts on Putah Creek, and fish species surveys on Putah Creek. Putah Creek Streamkeeper, Solano County Water Agency, Vacaville, CA.

Mr. Matt Tuggle. Various 2011. Contacted to discuss various Project related issues. Solano County Department of Resource Management, Public Works Engineering, Fairfield, CA

VII. REPORT PREPARERS

R. John Little, Ph.D., Botany, Claremont Graduate School, Claremont, CA. Over 30 years experience managing and conducting environmental projects involving impact assessment and preparation of numerous NEPA/CEQA compliance documents, Biological Assessments, and Caltrans Natural Environmental Studies. Experience includes conducting special-status plant and wildlife species surveys, jurisdictional wetland delineations, general biological surveys, permitting and biological report preparation. Dr. Little is a trained wetland delineator, an ISA Certified Arborist (WE-1057A), holds a California Department of Fish and Game Scientific Collecting Permit (#801180-01), and DFG Rare, Threatened and Endangered Plant Voucher Collecting Permit (#2081(a)-10-19-V).
Responsibilities: Senior technical lead.

Jeffery Little, A.A., Sacramento City College, Sacramento, CA. With over 18 years as an environmental consultant, Jeff Little is Vice President of Sycamore Environmental and serves as project manager during all phases of environmental development. He evaluates environmental and regulatory constraints to assist his clients determine realistic schedules of permits and entitlements. He prepares and manages CEQA/ NEPA documents and identifies the necessary technical studies during project evaluation. These documents include Caltrans NES and Biological Assessments. He develops project design recommendations to achieve regulatory compliance with the numerous applicable local, state, and federal environmental laws and regulations. During the project entitlements phase, Mr. Little prepares permit applications and mitigation, monitoring, and reporting plans and consults with the Corps to obtain Section 404 Nationwide permits, with Fish and Wildlife Service for both formal and informal section 7 Consultations, with the Department of Fish and Game to obtain 1600 Streambed Alteration Agreements, and with the Regional Water Quality Control Board to obtain Water Quality certifications.

He is the CAD/ GIS Manager responsible for data collection, map creation, impact analyses, and report preparation. He holds a California Department of Fish and Game Scientific Collecting Permit (#801180-04), and a DFG Rare, Threatened and Endangered Plant Voucher Collecting Permit (#08018.1). Mr. Little completed U.S. Army Corps of Engineers approved training for conducting jurisdictional wetland delineations. He has conducted field surveys for special-status species including Valley elderberry longhorn beetle, giant garter snake, California red-legged frog, and Swainson's hawk.
Responsibilities: Project Manager.

Chuck Hughes, M.S., Plant Biology, Michigan State University, East Lansing, MI. Over eight years conducting biological studies for the public and private sector. Prepares and edits biological/botanical resource evaluations, jurisdictional delineations, arborist reports, impact analyses, and mitigation and restoration plans and other documents used in the CEQA/ NEPA process. He conducts informal consultations with regulatory agency personnel and serves as assistant project manager. He is an ISA Certified Arborist (WE-6885A) and Professional Wetland Scientist (2029); holds a Fish and Wildlife Service recovery permit for vernal pool crustaceans (TE799564-3), and holds a California Department of Fish and Game Rare, Threatened and Endangered Plant Voucher Collecting Permit (#08053.1), and a DFG Scientific Collecting Permit (#801265-05). He has completed the California Wildlife Habitat Relationships training program.

Mr. Hughes has conducted field surveys for special-status wildlife including Valley elderberry longhorn beetle, giant garter snake, California red-legged frog, and Swainson's hawk. He has conducted botanical surveys for The Nature Conservancy for four field seasons and has field experience with numerous special-status plant species.
Responsibilities: Plant identification.

Michael Bower, M.S., Ecology, University of California, Davis, CA. Conducts plant and wildlife surveys, provides technical support for wetland delineations, biological resource evaluations, mitigation plans, and other documents used in the CEQA/NEPA process, queries the California Natural Diversity Database (CNDDB/ RareFind), and researches special-status species for projects. Leads public plant identification workshops. He holds a California Department of Fish and Game Rare, Threatened and Endangered Plant Voucher Collecting Permit (#2081(a)-09-14-V).
Responsibilities: Biological survey, plant identification.

Jessica Easley, B.S., Wildlife Biology, University of Montana, College of Forestry and Conservation, Missoula, MT. Conducts plant and wildlife surveys, provides technical support for wetland delineations, biological resource evaluations, mitigation plans, and other documents used in the CEQA/NEPA process, queries the California Natural Diversity Database (CNDDB/ RareFind), and researches special-status species for projects. She is an ISA Certified Arborist (WE-7845A), holds a California Department of Fish and Game Scientific Collecting Permit (#801180-02), and a DFG Rare, Threatened and Endangered Plant Voucher Collecting Permit (#2081(a)-10-06-V). Attended California red-legged frog (*Rana draytonii*) training presented by Norman J. Scott and Galen B. Rathbun (26 Mar 2009 workshop, Elkhorn Slough National Estuarine Research Reserve, Monterey County, CA).
Responsibilities: Biological surveys, wetland delineation, and report preparation.

Leane S. Dunn, M.F., Urban Forestry, University of California, Berkeley, CA and B.S., Ecology and Systematic Biology (emphasis in entomology), California Polytechnic State University, San Luis Obispo, CA. Conducts plant and wildlife surveys, arborist surveys, provides technical support for wetland delineations, biological resource evaluations, certified arborist reports, mitigation plans, and other documents used in the CEQA/NEPA process, queries the California Natural Diversity Database (CNDDB/ RareFind), and researches special-status species for projects. She is an ISA Certified Arborist (WE-7368AU), holds a California Department of Fish and Game Scientific Collecting Permit (#801180-03), and a DFG Rare, Threatened and Endangered Plant Voucher Collecting Permit (#2081(a)-11-09-V).
Responsibilities: Biological surveys, wetland delineation, and report preparation.

Aramis Respall, Over 18 years experience in drafting and design for public and private projects using Autodesk land development and ESRI ArcGIS geospatial programs. His primary experience evolved from conventional surveying and civil engineering practices to advanced GPS and GIS based technology. Past project experience includes CAD/GIS support for road and highway designs, facilities management, highway and airport master planning, noise studies, power transmission line alignments, and various private development projects such as subdivision layouts and golf courses.

Mr. Respall prepares figures for biological and permitting documents such as project location maps, aerial photographs, biological resource maps, CNDDB proximity maps, waters and wetland delineation, proposed project impacts, tree location maps and other supporting graphics. He prepares project location maps and field survey maps for the botanists and biologists to conduct botanical and biological surveys, jurisdictional delineations, and arborist surveys. He uploads and processes raw GPS data to integrate with aerial photos and engineering designs to map natural resources, calculate impacts, and plan mitigation. He provides geospatial analysis and support for projects involving geodesy, hydrology, watershed studies, project impact analysis, CNDDB occurrence records, critical habitat locations and mitigation design.
Responsibilities: Figure preparation and spatial analysis.

Cynthia Little, Principal, Sycamore Environmental.
Responsibilities: Senior editor, quality control.

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Appendix A

Channel Data Sheets

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project
Solano County, CA

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DATA FORM FOR CHANNELS

Field Personnel:	Jessica Easley & Leane Dunn	Channel #:	Putah Creek
Project/ Site:	Stevenson Bridge (23C0092) Rehabilitation Project	Date:	31 March 2011
Applicant/ Owner:	Solano County Department of Resource Management	County, State:	Solano Co., CA

CONDITION OF CHANNEL

Natural Feature: ☒ Yes ☐ No
If no, describe:

Width: (ft)	33.5 ft.
Condition of Channel bed:	Gravel; some large rock.
Condition of Channel banks	Vegetated riparian bench.
Vegetation Present-Bed:	Small clumps of torrent sedge (*Carex nudata*) along the edges.
Vegetation Present-Banks:	*Salix exigua, Rubus discolor, Juglans californica* var. *hindsii*
Water Present:	Yes
Does water flow appear:	☒ Permanent ☐ Intermittent ☐ Ephemeral ☐ Unknown

Evidence of Ordinary High Water Mark: Check All That Apply

☒ Natural line impressed on the bank	☐ Leaf litter disturbed or washed away
☐ Shelving	☒ Scour
☐ Changes in the character of the soil	☐ Deposition
☒ Destruction of terrestrial vegetation	☒ Multiple observed flow events
☒ Presence of litter and debris	☒ Bed and banks
☒ Wracking	☐ Water staining
☒ Vegetation matted down, bent, or absent	☒ Change in plant community
☒ Sediment sorting	

From Corps RGL 05-05

Other comments/ observations:

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Appendix B

Wetland Determination Data Forms – Arid West Region

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project
Solano County, CA

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WETLAND DETERMINATION DATA FORM – Arid West Region
Routine Wetland Determination
(September 2008 V2.0 COE Arid West Wetlands Delineation Manual)

Project/Site: Stevenson Bridge (23C0092) at Putah Creek City/County: Solano County Sampling Date: 31 March 2011
Applicant/Owner: Solano County Department of Resource Management State: CA Sampling Point: **1**
Investigator(s): Jessica Easley & Leane Dunn Section, Township, Range: See Report
Landform (hillslope, terrace, etc.): Creek Bench Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR): C Lat: See Report Long: Datum:
Soil Map Unit Name: Riverwash (Yolo County) NWI classification: None
Are climatic/hydrologic conditions on the site typical for this time of this year? Yes ☒ No ☐ (If no, explain in remarks.)
Are Vegetation ☐ Soil ☐, Or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐ Soil ☐, Or Hydrology ☐ Naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐			
Hydric Soil Present?	Yes ☐	No ☒	Is the Sampled Area		
Wetland Hydrology Present?	Yes ☐	No ☒	within a Wetland?	Yes ☐	No ☒

Remarks:

VEGETATION

Tree Stratum: (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juglans californica* var. *hindsii*	25	D	FAC
2. *Populus fremontii* ssp. *fremontii*	10	D	FACW
3.			
4.			
Total Cover:	35		

Sapling/Shrub Stratum: (Plot size:_____)			
1. *Tamarix parviflora*	10	D	FAC
2. *Quercus lobata*	5	D	FAC
3.			
4.			
5.			
Total Cover:	15		

Herb Stratum: (Plot size:_____)			
1. *Galium aparine*	60	D	FACU
2. *Toxicodendron diversilobum*	5		--
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	65		

Woody Vine Stratum: (Plot size:_____)			
1. *Rubus discolor*	10	D	FACW
2. *Vitis californica*	8	D	FACW
Total Cover:	18		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW or FAC: 6 (A)
Total Number of Dominant Species Across All Strata: 7 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 86% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species:	x 1 =
FACW Species	x 2 =
FAC Species	x 3 =
FACU Species	x 4 =
UPL Species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of Hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Riparian bench above creek.

SOIL Sampling Point: **1**

Profile Description: (Describe the depth needed to document the Indicator or confirm the absence of Indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100	None				Clay loam	

[1]Type : C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface water (A1)
- ☐ High water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible-Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____
Water Table Present? Yes ☐ No ☒ Depth (inches): _____
Saturation Present? Yes ☐ No ☒ Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections, if available:

Remarks: Soil is moist: Creek may have overtopped this bench recently, or water from recent rains.

WETLAND DETERMINATION DATA FORM – Arid West Region
Routine Wetland Determination
(September 2008 V2.0 COE Arid West Wetlands Delineation Manual)

Project/Site: Stevenson Bridge (23C0092) at Putah Creek City/County: Solano County Sampling Date: 31 March 2011
Applicant/Owner: Solano County Department of Resource Management State: CA Sampling Point: **2**
Investigator(s): Jessica Easley & Leane Dunn Section, Township, Range: See Report
Landform (hillslope, terrace, etc.): Creek Bench Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR): C Lat: See Report Long: Datum:
Soil Map Unit Name: Riverwash (Yolo County) NWI classification: None
Are climatic/hydrologic conditions on the site typical for this time of the year? Yes ☒ No ☐ (If no, explain in remarks.)
Are Vegetation ☐ Soil ☐, Or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐ Soil ☐, Or Hydrology ☐ Naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐			
Hydric Soil Present?	Yes ☐	No ☒	Is the Sampled Area		
Wetland Hydrology Present?	Yes ☐	No ☒	within a Wetland?	Yes ☐	No ☒

Remarks:

VEGETATION

Tree Stratum: (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juglans californica* var. *hindsii*	25	D	FAC
2.			
3.			
4.			
Total Cover:	25		
Sapling/Shrub Stratum: (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum: (Plot size:_____)			
1. *Galium aparine*	50	D	FACU
2. *Bromus diandrus*	5		--
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	55		
Woody Vine Stratum: (Plot size:_____)			
1. *Rubus discolor*	10	D	FACW
2.			
Total Cover:	10		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL Species:	x 1 =	
FACW Species	x 2 =	
FAC Species	x 3 =	
FACU Species	x 4 =	
UPL Species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of Hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL Sampling Point: **2**

Profile Description: (Describe the depth needed to document the Indicator or confirm the absence of Indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/3	98.5	5YR 4/6	1.5	C	PL	Clay loam	

[1]Type : C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Rusty barbed wire fence running through pit.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface water (A1)
- ☐ High water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible-Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____
Water Table Present? Yes ☐ No ☒ Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections, if available:

Remarks: Creek appears to have recently flowed over creek bench - damp soil from recent heavy rains.

WETLAND DETERMINATION DATA FORM – Arid West Region
Routine Wetland Determination
(September 2008 V2.0 COE Arid West Wetlands Delineation Manual)

Project/Site: Stevenson Bridge (23C0092) at Putah Creek City/County: Solano County Sampling Date: 31 March 2011
Applicant/Owner: Solano County Department of Resource Management State: CA Sampling Point: **3**
Investigator(s): Jessica Easley & Leane Dunn Section, Township, Range: See Report
Landform (hillslope, terrace, etc.): Terrace; Creek Bench Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): C Lat: See Report Long: Datum:
Soil Map Unit Name: Riverwash (Solano County) NWI classification: None
Are climatic/hydrologic conditions on the site typical for this time of the year? Yes ☒ No ☐ (If no, explain in remarks.)
Are Vegetation ☐ Soil ☐, Or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐ Soil ☐, Or Hydrology ☐ Naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐			
Hydric Soil Present?	Yes ☐	No ☒	Is the Sampled Area		
Wetland Hydrology Present?	Yes ☐	No ☒	within a Wetland?	Yes ☐	No ☒

Remarks:

VEGETATION

Tree Stratum: (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum: (Plot size:_____)			
1. *Salix exigua*	20	D	OBL
2.			
3.			
4.			
5.			
Total Cover:	20		
Herb Stratum: (Plot size:_____)			
1. *Raphanus* sp.	5		--
2. *Galium aparine*	5		FACU
3. *Cardamine oligosperma*	8		FACW
4. *Rumex crispus*	5		FACW
5. *Lolium multiflorum*	70	D	FAC
6.			
7.			
8.			
Total Cover:	93		
Woody Vine Stratum: (Plot size:_____)			
1. *Rubus discolor*	5	D	FACW
2.			
Total Cover:	5		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL Species:	x 1 =	
FACW Species	x 2 =	
FAC Species	x 3 =	
FACU Species	x 4 =	
UPL Species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of Hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL Sampling Point: **3**

Profile Description: (Describe the depth needed to document the Indicator or confirm the absence of Indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/3	100%	--	None			Sandy clay loam	Small gravel

[1]Type : C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Hit large gravel at 26"; Riparian bench.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface water (A1)
- ☐ High water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible-Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____
Water Table Present? Yes ☐ No ☒ Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections, if available:

Remarks:

Appendix C

Plant Species Recorded at Data Points

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project
Solano County, CA

Species	Common Name	Stratum[1]	Indicator[2]
Bromus diandrus	Ripgut grass	H	--
Cardamine oligosperma	Bitter cress	H	FACW
Galium aparine	Goose grass	H	FACU
Julgans californica var. hindsii	N. California black walnut	T	FAC
Lolium multiflorum	Italian ryegrass	H	FAC
Populus fremontii ssp. *fremontii*	Fremont cottonwood	T	FACW
Quercus lobata	Valley oak	T	FAC
Raphanus sp.	Wild radish	S	--
Rubus discolor	Himalayan blackberry	S	FACW
Rumex crispus	Curly dock	H	FACW
Salix exigua	Sandbar willow	T/S	OBL
Tamarix parviflora	Smallflower tamarisk	S	FAC
Toxicodendron diversilobum	Western poison oak	S	--
Vitis californica	California wild grape	S	FACW

[1] Stratum: T = tree; H = herb; S = shrub
[2] Indicator: Wetland Indicator Status (USFWS 1988)

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Appendix D

Photographs

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project
Solano County, CA

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Photo 1: Putah Creek looking west upstream from Stevenson Bridge. 31 Mar 2011.

Photo 2: Putah Creek looking east downstream from Stevenson Bridge. 31 Mar 2011.

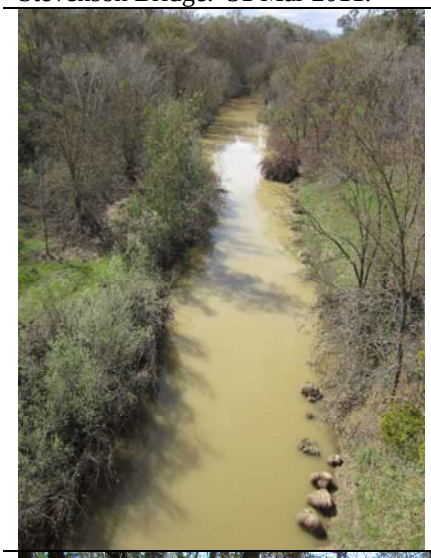

Photo 3: Putah Creek and Fremont cottonwood forest looking west upstream from Stevenson Bridge. 22 Mar 2011.

Photo 4: Looking south under Stevenson Bridge. Steep slopes surrounding Putah Creek. 31 Mar 2011.

Photo 5: Riparian vegetation on north side of Putah Creek, facing east. 31 Mar 2011.

Photo 6: Riparian vegetation on south side of Putah Creek, facing east. 31 Mar 2011.

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Appendix G Revegetation Planting and Erosion Control Specifications

The Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project (Project) is a federally funded project through the Federal Highway Administration (FHWA). The proposed Project involves the rehabilitation of the existing bridge and realignment of a portion of Stevenson Bridge Road. A temporary detour roadway will be used to facilitate rehabilitation of Stevenson Bridge. Erosion control measures will be appropriate for the level of impact that will result from construction of the Project. The Project Engineer shall determine the appropriate erosion control measures to be implemented.

I. Highway Planting

A. General

The work performed in connection with highway planting shall conform to the provisions in Section 20, "Erosion Control and Highway Planting," of the Caltrans Standard Specifications.

B. Highway Planting Materials - General

Native trees 5 inches or greater DBH removed during construction will be replaced at a 3:1 ratio. The replacement native trees shall be obtained from a local nursery. These trees are to be planted within the BSA or at other suitable locations near the BSA. Tree species and quantities of trees to be planted are in Table 3 of the NES. Disturbed soils in the Project area will be hydroseeded with native species.

C. Preparing Planting Areas

Plants adjacent to drainage ditches shall be located so that after construction of the basins, all portions of the basin walls shall be at least 2 feet from the flow line of graded ditches or at least 2.5 feet from the edge of ditches.

D. Preparing Planting Holes

Holes for plants shall be excavated to the minimum dimensions shown on the plans. Holes may be excavated by drilling.

E. Plant Establishment Work

The plant establishment period shall conform to the provisions in Section 20-4.08 of the Caltrans Standard Specifications; shall be Type 2; and shall be not less than 30 working days from completion of construction.

The Contractor shall determine the methods to be used to plant tree species including transporting, storing if required, planting, guying, and maintaining such trees.

Replacement trees shall be maintained from the time the trees are planted to the time of acceptance of the contract, provided that the contract will not be accepted unless the trees have been satisfactorily maintained for at least 30 working days after planting has been completed. The trees shall be watered and fertilized as necessary to maintain the trees in a healthy condition. Trash, debris, and weeds within basins, including the basin walls, shall be removed and disposed of outside the right-of-way as provided in Section 7-1.13 of the Caltrans Standard Specifications. Weeds shall be removed before they exceed 2 inches in height.

The provisions specified in Section 20-4.07, "Replacement," of the Caltrans Standard Specifications for the replacement of unsuitable plants shall apply to planted trees. The replacement tree for each unsuitable plant shall be the same size and species as the tree being replaced. Said trees shall be planted in individual plant holes at the locations designated by the Engineer within the area of the tree being replaced. Removed unsuitable trees shall be disposed of outside the right-of-way as provided in Section 7-1.13 of the Caltrans Standard Specifications.

Weed control, as specified in Section 20-4.08, shall be performed as required. Weeds removed shall be disposed of in conformance with provisions in Section 7-1.13 of the Caltrans Standard Specifications.

F. Environmentally Sensitive Areas

To the extent practical, Solano County will establish Environmentally Sensitive Areas (ESAs) around the dripline of existing oak and other native trees within the BSA that could be affected by Project construction, but which are not scheduled to be removed. Trucks and other vehicles shall not be allowed to park in, nor shall equipment be stored in, an ESA. No storage or dumping of oil, gasoline, or other substances that may be harmful to trees shall be permitted within an ESA. No burning shall be permitted within an ESA. All ESAs shall be clearly delimited with yellow caution tape or temporary fencing prior to commencement of construction activities. Equipment staging locations will be allowed in areas within the BSA that are not designated ESAs.

II. Erosion Control (Type D)

Erosion control (Type D) shall conform to the provisions in Section 20-3 "Erosion Control," of the Caltrans Standard Specifications and the Contract special provisions.

Erosion control work shall consist of applying one application of erosion control materials to embankment slopes, excavation slopes, and other areas designated by the Engineer. The application shall consist of the following: fiber, seed, commercial fertilizer, and water.

A. Materials

Materials shall conform to Section 20-2, "Materials," of the Caltrans Standard Specifications and the following:

1. Seed

Seed shall conform to the provisions in Section 20-2.10 "Seed," of the Caltrans Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed not required to be labeled under the California Food and Agricultural Code shall be tested for purity and germination by a seed laboratory certified by the Association of Official Seed Analysts, or a seed technologist certified by the Society of Commercial Seed Technologists.

Seed shall have been tested for purity and germination not more than one year prior to application of seed or seed shall be retested at the Contractor's expense.

Results from testing or retesting seed for purity and germination shall be furnished to the Engineer prior to applying seed.

The seed mixture shall consist of at least two species from Category A (grasses) and at least four species from Category B (legumes), and one from Category C (wildflowers). These species shall be selected from the following seed mixture table:

Table 1. Seed Mixture

Category	Scientific Name	Common Name	Type	Percentage Purity /& Germination (Minimum)	Pounds per acre
A	*Bromus carinatus*	California brome	Perennial grass	95/85	15
A	*Elymus glaucus*	Blue wild rye	Perennial grass	90/70	15
A	*Festuca californica*	California fescue	Perennial grass	90/70	15
A	*Hordeum brachyantherum* ssp. *californicum*	California barley	Perennial grass	90/70	15
A	*Nassella pulchra*	Valley needlegrass	Perennial grass	90/70	15
A	*Poa secunda*	Pine bluegrass	Perennial grass	90/70	15
B	*Lupinus bicolor*	Miniature lupine	Flowering annual	90/70	10
B	*Lupinus succulentus*	Arroyo lupine	Flowering annual	90/70	10
B	*Trifolium albopurpureum* (any subspecies)	Rancheria clover	Flowering annual	90/90	10
B	*Trifolium microcephalum*	Small-head clover	Flowering annual	90/90	10
B	*Trifolium willdenovii*	Tomcat clover	Flowering annual	90/90	10
C	*Clarkia purpurea* (any subspecies)	Clarkia	Flowering annual	90/70	5
C	*Eschscholzia californica*	California poppy	Flowering annual	90/80	5

2. Commercial Fertilizer

Commercial fertilizer shall conform to the provisions in Section 20-2.02, "Commercial Fertilizer," of the Caltrans Standard Specifications. When required by site specific conditions, modification of the type, amount, and application method of fertilizer application may occur at the engineer's discretion.

A. Application

The following erosion control mixture in the proportions indicated shall be applied with hydro-seeding equipment within 60 minutes after the seed has been added to the mixture:

Material	Pounds Per Acre (Slope Measurement)
Fiber	2,000
Seed	75
Commercial fertilizer	500

When premixed seed from containers is added to hydro-seeding equipment, the entire contents of the containers shall be used in preparing the hydro-seeding mixture. Partial use of a container of premixed seed will not be permitted in a hydro-seeding mixture.

Once erosion control work is started in an area, all applications shall be completed in that area on the same working day. The proportions of erosion control materials may be changed by the Engineer to meet field items in the Engineer's Estimate.

III. Water Quality Protection

A. Water Quality and Erosion Control Goals

The goal of water quality and erosion control is to prevent the loss of soil, to prevent siltation, and to prevent adverse impacts on waterways, such as Putah Creek.

B. Water Quality and Erosion Control Specifications

The proposed Project will adhere to erosion control specifications of the appropriate regulatory and resource agencies including Caltrans, DFG, and RWQCB.

Specific soil erosion control measures to which Solano County has committed include Best Management Practices of the California Stormwater Quality Association (2003), establishing temporary water bars where necessary during the construction phase to reduce the potential for sheet erosion, and minimizing construction impacts in the BSA. Where necessary, disturbed areas will be revegetated upon completion of construction.

IV. Summary

Erosion control materials will be applied to the area affected by the Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project. Specifications of the appropriate regulatory and resource agencies will be followed.

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Appendix H Restoration Plan

I. Introduction

A. Purpose of this Plan

The purpose of the Plan is to describe the approach for restoring the natural communities that will be impacted by the rehabilitation work of the Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project. This Plan describes goals, methods of implementation, and monitoring requirements in accordance with guidance provided by the Corps (2004). This plan incorporates background information from the NES for the Project, including the appendices of the NES.

B. Responsible Parties

1. Applicant:

Solano County Resource Management Department
Public Works Engineering
675 Texas Street, Suite 5500
Fairfield CA 94533
Phone: 707/ 784-6073
Contact: Matthew Tuggle, P.E., Engineering Manager

2. Preparer of mitigation plan:

Sycamore Environmental Consultants, Inc.
6355 Riverside Boulevard, Suite C
Sacramento, CA 95831
Phone: 916/ 427-0703
Fax: 916/ 427-2175
Contact: R. John Little, Ph.D.

3. Parties having financial responsibility for the attainment of the success criteria required by the proposed mitigation plan:

Solano County Resource Management Department (see contact information above).

4. Present owner and expected long-term owner of the proposed mitigation site:

Solano County (see contact information above)

UC Davis
Putah Creek Riparian Preserve
376 Mrak Hall
One Shields Avenue
University of California, Davis
Davis, CA 95616

5. Parties responsible for long-term maintenance of mitigation site:

Solano County Resource Management Department (see contact information above).

II. Project Requiring Restoration

More specific location information concerning the Project location, Project description, and the site characteristics are in the NES, preliminary jurisdictional delineation, and Biological Assessment (Sycamore Environmental 2011).

A. Location

The approximately 9.34-acre Project Biological Study Area (BSA) crosses Putah Creek on the border of Solano County and Yolo County, CA, approximately 5 miles west of Davis and 8 miles east of Winters. The bridge is located along Stevenson Bridge Road in Solano County, and crosses to County Road 95A in Yolo County.

B. Brief Summary of Overall Project

The Project will rehabilitate the existing bridge to address seismic deficiencies, scour, cracks, spalling, and de-lamination, while maintaining the historical architectural features of the bridge. The retaining wall on the south side of the bridge will be reconstructed. A gravel construction access road will be constructed along the northeast side of the bridge and will be maintained permanently. Rock slope protection (RSP) will be used to stabilize the creek bank and prevent scour. A creek crossing will be constructed between Piers 1 and 2, using either culverts and fill or temporary low span/bridge. Stevenson Bridge Road will be realigned to a location approximately 0.20 miles south of the bridge. The south bridge approach will also be realigned through the adjacent orchard to comply with County standards. Utility poles will be relocated by the utility owners. The area disturbed during construction is proposed by this Plan as a mitigation area for impacts associated with rehabilitation of the bridge, and construction of the south road approach.

C. Site Characteristics

The biological communities in the BSA are Valley oak woodland (VOW) and Fremont cottonwood forest (FCF). Both are designated as communities of special concern by DFG. The VOW is dominated by Valley oak with an understory of grass in the topographically level area northeast of the bridge (Section A, Figure 1), and an understory of milk thistle, blue elderberry, western poison oak, and rose along the slopes (Section B, Figure 1). The FCF consists of riparian vegetation dominated by Fremont cottonwood, sandbar willow, red willow, and Northern California black walnut in the overstory and Himalayan blackberry, ripgut grass, goose grass, and cranesbill in the understory.

Putah Creek is a perennial channel flowing through the BSA. FCF occurs along the margins of Putah Creek. The Putah Creek watershed begins in the Coast Ranges west of and outside the BSA, eventually connecting to the East Toe Drain through a series of irrigation channels. Putah Creek is known to support spawning Central Valley Fall-Run Chinook salmon, and is considered EFH for Pacific salmon. Putah Creek may provide potential habitat for Central Valley steelhead DPS. The Project site is not within any federally listed critical habitat.

Elderberry shrubs, suitable habitat for Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*), a federal-threatened species, occur in the BSA. Construction of the proposed Project requires the removal of 29 elderberry shrubs. Impacts to VELB are addressed in the Biological Assessment (Sycamore Environmental 2011). The northeast portion of the Project area occurs in the U.C. Davis Russell Ranch Mitigation Site B. Solano County will coordinate with U.C. Davis as necessary for the construction of the Project.

II. Proposed Mitigation

A. Restoration Plan Goals

The primary goal of this Restoration Plan is to maximize the survival of planted trees and shrubs. Implementing this plan will enhance and contribute to the establishment of VOW and FCF.

B. Replanting Site

Replanting will occur within the BSA on the areas temporarily disturbed by Project activities. The Project will temporarily impact 1.00 acres of VOW and 0.55 acres of FCF.

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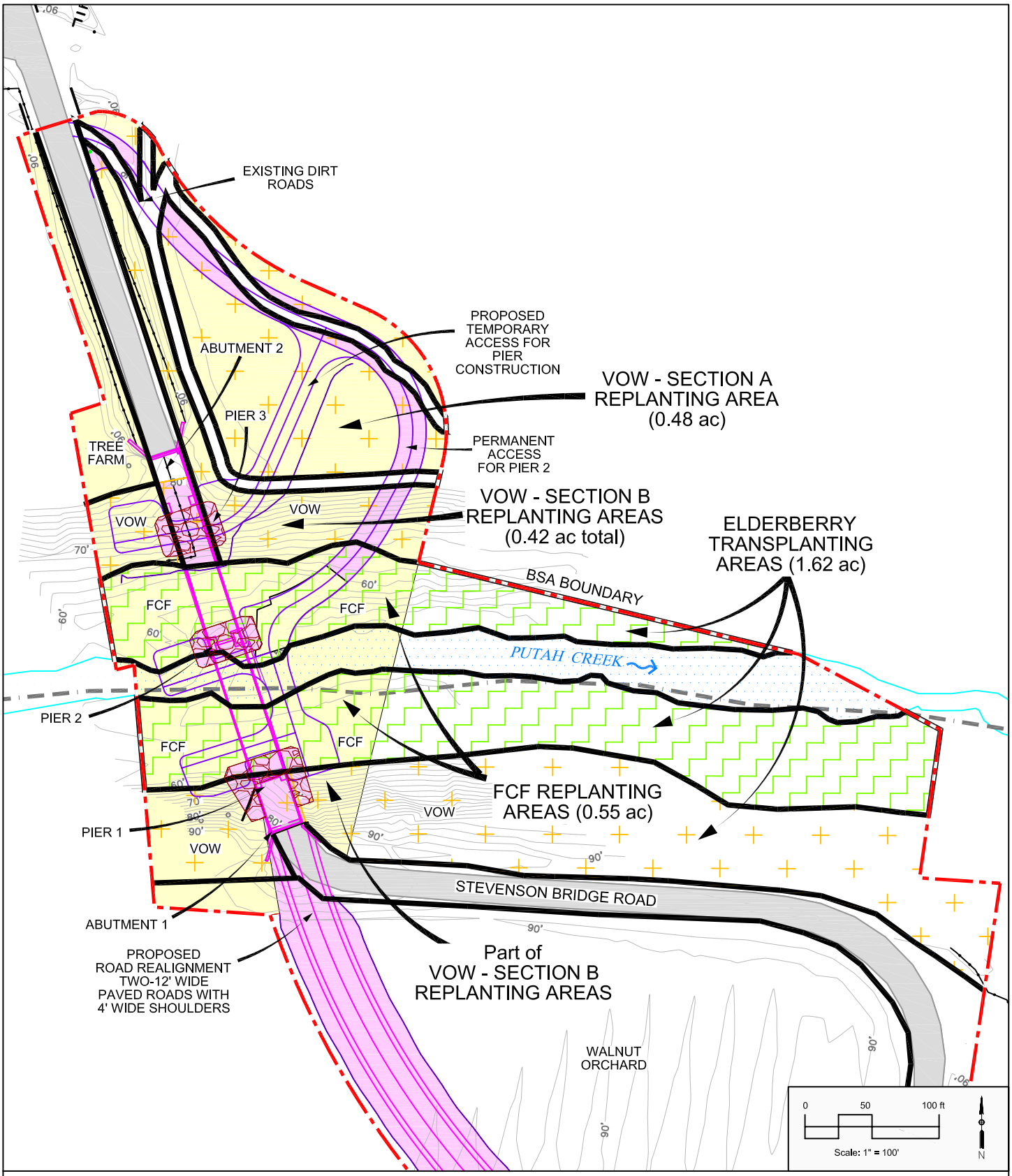

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project
Solano County, CA
28 February 2012

Figure 1. Replanting Plan Map

- Biological Study Area (BSA)
- Biological Community Boundary
- Fremont Cottonwood Forest (FCF)
- Valley Oak Woodland (VOW)
- Proposed Rock Slope Protection (RSP)
- Permanent Impact
- Temporary Impact
- Replanting Areas within FCF (0.55 ac)
- Replanting Areas within VOW Section A (0.48 ac)
- Replanting Areas within VOW Section B (0.42 ac)

Basemap: Topography Map with Proposed Alignment 05STEVENSONTO.dwg (14Feb10) by Solano County Dept. of Resource Management Public Works Engineering

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III. Restoration Design

A. Location and Basis for Design

Temporary impacts as a result of construction activities are proposed to be mitigated on the Project site with revegetation with native species. Permanent impacts to sensitive natural communities include VOW (0.18 acres) and FCF (0.06 acres). Placement of RSP will result in permanent impacts to waters of the U.S. in Putah Creek (< 0.01 acres). Permanent impacts to waters of the U.S. are proposed to be mitigated on the Project site with the use of a soil-rock mixture of RSP to facilitate revegetation.

B. Proposed Restoration Site

The restoration site includes areas in the VOW and FCF that will be temporarily impacted by Project activities. The area on the east side of Road 95A north of Putah Creek is owned by U.C. Davis. The remaining mitigation area is owned by Solano County.

C. Restored Habitats

The Project goal is to restore all Fremont cottonwood forest and Valley oak woodland areas impacted by the Project. The long-term goal is for the restored habitats to approximate the adjacent undisturbed habitats along the river. The Project will restore 1.00 acres of VOW and 0.55 acres of FCF.

IV. Implementation Plan

A. Tree Replacement Requirements

Mr. Rich Marovich, Putah Creek Streamkeeper at the Solano County Water Agency, was contacted on 6 June 2011 to discuss revegetation and restoration efforts on Putah Creek. Mr. Marovich agreed that the following tree species observed on site should be replanted: Valley oak (*Quercus lobata*), Oregon ash (*Fraxinus latifolia*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), box elder (*Acer negundo* ssp. *californicum*), red willow (*Salix laevigata*), and sandbar willow (*Salix exigua*). Western sycamore (*Platanus racemosa*) was recommended in place of Northern California black walnut (*Juglans californica* var. *hindsii*) because walnut is not native to Putah Creek. In addition, Mr. Marovich recommended planting big leaf maple (*Acer macrophyllum*), which is native to other parts of Putah Creek, and white alder (*Alnus rhombifolia*), which provides good fish habitat.

The Project will remove an estimated 22 trees in the BSA. Native trees removed in the FCF and VOW will be replaced at a 3:1 ratio. In addition to tree planting in the BSA, habitat temporarily disturbed during construction will be seeded with native grass and herbaceous species in accordance with Appendix F. A total of 66 native trees will be planted on-site to mitigate for trees removed during Project construction (22 x 3 = 66).

Mitigation for impacts to VELB requires the planting of 34 associative trees. The 34 trees planted to mitigate Project impacts to VELB will be counted towards mitigation for loss of trees removed during Project construction. A total of 32 additional native trees will be planted to archive the 3:1 replacement ratio (66 – 34 = 32; Table 1).

Table 1. Number and Location of Native Replacement Trees to be Planted

Native Tree Species to be Planted	Scientific Name	# needed to satisfy VELB CMMP	# additional trees for Restoration Plan	Total # to be planted in the BSA	# planted in the VOW (Section A)	# planted in the VOW (Section B)	# planted in the FCF
Big leaf maple	*Acer macrophyllum*	3	3	6	0	3	3
Box elder	*Acer negundo* ssp. *californicum*	3	3	6	0	3	3
White alder	*Alnus rhombifolia*	3	3	6	0	0	6[A]
Oregon ash	*Fraxinus latifolia*	3	3	6	0	3	3
Western sycamore	*Platanus racemosa*	3	3	6	0	3	3
Fremont cottonwood	*Populus fremontii* ssp. *fremontii*	3	3	6	0	2	4
Valley oak	*Quercus lobata*	10	8	18	10	8	0
Sandbar willow	*Salix exigua*	3	3	6	0	0	6[B]
Red willow	*Salix laevigata*	3	3	6	0	0	6[B]
Total:		**34**	**32**	**66**	**10**	**22**	**34**

[A] White alder will be planted on the banks of Putah Creek because they provide good habitat for fish (pers. comm. Rich Marovich). [B] 2 of each species of willow will be placed in the RSP (4 total).

Tree planting in the BSA will be in accordance with the planting specifications described in Appendix F (Revegetation Planting and Erosion Control Specifications). After initial planting is completed, the Revegetation Contractor will supply Solano County with an "as-built" report summarizing the mitigation planting. The report will include a map that clearly indicates the locations, numbers, and types of plants that were planted in the Mitigation Area.

B. Site Preparation

There will be no grading included in the site preparation. To reduce introduction of invasive plant species, all mud and debris will be washed off construction equipment prior to entering the site.

Immediately after construction has been completed, appropriate erosion control materials shall be placed on top of the temporarily impacted slopes and surrounding areas containing erosion-prone soils. The erosion control material will be securely anchored. Erosion control material should be biodegradable if possible. Prior to planting, invasive plants will be controlled by a qualified person with an appropriate method given site characteristics.

C. Planting

The County will be responsible, through a vegetation contractor, for preparing the area for planting, planting trees and shrubs, and monitoring the mitigation site for two years. Plantings will be obtained from local sources. Planting shall be conducted with species appropriate for each natural community. Figure 1 is the conceptual restoration plan. Table 1 lists the species and the suggested number of plants to be used in replanting the VOW and FCF.

The FCF and VOW Section B areas include a notable elevation gradient from stream edge to the top of the bank. Plant species found close to the stream in surrounding areas should be replanted close to the stream in the mitigation area (willows). Plant species found in locally elevated (presumably drier) areas far from the stream edge (valley oaks, wild rose) should be replanted in similarly positioned areas within the mitigation area. Remaining species can be planted at appropriate areas within the creek banks and slope (Fremont cottonwood, Western sycamore, etc).

White alders provide good habitat for fish species, and will be planted along the edge of Putah Creek. Willow trees or cuttings will be placed near Putah Creek and within the soil-rock RSP mixture. Valley oak trees will be planted in the VOW Section A.

a) Planting should occur in the fall following completion of the Project.

b) The soil may be compacted and planting holes may need to be excavated with power machinery or picks. Planting holes will be excavated to at least the depth of planting containers and three times the width. Shrubs cleared for construction will be chipped and used as mulch around shrub and tree plantings.

c) Native trees planted will be tagged and numbered to facilitate recording of data and tracking of individual plants. Tags will be loosely fitted to allow for the natural growth of the tree. Placement of the tags on the branches is preferred. Tags will not be nailed into the trunk of young trees. If metal tags are seen girdling any part of the tree, they will be removed and replaced. All tags will be removed at the end of the two year monitoring period.

d) After the native trees and shrubs have been planted in the mitigation site, the County (via the revegetation contractor) will prepare a report summarizing the mitigation planting. The report will include an "as-built" map that will indicate the locations, numbers, and types of plants that were planted in the BSA. The report will be used during future monitoring events to locate plants and assess the success of the mitigation activities and will be supplied to the annual monitor by the County.

D. Putah Creek Streamkeeper Solano County Water Agency

Mr. Marovich, Putah Creek Streamkeeper for the Solano County Water Agency, suggested additional species to be planted in areas disturbed by Project activities. Mr. Marovich stated that volunteers could be provided for additional days of planting. Conducting additional days of planting using volunteers and scheduling with Mr. Marovich is at the discretion of the Solano County Project Manager.

1. Riparian Planting

Below is a list of additional riparian plant species suggested by Mr. Marovich for the Project. Species are based on current vegetation, vegetation known from other areas of Putah Creek, native wildlife species that may benefit, and discouragement of illegal dumping activities.

- Santa Barbara sedge (*Carex barbarae*): Santa Barbara sedge is an understory riparian native to Putah Creek. Santa Barbara sedge should be planted in the FCF along Putah Creek.
- Wild rose (*Rosa californica*): Wild rose is an understory shrub native to Putah Creek. Wild rose provides a good barrier for illegal dumping activities. Wild rose species should be planted on the VOW slopes (Section B).

- Pipevine (*Aristolochia californica*): Pipevine is the host for the pipevine swallowtail, a butterfly native to the area. This species also associates well with oak trees. Pipevine should be planted on the VOW slopes (Section B).
- Naked sedge (*Carex nudata*): Naked sedge is currently found in Putah Creek in the Project area. Naked sedge should be planted in similar areas in the creek along the edge.

2. Upland Planting

Below is a list of additional upland plant species suggested by Mr. Marovich for the Project. Species are based on current vegetation, vegetation known from other areas of Putah Creek, native wildlife species that may benefit, and discouragement of illegal dumping activities.

- Creeping wild rye (*Leymus triticoides*): Creeping wild rye is a native plant that is good at outcompeting milk thistle. Milk thistle is a common introduced plant rated as invasive under Cal-IPC. Milk thistle is located in the upland area at the top of the slope in the Project area. Creeping wild rye should be planted in the upland VOW (Section A) on top of the slope to reduce the spread of milk thistle.
- Mugwort (*Artemisia vulgaris*): Mugwort is a native plant that is also good at outcompeting milk thistle. Mugwort should be planted in the upland VOW (Section A) on top of the slope to reduce the spread of milk thistle.
- Coyote bush (*Baccharis pilularis*): Coyote bush is a common native plant. This species is easy to propagate and provides good wildlife habitat. Coyote bush should be planted in the upland VOW (Section A).
- Quail bush (*Atriplex lentiformis*): Quail bush is a non-native species; however it provides rapid cover and good wildlife habitat. As the name implies, quail bush provides excellent habitat for native California quail. Quail bush should be planted in the upland VOW (Section A).
- Toyon (*Heteromeles arbutifolia*): Toyon is a native species proposed as barrier vegetation for illegal dumping. Illegal dumping is a significant problem in the area, and the bridge is one of the worst sites for trash dumping. Dense thickets of vegetation along the south road alignment may discourage illegal dumping in the area. Toyon should be planted in the ROW on either side of the realigned Stevenson Bridge Road (currently occupied by the walnut orchard).
- Coffeeberry (*Rhamnus californica*): Coffeeberry is a native species proposed as a barrier for illegal dumping. As discussed above, coffeeberry should be planted in the

ROW on either side of the realigned Stevenson Bridge Road (currently occupied by the walnut orchard).

3. Earth Moving

The flood plain elevation along Putah Creek can be lowered to allow more frequent flood plain inundation and benefit native riparian species. Mr. Marovich stated that equipment and volunteers can be provided for earth moving work prior to the County revegetating the area. Lowering of the flood plain elevation is at the discretion of the Solano County Project Manager.

VI. Monitoring and Success Criteria

A. Monitoring

Trees planted will be monitored once yearly for a period of two years, or until the success criteria have been met. During each monitoring event, the condition and number of surviving restoration plantings will be recorded. Natural recruitment of native species will also be recorded. The functioning of any erosion control materials and any occurrences of nonnative or invasive plants will be noted. A general assessment of the condition of the mitigation site will be made. Monitoring of these trees can be conducted concurrently with monitoring required for VELB mitigation.

B. Success Criteria

The goals of this Plan will be considered achieved if 60% of the plants are surviving by the end of the two year monitoring period. Mitigation for impacts to trees removed will be considered successful if 9 native tree plantings (15 trees x 60%) survive the two year monitoring period, and the requirements of the VELB CMMP are met. Native volunteer trees that colonize the BSA will be counted towards the 60% success criterion.

VII. Maintenance

Maintenance during the monitoring period may include upkeep of erosion control materials, additional plantings, control of invasive species, or addition of protective devices for plantings. Maintenance activities will be undertaken based on the results and suggestions of the annual monitoring events and shall be the responsibility of the County.

VIII. Monitoring Reports

A. Initial Monitoring Report

The first monitoring event shall occur approximately one year after the fall planting. The as-built report will be used as a reference for the monitoring events. The first monitoring event shall include a map of the plantings, a description of the methods and materials used, and establishment of photo-documentation points. A copy of the first monitoring report shall be due to the County by 31 December. A data sheet for planting of native restoration trees is in Appendix A.

B. Annual Monitoring Reports

Subsequent monitoring events will occur each year, and will use previous reports to locate plants and assess the success of the mitigation activities. A copy of the annual report shall be due by 31 December each year. Each annual report shall include the results of the monitoring event for that year, and a comparison of the results to the success criteria. A data sheet for annual monitoring of native restoration trees is in Appendix B.

IV. Potential Contingency Measures

If the monitoring report determines that the mitigation site is not meeting or is unlikely to meet the success criteria, then contingency measures shall be recommended by the County. Contingency measures could include additional plantings, different species, different methods, invasive species control, or other measures designed towards the goal of meeting the success criteria.

Within one year of noting that the survival rate has dropped below 60%, the County will replace failed plantings to bring survival above the 60% survival level. If the 60% success criterion is not met at the end of the initial two year monitoring period, Solano County will plant additional trees and continue yearly monitoring until the success criterion is met for two continuous years. It is the responsibility of Solano County to meet the success criteria, including implementation of any contingency measures towards that end.

V. Completion of Mitigation Responsibilities

Restoration is complete if the success criteria are met after the second year of monitoring. If the success criteria are not met after the second year of monitoring, then monitoring shall continue with the same methods and frequency until the success criteria are met for two years.

VI. Long-Term Management Plan

The restoration site will be managed the same as the surrounding habitat after the completion of restoration responsibilities.

VI. Literature Cited and Personal Communications

Literature Cited

Sycamore Environmental Consultants, Inc. 2011. Biological Assessment for Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project, Solano County, CA. Prepared for Solano County Transportation Department.

U.S. Army Corps of Engineers (Corps). 2004. Mitigation and monitoring proposal guidelines. Special Public Notice, San Francisco and Sacramento Districts, CA.

Personal Communications

Mr. Rick Marovich. 6 June 2011. Contacted regarding revegetation and restoration efforts on Putah Creek, and fish species surveys on Putah Creek. Putah Creek Streamkeeper, Solano County Water Agency, Vacaville, CA.

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APPENDIX A

Data Sheet for Planting of Restoration Trees

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project

DATE: _____
NAME OF MONITOR(S):_____

Tag #	Species	Height (ft)	DBH (inch)	Notes/Comments

APPENDIX B

Data Sheet for Annual Monitoring of Restoration Trees

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project

DATE: _____ NAME OF MONITOR(S): _____

Tag #	Species	Vigor[1]	Height (feet)	DBH (inch)	Evidence of New Growth[2]	Evidence of Reproduction[3]	Weeding Needed? (Y/N)	Notes/Comments

[1] **Vigor: G** = Good; **F** = Fair/Marginal; **P** = Poor/Stressed; **D** = Dead.

[2] **Evidence of New Growth: B** = Buds**; S** = Stems**; L** = Leaves.

[3] **Reproduction: FLR** = Flowers**; FR** = Fruits**; S** = Seeds.

Appendix I Valley Elderberry Longhorn Beetle Compensatory Mitigation and Monitoring Plan

I. Introduction and Purpose

The Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project requires transplantation of 29 blue elderberry shrubs (*Sambucus mexicana*), which are the host plant for the Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*; VELB), a federal-threatened species. The purpose of this Compensatory Mitigation and Monitoring Plan (CMMP) is to maximize survival of transplanted elderberry shrubs and their associated plantings in order to provide habitat for VELB.

Sycamore Environmental Consultants, Inc. prepared a NES (Sycamore Environmental 2011a) for Solano County that required the preparation of a Biological Assessment (BA) to evaluate Project effects to VELB. Caltrans, the Federal Highway Administration (FHWA) federal designee, will initiate formal consultation with U.S. Fish and Wildlife Service (USFWS) pursuant to section 7 of the Federal Endangered Species Act (FESA) based on the information provided in the BA and this CMMP. This CMMP incorporates by reference the entire BA for the Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project (Sycamore Environmental 2011b) and follows the Conservation Guidelines for the VELB (USFWS 1999).

The USFWS Conservation Guidelines for VELB are used to assist Federal agencies and non-federal applicants needing incidental take authorization through a section 7 consultation or a section 10(a)(1)(B) permit in developing measures to avoid and minimize adverse impacts to VELB. The guidelines specify measures for avoiding and protecting VELB habitat, transplanting elderberry shrubs that cannot be avoided, mitigation planting of associated elderberry seedlings and other native plant species, long-term protection, annual monitoring, and success criteria (USFWS 1999).

II. Proposed Mitigation

A. Mitigation and Monitoring Plan Goals

The primary goal of this CMMP is to maximize the survival of transplanted elderberry shrubs and their associated plantings, and to provide habitat for VELB.

B. Project Location and VELB Mitigation Site

The 9.34-acre BSA crosses Putah Creek on the border of Solano County and Yolo County, CA, approximately 5 miles west of Davis and 8 miles east of Winters (Figure 1, Figure 2).

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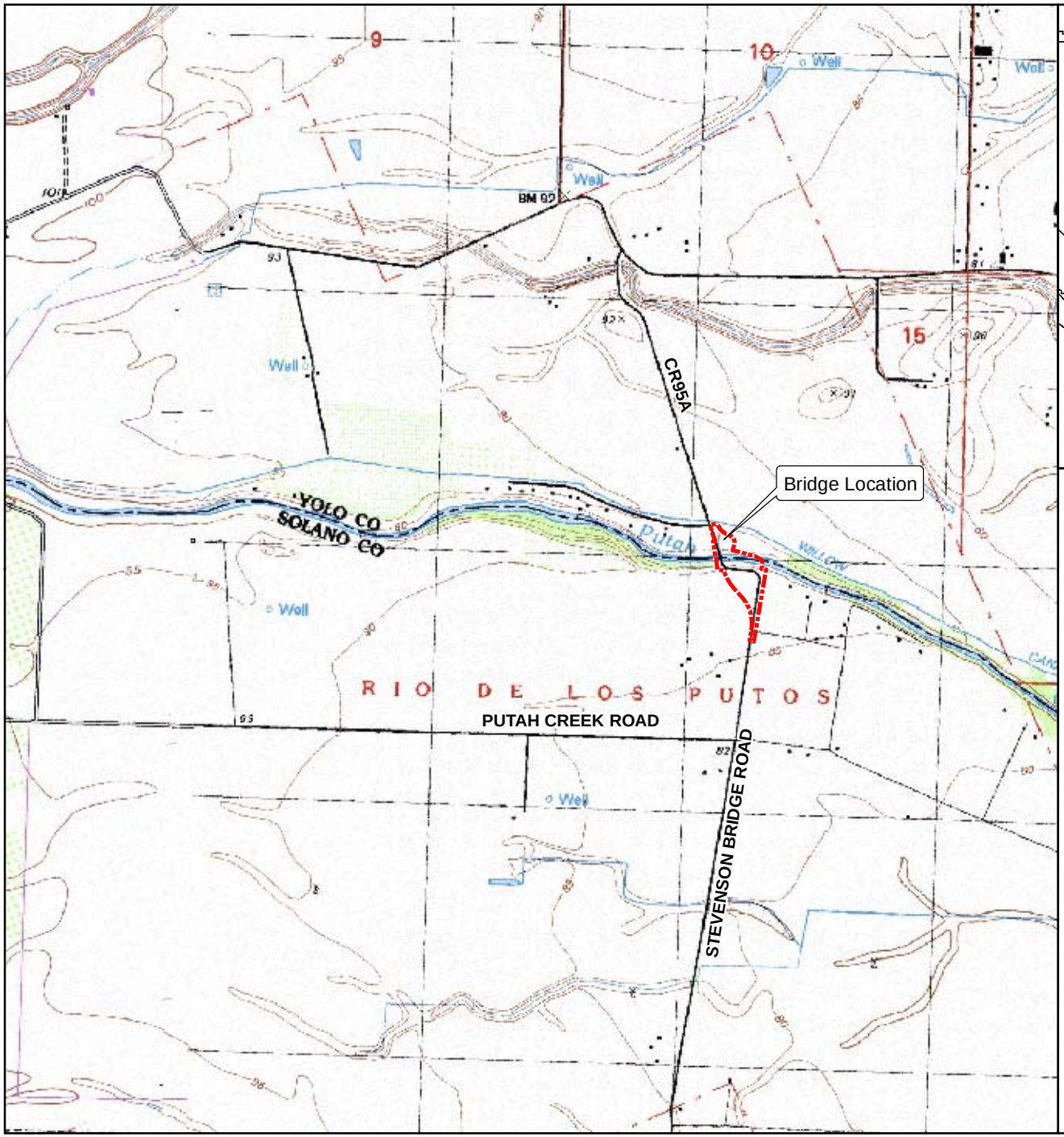

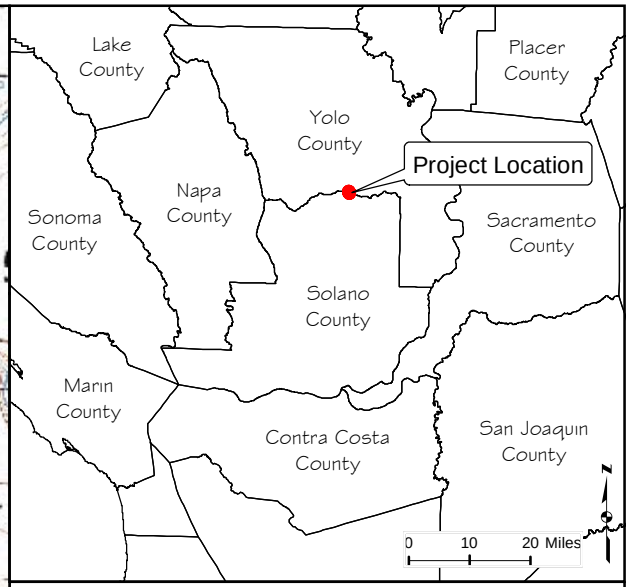

Stevenson Bridge (23C0092) at
Putah Creek Rehabilitation Project
Solano County, CA
28 February 2012

Figure 1. Location Map

Project Location

2,000 1,000 0 2,000 Feet

N

Scale: 1 inch = 2,000 feet

24K DRG:
Merritt, CA (1992)
USGS 7.5' Quad. DRG Mosaics
o_nw0301.sid
California Spatial Information Library (CASIL)

09067StevensonBrdgRdRehab_Fig1LocationMap.mxd

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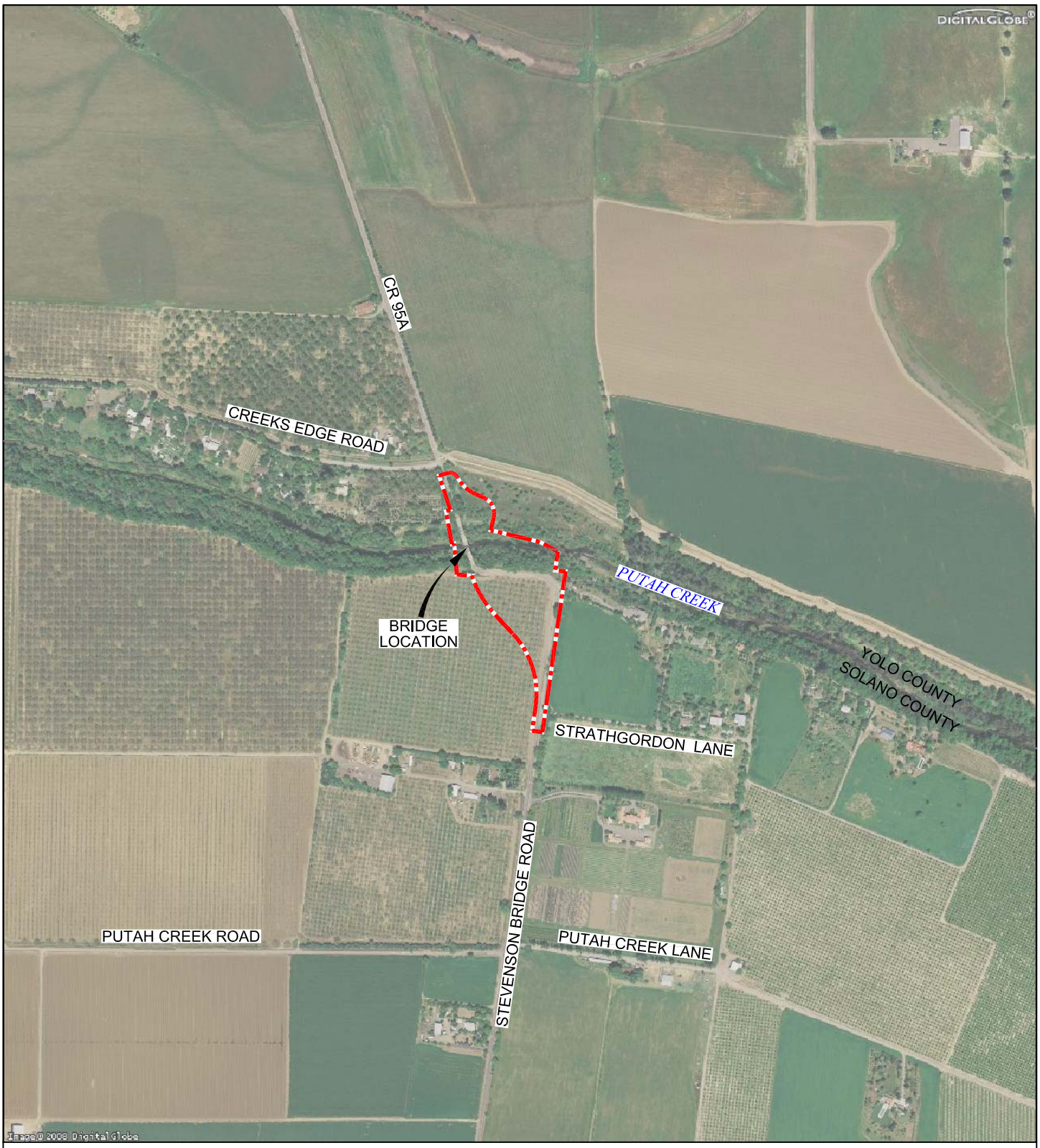

Stevenson Bridge (23C0092) at
Putah Creek Rehabilitation Project
Solano County, CA

28 February 2012

Biological Study Area (BSA)

0 400 800 ft

Scale: 1" = 800'

N

Aerial Photograph:
April 2009, Copyright 2010.
DigitalGlobe, Inc. All rights reserved.

Figure 2. Aerial Photograph

09067StevensonBridgeRd_v6.dwg

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The bridge is located along Stevenson Bridge Road in Solano County, which becomes County Road 95A in Yolo County.

The BSA is on the Merritt USGS topographic quad (unsectionalized portion of the Rio de Los Putos Land Grant) and is in the Lower Sacramento River hydrologic unit (hydrologic unit code 18020109). Elevation in the BSA varies from approximately 60 feet above sea level at the Putah Creek ordinary high water mark (OHWM), to approximately 94 feet above sea level in the surrounding upland area.

The BSA crosses a riparian area, and is surrounded by oak woodland, agricultural, and rural residential land uses. The structures in the BSA include Stevenson Bridge, Stevenson Bridge Road to the south, and Road 95A to the north. Putah Creek flows east through the BSA. The area on the east side of Road 95A north of Putah Creek is owned by U.C. Davis. The remaining mitigation area is owned by Solano County. Adjacent land use consists of the UC Davis Russell Ranch Mitigation Area and agricultural.

The BSA includes Putah Creek, Fremont Cottonwood Forest (FCF) along Putah Creek, Valley Oak Woodland (VOW) on the slopes adjacent to the FCF and on the northeast side of the bridge, an English walnut orchard on the southwest side of the bridge, and a tree farm on the west side of County Road 95A. Elderberry shrubs and associated plants will be transplanted/planted within the BSA boundary. Existing elderberry shrubs impacted by the project will be transplanted in VOW and/or FCF outside the area of construction impacts, east of the bridge. Associated elderberry seedlings and native trees will be used to revegetate the areas temporarily disturbed by construction activities (Figure 3).

C. Proposed Elderberry Mitigation Compensation

The proposed project will require the transplantation of 29 elderberry shrubs composed of a total of 33 stems greater than or equal to one inch diameter at ground level. The USFWS Conservation Guidelines for VELB requires a 1,800 square feet planting area for each elderberry transplant (USFWS 1999). Elderberry mitigation for the Project will require a total of 1.20 acres ([1,800 square feet x 29 EB]/ 43,560 square feet = 1.2 acres) for each transplanted elderberry. The transplanting area east of the bridge (Figure 3) is 1.62 acres. This area is large enough to provide the required 1,800 square feet necessary for each transplanted elderberry shrub.

Studies have shown that VELB is more abundant in dense native plant communities with a mature overstory and a mixed understory (USFWS 1999). Elderberry stems measuring 1.0 inch or greater in diameter at ground level that will be adversely affected (i.e. transplanted) by the project will require additional elderberry seedlings and associated native trees to be planted at the project site or similar sites. The 29 elderberry shrubs that will be transplanted have a total of 33 stems greater than 1.0 inch in diameter. The mitigation ratios in Table 1 are based on the USFWS Conservation Guidelines for VELB (USFWS 1999). As many as 10 associated plantings (elderberry seedlings and/or native trees) *may* be planted within the 1,800 square feet area with each transplanted elderberry. An additional 1,800 square feet shall be provided for every additional 10 associated plantings.

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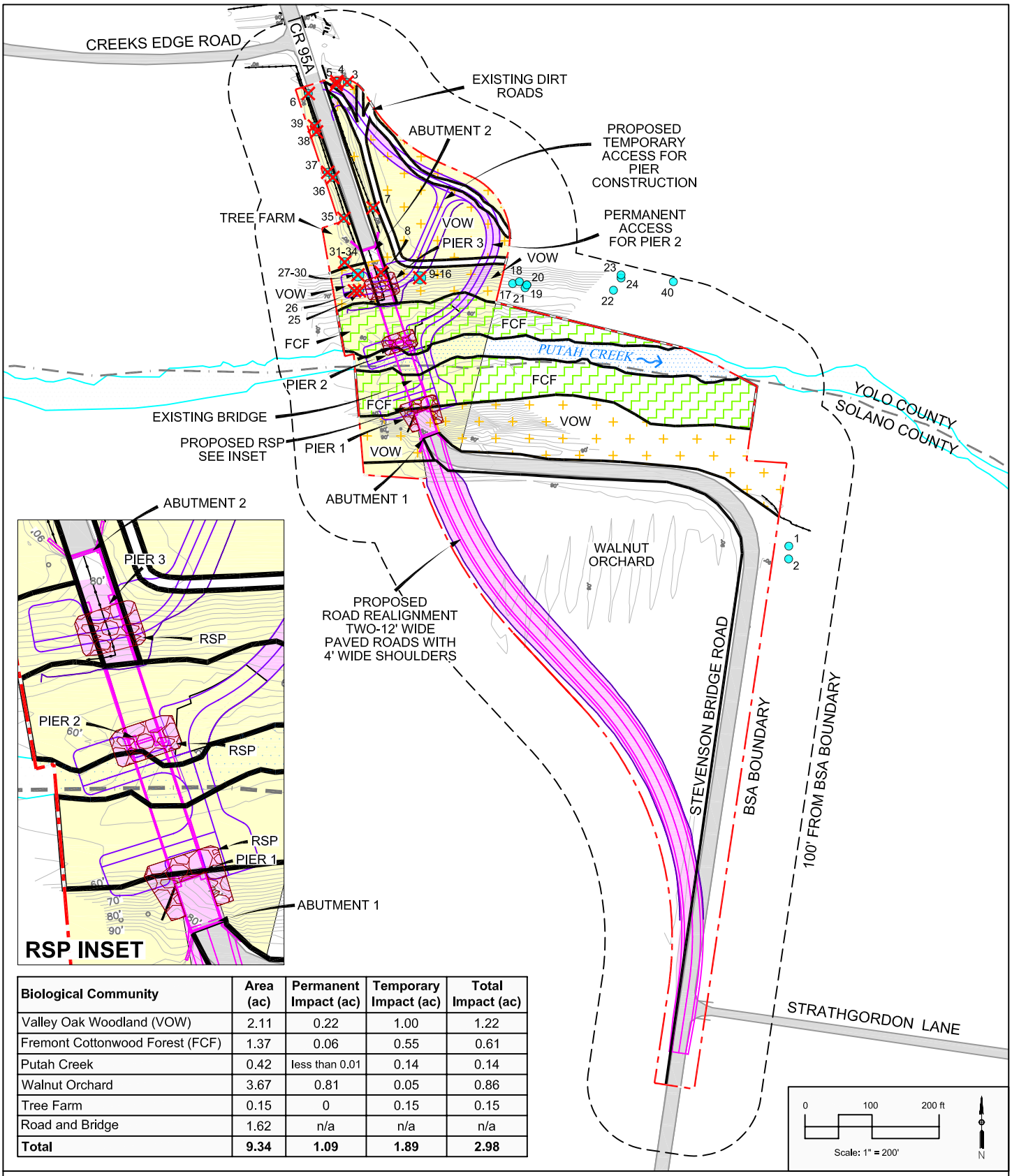

Biological Community	Area (ac)	Permanent Impact (ac)	Temporary Impact (ac)	Total Impact (ac)
Valley Oak Woodland (VOW)	2.11	0.22	1.00	1.22
Fremont Cottonwood Forest (FCF)	1.37	0.06	0.55	0.61
Putah Creek	0.42	less than 0.01	0.14	0.14
Walnut Orchard	3.67	0.81	0.05	0.86
Tree Farm	0.15	0	0.15	0.15
Road and Bridge	1.62	n/a	n/a	n/a
Total	**9.34**	**1.09**	**1.89**	**2.98**

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project
Solano County, CA

28 February 2012

Biological Study Area (BSA)

100' Buffer from BSA boundary

Biological Community Boundary

Putah Creek

25 Elderberry shrub and number

Permanent Impact

Temporary Impact

Fremont Cottonwood Forest (FCF)

Valley Oak Woodland (VOW)

25 Elderberry shrub to be removed

Proposed Rock Slope Protection (RSP)

Basemap: Topography Map with Proposed Alignment 055TEVENSONTO.dwg (14Feb10) by Solano County Dept. of Resource Management Public Works Engineering

Figure 3. Project Impact Map

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Elderberry transplanted areas already contain dense riparian vegetation suitable for VELB. Associated elderberry seedlings and native trees will be used to revegetate areas temporarily disturbed by construction activities. This will ensure the entire area along Putah Creek provides the necessary habitat for VELB. Based on Table 1, a total of 62 elderberry seedlings and 34 native trees will be needed for the transplant of the elderberry shrubs. Every 10 associated plantings (elderberry seedlings and native trees) require at least 1,800 square feet of planting area, for a total of 0.40 acres [62 + 34 = ((96/10) x 1,800 square feet)/43560 = 0.40 acres]. Construction activities will result in temporary disturbance of 1.00 acres of VOW and 0.55 acres of FCF. The temporarily disturbed areas in the BSA contain the area necessary to accommodate the associated elderberry seedlings and native tree plantings.

At the discretion of USFWS, elderberry shrubs unlikely to survive transplantation because of poor condition or location, or would be extremely difficult to move due to access problems, may be exempted from transplantation. Instead, USFWS may allow the County to plant seedlings at higher ratios for each elderberry shrub that cannot be transplanted.

Table 1. VELB Mitigation Ratios

Location	Stems (maximum diameter at ground level)	Exit Holes Present[1]	# of stems	Elderberry seedling ratio[2]	# of elderberry seedlings to plant	Associated native plant ratio[3]	# of associates to plant
Non-riparian	≥1" & ≤ 3"	No	**17**	1:1	17	1:1	17
		Yes	**0**	2:1	0	2:1	0
Non-riparian	≥3" & ≤ 5"	No	**6**	2:1	12	1:1	6
		Yes	**0**	4:1	0	2:1	0
Non-riparian	≥ 5"	No	**9**	3:1	27	1:1	9
		Yes	**1**	6:1	6	2:1	2
Riparian	≥1" & ≤ 3"	No	**0**	2:1	0	1:1	0
		Yes	**0**	4:1	0	2:1	0
Riparian	≥3" & ≤ 5"	No	**0**	3:1	0	1:1	0
		Yes	**0**	6:1	0	2:1	0
Riparian	≥ 5"	No	**0**	4:1	0	1:1	0
		Yes	**0**	8:1	0	2:1	0
		Totals:	**33**		**62**	**--**	**34**

[1] All stems measuring 1.0 inch or greater in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

[2] Ratios correspond to the number of seedlings to be planted per elderberry stem (1.0 inch or greater in diameter at ground level) affected by the Project.

[3] Ratios correspond to the number of associated native species to be planted per elderberry seedling planted.

Compensation Summary

- Transplant the 29 elderberry shrubs
- Plant 62 additional elderberry seedlings
- Plant 34 associated native trees

D. Associated Native Species

Mr. Rich Marovich, Putah Creek Streamkeeper at the Solano County Water Agency, was contacted on 6 June 2011 to discuss revegetation and restoration efforts on Putah Creek. Mr. Marovich said the following tree species should be replanted: Valley oak (*Quercus lobata*), Oregon ash (*Fraxinus latifolia*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), Western sycamore (*Platanus racemosa*), box elder (*Acer negundo* ssp. *californicum*), red willow (*Salix laevigata*), and sandbar willow (*Salix exigua*). In addition, Mr. Marovich recommended planting big leaf maple (*Acer macrophyllum*), which is native to other parts of Putah Creek, and white alder (*Alnus rhombifolia*), which provides good fish habitat. A species list with the number of required planting is in Table 2.

Table 2. Number of Native Replacement Trees to be Planted

Common Name	Scientific Name	# to be Planted
Big leaf maple	*Acer macrophyllum*	3
Box elder	*Acer negundo* ssp. *californicum*	3
White alder	*Alnus rhombifolia*	3
Oregon ash	*Fraxinus latifolia*	3
Western sycamore	*Platanus racemosa*	3
Fremont cottonwood	*Populus fremontii* ssp. *fremontii*	3
Valley oak	*Quercus lobata*	10
Sandbar willow	*Salix exigua*	3
Red willow	*Salix laevigata*	3
	Total:	**34**

III. Preconstruction Activities

A. Elderberry Avoidance and Protection

Suitable beetle habitat that occurs on or within close proximity to the BSA will be protected from disturbance during the construction and operation of the project. The following measures will be implemented prior to the commencement of construction activities:

- Elderberry shrubs will be avoided to the greatest extent feasible.
- The County and/or construction contractor will establish the limits of environmentally sensitive areas (ESAs) around elderberry shrubs within 100ft of project activities. ESAs will be

established through the use of orange mesh fencing, or similar material, prior to construction activities.

- ESA fencing will be placed the greatest distance possible around existing elderberry shrubs. A minimum setback of at least 20 feet from the dripline of each elderberry plant is required.
- Signs will be placed every 50 feet along the edge of the ESA and will state: "*This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment.*" The signs will be readable from a distance of 20 feet and will be maintained for the duration of construction.

B. Transplanting of Elderberry Shrubs

Prior to the commencement of project construction activities, elderberry shrubs within the construction impact footprint with stems that are 1.0 inch or greater at ground level will be transplanted in the BSA. Transplanting will occur outside the area of construction impacts, east of the bridge (Figure 3). The County will determine the specific location for transplanting the shrubs. The following requirements, based on the USFWS Conservation Guidelines for VELB (USFWS 1999), will be adhered to during transplanting activities:

a) A qualified biologist will be on-site during transplanting of elderberry plants to ensure that no unauthorized take of VELB occurs. If unauthorized take occurs, the biologist will have the authority to stop work until corrective measures have been completed. Any unauthorized take will be reported immediately to USFWS and DFG.

b) Each elderberry shrub to be transplanted will be marked by the County with surveyor's tape.

c) Transplanting of elderberries will occur when the plants are dormant, approximately 1 November through 15 February, after they have lost their leaves. This will reduce shock to the elderberries and increase transplanting success.

d) During transplanting, the biological monitor will inspect the stems and roots of transplants to determine presence or absence of VELB exit holes. These data will be recorded on a form similar to Attachment B. Existing exit holes on stems will be marked with white paint (exterior, flat, latex) around each hole. Paint should not enter the hole. Marking holes in this manner will allow monitors in subsequent years to distinguish new exit holes from old ones.

e) Shrubs that cannot be successfully transplanted because they are in a state of decline, in obvious poor health, or for other reasons such that they would not likely survive transplanting will be transported to the mitigation site and left to decompose. Elderberry stems and cuttings will also be left in the mitigation site. Cuttings will not be chipped or destroyed because they may contain developing larvae and/or pupae that could complete development and successfully emerge from dead wood.

f) During transplanting, the biological monitor will ensure that existing elderberry shrubs adjacent to the construction area are not adversely affected.

g) The biological monitor will develop a numbering system for transplanted elderberry shrubs to facilitate the recording of data and the tracking of individual plants. A metal tag will be affixed to each plant, indicating its number. Tags will be loosely fitted to allow for the natural growth of the stems. Placement of the tags on the branches is preferred. Tags will not be nailed into the trunk. If metal tags are seen girdling any part of the plant, they will be removed and replaced. All tags will be removed at the end of the monitoring period. A code will be used to identify it as a transplanted elderberry shrub (TE).

h) After transplanting activities are completed, the biological monitor will obtain baseline data on the transplanted shrubs to establish post-construction monitoring parameters (Section IV). These data will be recorded on a form similar to that in Attachment B.

i) Transplanting Procedure:

   i. Cut the plant back 3 to 6 feet from the ground or to 50% of its height (whichever is taller) by removing branches and stems above this height. The trunk and all stems measuring 1.0 inch or greater in diameter at ground level should be replanted. Any leaves remaining on the plant should be removed.

   ii. Excavate a hole of adequate size to receive the transplant.

   iii. Excavate the plant using a Vemeer spade, backhoe, front end loader, or other suitable equipment, taking as much of the root ball as possible, and replant immediately at the conservation area. Move the plant only by the root ball and wire and wrap it with burlap. Dampen the burlap with water, as necessary, to keep the root ball wet. Do not let the roots dry out. Care should be taken to ensure that the soil is not dislodged from around the roots of the transplant. If the site receiving the transplant does not have adequate soil moisture, pre-wet the soil a day or two before transplantation.

   iv. The planting area must be at least 1,800 square feet for each elderberry transplant. The root ball should be planted so that its top is level with the existing ground. Compact the soil sufficiently so that settlement does not occur. The transplant should have its own water basin measuring at least 3 feet in diameter. Watering basins should have a continuous berm measuring approximately 8 inches wide at the base and 6 inches high.

   v. Saturate the soil with water. Do not use fertilizers or other supplements or paint the tips of the stems with pruning substances, as the effects of these compounds on the beetle are unknown.

   vi. Monitor to ascertain if additional watering is necessary. If the soil is sandy and well-drained, plants may need to be watered weekly or twice monthly. If the soil is clayey and poorly drained, it may not be necessary to water after the initial saturation. However, most transplants require watering through the first summer. A drip watering system and timer is ideal. However, in situations where this is not possible, a water truck or other apparatus may be used.

C. Contractor Training

The County will ensure that all contractors and on-site personnel complete a training session prior to the commencement of construction activities. The purpose of this training is to inform on-site personnel of the need to protect elderberry shrubs and the consequences of causing damage to them. Training materials will be maintained at the job site to ensure that all new untrained personnel receive this training prior to starting work. County personnel or a qualified biologist will perform the initial VELB training to ensure that all on-site personnel:

- Are informed of the legal status of VELB, the presence of this federally-protected animal on the site, and the need to protect its elderberry host shrub;
- Are notified that disturbance of any elderberry shrubs that are not scheduled to be removed could result in a violation of Section 9 of the Endangered Species Act of 1973, as amended, which could result in a fine of up to $50,000 or imprisonment for up to one year, or both; and
- Sign a form attesting to having received this training. A form is provided in Attachment A.

The County will comply with reporting requirements and procedures pursuant to the incidental take of elderberry shrubs as a result of this Project. The Sacramento Endangered Species Office will be notified:

- That the bridge rehabilitation and revegetation contractors have been advised that all on-site personnel must receive VELB training prior to commencing work on the project; and
- If elderberry shrubs outside the construction zone are disturbed. The details surrounding the incident and the corrective measures taken will be reported within 5 working days of any such disturbance.

IV. Post Construction Planting

Phase 3: Plant Elderberry Seedlings and Associated Trees

Elderberry seedlings and associated trees will also be planted in the BSA in temporarily impacted areas after construction activities are complete (Section A and Section B, Figure 3). The revegetation contractor will determine the specific planting locations after consulting with the County. Plantings will be obtained from local sources. Planting shall be conducted with species appropriate for each natural community. Table 2 lists the species and the suggested number of plants to be used in replanting the VOW and FCF.

The FCF and VOW Section B areas include a notable elevation gradient from stream edge to the top of the bank. Plant species found close to the stream in surrounding areas should be replanted close to the stream in the mitigation area (willows). Plant species found in locally elevated (presumably drier) areas far from the stream edge (valley oaks, wild rose) should be replanted in similarly positioned areas within the mitigation area. Remaining species can be planted at appropriate areas within the creek banks and slope (Fremont cottonwood, Western sycamore, etc).

White alders provide good habitat for fish species, and will be planted along the edge of Putah Creek. Willow trees or cuttings will be placed near Putah Creek and within the soil-rock RSP mixture. Valley oak trees will be planted in the VOW Section A.

The following planting measures will be implemented after the completion of construction activities:

a) A total of 62 elderberry seedlings and 34 native trees will be planted in the FCF and Section A and Section B of VOW communities (Figure 3). Tree species and amount of each are listed in Table 2.

b) Container-grown elderberry seedlings and native trees and shrubs will be tagged and numbered to facilitate recording of data and tracking of individual plants. Tags will be loosely fitted to allow for the natural growth of the plants. Placement of the tags on the branches is preferred. Tags will not be nailed into the trunk. If metal tags are seen girdling any part of the tree, they will be removed and replaced. All tags will be removed at the end of the monitoring period. A code will be used to identify the plant as an elderberry seedling (ES) or associated tree for elderberry mitigation (AT).

c) After the elderberry seedlings and associated trees have been planted in the mitigation site, the County (via the revegetation contractor or biological monitor) will prepare a report summarizing the mitigation planting. The report will include an "as-built" map that will indicate the locations, numbers, and types of plants that were planted in the BSA, including elderberries transplanted prior to construction activities. The report will be used during future monitoring events to locate plants and assess the success of the mitigation activities and will be supplied to the annual monitor by the County.

V. Post Construction Maintenance and Monitoring

This section describes the maintenance and monitoring activities that will be implemented after the planting activities have been completed at the VELB mitigation site, based on the USFWS Conservation Guidelines for VELB (USFWS 1999).

Elderberry transplants and associated elderberry seedlings and native trees are required to be monitored for a period of either 10 consecutive years or for 7 years over a 15-yr period. Survey reports are required every year for 10 consecutive years of monitoring. Reports are required on years 1, 2, 3, 5, 7, 10 and 15 for a 15-yr monitoring period. The monitoring report must state which monitoring schedule will be followed.

A. Post-construction Maintenance

The maintenance and monitoring program for the elderberry shrubs and associated trees consists of watering, weeding, and conducting two monitoring visits per monitoring year.

a. Watering

The County will water the transplants and associated species for the first year following transplanting or planting. The watering method, frequency, and regime will be designed to enhance the survival of all plants in order to meet the success criteria.

b. Weeding

The County will remove nonnative plants from the mitigation site once per year. Only mechanical weed removal procedures will be used.

c. Pesticides

Neither the County nor its subcontractors will use pesticides, herbicides, fertilizers, or other chemical agents in the mitigation site.

d. Litter Control

Trash or other foreign material that has accumulated in the mitigation site will be removed within 10 working days of discovery.

e. Signs

A minimum of two signs containing the following information will be prominently placed around the perimeter of the mitigation site.

"This area is habitat of the Valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment."

B. Annual Monitoring Visits

A qualified biologist or other qualified person will monitor the mitigation site twice annually during the appropriate monitoring period beginning the first year that transplanting and planting is completed. Monitoring will occur between 14 February and 30 June of each year. One annual report will summarize the results of both monitoring visits. Monitoring reports requirements are described in Section VII.

1. Methods to Follow for Annual Monitoring:

- The biological monitor will be familiar with the procedures for identifying VELB exit holes (e.g., the distribution, habitat, and status of the Valley elderberry longhorn beetle, USFWS 1991).
- The biological monitor will take photos of new exit holes (prior to marking them with white paint), if they are present. Such evidence will demonstrate that a VELB larva was present inside a transplanted shrub or that the mitigation site has been colonized by VELB.
- The biological monitor will establish at least two photo-documentation points at the mitigation site and will take at least two photos from each point to provide complete coverage of the

mitigation site. These points will be established the first year and the same points and views will be used on subsequent monitoring visits.

2. Information to be Recorded during Annual Monitoring Visits:

- A population census of the adult beetles, including the number of beetles observed, their condition, behavior, and their precise locations. Visual counts shall be used; mark-recapture or other methods involving handling or harassment must not be used.
- A census of beetle exit holes in elderberry stems, noting their precise locations and estimated ages.
- An evaluation of the elderberry shrubs and associated native plants in the mitigation site including the number of plants, their size and condition.
- An evaluation of the adequacy of the fencing, signs, and weed control efforts in the avoidance and mitigation areas.
- A general assessment of the habitat, including any real or potential threats to the beetle and its host plants, such as erosion, fire, excessive grazing, off-road vehicle use, vandalism, excessive weed growth, etc.
- The biological monitor will record data on a data sheet similar to Attachment C. A separate data sheet will be used for each visit. The following information is recorded on the Data Sheet for Annual Site Monitoring:
    - **Vigor** is an estimate of the overall health of the plant, based on the professional judgment of the observer. If there is any question of vigor, the monitor should observe the condition of nearby elderberry shrubs outside the mitigation site.
    - **Height** of the plant is a measurement <u>of the tallest or highest live branch</u> from ground level to the tip. Actual measurements should be made with a tape measure or meter stick when possible.
    - **Evidence of New Growth** is based on the current year's growth. The biological monitor should determine if the plant produced evidence of any new buds, stems, or leaves during the current year.
    - **Evidence of Reproduction** includes flowers, fruits, and seeds. The biological monitor will record if the plant shows signs of having produced any of these structures during the current year.
    - **Exit Holes Present** is a parameter to be determined each visit. After observing stems, the biological monitor will mark the area <u>around</u> new exit holes with white paint. Paint should not enter the hole. Marking holes in this manner will allow the monitor to distinguish new exit holes from old ones. If paint around old exit holes is weathered such that rapid identification is difficult, fresh paint should be applied.

VI. Success Criteria

A minimum survival rate of at least 60% of the elderberry plants and 60% of the associated native plants must be maintained throughout the monitoring period. Native volunteer trees and shrubs that colonize the BSA will be counted towards the 60% success criteria for associated species. The numbers of plants required to meet the 60% survival criteria during the monitoring period are in Table 3.

Survival rate will be determined during each monitoring event. If the survival rate has dropped below 60%, the County will replace the failed plantings within one year of discovery to bring survival above the 60% required level. USFWS will make a determination as to the County's responsibilities due to circumstances beyond the County's control, such as damage or death caused by flooding or vandalism.

Table 3. Survival Rate Required to Achieve the Success Criteria

Plant Type	Original Number Planted	60% Survival
Elderberry shrubs: Transplants (TE) and Seedlings (ES)	29 + 62 = 91	55
Associated trees (AT)	34	21

VII. Monitoring Reports

A. As-Built Report

The first spring monitoring event shall occur after the completion of transplanting and planting activities, and shall serve as the as-built report. The as-built shall include a map of the plantings, a description of the methods and materials used, and establishment of photo-documentation points. The report will be used during future monitoring events to locate plants and assess the success of the mitigation activities. A copy of the as-built report shall be due to the County by 31 December of the year of transplant/planting.

B. Annual Reports

An annual report shall be completed based on an appropriate monitoring schedule. Each annual report shall include the results of the monitoring events for that year and a comparison of the results to the success criteria. The County will submit the annual report to USFWS, California Department of Fish and Game, and the California Academy of Sciences. Original photos, field notes, and correspondence will accompany the copy of the report submitted to the California Academy of Sciences. The Academy will then provide a call number for the annual report. The County will notify USFWS of the call number. A copy of the annual report shall be due by 31 December each year.

The annual report will discuss the previous year's monitoring results and describe any corrective actions that were taken during that monitoring year. The report will:

- Evaluate and summarize the data for the current year compared to previous years;
- Note if evidence of VELB has been observed in the mitigation site; and

- Discuss the condition of the transplanted elderberry shrubs, elderberry seedlings, and associated trees.

The report will specify if the goals are being achieved. Photos taken at the photo documentation points will be included with the report. A discussion of potential problems and recommended corrective actions will also be presented. Table 4 is the distribution list for the annual report.

Table 4. Distribution List for Copies of the Annual Report

USFWS Chief of Endangered Species Sacramento Fish and Wildlife Office Attn.: VELB Report U.S. Fish and Wildlife Service 2800 Cottage Way, W-2605 Sacramento, CA 95825	DFG Supervisor Environmental Service Attn.: VELB Report Department of Fish and Game 1416 Ninth Street, 12th Floor Sacramento, CA 95814
CAS Librarian California Academy of Sciences Attn.: VELB Report 55 Music Concourse Dr. Golden Gate Park San Francisco, CA 94118	DFG Staff Zoologist Attn.: VELB Report Biogeographic Data Branch 1807 13th Street, Suite 202 Sacramento, CA 95811

VIII. Potential Contingency Measures

If the monitoring report determines that the mitigation site is not meeting or is unlikely to meet the success criteria, then contingency measures shall be recommended by the monitoring report. Contingency measures could include additional plantings, different species, different methods, invasive species control, or other measures designed towards the goal of meeting the success criteria. It is the responsibility of Solano County to meet the success criteria, including implementation of any contingency measures towards that end.

IX. Completion of Mitigation Responsibilities

Mitigation is complete if the success criteria are met after the final year of monitoring. If the success criteria are not met after the final year of monitoring, then monitoring shall continue with the same methods and frequency until the success criteria are met.

At the end of the 10 or 15-year monitoring period, the County will request that USFWS conduct a final inspection to verify that the elderberry success criteria have been met and that the mitigation site is functioning. If circumstances beyond the control of the County result in elderberry shrubs being damaged or killed, the County may request that USFWS modify the success criteria in order to complete the mitigation.

X. Long-Term Management Plan

The conservation area must be protected in perpetuity as habitat for the valley elderberry longhorn beetle. A conservation easement or deed restrictions to protect the conservation area must be arranged. Conservation areas may be transferred to a resource agency or appropriate private organization for long-term management. USFWS must be provided with a map and written details identifying the conservation area; and Solano County must receive approval from the Service that the conservation area is acceptable prior to initiating the conservation program. A true, recorded copy of the deed transfer, conservation easement, or deed restrictions protecting the conservation area in perpetuity must be provided to the Service before project implementation.

XI. Summary of Mitigation Actions

This CMMP describes pre-construction transplanting and protection, post-construction planting, maintenance and monitoring, annual reporting, and success criteria. Table 5 presents a summary of these activities.

Table 5. Summary of elderberry monitoring and maintenance plan activities

ACTION	PURPOSE	FREQUENCY	RESPONSIBILITY	SCHEDULE
Transplant elderberry shrubs (inspect for VELB)	To remove existing elderberry clumps from the project site	Once	Solano County or designated representative	Before bridge rehabilitation begins
Monitor transplanting and planting activities	To ensure that correct techniques are used	Once during transplanting and once during planting	Solano County or designated representative	Monitor transplanting activities prior to bridge rehabilitation, and planting activities following project completion
Establish ESA, post signs	To protect elderberry shrubs outside of project area if necessary	Once	Solano County or designated representative	Before bridge rehabilitation begins
Train contractor and all on-site personnel regarding VELB	As per regulations	Once per worker	Solano County or designated representative	As necessary throughout construction period
Report disturbance of elderberry shrubs outside project study area	To inform USFWS	As necessary	Solano County or designated representative	Within 5 working days of disturbance
Plant elderberry seedlings (ES) and associated trees (AT)	Complete mitigation planting	Once	Solano County or designated representative	Plant following project completion
"As-Built" Report for Mitigation Site Planting Plan	Provide map of plant locations and species	Once	Revegetation contractor submits to County	After all planting is completed
Watering	To help transplanted, planted and container-grown plants maintain existing and establish new root systems	As necessary to insure survival of mitigation plantings	Solano County or designated representative	April-September, during the first year after transplanting
Monitoring visits	To evaluate success of transplants and container-grown plants	2 per year	Solano County or designated representative	Between February 14 and June 30 of each year of the monitoring schedule.
Weeding	To remove competition for water and nutrients	1 per year	Solano County or designated representative	Once per year in late spring or early summer for first 5 years

Remove trash	To keep area natural and reduce interference with growth of native trees	As needed	Solano County	As needed
Prepare annual report	To inform USFWS and DFG how the requirements of the Biological Opinion are being met	1 per year	Solano County	Complete by 31 December of each year for 10 years for VELB mitigation
California Academy of Sciences call number	To inform USFWS	Yearly	Solano County	Inform USFWS after the number is received from California Academy of Sciences
Request final inspection	To verify success criteria have been met and mitigation is complete	Once	Solano County	Prior to end of tenth year after mitigation for VELB is implemented
Final report	To verify success criteria have been met and mitigation is complete	At the end of 10 year mitigation period	Solano County	By 31 Dec of final year after VELB mitigation is implemented

XII. Literature Cited and Personal Communications

Literature Cited

Sycamore Environmental Consultants, Inc. 2011a. Natural Environment Study and Jurisdictional Delineation Report for Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project, Solano County, CA. Prepared for Solano County Resource Management Department.

Sycamore Environmental Consultants, Inc. 2011b. Biological Assessment for Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project, Solano County, CA. Prepared for Solano County Resource Management Department.

U.S. Fish and Wildlife Service (USFWS). 1991. The distribution, habitat, and status of the Valley elderberry longhorn beetle. U.S. Fish and Wildlife Service, Sacramento, CA.

U.S. Fish and Wildlife Service. 9 July 1999. Conservation guidelines for the Valley elderberry longhorn beetle. U.S. Fish and Wildlife Service, Sacramento, CA.

Personal Communications:

Mr. Rich Marovich. 6 June 2011. Contacted regarding revegetation and restoration efforts on Putah Creek, and fish species surveys on Putah Creek. Putah Creek Streamkeeper, Solano County Water Agency, Vacaville, CA.

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ATTACHMENT A.

Record Sheet for VELB Training

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project

Elderberry shrubs are the food plant for the Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*; VELB), a federally listed, threatened species. The proposed project has the potential to 'take' VELB habitat through damage to elderberry shrubs within or near the study area that are not scheduled to be transplanted. The term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (Sec. 3(19) Endangered Species Act of 1973, as amended through the 100th Congress, 1988).

Disturbance of elderberry shrubs outside the study area could result in a violation of Section 9 of the Endangered Species Act of 1973, as amended, which could result in a fine of up to $50,000 or imprisonment for up to one year, or both.

Signatures given below acknowledge receipt of information regarding the status of the threatened VELB, the potential presence of this federally protected animal on the site, the need to protect its elderberry host plant, and the consequences resulting from disturbance of elderberry host plants.

Name	Organization & Address	Phone Number	Date

ATTACHMENT B.

Data Sheet for Transplanting and Planting
Elderberry Shrubs and Associated Trees

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project

NAME OF MONITOR(S):_____ DATE: _____

Elderberry Shrubs and Associative Trees			Elderberry Only	
Plant # and Type [1]	**Vigor** [2] **(G; F; P; D)**	**Height of Tallest Stem (feet or meters)**	**Exit Holes Present?** [3] **(Y/N) (S; R)**	**Notes/Comments**

[1] **TE** = Transplanted elderberry; **ES =** Elderberry seedling; **AT** = Associative tree
(Plant number indicated on metal tag affixed to tree or shrub.)

[2] **Vigor: G** = Good; **F** = Fair/Marginal; **P** = Poor/Stressed; **D** = Dead.

[3] **For elderberry shrubs only: are Exit Holes Present? Y/ N; S; R =** Yes/No; Stems; Roots

ATTACHMENT C.

Data Sheet for Annual Monitoring of Elderberry Seedlings and Associative Trees

Stevenson Bridge (23C0092) at Putah Creek Rehabilitation Project

NAME OF MONITOR(S): _____ DATE: _____

Elderberry Shrubs and Associative Trees						Elderberry Only	
Plant # and Type[1]	**Vigor[2] (G; F; P; D)**	**Height (feet or meters)**	**Evidence of New Growth[3] (B; S; L)**	**Evidence of Reproduction[4] (FLR; FR; S)**	**Weeding Needed? (Y/N)**	**Exit Holes Present?[5] (Y/N) (S; R)**	**Notes/Comments**

[1] **TE** = Transplanted elderberry; **ES =** Elderberry seedling; **AT** = Associative tree (Plant number indicated on metal tag affixed to tree or shrub.)

[2] **Vigor: G** = Good; **F** = Fair/Marginal; **P** = Poor/Stressed; **D** = Dead.

[3] **Evidence of New Growth: B** = Buds**; S** = Stems**; L** = Leaves.

[4] **Reproduction: FLR** = Flowers**; FR** = Fruits**; S** = Seeds.

[5] **For elderberry shrubs only: are Exit Holes Present? Y/N; S; R = Yes/No; Stems; Roots.**

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